ARTIFICIAL INTELLIGENCE INTEGRATION IN SOCIAL SCIENCE

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ABOUT THE BOOK

Artificial Intelligence (AI) is a Cognitive Science and the history of its evolution suggests that it has grown out of the knowledge derived from disciplines such as Science, Mathematics, Philosophy, Sociology, Computing and others. Hence, it is fair for any education system to recognize the importance of integrating AI Readiness to maximize learning across other disciplines.

AI is being widely recognized to be the power that will fuel the future global digital economy; and has gained geo-strategic importance. A large number of countries are striving hard to stay ahead with their policy initiatives, to get their youth ready to function in an environment driven by AI and other emerging technologies.

India's own AI Strategy identifies AI as an opportunity and solution provider for inclusive economic growth and social development. The report also identifies the importance of skills-based education (as opposed to knowledge intensive education), and the value of project related work in order to "effectively harness the potential of AI in a sustainable manner" and to make India's next generation 'AI ready'.

CBSE has introduced Artificial Intelligence as an optional subject at Class 9 from the Session 2019-2020 onwards and has been conducting trainings for Teachers on how to use AI in the Classroom. A Training Video has also been prepared to assist the same.

CBSE has also announced AI as a multi-disciplinary integrated pedagogical approach to further enhance teaching and learning across classes 6 to 10. This document is an attempt to propose how schools may train the trainers to match relevant topics/ themes from the curricula with AI concepts. It contains details on the importance of Artificial Intelligence and Artificial Intelligence Tools as a pedagogical support for experiential learning. Guidelines for Teachers can be found in the form of Lesson Plans integrating AI in Classroom Teaching.

How this Integration Document was created

In keeping with the vision of CBSE to introduce and train Teachers on AI readiness, and the usage of AI in classroom teaching and learning practices; a series of online webinars were conducted with AI experts and Teachers of various Subjects from CBSE Schools. (*see Figure 1*)

Lesson Plans in each Subject were discussed and written, and a suggestive list of activities and projects integrating Artificial Intelligence into regular subject teaching was curated and compiled. An AI Glossary, relevant to each Lesson Plan was created to facilitate ease of reference and usage. At the same time a comprehensive glossary of AI Tools used by all the subject teachers has been added to each of the subject document. for reflection and necessary follow up by teachers.

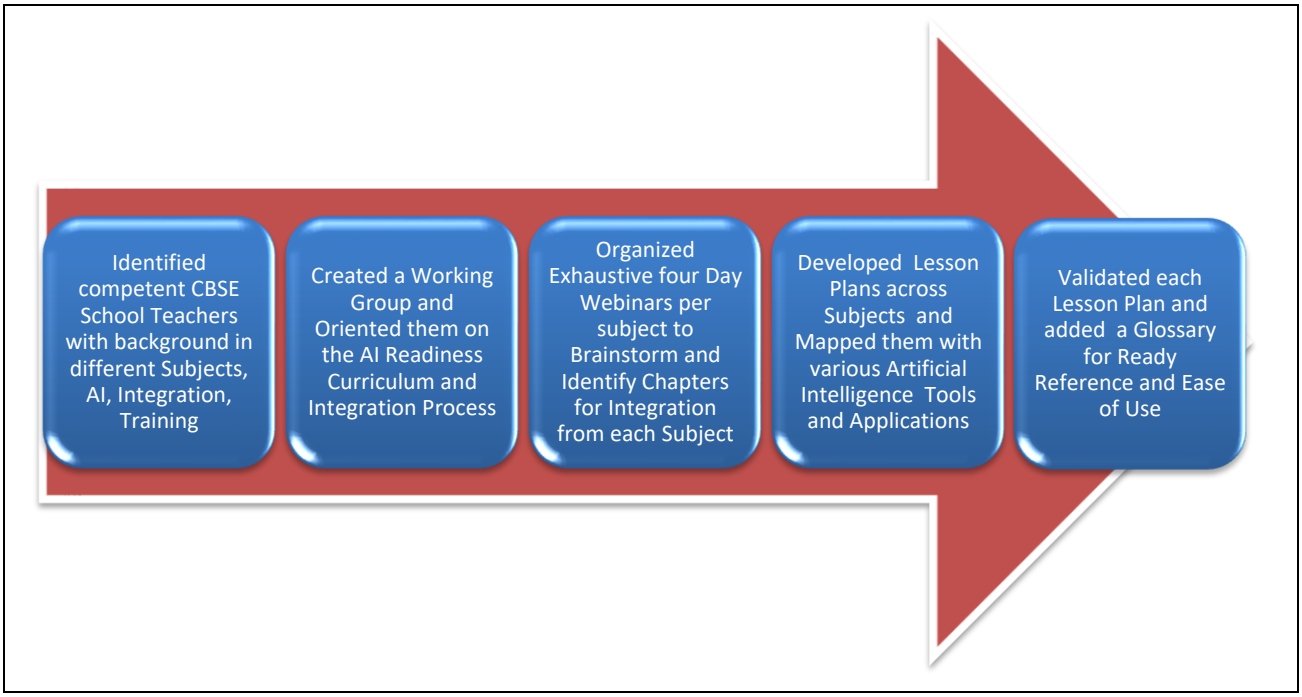

Figure 1: How this Integration Document was created

It is important to understand that AI is one of the cognitive science disciplines that provides tools to build intelligence in contrast to other disciplines that just study and analyze the external behavior of intelligent agents. Realizing this need, it has been decided that all teachers teaching in CBSE schools should familiarize themselves with the prevalent AI knowledge and use it to make learning of their subjects more effective and student centered. It is visualized that such a step would help to build larger understanding of AI among teacher and student communities.

It is highly recommended that teachers explore the Exemplar Lesson Plans and Glossary in this document, and go beyond what has been showcased, to develop more such exemplars and teaching methodologies integrating Artificial Intelligence in day to day learning across subjects, for students.

Disclaimer: **Individual lesson plans have been created and edited by the contributing teachers as per their respective beliefs and understanding. The originality of their perception has been maintained while curating this document**

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Chapter 4 Appendices

CHAPTER 1

AN INTRODUCTION TO ARTIFICIAL INTELLIGENCE

1.1 What is Artificial Intelligence?

Artificial Intelligence has always been a term which intrigues people all over the world. Artificial Intelligence (AI) refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making; it is inspired by the ways people use their brains to perceive, learn, reason out and decide the action.

Various organizations have coined their own versions of defining Artificial Intelligence. Some of them are mentioned below:

NITI Aayog: National Strategy for Artificial Intelligence

AI refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making. Initially conceived as a technology that could mimic human intelligence, AI has evolved in ways that far exceed its original conception. With incredible advances made in data collection, processing and computation power, intelligent systems can now be deployed to take over a variety of tasks, enable connectivity and enhance productivity.

World Economic Forum

Artificial intelligence (AI) is the software engine that drives the Fourth Industrial Revolution. Its impact can already be seen in homes, businesses and political processes. In its embodied form of robots, it will soon be driving cars, stocking warehouses and caring for the young and elderly. It holds the promise of solving some of the most pressing issues facing society, but also presents challenges such as inscrutable “black box” algorithms, unethical use of data and potential job displacement. As rapid advances in machine learning (ML) increase the scope and scale of AI’s deployment across all aspects of daily life, and as the technology itself can learn and change on its own, multi-stakeholder collaboration is required to optimize accountability, transparency, privacy and impartiality to create trust.

European Artificial Intelligence (AI) leadership, the path for an integrated vision AI is not a well-defined technology and no universally agreed definition exists. It is rather a cover term for techniques associated with data analysis and pattern recognition. AI is not a new technology, having existed since the 1950s. While some markets, sectors and individual businesses are more advanced than others, AI is still at a relatively early stage of development, so that the range of potential applications, and the quality of most existing applications, have ample margins left for further development and improvement.

Encyclopedia Britannica

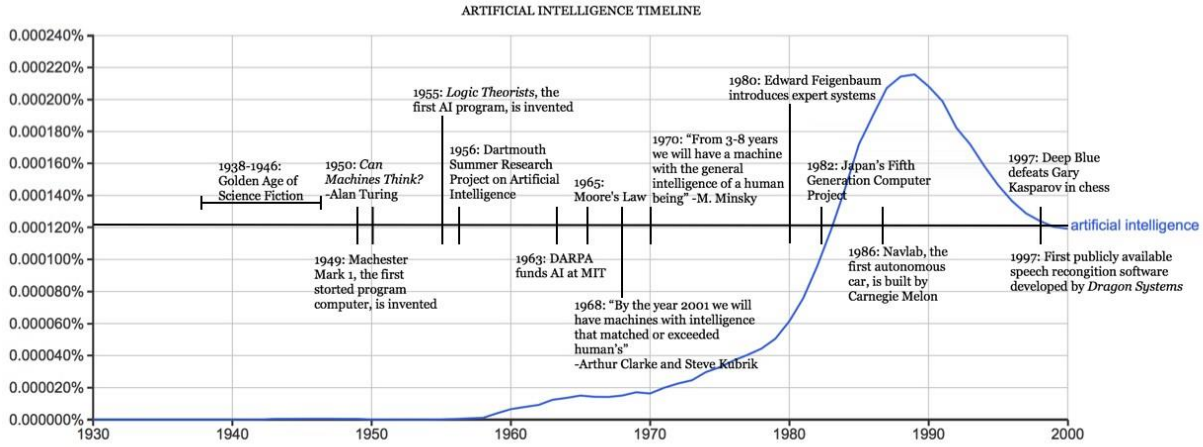
Artificial intelligence (AI), is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize or learn, from past experience.

In other words, AI can be defined as:

AI is a form of intelligence, a type of technology and a field of study. AI theory and development of computer systems (both machines and software) are able to perform tasks that normally require human intelligence. Artificial Intelligence covers a broad range of domains and applications and is expected to impact every field in the future. Overall, its core idea is building machines and algorithms which are capable of performing computational tasks that would otherwise require human like brain functions.

1.1.1 History of AI – Live Science

The beginnings of modern **AI** can be traced to classical philosophers' attempts to describe human thinking as a symbolic system. (see Annexure 4.5) But the field of **AI** wasn't formally founded until 1956, at a conference at Dartmouth College, in Hanover, New Hampshire, where the term "**Artificial Intelligence**" was coined. The graphic below appropriately explains why AI is a live science, what are the ups and downs in the pace of AI journey and how AI progressed in this domain from the year 1930-2000.

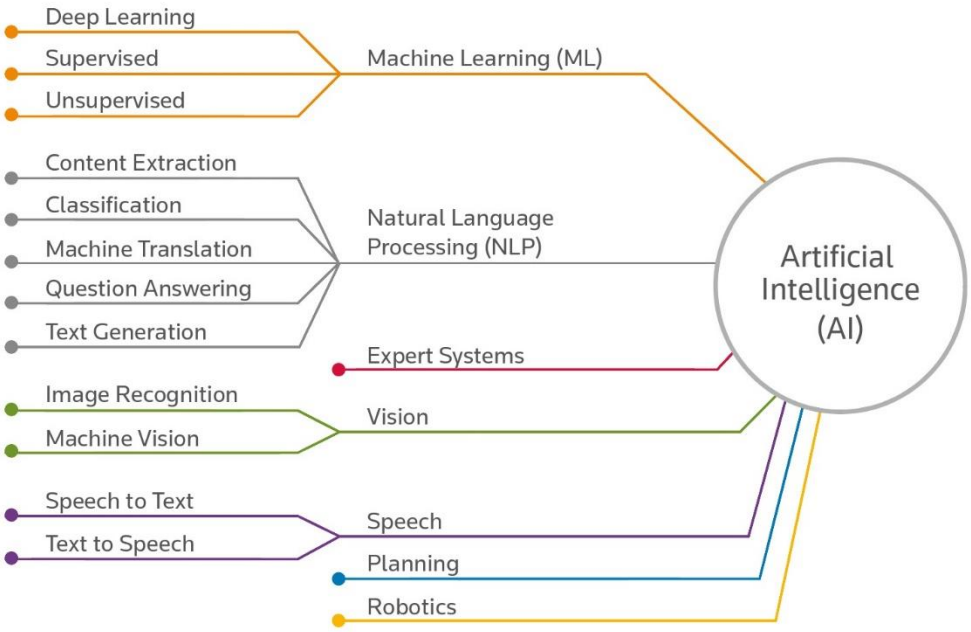


http://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/

1.2 What do we understand by AI in EDUCATION?

An effective education system has the dual responsibility to develop the most critical resource (i e the human resource) of a nation.1-, that the younger generations must be educated in a way that they are 'ready for life' and are positive contributors to the advancement & enrichment of their nation.2- , they must be exposed to such learning environments with the help of updated tools and enlightened teachers so that their learning outcomes can be maximized and suited to the potential of every learner. In order that modern-day education achieves its goals of making its students 'AI Ready', it is imperative to know what K-12 learners must experience and confront in their day to day life.

AI is underlying the multitudes of its applications in the world; it encompasses and works on an array of capabilities which have universal application in different areas of study and operations. Some of the most important AI competencies with significant commonalities and connections with those of the other fields of study are shown in the graphic below.



http://www.fullai.org/short-history-artificial-intelligence/

A careful study of the above graph would lead us to believe that many of the technologies and the underlying principles that each of these follows, have a strong correlation with the teaching learning processes at school as well as college levels. Hence it is necessary that AI should not only be introduced as a subject in the school curricula, but also should become a link to teach other subjects at all the levels. Many of the AI based applications are now available to facilitate a learner to learn in his own unique way and at his own pace.

1.3 What is CBSE's initiative encompassing Artificial Education?

Making school students 'AI Aware' or forging 'AI Readiness' among students is a huge task indeed. Central Board of Secondary Education has taken a '***twin initiative'*** in this regard.

First is to introduce AI as an elective subject in classes 8,9 and 10. To begin with, schools have to apply to CBSE and be approved to run this course. AI curriculum for classes 8 and 9 has been chalked out and a Facilitators' Handbook has been produced. CBSE is also supporting extensive teacher training for the teaching of AI in schools.

The ***Second*** part of *CBSE* initiative deals with the premise that AI is a Cognitive Science which can be linked to various subjects that concern themselves with cognition and reasoning. Almost every one of the school subjects would fall in this domain. Be it - Mathematics, Computing, Neuro-Sciences, Psychology, Physics, Economics, Sociology, Philosophy, Languages and some others. It is, therefore, mandated by CBSE that all its schools begin to integrate AI with other disciplines from classes 1 -12.

1.4 What is the rationale for this Twin Initiative?

Initiative 1: Artificial Intelligence permeates the length and breadth of the world we live in today. Our young generation is witnessing many uses of AI every day. While Google manages our mail accounts, it also makes suggestions about what words to use to respond to a given email and/ or project follow up reminders. Facebook not only connects us with friends but also makes suggestions about our priorities, personal needs and preferences. Today we witness smart parking spaces as well as have cars that park themselves. In many advanced countries the traffic is monitored, controlled and managed by using the data collected of moving traffic and prevalent weather conditions. Chat bots collect data for big and small businesses to assess the market requirements of their products and also support the respective business houses in interaction with the customer and resultant satisfaction. There are also AI powered devices to support households in simple tasks such as cleaning etc. All the domains of life - from medicine to manufacturing to national security and defense – are currently getting impacted by the use of Artificial Intelligence. Space missions, which extensively use unmanned space shuttles and unmanned vehicles to traverse the unknown areas of other planets, collect tremendous data not only to understand the planet they go to but also to acquire intelligence about the betterment of their own operations in future. Hence, it is essential that students of today should study this domain to understand and later be able to expand this knowledge in their own interest and in the interest of humanity.

Initiative 2: It is important to understand that AI is one amongst the cognitive science disciplines that provides tools to build intelligence in contrast to other disciplines that just study and analyze the external behavior of intelligent agents. Realizing this need, it has been decided that all teachers teaching in CBSE schools should familiarize themselves with the prevalent AI knowledge and use it to make learning of their subjects more effective and student centered. It is visualized that such a step would help to build larger understanding of AI amongst the teacher and student communities.

This document is an attempt to suggest how schools may train the teachers of class 6 –10 to relate to the relevant topics/ themes from their respective curricula with technologies that AI deploys. The document will also showcase to the teachers the AI based tools that can support and augment learning across disciplines, in and out of the classrooms. The extensive AI glossary and the App Matrix is an effort to include a list of varied resources for teachers to extend the integration activity to other topics of their respective subjects.

1.5 What do we mean by AI Integrated Education?

AI integration with the other school disciplines is to be viewed from two different perspectives.

Perspective 1: While exploring the possibilities to integrate subjects with AI, it was felt that it can be a two-way process. The teacher may select a topic from the subject that easily lends itself to any one of the AI concepts. He/she would, then, either select the AI concept as a tool to teach the subject topic chosen by him/her or using the understanding of the topic, he/she may be able to show a linkage to AI knowledge and usage.

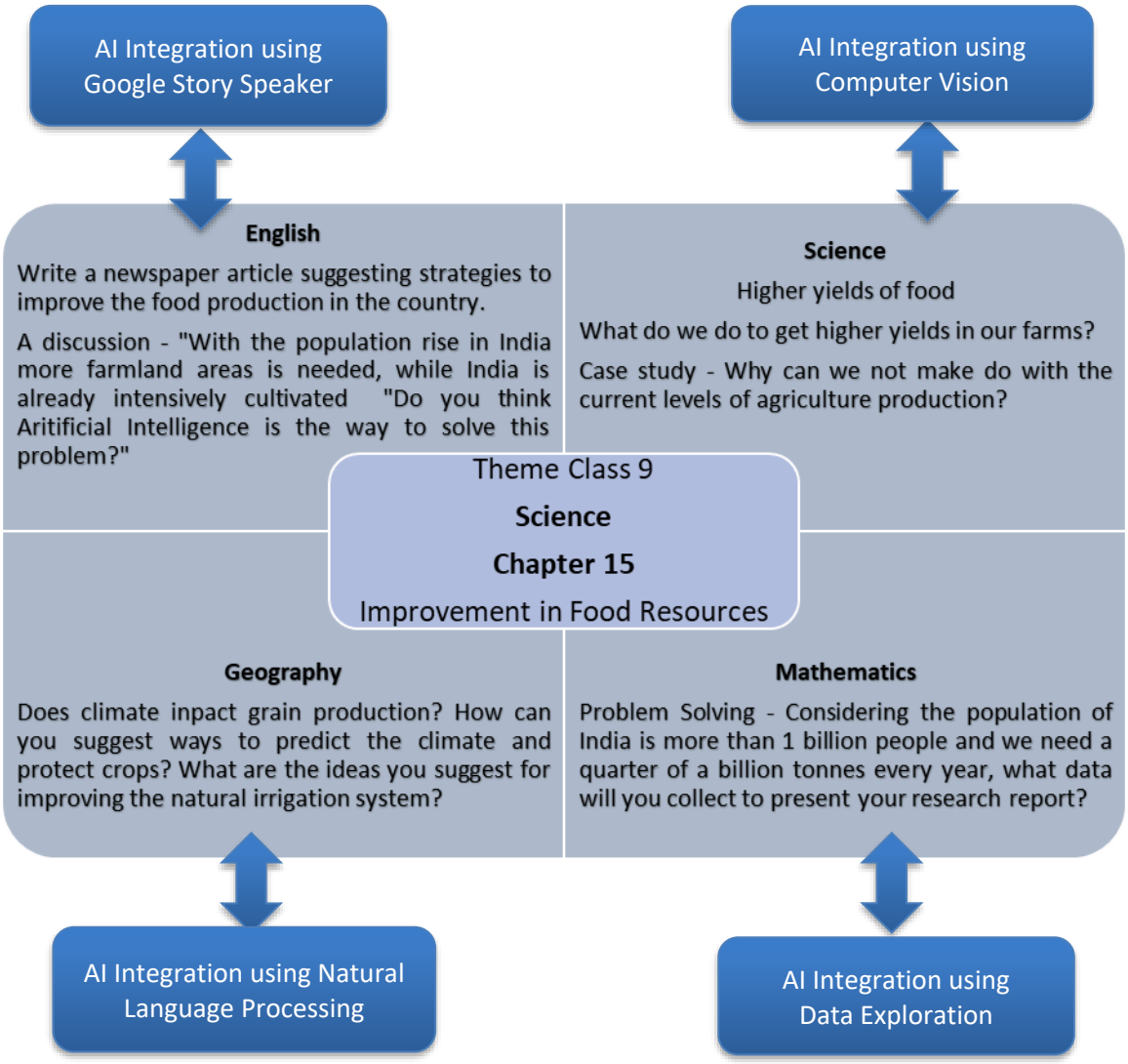
For example: 'Data Collection' is a familiar task in Mathematics and 'Data Acquisition' is an important basic AI concept. The teacher may use an AI based app to demonstrate Data collection in a Mathematics Class or teach the concept and functionality of the AI application through their understanding of the Data Collection operations in Mathematics.

Perspective 2: A practicing teacher may consider one subject +AI integration with it, which is a simpler and more functional approach.

The other approach could be to have inter disciplinary integration, in which the teacher may pick up one such topic from her own subject that has relevance to other subjects also. Then, in consultation with other teachers, the four of them could explore the same topic to achieve the learning outcomes of their respective subjects, while at the same time integrating each subject with AI. (see example 2 below)

The former approach is feasible in normal classroom teaching, the later would have to take the shape of a project and would have to be conducted in large class groups over a span of time.

Interdisciplinary Integration with Artificial Intelligence - Class 9



Since, Artificial Intelligence is a Cognitive Science and the history of its evolution suggests, it has grown out of the knowledge systems derived from other disciplines like Science, Mathematics, Philosophy, Sociology, Computing and others, it is fair for students to see the linkages. Hence, it is fair for any education system to recognize the importance of its integration with the teaching of other disciplines, to maximize learning.

1.6 What would the students do in an AI integrated Class?

A working group at CBSE has put together 7 Big Markers that may be adopted to develop a structured action plan by the teacher for K-12 learners.

Marker 1. *Identifying the problem* is the *starting point of the learning cycle*; students of all levels without any exception must be exposed to the skill of scoping and identifying the problem. Having done so, the learners of all ages must learn the way to state the problem to their parents/ teachers/ themselves/ community/ team, they are working with or working for.

Marker 2. *Data acquisition related to the identified problem is another big domain for learning* and it is a logical next step to proceed with. Such an exercise will prepare the students to attempt the nuances of problem solving which is also an important aspect of the AI project cycle.

Marker 3. *Computers are machines which can also 'see', 'hear' and 'speak'*. So, as such, they can be used to collect data for us. Many applications are now available which make our machines very useful for this purpose. An exposure to such capabilities of the machine needs to be explained to students of all grades. By using AI in teaching, the expectation is that the teacher will lead students to identify these tools and consequently use them to improve the learning process.

Marker 4. *Learners must learn to represent the collected data in the form of identifiable models*. Once the students have the data to solve the problem, they can progressively be made to develop the skill of representing the collected data in visual presentations in the form of graphs, charts etc. The understanding and skill to build such comprehensible models is critical learning for a 21st century student. *Computers are the given machines which help store data and represent models*.

Marker 5. *Computers also learn by themselves from the newer data acquired by them to build newer and better models in the future.* With interaction of inputs from the training data available to the machines, just like the human mind, the machines are able to produce entirely different models/ representations. Students of all grades need to be made aware of such capabilities which make machines "intelligent".

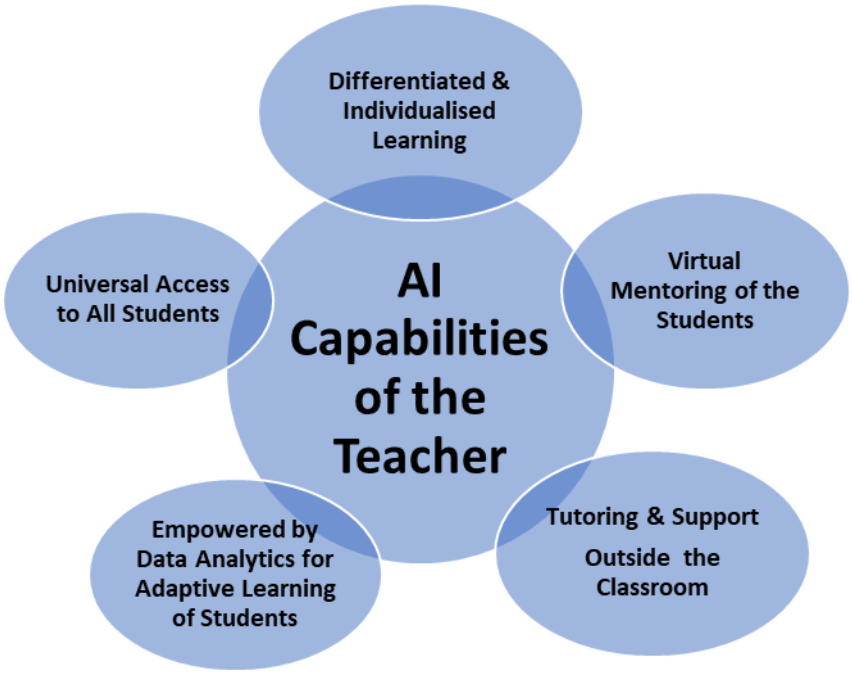
Marker 6. *For training the machine, it needs to interact with humans (intelligent agents); Though such interactions make the machine more and more intelligent, it can never be presumed that the machine would ever be as intelligent as humans are.* It is highly impossible for the machine to reach the capabilities of the human mind. The Robots (as these machines are sometimes called), would at their best be able to improve the efficiency of human beings and never really be able to replicate it. Such debates need to be part of discussions in the class when AI is integrated with other subjects.

Marker 7. *AI applications can be beneficial or harmful in the long run*. What, when, where and to what extent should these AI applications be built? At what stage and in what ways can an AI based application be used or not used? Students of all age groups in class 1-12 should be sensitized to AI ethics through different simulations, role plays, discussions and debates.

1.7 How can AI integrated teaching help teachers to achieve the desired learning outcomes?

While the debate regarding how much screen time is appropriate for children rages on among educators, psychologists, and parents, Artificial Intelligence and Machine Learning are additional emerging technologies that are beginning to alter education institutions and changing how education may happen in the future. Even though most experts believe the critical presence of teachers is irreplaceable, there have to be many changes to the way a teacher's job is done and to educational best practices.

As AI educational solutions continue to mature, the hope is that AI will help fill need gaps in learning and teaching and allow schools and teachers to do more than ever before. AI can drive efficiency, personalization and allow teachers some extra time to deploy their understanding and adaptability—uniquely human capabilities, to teach, where machines would struggle. By leveraging the best attributes of AI machines and teachers, the education system will be driven towards the best outcome for students. Since the students of today will need to work in a future where AI is no longer a notion but is the reality, it's important that our educational institutions expose students to updated technologies and their usage. No one can deny the fact that AI capabilities would help teachers to achieve desired learning outcomes, in the following five-fold ways:



Once AI tools are in operation, the teacher will be facilitated, to have more spare time in the classroom. So, she/he can now focus on unique learning styles of her students. Having assumed the AI capabilities, she/he can also in turn, focus suitably on the challenge of developing the skills of language processing, reasoning and cognitive modelling.

1.8 Does AI integration in Education promote 'Effective Pedagogy' in the classroom?

Since all cognitive domains of education relate very closely to the concept of AI, it offers ample opportunities for student engagement that cannot be found in lecturing out of the textbooks within the fixed four walls setting of the classroom. In an era termed as AI SPRING, AI and machine learning are growing dynamically, they each have the potential to propel the other forward and accelerate the learning frontiers in a synergistic fashion, along with the creation of newer innovative technologies. It is universally acknowledged that AI would be the source and the cause of improving the teaching- learning methodology in the classroom.

In many parts of the world, especially in advanced nations, Machine Learning algorithms in the education space, have already begun helping teachers fill the gaps, in the Subjects students are struggling with the most.

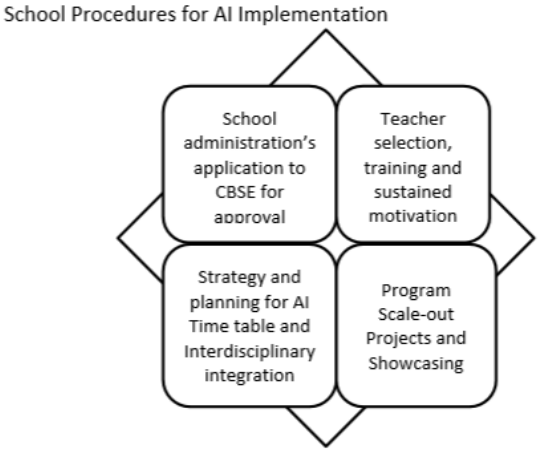
As of today, the list of such AI based pedagogical practices is long. A motivated and enlightened teacher would come across many such tools and practices during her research which can be profitably used by her from time to time in the interest of her students.

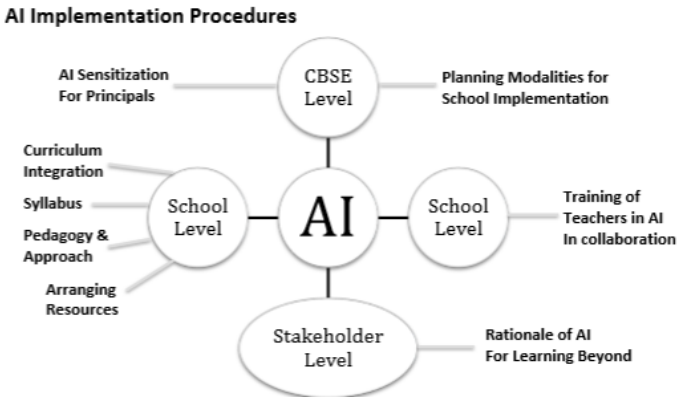
1.9 What is the role of Schools in the success of CBSE directive for AI integrated Learning?

Much of the professional world which today's student is going to face 10 or 15 years from now, will be increasingly based on and derived from AI technologies. Hence there is dire need for the present generation of young students to be exposed and empowered enough to understand and practice AI competencies in order to remain relevant to the times they live in. In doing so, while they benefit from an AI embedded world now, later in their lives, they must also learn how to identify and perceive the challenges that extensive use of AI may pose. Taking a cue from proactive thinking of CBSE about its responsibility towards the students studying in its affiliated schools, it is high time that the leadership in CBSE schools in particular, pledge their support to the task of sensitizing their students about AI in their lives and teach them to be positive contributors towards AI development in the larger interest of the society they live in.

The outcome of the twin initiatives of CBSE would depend on the way schools perceive and implement it, the way teachers engage with it and plan some of their lessons, so that the resultant understanding about AI amongst the students is logical. Once the trigger is positive, we believe a large population of students would go on an 'auto' mode to explore AI domains and get sensitized to AI applications. It has been observed that some teachers suffer from a complex that anything that is technology is computer based and anything that is computer based is beyond their comprehension or reach. It is important to reiterate here that once the teacher accepts the reality of AI inevitability in modern day living and its enhanced role in the future, she/he would view this document and the suggestions made herein with an open mind. We hope that the support material and examples provided in this document will serve as a useful trigger for practicing teachers to use AI as a tool to enhance learning. With such a positive mindset, the schools and teachers would not only augment their own AI awareness, but will also be seen empowering their students with the requisite AI capabilities. They will find umpteen examples in their respective environments to connect the knowledge of individual subjects to AI technologies. It won't be an exaggeration to state that many scenarios will be created in such a collaboration of the teachers and the learners that AI integration will be an important case in study maximizing student learning outcomes in such schools.

AI Implementation Procedures





1.10 How would this AI integrated Learning help meet the national goals-NCF/ NCERT/ NA

This thought process is completely in sync with the National Policy stipulated by NITI Aayog in '**Skilling for the AI Age – Getting India Ready for the AI Wave**'. Even the National Curriculum Framework developed as far back as 2005, and the Position Paper on Education Technology have echoed similar outcomes that AI integration is expected to achieve.

NITI Aayog Vision

"The Education sector needs to be realigned in order to effectively harness the potential of AI in a sustainable manner. In primary and secondary schools, there is a need for transition to skill-based education in subjects relevant to AI. Often criticized for being overly knowledge intensive, Indian education is in urgent need of transition in subjects relevant to STEM, or computer-based education. As jobs based on technology become prominent, so will the need to develop applied skills in a continuously changing environment.

Increased amount of project work across education levels, promoting schemes like Atal Tinkering Labs (ATL) in schools, necessary changes in curricula in schools, are some of the steps that need to be considered."

The National Curriculum Framework 2005

The aims of education as stated in the NCF are as follows:

Seeking guidance from the Constitutional vision of India as a secular, egalitarian and pluralistic society, founded on the values of social justice and equality, certain broad aims of education have been identified in this document. These include:

- Independence of thought and action
- Sensitivity to others' well-being and feelings
- Learning to respond to new situations in a flexible and creative manner
- Pre-disposition towards participation in democratic processes, and
- The ability to work towards and contribute to economic processes and social change.

NCF has laid down five guiding principles for curriculum development:

- Connecting knowledge to life outside the school
- Ensuring that learning shifts away from rote methods
- Enriching the curriculum so that it goes beyond textbooks
- Making examinations more flexible and integrating them with classroom life, and
- Nurturing an overriding identity informed by caring concerns within the democratic polity of the country.

And for the aims of teaching, NCF states that:

- No system of education can rise above the quality of its teachers, and the quality of teachers greatly depends on the means deployed for selection, procedures used for training, and the strategies adopted for ensuring accountability
- Teaching should aim at enhancing children's natural desire and strategies to learn
- Knowledge needs to be distinguished from information, and teaching needs to be seen as a professional activity, not as coaching for memorization or as transmission of facts.
- Activity is the heart of the child's attempt to make sense of the world around him/her. Therefore, every resource must be deployed to enable children to express themselves, handle objects, explore their natural and social milieu, and to grow up healthy.

The NCERT Position Paper on Education Technology (**2.6) in its section 6.4.5 on** In School Education **states that:**

- "Move from a predetermined set of outcomes and skill sets to one that enables students to develop explanatory reasoning and other higher order skills.
- Enable students to access sources of knowledge, interpret them and create knowledge rather than be passive users.
- Promote flexible models of curriculum transaction.
- Promote individual learning styles.
- Encourage use of flexible curriculum content, at least in primary education, and flexible models of evaluation."

It further clarifies that:

"Computers are programmable devices. This very fact makes it possible for users to make demands on these machines. This implies two things: first, that the computer ought to be capable of responding to intuitive demands, and second, that the user communicates in a language that the computer can interpret." and that "The creative potential of the computer, and the liberating potential of the internet can only be unleashed when we actively make these kinds of demands of these technologies. The students of the future should be oriented to this possibility, allowing them to stand their ground amidst the technology mediated onslaughts of the modern world. Integrating ICT into education will require that these aspects of the technology are catered to as a whole."

It is important to note that NCF observations were made as early as 2005 when the noise about AI was not heard much, yet the 'writing on the wall' lends itself to endorsing the recent developments of AI in Education.

Hence, **CBSE in its Circular No 14/ 2019** dated 09-03-2019 has clearly communicated that:

"Artificial Intelligence (AI) is being widely recognized to be the power that will fuel the future global digital economy. AI in the past few years has gained geo-strategic importance and a large number of countries are striving hard to stay ahead with their policy initiatives to get their country ready. India's own AI Strategy identifies AI as an opportunity & solution provider for inclusive economic growth and Social development. The report also identifies the importance of skills-based education (as opposed to knowledge intensive education), and the value of project related work in order to "effectively harness the potential of AI in a sustainable manner" and to make India's next generation to be 'AI ready'.

As a beginning in this direction, CBSE has introduced Artificial Intelligence as an optional 6th subject at Class 9 from the Session 2019-2020. To enhance the multidisciplinary approach in teaching learning and also to sensitize the new generation, it has been decided that Schools may start AI "Inspire module" of 12 hours at Class 8 itself.

1.11 OPTIMISM

It is interesting to present the following content of “Optimism” from the History of evolution of AI to add to the reader’s understanding that seemingly unimaginable and impossible events actually happen due to human effort, if a streak of positivity and optimism is maintained during the course of action.

*The Optimism

The first generation of AI researchers made these predictions about their work:

- 1958, H. A. Simon and Allen Newell: "within ten years a digital computer will be the world's chess champion" and "within ten years a digital computer will discover and prove an important new mathematical theorem."[57]
- 1965, H. A. Simon: "machines will be capable, within twenty years, of doing any work a man can do."[58]
- 1967, Marvin Minsky: "Within a generation ... the problem of creating 'artificial intelligence' will substantially be solved."[59]
- 1970, Marvin Minsky (in *Life* Magazine): "In from three to eight years we will have a machine with the general intelligence of an average human being."[60]

https://en.wikipedia.org/wiki/History_of_artificial_intelligence

The ‘Optimism’ showcased by the researchers above, has to be simulated by the practicing teacher in terms of AI Integration in their classrooms making their pedagogy more effective and maximizing the learning outcomes of their students.

1.12 National Education Policy 2020

As per the National Education Policy 2020

The world is undergoing rapid changes in the knowledge landscape. With various dramatic scientific and technological advances, such as the rise of big data, machine learning, and artificial intelligence, many unskilled jobs worldwide may be taken over by machines, while the need for a skilled workforce, particularly involving mathematics, computer science, and data science, in conjunction with multidisciplinary abilities across the sciences, social sciences, and humanities, will be increasingly in greater demand

India is a global leader in information and communication technology and in other cutting-edge domains, such as space. The Digital India Campaign is helping to transform the entire nation into a digitally empowered society and knowledge economy. While education will play a critical role in this transformation, technology itself will play an important role in the improvement of educational processes and outcomes; thus, the relationship between technology and education at all levels is bidirectional.

Given the explosive pace of technological development allied with the sheer creativity of tech savvy teachers and entrepreneurs including student entrepreneurs, it is certain that technology will impact education in multiple ways, only some of which can be foreseen at the present time. New technologies involving artificial intelligence, machine learning, block chains, smart boards, handheld computing devices, adaptive computer testing for student development, and other forms of educational software and hardware will not just change what students learn in the classroom but how they learn, and thus these areas and beyond will require extensive research both on the technological as well as educational fronts

CHAPTER 2

HOW to INTEGRATE AI in SCHOOL TEACHING – A CALL TO TEACHERS

2.1 AI is NOT ALONE

AI does not operate in silos nor is it a stand - alone field of study or practice. Many a times in Chapter 1, it has been said that it drives its knowledge as well as has its applications across other domains of knowledge. See below how the school domains of study (both formal and informal) interact with the concepts that Artificial Intelligence follows.

AI CROSS BREEDS WITH OTHER SUBJECTS

Subject Domain	What is Common with AI domain
Psychology	How people perceive information, process it and build knowledge; how they behave
Philosophy	Mind as a physical entity, methods of reasoning, basis of learning, foundations of language, rationality and logic
Neuro-Science	How the basic information processing units - neurons process information
Mathematics	Algorithms, computability, proof, methods of representation, tractability & decidability
Statistics	Learning from data, uncertainty/ certainty of modelling
Economics	Rational economic agents, usefulness of data & models, decision theory
Linguistics	Grammar, syntax, knowledge representations
Computer Science	Building computers
Cognitive Sciences	Processes & things in nature, interpretation of different phenomena & their impact

2.2 PRINCIPLES of AI INTEGRATED LEARNING

AI creates some Essential Learning Experiences which are:

- Experiences of creating through the process of problem solving
- Experiences of informed decision making
- Experiences of self-reflection, values and ethics.
- Experiences for exploring future career opportunities
- Experiences of demonstrating responsible citizenship

2.3 OBJECTIVES of AI INTEGRATED LEARNING

AI integrated learning would help to develop Key Competencies for Lifelong Learning, some of which are:

- Acquiring subject knowledge using AI as a tool
- Learning problem solving
- Innovativeness and taking initiative
- Application across key disciplines
- Developing interaction and Learning to Be
- Assuming Social responsibilities and applications
- Learning Vocational ethics
- Applying Communication skills

2.4 PRACTICE 'AI+X' PARADIGM for INTEGRATION

So, this could be the starting point for a practicing teacher. The teacher needs to go through the following steps to integrate her normal lesson plan with AI.

Step 1- Identify the topic from the subject for which the subject teacher has certain teaching pedagogy; let us call it 'X'

Step 2- Research to find 'AI' concepts that show conceptual commonality with the subject and the topic. Research to find 'AI' can be done with the help of any of the four resources given below

A) through online search
B) from the exemplars provided in this document
C) from the list of support material provided in this document in terms of 'Additional Resources' 'AI Concepts' and 'Glossary'

Step 3- Attach this 'AI' to 'X' in your lesson planning.

A) Discuss your lesson plan related requirement with your department colleagues or the computer faculty. This now becomes X+AI or AI +X, where X is your subject topic.

Such **"AI+X"** or **"X+AI" paradigm** is advocated in our national policy document also.

2.5 ARTIFICIAL INTELLIGENCE CONCEPTS PERVADE MAINSTREAM DISCIPLINES

Artificial Intelligence cannot be divorced from other disciplines; its evolution and development is mutually interlinked as shown in the table given below. Hence both the fields need to be linked for mutual benefit. As educators, it is the right step to consider integration of AI with the other school disciplines where two different approaches are possible:

a) AI as a tool to learn Mathematics, English, Science or Social Science or

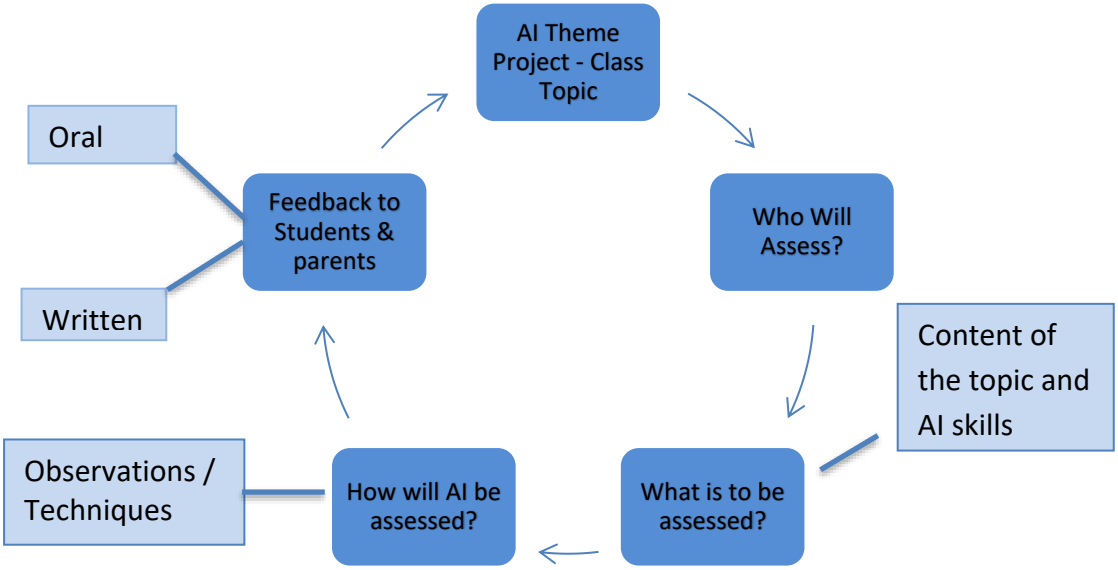
b) Language or Mathematics and other disciplines as a tool to learn Artificial Intelligence

2.5.1 Skills Assessed

After completion of each unit, the students may be evaluated for the following skills:

Conceptual Skills	Technical Skills	Life Skills
- Problem Scoping - Problem statement - Data Acquisition - Data Exploration - Graphical Representation of data/ building models - Neural networks - 3 domains of AI – Data, Computer Vision & Natural language Processing - AI Applications	- Ability to use AI powered Tools - Identifying linkage of AI Applications with knowledge systems	- Thinking skills - Problem Solving skills - Decision making Skills - Social Skills- Teamwork - Leadership - Effective Communication Skills - Oral & Written Presentation Skills

2.5.2 Suggestive Assessment Approaches for AI



2.5.3 Assessment Rubrics

SKILLS	SUB SKILL ASSESSED (from 2.5.1 above)	Highly Proficient	Proficient	Beginner	Teacher's Comments
AI CONCEPTS					
THINKING SKILLS					
LIFE SKILLS					

Also read Chapter 4 Appendix 6 for detailed Assessment Rubrics

CHAPTER 3

AI Integrated Lesson Plans

SOCIAL SCIENCE

CLASS 6

3.1 Panchayati Raj

Chapter Covered	Chapter 5 Panchayati Raj	Integration of Artificial Intelligence
Name of the book	**Social and Political Life -I, Class 6, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding Panchayati Raj and its functioning using the concept of Neural Networks in Artificial Intelligence	
Objectives	● To understand how a Neural network works ● To draw an analogy between Gram Sabha and Gram Panchayat functioning and the way in which Neural Network functions ● To understand different levels of Panchayat. ● To understand the link between Gram Sabha and Gram Panchayat ● To understand how Gram Sabha and Gram Panchayat are different.	Introduction to Neural Network using three levels of Panchayat as an analogy
Time Required	3 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, blackboard, chalk, smartboard/screen and projector, internet websites for data acquisition & laptops	
Pre- Preparation Activity	The students are given a presentation on how Neural Networks function and are made to play the Neural Network Game	
Previous Knowledge	Students are asked what they know about how governance in rural areas function	
Introduction	There is a class discussion on common problems encountered in rural areas and how government policies have been formulated to resolve these	
Methodology	● The teacher leads the students to role play with a situation involving a common problem in a rural area with a plaintiff and a Panchayat and how the Panchayat takes action to resolve the problem keeping in mind the policies of the government ● The students are asked to present the role play ● The students are now asked to play the Neural Network Game again with the Problem being given to the input layer while the solution is derived and presented by the output layer with help from the hidden layers that will take government policies into consideration while deriving a solution and passing it to the next layer. ● They are asked to present a final response to the Problem and the solution as provided by the Gram Panchayat.	Using Neural network in AI to explain the concept of layers of Panchayati Raj
Discussion on the Text	There is an open discussion on: ● What problems did the villagers have? ● How was this problem solved?	

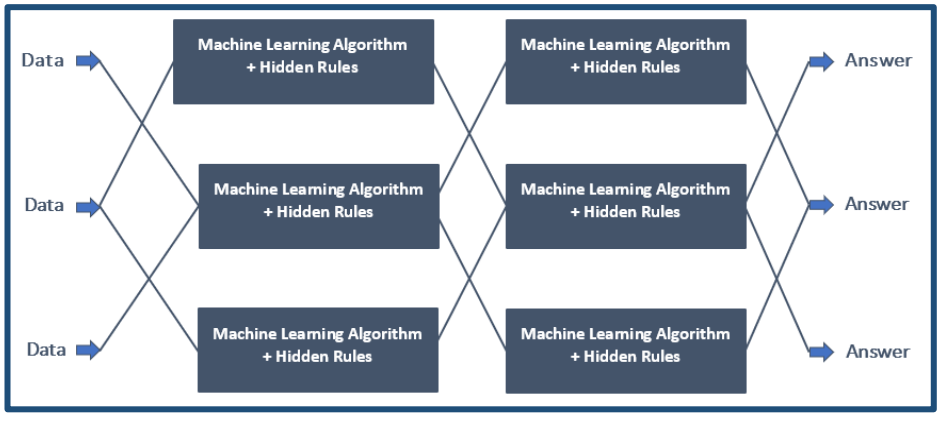
	• What is the importance of Gram Sabha? • Is there any link between Gram Sabha and Gram Panchayat? • What is the difference between Gram Sabha and Gram Panchayat	
Learning Outcomes	• Students are able to understand how a Neural network works • Students are able to draw an analogy between Gram Sabha and Gram Panchayat functioning and the way in which Neural Network functions • They will be able to understand different levels of Panchayat and its functions. • Students will be able to understand the link between Gram Sabha and Gram Panchayat • Students will be able to understand how Gram Sabha and Gram Panchayat are different	
Self-Evaluation and Follow-Up	• The students are asked to take the example of any one task done by a Panchayat in their area or nearby rural area and find out the following • Why was it taken up? • Where did the money come from? • Whether or not the work has been completed	
Follow-up Activity	• The students will be asked to identify more such issues and look for solutions to the same	

GLOSSARY:

1. AI Related Terminologies

Neural Networks

a. Neural networks are loosely modelled after how neurons in the human brain behave. The key advantage of neural networks are that they are able to extract data features automatically without needing the input of the programmer. A neural network is essentially a system of organizing machine learning algorithms to perform certain tasks. It is a fast and efficient way to solve problems for which the dataset is very large, such as in images.



b. This is a representation of how neural networks work. A Neural Network is divided into multiple layers and each layer is further divided into several blocks called nodes. Each node has its own task to accomplish which is then passed to the next layer. The first layer of a Neural Network is known as the input layer. The job of an input layer is to acquire data and feed it to the Neural Network. No processing occurs at the input layer. Next to it, are the hidden layers. Hidden layers are the layers in which the whole processing occurs. Their name essentially means that these layers are hidden and are not visible to the user.

c. Each node of these hidden layers has its own machine learning algorithm which it executes on the data received from the input layer. The processed output is then fed to the subsequent hidden layer of the network. There can be multiple hidden layers in a neural network system and their number depends upon the complexity of the function for which the network has been configured.

2. AI Activity Description

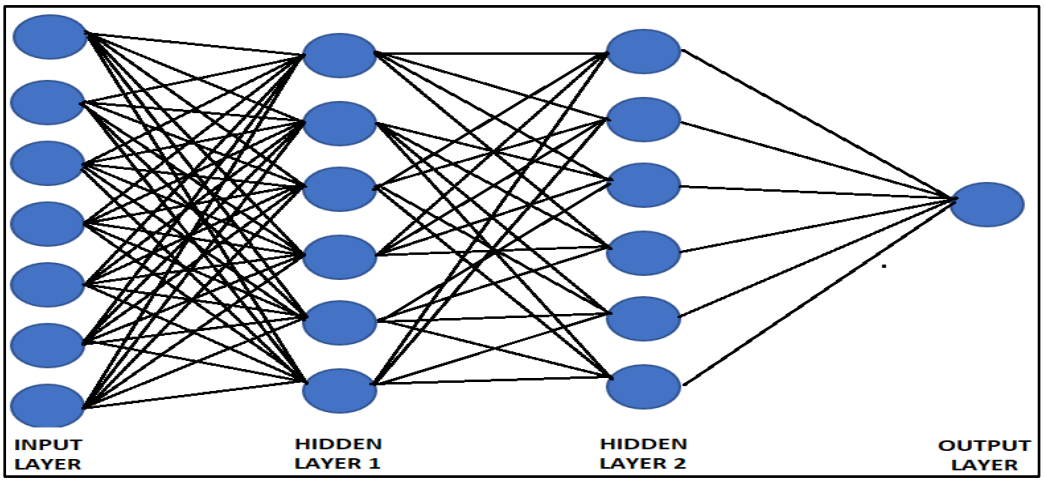
Human Neural Network

Materials Required:

ITEM	QUANTITY
Images (To be kept with the facilitator)	2
Post-It Notes	80
Sketch-pens	40

Game Structure:

Layers	Number of Students	Number of chits
Input Layer	7	6
Hidden Layer 1	6	4
Hidden Layer 2	6	2
Output Layer	1	-
TOTAL	**20**	**-**



Ground Rules:

- No one is allowed to talk or discuss till the game ends. Fun of the game lies in playing it honestly.
- Each layer should sit distant to each other.
- The image should only be shown to the Input layer and no one else.
- The game is supposed to be played silently. This means that one has to write a word on the chit and pass on the chit without speaking out aloud.
- One needs to process the data as fast as possible, hence not much time can be taken to write and pass on the chits.

- Input layer nodes cannot discuss the image shown with each other. Everyone has to use their own discretion.
- No sentences or multiple words are to be written on the chit. Only one word per chit is allowed.
- Once the task of a layer is finished, that layer needs to go and sit aside and not disturb others till the game ends.

Game Instructions:

- **Input Layer:**
  - 7 students will be standing as the nodes of an input layer.
  - All of them will be shown an image. After looking at it, they need to write 6 different words on 6 different chits. They have to choose the words which describe the image in the best way possible. They can also repeat the words if needed.
  - After making these chits, they need to pass on one chit to each of the nodes of hidden layer 1. That is, 1 chit will be given to one member.
  - Analogy with the chapter: The Input layer has an analogy with the common people of a village who take their problems/issues to the panchayat. This is where the data starts flowing to the Gram Panchayat which is the first tier of Panchayati Raj.

- **Hidden Layer 1:**
  - 6 students will be standing as the nodes of hidden layer 1.
  - Each of them will receive 7 chits from 7 different input nodes. Now they have to take a good look at the chits and then write down 4 different words on 4 different chits. For this, they can either use the same words as the input layer did, or they can make their own information (relevant to the context) and write it.
  - Now these 4 chits are to be given randomly to any 4 nodes of Hidden Layer 2. Out of the 6 nodes of 2nd hidden layer, one can choose any 4 and give one chit to each. (For best results, each node of hidden layer 2 should get almost the same number of chits thus the division should be done properly)
  - Analogy with the chapter: In this layer, the data fed by the people at the input layer has now reached the Gram Panchayat. Gram Panchayat looks into the matter and tries to cull out the important matters. The Gram Panchayat then holds a meeting for the same and carries forward the crucial matters to the Gram Sabha.

- **Hidden Layer 2:**
  - 6 students will be standing as the nodes of hidden layer 2.
  - Each one of them will get some number of chits from the previous layer. Now they have to perform the same task as hidden layer 1 and have to write down 2 different words on 2 different chits and pass it on to the output layer.

  - Analogy with the chapter: Now the information has reached the Gram Sabha from Gram Panchayat. The role of Gram Sabha is to make sure that Gram Panchayat is doing their work responsibly. Thus, Gram Sabha now looks into the matter and then after having meetings about its implementation, it then goes to Zila Parishad for further permissions.

- **Output Layer:**
  - Finally, the output layer node will get 12 chits. Now she/he has to understand all the words and has to guess which image was shown to the input layer initially.
  - Output layer will then write a summary out of all the words received to explain his/her deduction. The summary should not be more than 5 lines.
  - Analogy with the chapter: Zila Parishad is the highest authority for Panchayati Raj. The information flows from the people to Gram Panchayat which then reaches the Gram Sabha and finally comes to the Zila Parishad. Zila Parishad is responsible for getting the plans implemented in their respective districts. Finally, Zila Parishad is responsible for showcasing the output of the whole process and depending upon its efficient implementation, the whole system can be rated.

- Finally, the output layer presents this summary in-front of everyone and the real image is finally revealed to all
- If the summary is accurate enough, the whole network wins else they lose.

SOCIAL SCIENCE

CLASS 6

3.2 Ashoka

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 8 - Ashoka, The Emperor who Gave up War**	
Name of the Book	**Our Past – I, Class – 6, NCERT**	
Subject and Artificial Intelligence Integrated	My Story Time and Inklewriter, AI tools integrated with Ashoka, The Emperor who gave up war.	
Learning Objectives	• To understand how are the empires different from kingdoms? • To know more about Ashoka, the greatest ruler and his inscriptions carved on pillars. • To understand Ashoka's Dhamma and the problems that Ashok wanted to solve by introducing Dhamma. • To understand the different means adopted by Ashoka to spread his message of Dhamma.	
Time Required	2 Periods of 40 minutes each	
Classroom Arrangement	Flexible Seating arrangement	
Material Required	Textbooks, Blackboard, chalk, laptop / desktop, internet connection.	
Pre – Preparation Activities	• Students are asked to read the Ashoka's Inscription describing the kalingawar: Page No. 79. Teacher would ask about their reflections on it.	**Google Lens** is used for the image recognition of Ashoka's Inscription for providing visual experience to the students
Previous Knowledge	Teacher would ask some kingdoms, kings and early republic (reference Chapter 6 of Class VI)	
Methodology	Teacher would narrate the story of Ashoka, who gave up the war with the help of AI app. Mystorytimehttps://experiments.withgoogle.com/my-storytime	**https://experiments.withgoogle.com/my-storytime**

Learning Outcomes	• The students would be able to understand how are the empires different from kingdoms? • The students would be able to Know more about Ashoka, the greatest ruler and his inscriptions carved on pillars.. • The students would be able to understand Ashoka's Dhamma and the problems that Ashok wanted to solve by introducing Dhamma. • The students would be able to understand the different means adopted by Ashoka to spread his message of Dhamma.	
Follow up Activities	Students would be asked to write a paragraph as follow up activity: Suppose you had the power to inscribe your orders, what four commands would you like to issue.	
Reflections	Students would be writing their paragraph on inkle writer. www.inklewriter.com.	**www.inklewriter.com**

GLOSSARY:

AI related terminologies:

My Storytime: My Storytime is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant.

https://experiments.withgoogle.com/my-storytime

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

Google Lens: Google Lens is an image recognition technology developed by Google, designed to bring up relevant information related to objects it identifies using visual analysis based on a neural network.

SOCIAL SCIENCE
CLASS 6

3.3 Motions of the Earth

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: Motions of the Earth**	
Name of the Book	**Our Environment, Class -6, NCERT**	
Subject and Artificial Intelligence Integrated	Data Acquisition and Exploration & Inkle Writer; AI tools integrated with concept of Seasons, leap year, Rotaion and Revolution of the Earth.	
Learning Objectives	• To understand the Rotation and Revolution of the Earth and their effects with the use of AI • The students will be able to understand the reason behind the change in the season. • The revolution of the earth will be shown by the system map- Loopy. The link is given below- • https://bit.ly/3lyjcnt • Students will be able to understand the concept of seasons and leap years.	
Time Required	3-4 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Textbooks, Smart Board/ screen and projector, pen and paper, Laptop or smart phone	
Pre – Preparation Activities	A video will be shown to students to make them curious to learn about the topic- https://www.youtube.com/watch?v=cDed5eXmngE Time - :1:00 Min to 3:00 Min Another video will be shown to students to make them understand about the rotation and revolution of the earth. https://www.youtube.com/watch?v=SCm5ws87uyY	
Previous Knowledge	Some questions will be asked to understand their previous knowledge. • What is the effect of Rotation? • What are the impacts of Revolution in our life? • What would happen If the Earth stopped rotating and revolving? • What is the Earth's axis on which it is rotating?	
Methodology	Students will be shown videos. • They will be told why leap year occurs after every third year. • 3. Students will be asked to Collect the data which were the leap years in past fifty years. • 4. They will be asked to collect the data and find out next time which year will be the leap year.	Data Acquisition Data Exploration

Learning Outcomes	• They will be able to understand the importance of motions of the earth for their life. • They will learn why and how an Extra Day is added in leap year. • They will also be able to learn how to calculate to get the year of leap year. • They will also learn why seasons change in Northern and Southern Hemisphere.	
Follow up Activities	The class will be divided in groups and every group will be provided with Post Worksheets containing some questions like • Why do Australians celebrate Christmas in summer season? • What is the day with most daylight hours called? • What is the date of Winter solstice? • What would be the result if The earth's axis is not tilted but straight up and down? • What is the longest day of the year? • The students will discuss within the group and answer the questions.	
Reflections	Students will be asked to write a report on the basis of their findings and learning. For report writing they can use inkelwriter	http://www.inklewriter.com/

GLOSSARY:

AI Related Terminologies

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired could then be divided into two categories: Training Data and Testing Data.

The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which you can collect data. Some of them are:

• Surveys
• Web Scraping
• Sensors
• Cameras
• Observations

• Application Program Interface

Data Exploration: After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can:

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

SOCIAL SCIENCE
CLASS 6

3.4 What is Government

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: What is Government**	
Name of the Book	**Social and Political life -1, Class 6, NCERT**	
Subject and Artificial Intelligence Integrated	Mentimetre, AI Baloon Debate and My Story Time; AI tools integrated with topic “What is Government”	
Learning Objectives	To understand the need for universal adult franchise. To understand the the need and importance of government and its various levels in a country. To make them able to distinguish between democratic and monarchical form of government. To examine which form of government is better and why.	
Time Required	3 Periods of 40 minutes each	
Classroom Arrangement	Flexible.	
Material Required	Pen, paper, blackboard, chalk, smartboard/screen and projector, internet.	
Pre – Preparation Activities	Students would be asked to highlight the role of government through collage of newspaper headlines.	
Previous Knowledge	Teacher will ask about the importance of government in our country. How does this help in developing systems in country?	
Methodology	**Activity 1: Explanation and Group Discussion:** Students are told about different levels of government in our country. Students are explained why the lawsare being made and what to happen if someone breaks the law. Students to be told about different type of governance in our country. **Activity 2: AI Balloon Debate** Students would to be divided into group consisting four students each. Who should be thrown out of a hot air balloon? By giving some points for debate -Health, Security, Service, Transport, Entertainment Students will be asked to justify the importance of universal adult franchise and why democracy is characterized as best form of government.	AI Balloon debate

Learning Outcomes	• The Students will be able to critically analyze the need for universal adult franchise. • The Students will be able to understand why is a democratic environment necessary for free and fair treatment of citizens. • The Students will be able to justify the need and importance of government and its various levels in a country. • The Students will be able to distinguish between democratic and monarchical form of government • The Students will be able to analyse which form of government is better and why.	
Follow up Activities	Find out which countries follow monarchy and democratic forms of government. Carry out a poll using Mentimeter.	Mentimeter https://www.mentimeter.com/
Reflections	Students asked to create their report how they will feel if they are compelled to stay and accept whatever goes in your country giving your option.	My Storytime https://experiments.withgoogle.com/my-storytime 7

GLOSSARY:

AI integrated Terminology:

AI Balloon-BALLOON DEBATE: **Session Preparation:**

Logistics: For a class of 40 students [group activity – groups of 4]

Purpose: To introduce the concept of ethics (bias, access, privacy) in AI and its complexity.

Say: “We are going to debate about the boon and bane of various AI applications in the different industries you researched about. This will be a 4 v 4 debate. As you know, each theme has been given to two different teams. Now one team out of these two with be in affirmation with AI applications in their theme while the other one will be against AI applications in the same theme. The debate will go theme by theme wherein each member of the team will get a minute to speak. The first speaker of the affirmative team will start the debate after which the first speaker of the rebuttal team will put their points. In this manner, each speaker will get a minute to speak and finally one team will be chosen to be thrown out of the balloon debate depending upon how convincing their points were. The speaker who speaks more than a minute will get his team disqualified. You will get 15 minutes to prepare your points. And your time starts now!”

Their debate should be based on the research they did on their respective themes.

50

Imagine there are two families of four people out for a ride in a hot air balloon. Suddenly the balloon starts to move towards the earth instead of staying airborne. To stabilize it, one family needs to take the parachute and go out of the balloon or else it will come crashing down.

Different topics for debate could be given like-

Health, Security, Service, Transport, Entertainment

Groups can speak about for and against.

Reflect on the -

- With the increase in AI applications leading to replacing human workforce, do you consider it ethical to incorporate the use of AI for various jobs?
- How do you think income would be shared if Ai is used in place of Human Workforce?
- AI will probably bring with it many Health benefits. How will these Health benefits be made accessible and available to all the people in society?
- AI is a powerful tool in various fields, however depending on how it is used, it can either be a boon or
- a bane. Discuss.
- How can learning opportunities for AI be extended to all?
- How will human beings ensure that they stay ahead of Artificial Intelligence?

Menti meter

Teacher should expose students about the polling which takes places with the help of the menti meter within the classroom.

https://www.mentimeter.com/

My Storytime

My Story time is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant

https://experiments.withgoogle.com/my-storytime

SOCIAL SCIENCE
CLASS 6

3.5 Rural Administration

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 6: Rural Administration**	
Name of the Book	**Social and Political Life -I , Class 6, NCERT**	
Subject and Artificial Intelligence Integrated	AI integrated with understanding Rural Administration and its functioning using the concept of Neural Networks in Artificial Intelligence	
Learning Objectives	● To understand the different structure of rural administration. ● To understand the functioning of Tehsildar and Patwari ● To know the features of Hindu Succession Amendment Act, 2005**.**	
Time Required	2 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, blackboard, chalk,, internet websites for data acquisition & laptops and performing the activity	
Pre – Preparation Activities	The students are given a presentation on how Neural Networks function and are made to play the Neural Network Game	Neural Network
Previous Knowledge	Students are asked what do they know about Panchayat, Gram Sabha and their functions. A group discussion would be organized on rural administration .	
Methodology	**Activity 1: Role Play** The teacher will provide a situation which is given in the book - an argument regarding the land record and how it will be resolved. Students will present a role play **Activity 2: case study** The students will prepare a case study on any one topic related to the problems facing the women**.**	www.inklewriter.com

Learning Outcomes	● The Students will able to know how land related issues are solved in the rural areas. ● The Students will able to understand the different structures of rural administration. ● The Students will able to understand the roles of Patwari and Tehsildar . ● The Students will able to learn about HIndu Succession Amendment Act, 2005.	
Follow up Activities	● Students will be asked to give the name of any one law related to the women .	
Reflections	Students will be asked what are the other problems faced by Women in the society ·	

GLOSSARY:

AI Related Terminologies

1. Neural Networks

Neural networks are loosely modelled after how neurons in the human brain behave. The key advantage of neural networks are that they are able to extract data features automatically without needing the input of the programmer. A neural network is essentially a system of organizing machine learning algorithms to perform certain tasks. It is a fast and efficient way to solve problems for which the dataset is very large, such as in images.

This is a representation of how neural networks work. A Neural Network is divided into multiple layers and each layer is further divided into several blocks called nodes. Each node has its own task to accomplish which is then passed to the next layer. The first layer of a Neural Network is known as the input layer. The job of an input layer is to acquire data and feed it to the Neural Network. No processing occurs at the input layer. Next to it, are the hidden layers. Hidden layers are the layers in which the whole processing occurs. Their name essentially means that these layers are hidden and are not visible to the user.

Each node of these hidden layers has its own machine learning algorithm which it executes on the data received from the input layer. The processed output is then fed to the subsequent hidden layer of the network. There can be multiple hidden layers in a neural network system and their number depends upon the complexity of the function for which the network has been configured.

2. AI Activity Description

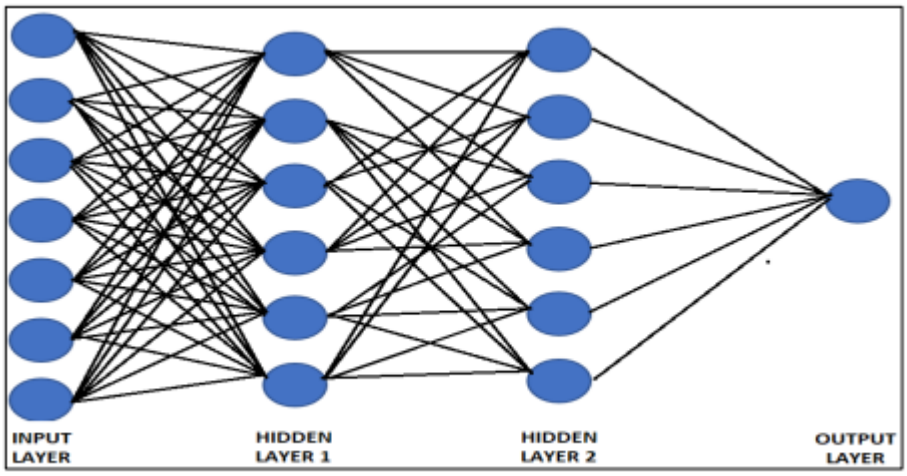
Human Neural Network

Materials Required:

ITEM	QUANTITY
Images (To be kept with the facilitator)	2
Post-It Notes	80
Sketch-pens	40

Game Structure:

Layers	Number of Students	Number of chits
Input Layer	7	6
Hidden Layer 1	6	4
Hidden Layer 2	6	2
Output Layer	1	-
TOTAL	**20**	-



Ground Rules

- No one is allowed to talk or discuss till the game ends. Fun of the game lies in playing it honestly.
- Each layer should sit distant to each other.
- The image should only be shown to the Input layer and no one else.
- The game is supposed to be played silently. This means that one has to write a word on the chit and pass on the chit without speaking out aloud.
- One needs to process the data as fast as possible, hence not much time can be taken to write and pass on the chits.
- Input layer nodes cannot discuss the image shown with each other. Everyone has to use their own discretion.
- No sentences or multiple words are to be written on the chit. Only one word per chit is allowed.
- Once the task of a layer is finished, that layer needs to go and sit aside and not disturb others till the game ends.

Game Instructions

Input Layer

- 7 students will be standing as the nodes of an input layer.
- All of them will be shown an image. After looking at it, they need to write 6 different words on 6 different chits. They have to choose the words which describe the image in the best way possible. They can also repeat the words if needed.
- After making these chits, they need to pass on one chit to each of the nodes of hidden layer 1. That is, 1 chit will be given to one member.
- Analogy with the chapter: The Input layer has an analogy with the farmers having information about their farms like crop grown , fallow land , area , second crop grown , facilities etc .. This is where the data starts flowing to the Patwari which is the first tier structure of rural administration .

- **Hidden Layer 1**
  - 6 students will be standing as the nodes of hidden layer 1.
  - Each of them will receive 7 chits from 7 different input nodes. Now they have to take a good look at the chits and then write down 4 different words on 4 different chits. For this, they can either use the same words as the input layer did, or they can make their own information (relevant to the context) and write it.
  - Now these 4 chits are to be given randomly to any 4 nodes of Hidden Layer 2. Out of the 6 nodes of 2nd hidden layer, one can choose any 4 and give one chit to each. (For best results, each node of hidden layer 2 should get almost the same number of chits thus the division should be done properly)
  - Analogy with the chapter: In this layer, the data fed by the people at the input layer has now reached the Patwari . Patwari looks into the matter and tries to make the Khasra Record .

- **Hidden Layer 2**
  - 6 students will be standing as the nodes of hidden layer 2.
  - Each one of them will get some number of chits from the previous layer. Now they have to perform the same task as hidden layer 1 and have to write down 2 different words on 2 different chits and pass it on to the output layer.
  - Analogy with the chapter: Now the information has reached the Tehsildar . The role of Tehsildar is to supervise that Tehsildar is doing his work responsibly.

- **Output Layer**
  - Finally, the output layer node will get 12 chits. Now she/he has to understand all the words and has to guess which image was shown to the input layer initially.
  - Output layer will then write a summary out of all the words received to explain his/her deduction. The summary should not be more than 5 lines.
  - Analogy with the chapter: District Collector is the highest authority in rural administration .. The information flows from the people to Patwari , Tehsildar and District Collector .

- Finally, the output layer presents this summary in-front of everyone and the real image is finally revealed to all.
- If the summary is accurate enough, the whole network wins else they lose.

3. Inklewriter

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

SOCIAL SCIENCE
CLASS 6

3.6 New Empires And Kingdoms

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 11: New Empires And Kingdoms**	
Name of the Book	**Our Pasts - I, Class 6, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the reasons and of Samantas becoming powerful and its effects with help of AI Tool :Loopy & AI Ethics.	**http://ncase.me/loopy/**
Learning Objectives	The students will be able to : • Analyze the relevance of Prashastis in understanding the contribution of rulers. • Understand the genealogy of Gupta rulers. • Understand how Samantas rose to power and established their independent kingdoms. • Compare the administration of Gupta empire with present administration. • Examine the role of assemblies in administration of South India. • Derive information about the life of ordinary people through stories and plays written during that period.	Loopy to understand the role of Samantas https://bit.ly/2YK41xR
Time Required	7 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, Paper, Whiteboard, Marker, screen and projector, desktop, internet websites for data acquisition	
Pre – Preparation Activities	The students are given instructions on how cause and effect relationship works and how does Loopy work	
Previous Knowledge	The students will be asked about the inscriptions of Ashoka and then the teacher will relate it to the Prashahtis. There is a class discussion to reason out why these were written in praise of the kings.	
Methodology	**Activity 1: Compose a Prashasti** The students are going to compose a prashastis for their mother. This is how they will learn why Prashastis were always written in the praise of the Kings. **Activity 2: Genealogy Chart** The students will make a genealogy for themselves depicting at least three generations. **Activity 3: Map pointing** The students will get to know about different rulers and Samudragupta's policies towards them with the help of map. **Activity 4: Study of Sources**	Loopy **http://ncase.me/loopy/**

	The students will read the Sources given on Pg. 118 and 119 and derive information about the life of ordinary people. **Activity 5: Loopy** With the help of Loopy, the students will understand the causes behind Samantas becoming powerful and its effects.	
Learning Outcomes	The students will be able to : • Analyse the importance of Prashastis with reference to Allahabad Pillar inscription and Aihole inscription. • Draw the genealogy of Gupta rulers. • Compare the administration done in Gupta period, South India and Present day. • Critically examine the reasons for Samantas getting into power.	
Follow up Activities	Use the internet and collect some pictures of old coins of the Gupta dynasty. Also, Mention the information that it provides.	
Reflections	Use of Ethics in AI to understand the how wars affect the lives of ordinary people.	Ethics in AI

GLOSSARY:

AI Related Terminologies

Loopy

It is an opensource tool to understand the concept of system maps. A system map shows the components and boundaries of a system and the components of the environment at a specific point in time. With the help of system maps, one can easily define a relationship amongst different elements which come under a system. The map shows the cause & effect relationships of elements with each other with the help of arrows. The arrow-had depicts the direction of the effect and a sign (+ or -) shows their relationship. A + sign indicated positive relationship and a - sign indicates negative relationship between the elements. Considering the data features of any problem to be solved, a system map can be drawn.

Loopy has been used with the topic of Samantas to show the reasons for Samantas becoming powerful and the effect that it led to the decline of the empire.

Reasons have been shown in positive (+) while the effect has been shown through negative (-).

Ethics in AI

Artificial intelligence is a field that is boundless in today's time. There are a lot of scenarios that tell us that ethical issues exist around AI. Hence, it is important to have an understanding of ethics in AI and to have ethical guidelines which can guide us in such conditions where there is no clear definition of what is right or wrong.

Ethics in AI has been used to understand the affects of wars on the lives of ordinary people.

SOCIAL SCIENCE
CLASS 6

3.7 What books and burials tell us

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 4: What books and burials tell us**	
Name of the Book	**Our Pasts-1, Class 6, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the concept of burials using Artificial Intelligence application. Silent sentinels- the story of megaliths, Burial sites and Social differences	
Learning Objectives	• To understand the concept of megalithic burials. • To establish the relationship between burial sites and social status of people. • To find out the possible occupations of people using AI tool.	
Time Required	2 periods of 40 minutes each.	
Classroom Arrangemen	Flexible	
Material Required	White board, marker, laptop/desktop and internet connection	
Pre – Preparation Activities	An audio visual documentary on megaliths will be arranged for the students on you tube in the classroom setting.	https://youtu.be/6n073lMgrJU
Previous Knowledge	**Brain storming Activity**: Students will be asked to write different sources of evidences used in the past by archaeologist. Students will mention the points or objects on the marker board.	
Methodology	Students are divided into pairs and asked to download Inkle writer app. They will work in pairs to create an imaginary story depicting the relevance of burials and social status of people. They share their stories with each other.	https://inklewriter-stories.fandom.com/wiki/Fantasy_stories
Learning Outcomes	Students will be able to: • Work together and develop team spirit. • Learn the skill of story Writing and Storytelling. • Collect data from various sources about the life and occupations of people and present them in sequential order. • Learn to built a narrative story depicting relevant information regarding burial sites and the social status.	Data acquisition and data exploration. https://datavizcatalogue.com

Follow up Activities	Students can assess their performance by analysing the stories with other ones and try to use the AI features into an interesting way.	
Reflections	Students will be able to mention the objects buried with them and the occupations of people at that time·	

GLOSSARY:

AI Related Terminologies

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired could then be divided into two categories: Training Data and Testing Data.

The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which you can collect data. Some of them are:

- Surveys
- Web Scraping
- Sensors
- Cameras
- Observations
- Application Program Interface

Data Exploration: After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

Inklewriter

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

https://inklewriter-stories.fandom.com/wiki/Fantasy_stories

SOCIAL SCIENCE
CLASS 6

3.8 Urban Administration

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 7: Urban Administration**	
Name of the Book	**Social and Political Life - 1, Class 6 NCERT**	
Subject and Artificial Intelligence Integrated	Understanding Urban Administration and its functioning using the concept of Neural Networks in Artificial Intelligence	**Using Neural network in AI**
Learning Objectives	• To understand who performs what role within the urban administration. • To understand how the various levels of administration at the local level are interconnected. • To understand Municipal Corporation elections, decision making structures • To understand Working and functions of the municipal corporation, ward councillors and administrative staff.	
Time Required	3 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Textbook, Pen, paper, white board/smart board, marker, Laptops and Internet connection.	
Pre – Preparation Activities	Video showing important places in a city https://youtube.be/bR2m6whQv88	
Previous Knowledge	The students shall be asked questions: Who takes care of the people living in a village? How do they get the basic facilities?	4 W CANVAS • **Who** takes care of people in a village? • **What** are their social issues? • **When and where** do villagers go to get their grievances addressed? • **Why** do we have a panchayati system?

Methodology	The teacher will lead the students to role play with a situation involving a common problem in an urban area with some people complaining over the amount of garbage littered around in the neighbourhood and it being not collected by the garbage workers on time. ● The students are asked to present the role play ● The students are now asked to play the Neural Network Game again with the Problem being given to the input layer while the solution is derived and presented by the output layer with help from the hidden layers that will take government policies into consideration while deriving a solution and passing it to the next layer. ● They are asked to present a final response to the problem and the solution as provided by Municipal Corporation.	Using Neural networkin AI to explain the role of ward councillors and the administrative staff.
Learning Outcomes	• Students will be able to understand how a Neural network works • Students will be able to draw an analogy between the ward councillors and municipal corporations and the way inwhich Neural Network functions. • Students will be able to understand different levels of urban administration and its functions. • Students will be able to understand the Functions of ward councillors and administratative staff and the commissioner in an urban set up.	
Follow up Activities	The students are asked to take the example of any one task done by the ward councillor in their area • Why was it taken up? • Where did the money come from? • Whether or not the work has been completed?	
Reflections	The students will be asked to identify more suchissues and look for solutions to the same	www.inklewriter.com

GLOSSARY:

1. AI related Terminology

- Neural networks are loosely modelled after how neurons in the human brain behave. The key advantage of neural networks are that they are able to extract data features automatically without needing the input of the programmer. A neural network is essentially a system of organizing machine learning algorithms to perform certain tasks. It is a fast and efficient way to solve problems for which the dataset is very large, such as in images.
- This is a representation of how neural networks work. A Neural Network is divided into multiple layers and each layer is further divided into several blocks called nodes. Each node has its own task to accomplish which is then passed to the next layer. The first layer of a Neural Network is known as the input layer. The job of an input layer is to acquire data and feed it to the Neural Network. No processing occurs at the input layer. Next to it, are the hidden layers. Hidden layers are the layers in which the whole processing occurs. Their name essentially means that these layers are hidden and are not visible to the user.

- Each node of these hidden layers has its own machine learning algorithm which it executes on the data received from the input layer. The processed output is then fed to the subsequent hidden layer of the network. There can be multiple hidden layers in a neural network system and their number depends upon the complexity of the function for which the network has been configured.

2. AI Activity Description

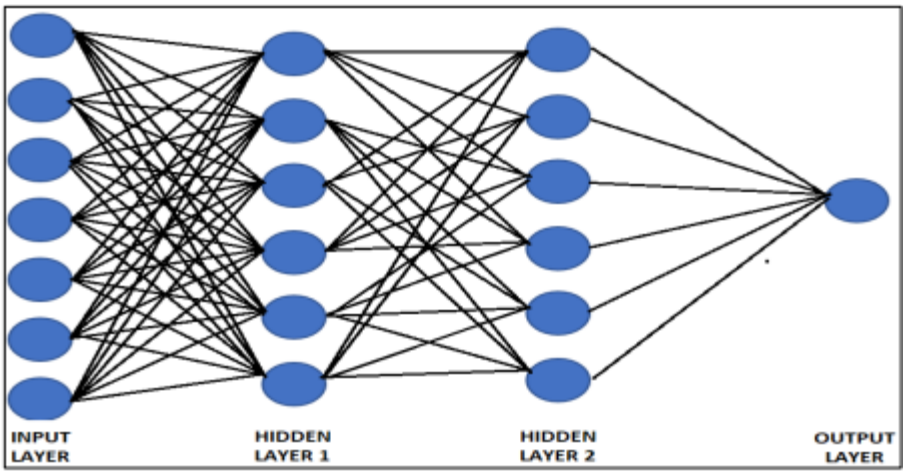
Human Neural Network

Materials Required:

ITEM	QUANTITY
Images (To be kept with the facilitator)	2
Post-It Notes	80
Sketch-pens	40

Game Structure:

Layers	Number of Students	Number of chits
Input Layer	7	6
Hidden Layer 1	6	4
Hidden Layer 2	6	2
Output Layer	1	-
TOTAL	**20**	-



Ground Rules

- No one is allowed to talk or discuss till the game ends. Fun of the game lies in playing it honestly.
- Each layer should sit distant to each other.
- The image should only be shown to the Input layer and no one else.
- The game is supposed to be played silently. This means that one has to write a word on the chit and pass on the chit without speaking out aloud.
- One needs to process the data as fast as possible, hence not much time can be taken to write and pass on the chits.
- Input layer nodes cannot discuss the image shown with each other. Everyone has to use their own discretion.
- No sentences or multiple words are to be written on the chit. Only one word per chit is allowed.
- Once the task of a layer is finished, that layer needs to go and sit aside and not disturb others till the game ends.

Game Instructions

Input Layer

- 7 students will be standing as the nodes of an input layer.
- All of them will be shown an image. After looking at it, they need to write 6 different words on 6 different chits. They have to choose the words which describe the image in the best way possible. They can also repeat the words if needed.
- After making these chits, they need to pass on one chit to each of the nodes of hidden layer 1. That is, 1 chit will be given to one member.
- Analogy with the chapter: The Input layer has an analogy with the farmers having information about their farms like crop grown , fallow land , area , second crop grown , facilities etc .. This is where the data starts flowing to the Patwari which is the first tier structure of rural administration .

- Hidden Layer 1
  - 6 students will be standing as the nodes of hidden layer 1.
  - Each of them will receive 7 chits from 7 different input nodes. Now they have to take a good look at the chits and then write down 4 different words on 4 different chits. For this, they can either use the same words as the input layer did, or they can make their own information (relevant to the context) and write it.
  - Now these 4 chits are to be given randomly to any 4 nodes of Hidden Layer 2. Out of the 6 nodes of 2nd hidden layer, one can choose any 4 and give one chit to each. (For best results, each node of hidden layer 2 should get almost the same number of chits thus the division should be done properly)
  - Analogy with the chapter: In this layer, the data fed by the people at the input layer has now reached thePatwari . Patwari looks into the matter and tries to make the KhasraRecord .

- Hidden Layer 2
  - 6 students will be standing as the nodes of hidden layer 2.
  - Each one of them will get some number of chits from the previous layer. Now they have to perform the same task as hidden layer 1 and have to write down 2 different words on 2 different chits and pass it on to the output layer.
  - Analogy with the chapter: Now the information has reached the Tehsildar. The role of Tehsildar is to supervise that Tehsildar is doing his work responsibly.

- Output Layer
  - Finally, the output layer node will get 12 chits. Now she/he has to understand all the words and has to guess which image was shown to the input layer initially.
  - Output layer will then write a summary out of all the words received to explain his/her deduction. The summary should not be more than 5 lines.
  - Analogy with the chapter: District Collector is the highest authority in rural administration .. The information flows from the people to Patwari , Tehsildar and District Collector .
- Finally, the output layer presents this summary in-front of everyone and the real image is finally revealed to all.
- If the summary is accurate enough, the whole network wins else they lose.

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

Problem Scoping: Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What, When/Where and Why. The answers to these questions lead to a problem statement.

SOCIAL SCIENCE
CLASS 6

3.9 On the Trail of the Earliest People

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 2: On the Trail of the Earliest People**	
Name of the Book	**Our Pasts-1, Class 6, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the rock tools made by early man in different stone ages using AI training and classification model	
Learning Objectives	● To know the reasons why early men were nomads. ● To identify the rock tools made by early man in different time periods/ Stone ages. ● To know the significance of rocks and Stone tools. ● To understand the journey of man from hunter gatherer to food producer	
Time Required	4 periods of 45 minutes	
Classroom Arrangement	Flexible	
Material Required	Pen, Paper, Black/Green Board, chalk, Smart board, Internet and Laptops	
Pre – Preparation Activities	The students are given the chance to watch a video on the life of early people.	
Previous Knowledge	Students are asked about What do they know about early man.? How was the life of an early man?	
Methodology	• Students are asked to read about the life of an early man as a nomad and about the two techniques of making stone tools. • Students collect images of different stone tools made by an early man and classify them on the information they have into - Paleolithic tools - Mesolithic tools - Neolithic tools • Comic stripe on how hunter gatherer changed into a food producer. • There will be discussion on - Why early man a nomad? - significance of stone tools.	AI model training and classification Google Lens

Learning Outcomes	Students will be able to : ● Analyse why early men were nomads. ● Identify rock tools used by early men in different stone ages. ● Analyse the significance of stone tools. ● Understand the journey of man from hunter gatherer to food producer	
Follow up Activities	Students will collect some stones and try to use them as tools. Students will use two techniques ● Stone on stone ● Pressure flaking And try to make stone tools	
Reflections	Students will prepare a presentation on use of rocks in the past and in the present and its significance.	

GLOSSARY:

AI Related Terminologies

AI Model Training:

An algorithm is said to be artificially intelligent if it gets trained and can make decisions/predictions by its own. The intelligence which a machine gains, comes by the training the machine with the appropriate dataset. For example, a machine is to be created which needs to classify an image as either for example apple or banana.

To achieve this task, the machine is trained with the images we required. The machine is tested by providing image.

https://teachablemachine.withgoogle.com/models/WU_llfNfJ/

AI Activity Description:

Ask the students to understand the features of stone tools of all three stone ages and ask them to collect the images of stone tools. Let students to classify the images as:

- Paleolithic period
- Mesolithic period
- Neolithic period

Once they are able to classify them, ask students about the approach they used and connect and explain that this is how the AI machines do classification. The AI machines get trained on the basis of knowledge(instructions) available and then give the desired classification.

Google Lens:

Google Lens is an image recognition technology developed by Google, designed to bring up relevant information related to objects it identifies using visual analysis based on a neural network.

SOCIAL SCIENCE
CLASS 7

3.10 Inside Our Earth

Chapter Covered	**Chapter 2: Inside Our Earth**	**Integration of Artificial Intelligence**
Name of the book	**Our Environment, Class 7, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the structure of the Earth and types of rocks using AI training and classification model	
Objectives	● To identify the different types of rocks by creating a rock cycle ● To identify construction of various structures and list the types of rock used for it.	
Time Required	3 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, blackboard, chalk, smartboard/screen and projector, internet, VR boxes & laptops	
Pre- Preparation Activity	The students are given the chance to watch a video/VR presentation on the interior of earth	
Previous Knowledge	Students are asked what they know about various types of rocks	
Introduction	There is an AV clip from "Journey to the Centre of the Earth" shown to students in preparation for the lesson	
Methodology	● Students are asked to read about the layers of the earth and identify the various kinds of rocks ● They are asked to discuss about physical properties and chemical composition of rocks and minerals. ● Now, the students start collecting the images of various monuments and they try to identify which rock is used to make which monument.	**AI Model Training and Classification.**
Discussion on the Text	There is an open discussion on: ● Three layers of the Earth? ● Rocks and types of rocks? ● Uses of rocks?	
Self-Evaluation and Follow-Up	● The students are asked to collect pictures of some monuments and find out which are the rocks used to build them.	
Follow-up Activity	Make a presentation on your findings regards the monuments identified and the type of rocks used to build this monument	

GLOSSARY:

1. AI Related Terminologies

AI Model Training: An algorithm is said to be artificially intelligent if it gets trained and can make decisions/predictions by its own. The intelligence which a machine gains comes by training the machine with the appropriate dataset. For example, a machine is to be created which needs to classify an image as either an apple or a banana. To achieve this task, the machine is trained with hundreds of images of apples and bananas each. While training, the machine extracts features from the image dataset of apples which would help the machine classify any image of an apple as an apple. The same is done for the banana dataset. Finally, after training, the machine is tested by providing an image of either an apple or banana. If the machine is able to classify it correctly, the efficiency is said to be good else it gets re-trained on a better dataset.

Training an AI model requires two datasets: Training Data and Testing Data. The machine is first fed the training data from which it makes its own rules which help it to predict the output. Then the testing data is used to check the efficiency of the model. Once training and testing is done, the model is deployed for use.

Classification: Machine Learning algorithms can be broadly classified into tree families: Supervised learning, Unsupervised learning and Reinforcement learning. Classification is a part of Supervised learning model. Classification models work on labelled datasets and are used to predict the label of the testing dataset. For example, 100 images of apples and 100 images of bananas have been taken as a training dataset for the AI model. These 200 images have been labelled as apples or bananas respectively. This labelled data is then fed to the machine which trains itself by extracting common features from the dataset and understanding which features come under the apple label and which ones come under the banana label. At the time of testing, the machine takes an input image and extracts features from it which are then compared with the features marked under both the labels. On the basis of the degree of similarity, the machine will label the testing image as either apple or banana. This process is known as Classification.

2. AI Activity Description

Ask the students to understand the properties of all three types of rocks and ask them to collect the images of various monuments in which the rocks have been used for construction. Let the students explore these images and ask them to classify each of the images as igneous, metamorphic or sedimentary rock. Once they are able to classify them, ask students about their approach to classification and explain that this is how the AI machines do classification. The AI models get trained on the basis of knowledge (instructions) available and then give the desired classification output.

SOCIAL SCIENCE
CLASS 7

3.11 Struggles for Equality

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 10: Struggles for Equality**	
Name of the Book	**Social and Political life –II, Class – 7, NCERT**	
Subject and Artificial Intelligence Integrated	AI integrated with Struggles for Equality: Tawa Matsya Sangh- A case study	https://ncase.me/loopy/v1.1/?data=[[[10,602,324,0.83,%22Struggle%2520for%2520Equality%253A%2520TMS%2520Case%2520Study%22,4],[11,293,253,0.83,%22Making%2520Dam%2520on%2520TAWA%2520River%252C%2520MP%22,4],[12,503,100,0.83,%22Acquistion%2520of%2520land%253A%22,4],[13,702,42,0.83,%22Displacement%2520of%2520People%22,4],[14,928,213,0.83,%22Privatisation%2520in%2520Fishing%22,4],[15,998,441,0.83,%22Protest%2520by%2520Displced%2520and%2520federations%2520coming%2520together%22,4],[16,726,516,0.83,%22Committee%2520recommended%2520for%2520Right%2520of%2520Displaced%2520%22,4],[17,391,455,0.83,%22Better%2520placement%2520and%2520Livelihood%2520of%2520displced%2520people%22,4]],[[11,12,13,1,0],[12,13,10,-1,0],[11,14,73,-1,0],[13,15,159,1,0],[15,14,17,-1,0],[16,10,-38,1,0],[15,16,16,1,0],[16,14,10,-1,0],[16,17,18,1,0],[17,10,35,1,0],[10,11,-17,1,0]],[],17%5D

Learning Objectives	• To understand Problem scoping and Loopy tool as AI tools to understand the problem of displaced people and for establishing cause and effect relationship among various attributes/ Factors. • To understand the concept of Right of equality. • To analyse how is social discrimination pattern in India leading to inequality. • To understand the issues the Tawa Matsya Sangh is fighting for. • To analyse how the large scale participation of villagers has contributed to success of TMS-Right of Equality.	4 W canvas • 1 **Who** are the people getting affected ? • **What** was the reason factors responsible for their displacement from their native place and their struggle for equality? • **Where** is the problem located and context, where the stakeholders experience the problem? • **Why** was the Tawa Matsya Sangh formed? & how did the situation improved?
Time Required	2 Periods of 40 minutes each	
Classroom Arrangement	Flexible Seating arrangement	
Material Required	Textbooks, Blackboard, chalk, laptop/ desktop, internet connection, project if possible to display the loopy ·	
Pre – Preparation Activities	A group discussion can be organised to understand what our constitution says with regard to right to equality. Why do you think it is important for all people to be equal?	
Previous Knowledge	Having an insight on Differences leading to discrimination as a result - Inequality (Reference Chapter 2 : Diversity and Discrimination of class V)	
Methodology	• In continuation of the discussion held in pre preparation activity Students are asked to think of one person in their family, community, village, town or city whom they respect because of their fight for equality and justice. • Students are divided in the group of 4 to read the case study and identify the cause and effect relationship between different factors arising out of the situation of TMS. • Students would be introduced to AI tool Loopy and be told how it works in order to develop systematic thinking. http://ncase.me/loopy/	

Learning Outcomes	• The students would be able to understand the concept of Right of equality. • The students would be able toanalyse how social discrimination patterns in India leading to inequality. • The students would be able to understand the issues the Tawa Matsya Sangh is fighting for. • The students would be able to understand Loopy as an AI tool for establishing cause and effect relationship among various attributes/ Factors through the case study of TMS.	
Follow up Activities	Students would be asked to design a social advertisement on Equality in their same small groups.	
Reflections	What role does the Constitution play in people's struggle for equality.	

GLOSSARY:

AI Tools Terminologies

Problem Scoping (4 W Canvas)

Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What, When/Where and Why. The answers to these questions lead to a problem statement.

Loppy

Loopy is an opensource tool to understand the concept of system maps. A system map shows the components and boundaries of a system and the components of the environment at a specific point in time. With the help of system maps, one can easily define a relationship amongst different elements which come under a system. The map shows the cause & effect relationships of elements with each other with the help of arrows. The arrow-had depicts the direction of the effect and a sign (+ or -) shows their relationship. A + sign indicated positive relationship and a - sign indicates negative relationship between the elements. Considering the data features of any problem to be solved, a system map can be drawn.

http://ncase.me/loopy/

SOCIAL SCIENCE
CLASS 7

3.12 Advertising and Media

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter5: Advertising and Media**	
Name of the Book	**Social and Political Life, Class -7, NCERT**	
Subject and Artificial Intelligence Integrated	AI with Understanding the role of advertising in a world of increasing consumerism and competition.	
Learning Objectives	• To understand the meaning and role of advertising as a means of communication between the seller and buyer. • To help students understand the impact of advertising. • To understand how a variety of media, like magazines, newspapers, radio, television and billboards are used for advertising.	.
Time Required	2 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, Paper, Smart board, Internet connection, Projector for showing Ads, Newspapers, Magazines	
Pre – Preparation Activities	• Students will be shown a video on what is Advertising and Ads that changed the world and Award Winning Ads. • Ads which sparked debate and helped change the mindset of the people would be discussed. Example: All Out, Ariel #ShareTheLoad, Fairness creams • George Floyd's death and the shockwaves it sent to skin whitening cream. Unilever renaming Skin lightening Cream. • Students will be then asked to evaluate their reasons for identifying with a specific/particular brand. • Students will be told to find out the names of some of the popular brands and why they remember the names of those products or brands	Google Lens

	• Students can use Google Lens for recognising a particular product/brand, logo of Social Media platforms. ttps://www.youtube.com/watch?v=jq4cnKh0jbU ttps://www.youtube.com/watch?v=K9vFWA1rnWc	
Previous Knowledge	Students will be asked about their previous knowledge related to advertising and brands/products. What is their idea/understanding of advertising?	
Methodology	• The jingles of some of the Ads will be played out in the class and students will be asked to identify the name of the brand/product with the help of AI Tools, Sound Hound, Shazam • Popular Ads could be played out in the class with the help of Google Assistant.	https://www.soundhound.com/ https://www.shazam.com/ Google Assistant
Learning Outcomes	• Students will be able to understand the meaning and role of advertising as a means of communication between the seller and buyer. • Students will be able to understand the impact of advertising. • Students will be able to understand how a variety of media, like magazines, newspapers, radio, television and billboards are used for advertising.	
Follow up Activities	In their Scrapbook, students can paste advertisements of products/services which are good for our health or useful for us. Ads that have a catchy slogan. Students can ask their parents why they like particular products. Is it because they offer discounts or announce sale or because it is endorsed by a celebrity or is useful. Students can also come up with their own brand slogans or design a logo of a particular brand.	
Reflections	Students could reflect on few questions. Have they ever had any experience where they or their parents were fooled by promises made in an ad? Students can take the help of Inkle writer and write their reflections	Inklewriter https://www.google.com/search?q=inklewriter&rlz=1C1CHBD_enIN779IN779&oq=inklewriter&aqs=chrome..69i57j0l7.5645j0j7&sourceid=chrome&ie=UTF-8

GLOSSARY:

AI Related Terminology

Google Lens

Google Lens is an image recognition technology developed by Google, designed to bring up relevant information related to objects it identifies using visual analysis based on a neural network.

Google Lens https://lens.google.com/

Inklewriter

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

Inklewriter: https://www.inklestudios.com/inklewriter/

Links :

Google Assistant https://assistant.google.com/platforms/phones/

SoundHoundhttps://www.soundhound.com/

Shazam https://www.shazam.com/

SOCIAL SCIENCE
CLASS 7

3.13 Water

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 5: Water**	
Name of the Book	**Our Environment, Class 7, NCERT VII**	
Subject and Artificial Intelligence Integrated	AI Project Cycle integrated with Water and Need for water conservation and management	
Learning Objectives	• To know about the major sources of freshwater are glaciers, rivers, springs, ponds, and lakes. • To understand the concept of water cycle using AI application and how water is a renewable resource. • To analyze the reason of rise and fall of waves within the sea or ocean • To relate the concept of terrarium with that of our Earth to imbibe the concept of conservation of water. • To interpret the effect of the gravitational force of Sun and Moon causing tides . • To Distinguish between Spring and Neap tides. • To adopt different measures of water conservation	AI project cycle System mapping using Loopy App. (http://ncase.me/loopy/)
Time Required	3 Period 40 min	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, blackboard, chalk, smartboard/screen and projector, internet.	
Pre – Preparation Activities	Students are asked to list down the area affected by water scarcity and the possible reasons behind the present situation of water scarcity.	
Previous Knowledge	The students are asked to discuss the various usage of water and to devise how water wastage can be controlled.	

Methodology	● The teacher will initiate a discussion about the latest facts and figures about water scarcity. ● The students are asked to collect data on availability and distribution of freshwater resources at different places in the world. ● The students are asked to find out different sources of water available around us. ● The students are asked to develop a scrap book which includes different types of water conservation methods practiced in different areas. ● The students are asked to evaluate each and every model (Advantage and disadvantages) and choose the best model which gives the most efficient and best result. ● The student will be told about waves which continuously take place in the sea and a huge tidal wave called tsunami. ● Ocean current and fall of ocean water twice in a day due to Tides. ● Video on Tides and the causes. https://www.youtube.com/watch?v=M3hAhNsyf7 ● Students will be shown the movement of ocean current with the help of jamboard.	Problem scoping: Who, What, Where and Why Data Acquisition Data Exploration Data Visualization Evaluation https://jamboard.google.com/
Learning Outcomes	The students will be able to: • Analyze the reason of rise and fall of waves within the sea or ocean • Relate the concept of terrarium with that of our Earth,to imbibe the concept of conservation of water. • Interpret the effect of the gravitational force of Sun and Moon causing tides . • Distinguish between Spring and Neap tides. • To adopt different measures of water conservation.	
Follow up Activities	Crossword puzzle of the chapter would be solved by the students.	
Reflections	Students will be asked to analyze the situation in their surroundings Colony, Village or City, and submit the report on the Water Management mechanism.	http://ai-writer.com/

GLOSSARY

AI Related Terminologies

Problem Scoping: Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What, When/Where and Why. The answers to these questions lead to a problem statement.

Data Acquisition: Data Acquisition refers to acquiring authentic data from reliable and authentic sources/ platforms that is required for the AI model. There can be various ways to collect data.

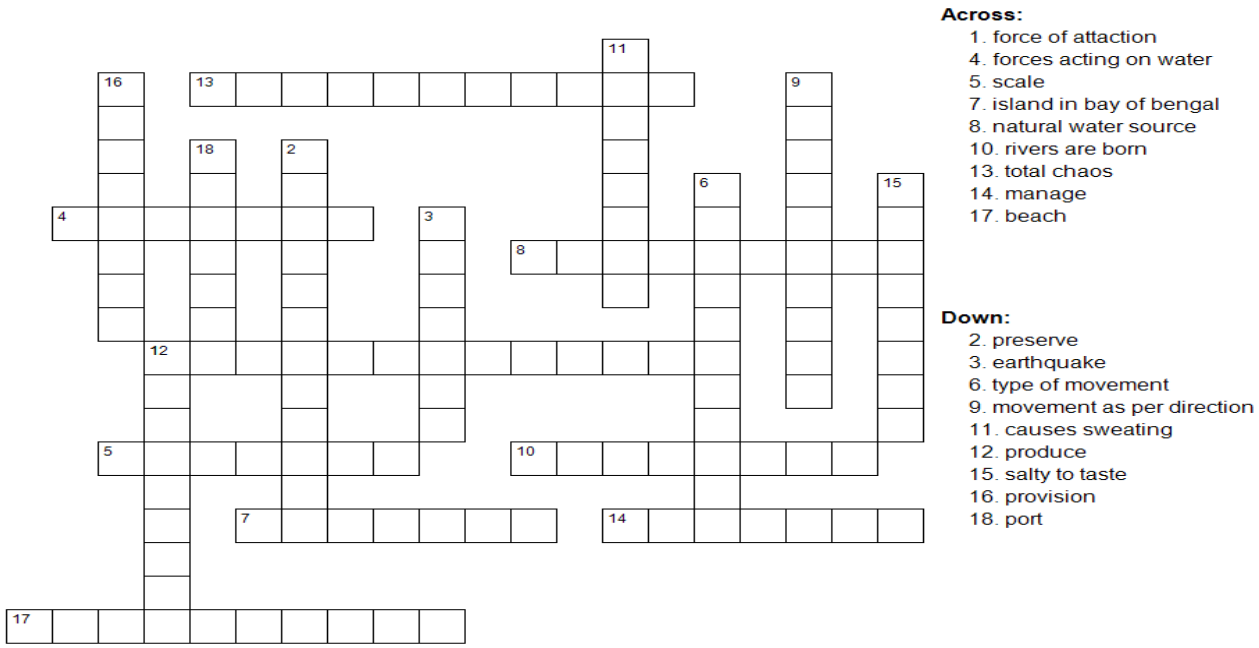
Data Exploration: Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

Data Visualization: Data is the fuel of artificial intelligence. A machine is said to be artificially intelligent if it gets trained and can make decisions/ predictions on its own and learns from its own experience and mistakes. In the modelling stage, data is split to training set and testing set. The model is trained on the training set from which it makes its own rules that helps the machine to give an output and the model is then evaluated on the testing set.

AI Writer: AI Writer tries to make a best guess response based upon what is generally known about that person but obviously should not be considered a reliable source nor an accurate reflection of their actual views and opinions.

This is intended as a research project to examine the potential applications and considerations for interacting with highly-capable AI.

Crossword



Across:
1. force of attaction
4. forces acting on water
5. scale
7. island in bay of bengal
8. natural water source
10. rivers are born
13. total chaos
14. manage
17. beach

Down:
2. preserve
3. earthquake
6. type of movement
9. movement as per direction
11. causes sweating
12. produce
15. salty to taste
16. provision
18. port

SOCIAL SCIENCE
CLASS 7

3.14 Natural and Human Environment

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 1: Natural and Human Environment**	
Name of the Book	**Our Environment, Class 7, NCERT**	
Subject and Artificial Intelligence Integrated	AI tools: Data Acquisition and Exploration, Mystery Animal and My Story Time integrated with Components Of Environment and Eco Systems	
Learning Objectives	• Students will be made aware about the surroundings • Students will be sensitised about the environment and its components. • They will be able to appreciate nature.	
Time Required	2 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, blackboard, chalk,, internet websites for data acquisition & laptops and performing the activity	
Pre – Preparation Activities	Students will be asked to play AI game Mystery Animal to develop curiosity about topic	**Mystery animal** http://bit.ly/iai4yma
Previous Knowledge	● Students will be asked what the things which surround them are. ● What are the different layers of the environment?	
Methodology	● Teacher will show a virtual tour of the environment and ask them to observe and tell the things they have observed. ● All those things comprises of the environment. ● They will be taken for a nature walk in the school to explain the topic. ● There are different components like natural and manmade .	
Learning Outcomes	● Students will learn about the environment . ● They will learn to appreciate the environment .	
Follow up Activities	● Students will be asked to observe the surroundings near their homes and collect the data of what kind of birds are there and name them	Data exploration and acquisition https://datavizcatalogue.com

Reflections	Students will be asked to prepare a creative story on different layers of atmosphere in My story time.	My Storytime https://experiments.withgoogle.com/my-storytime

GLOSSARY:

AI Related Terminologies

Mystery Animal game: NLP

Ask the students to go on this link using Google Chrome browser: https://mysteryanimal.withgoogle.com/. Once students reach this site, they need to click on 'preview it here'. The tutorial will start on the screen. Ask the students to go through the whole tutorial. Also, make sure that the microphone is enabled for this site. The machine will act as an animal and the students need to guess that animal by asking 20 questions to the machine. The questions need to be Yes/No questions as the machine will interpret their questions and answer only either Yes or No. Students may ask questions about its diet, surrounding, species, etc. Once students exhaust all 20 questions, the machine will reveal the animal and then the students can evaluate their questions and see how far they could reach. With the help of this game, students can understand how the machine interprets natural language and tries to converse in the same way. They will also explore various constraints which occur during the process.

http://bit.ly/iai4yma

Data Acquisition

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

Data Exploration:

Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

https://datavizcatalogue.com

My Storytime

My Story time is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant

https://experiments.withgoogle.com/my-storytime

SOCIAL SCIENCE
CLASS 7

3.15 Our Changing Earth

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: Our Changing Earth**	
Name of the Book	**Our Environment, Class 7, NCERT**	
Subject and Artificial Intelligence Integrated	AI tools; Data Acquisition and Data Exploration & Inkle Wrier are used to study the effects of Earthquakes.	
Learning Objectives	The students will be able to : • Recognise the forces that cause changes on Earth. • Understand the cause and the process of Volcanic eruption. • Create a working model of a Volcano • Demonstrate the ways to prepare themselves for the Earthquake. • Identify the effects of weathering and erosion on different landforms by various agents.	Data Acquisition and Data Exploration
Time Required	8 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, Paper, Whiteboard, Marker, screen and projector, desktop, internet websites for data acquisition Working model of a Volcano : Clay, Vinegar, Food colour Earthquake preparedness demonstration : Chart papers, Pen, Projector screen, Desktop	
Pre – Preparation Activities	The students will be divided into groups of four. They are asked to research and collect data about magnitude, focus point, areas of destruction and ways to mitigate the effects of an Earthquake.	
Previous Knowledge	The students will be asked about Lithospheric plates, the process of weathering and erosion.	
Methodology	**Activity 1: Movement of molten magma** The students will understand the way molten magma moves inside the Earth. **Activity 2 : Working model of a Volcano** The students will construct a working model of a Volcano to understand the process of its eruption. **Activity 3: Vibrations** The students will understand the reason for the occurrence of an Earthquake.	Inkle Writer

	Activity 4: Data Acquisition and Exploration The students will collect and visualise the data regarding Earthquakes to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. After collecting the data, the data will be presented through Inkle Writer.	
Learning Outcomes	The students will be able to : • Differentiate between endogenic and exogenic forces • Understand the reason behind volcanic eruption and Earthquake • Construct a working model of a volcano • Realize the importance of preparing for natural calamities in advance. • Understand the work of river, wind, ice, glaciers and sea waves in changing the landforms.	
Follow up Activities	The students will identify the various photographs and tell whether these landforms have been created by erosional or depositional features.	
Reflections	Through Ethics in AI, the students will write How they will help others during the time of a calamity	

GLOSSARY:

AI Related Terminologies

Data Acquisition: Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.
Various sites will be referred for the acquisition of the data.
Data will be related to magnitude, focus point, areas of destruction and ways to mitigate the effects of an Earthquake.

Data Exploration: Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.
A discussion will be conducted after Data exploration.

https://datavizcatalogue.com

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.
With the help of the Inkle writer, the students will present their data collected.

www.inklewriter.com

SOCIAL SCIENCE
CLASS 7

3.16 Life in the Deserts

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 9: Life in the Deserts**	
Name of the Book	**Our Environment, Class 7, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the life in desert using artificial intelligence experiential application.	
Learning Objectives	• To explain the climatic condition of hot and cold desert. • To identify the geographical location of desert. • To relate how different animals adapt in different regions using artificial intelligence application.	
Time Required	2 period 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Smart board, world map, laptop/desktop, internet connection, projector and marker.	
Pre – Preparation Activities	A map is required to show the geographical area of Sahara desert and Ladakh.	
Previous Knowledge	Ask students to • discuss about the features of desert . • the animals live in desert . • if they would like to live in the desert area. Why/why not?	
Methodology	**Activity 1** Using a projector, the geographical area will be shown to the pupils, and they will be asked to mark the correct location of Sahara desert on the map of Africa and any four countries around it. **Activity 2** Students will be asked to collect information from the weekly weather forecast regarding the world ‘s largest hot desert and the cold desert in Ladakh. They will represent the data using AI application and represent it on bar charts. From the graphical representation, they can gain greater insight into the extreme climatic condition of both the deserts. **Activity 3** Students are divided into pairs to play the AI Game Mystery Animal. Students are asked to recount their experience of playing against AI and identify the animal. Each pair will be asked to speak about the unique features of animals they ide*ntified.*	Data acquisition and data exploration to identify the climatic condition. https://datavizcatalogue.com https://experiments.withgoogle.com/mystery-animal

Learning Outcomes	Student will be able to understand the life in desert and how different animals adapt to the climate of a place through an AI Mystery animal game.	
Follow up Activities	Students will discuss about the harsh climatic influences on the life of people living in desert.	
Reflections	Students are able to mark the Sahara desert on their own.	

GLOSSARY:

AI Related Terminologies

Data Acquisition

Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired could be then divided into two categories: Training Data and Testing Data.
The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which you can collect data.

Some of them are:
- Surveys
- Web Scraping
- Sensors
- Camera
- Observations
- Application Program Interface

Data Exploration

After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can:
- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

Mystery Animal

Ask the students to go on this link using Google Chrome browser: https://mysteryanimal.withgoogle.com/. Once students reach this site, they need to click on ‘preview it here’. The tutorial will start on the screen. Ask the students to go through the whole tutorial. Also, make sure that the microphone is enabled for this site. The machine will act as an animal and the students need to guess that animal by asking 20 questions to the machine. The questions need to be Yes/No questions as the machine will interpret their questions and answer only either Yes or No. Students may ask questions about its diet, surrounding, species, etc. Once students exhaust all 20 questions, the machine will reveal the animal and then the students can evaluate their questions and see how far they could reach. With the help of this game, students can understand how the machine interprets natural language and tries to converse in the same way. They will also explore various constraints which occur during the process.

SOCIAL SCIENCE
CLASS 7

3.17 Natural Vegetation and Wildlife

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 6: Natural Vegetation and Wildlife**	
Name of the Book	**Our Environment, Class 7, NCERT**	
Subject and Artificial Intelligence Integrated	Use of trail guard for tracking poaching activities	
Learning Objectives	• To understand what is vegetation and its types? • To be able to differentiate forests, grasslands, shrubs • To know about types of forests • To understand and find out ways of forest and wildlife conservation	
Time Required	3 periods of 40 minutes each	
Classroom Arrangement	Flexible seating arrangement	
Material Required	Textbook, Pen, You tube paper, white board/smart board, marker, Laptops and Internet connection.	
Pre – Preparation Activities	Video showing types of landforms and how the climate affects vegetation, https://www.youtube.com/watch?v=oYS2Xo2vsb8 Students can be taken to a zoo.	
Previous Knowledge	The students shall be asked questions • What are forests? • How are they useful to us? • Do we find vegetation in all parts of the world? • 4.How can we save forests and animals?	

Methodology	I**ntroduction** • There is a video on types of vegetation shown to students in preparation for the lesson. https://www.youtube.com/watch?v=D2we2chDH88 • Students are asked to read about natural vegetation and identify the various types of vegetation. Later they would be asked to have discussion on different types of vegetation. • Mystery animal will be used with the students to identify various animals and then the teacher will do brainstorming and will ask about causes and ways of forest and wildlife conservation. ● Teacher will ask the students that How AI can help in forest and wildlife conservation.	Mystery Animal http://bit.ly/iai4yma Trail guard
Learning Outcomes	Students will be able to • Understand the use of AI in forest and wildlife conservation. • understand about various types of vegetation	
Follow up Activities	The students can be given the assignment of collection data regarding decrease in tiger population since 1950 and to represent it through line or bar graph.	
Reflections	The students will be asked to identify the types of vegetation found in the world for global understanding.	

GLOSSARY:

AI Related Terminologies

Mystery Animal

Mystery Animal is platform that allows you to make things for the Google Assistant and the Google Home. It uses Dialogflow to handle understanding what the player says, Firebase Cloud Functions for backend code, and Firebase Database to save data. The project is written in JavaScript, using Actions on Google's Node.js client library.

This repo contains a pre-built Dialogflow Agent you can import into your own project. It contains all the Intents and Entities for Mystery Animal. This is all in the dialogflow agent folder.

Everything in the functions folder is used in Firebase Cloud Functions, which hosts the webhook code for Dialogflow. The webhook handles all the response logic for Mystery Animal. The bulk of the code is in index.js.

Trail Guard

AI tool designed to stoppoachers and protecting parks and communities. In Africa and Asia, poaching is reaching epidemic proportions and placing iconic mammals at risk of extinction within our lifetimes. While new technologies have emerged to track and analyze contraband from the illegal wildlife trade, there are no affordable technologies that help law enforcement effectively locate poachers before they reach their target animals. To help address this challenge, RESOLVE partnered with Steve Gulick (a conservation technologist) and Intel to develop TrailGuard™ AI, a cryptic anti-poaching camera system designed to stop poachers before they kill.

SOCIAL SCIENCE

CLASS 7

3.18 Air

Chapter Covered	**Chapter 4: Air**	
Name of the book	**Our Environment, Class 7, NCERT**	
Subject and Artificial intelligence integrated	Understanding the concept of Air and Atmosphere with AI tools like Data Acquisition & Exploration and Inkle writer.	
Learning Objectives	● To understand the concept of weather and Climate and how both are different. ● To analysis the factors affecting weather. ● To understand the composition of gasses in atmosphere. ● To analyse the importance of Carbon dioxide (Green house gasses) in atmosphere. ● To analyse the features of different layers of atmosphere.	
Time Required	4 periods 40 mins each	
Class room arrangement	Flexible	
Materials Required	Pen, paper, black/green board, chalk, smartboard, internet, laptops	
Pre preparation activity	Students will be divided into groups and will be asked to collect weather report of last one week from news paper. Students will be asked to visit the following and discuss about what they understand regarding weather and how it can be predicted. https://interestingengineering.com/ai-might-be-the-future-for-weather-forecasting	DATA ACQUISITION and Exploration
Methodology	• Students will present Weather report on the basis of the information they collected from the newspaper and the video they watched. They are introduced to how AI is playing major role in collection, collation and analyses of data to predict weather in the form of weather forecast. • Students will read a case study of Global warming and watch a video on importance of Green housegasses andanalyse its importance https://www.youtube.com/watch?v=x_sJzVe9P_8 https://www.youtube.com/watch?v=d7Ci_EooW-k • Students will prepare a mind map/Loopy system map to present the relation of green house gasses, temperature and other factors.	https://datavizcatalogue.com http://ncase.me/loopy/
Discussion on the text	There will be discussion on: ● Weather and climate ● Factors affecting weather ● Imporatance of Carbon dioxide. ● Features of different layers of atmosphere	
Learning outcomes	Students will be able to: ● Differentiate Weather and climate ● Analyse the factors affecting weather	

	● Analyse the importance of and affects of carbondioxide (Green house gasses) in atmosphere ● Analyse the features of different layers of atmosphere	
Self evaluation and follow up	Teacher will analyses the responses of students and the data collected by students	
Reflection	Students will prepare a weather report and share.Students will write an article on Global warming and its effects	Inklewriter.com

GLOSSARY:

1. AI Related Terminologies

Data Acquisition:

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

Data Exploration:

Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

https://datavizcatalogue.com

Loopy:

Loopy is an opensource tool to understand the concept of system maps. A system map shows the components and boundaries of a system and the components of the environment at a specific point in time. With the help of system maps, one can easily define a relationship amongst different elements which come under a system. The map shows the cause & effect relationships of elements with each other with the help of arrows. The arrow-had depicts the direction of the effect and a sign (+ or -) shows their relationship. A + sign indicated positive relationship and a - sign indicates negative relationship between the elements. Considering the data features of any problem to be solved, a system map can be drawn.

http://ncase.me/loopy/

Inklewriter:

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

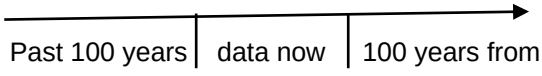
www.inklewriter.com

2. AI Activity Description

In this intro activity students will collect the weather report of one week from news papers and other sources in groups. Ask students to brainstrom on how AI be used to help in such situation to predict the weather and climatic conditions of the place.

SOCIAL SCIENCE
CLASS 8

3.19 History – How, When and Where

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 1: History – How, When and Where**	
Name of the book	**Our Pasts–III Part 1, Class 8, NCERT**	
Subject and Artificial Intelligence Integrated	History and AI	**Data Acquisition & Data Exploration**
Objectives	The objective of the lesson is to understand the importance of dates in collecting information of time periods in history highlighting the use of records for administrative purposes.	
Time Required	2-3 periods	
Classroom Arrangement	Regular classroom arrangement	
Material Required	Text book, Questionnaire, presentation – through PowerPoint / charts	
Pre- Preparation Activity	Teacher to discuss and explain about data and its importance. Examples in collecting, classifying and recording data to be shared.	
Introduction/Previous Knowledge	Learners dwell upon their understanding about data interpretation in Mathematics in the form of graphs. Ques 1; How do you think we know about different events that happened in the past? Do you think that there are different ways to collect information? Do you think that the official records of the past tell us something about the thoughts of the people, food, costumes, culture and hobbies of that time ? If you had to rewrite history what other information do you think you would need to collect to get a complete picture of those times? If we draw a time-line of history do you think there will be a change in the way we collect data? Will AI be of some benefit ?  	**Data Acquisition & Data Exploration**
Methodology	!. Children are divided into groups of 5 and asked what data would they like to collect about the past besides the ones collected by the British Administration? Some examples – data about the Types of Occupation Types of Transport Types of Houses Types of Entertainment After collecting the data for any one of the above the students will be asked to prepare a bar graph and a presentation What resources will you use to collect this data? Library resources, interviewing historians, old people and their experiences, Government data sets etc.	

Discussion on the Text	Discussion on • How can they make this process simpler with the help of using AI? • How can AI help to collect data? • Why is it important to understand the importance of Data for understanding AI?	Data Acquisition & Data Exploration Use of Sketchy Graphs to represent data sets.
Learning Outcomes	Students will be able to understand the importance of data Students will be able to identify the sources for data Students will be able to interpret the data through graphs and presentation	
Self-Evaluation and Follow-Up	Students will listen to each other and learn from their peers during the presentation.	
Follow-up Activity	They will collectively make a collage for the school to talk about the importance of data in History and how data can be collected and stored in the future through AI.	

GLOSSARY:

1. AI Related Terminologies

Data
Data can be a piece of information or facts and statistics collected for reference or analysis.

Data Acquisition
AI Project cycle is a framework which is used to design an AI project keeping all the crucial factors into consideration. The project cycle consists of 5 steps namely: problem scoping, data acquisition, data exploration, modelling and evaluation. Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired could be then divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data.
There can be various ways in which you can collect data. Some of them are:

- Surveys
- Web Scraping
- Sensors
- Cameras
- Observations
- Application Program Interface

2. AI Activity Description

In this activity, students will be collecting data around various parameters which will help them in exploring history in a better way. They will think of areas which interest them the most and search online for various sources of data. They then need to select reliable sources of data and seek authentic information of out them. After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc. Using these representations, students need to understand the patterns of lifestyle in the past and deliver a presentation on the same.

SOCIAL SCIENCE
CLASS 8

3.20 Mineral and Power Resources

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: Mineral and Power Resources**	
Name of the Book	**Resources and Development, Class 8, NCERT**	
Subject and Artificial Intelligence Integrated	AI tools: Data Acquisition & Exploration and Inkle writer integrated with Mineral and power Resources.	
Learning Objectives	• To identify different types of minerals and Power Resources. • To Know Distribution of Minerals and Power Resources in World and India. • To understand different uses of minerals in day to day life. • To understand the importance of conservation of Minerals Power Resources. • To check the understanding about Distribution of Mineral and Power resources and their different facts and aspects through AI app. (Data Acquisition and Data Exploration)	https://datavizcatalogue.com
Time Required	2 Periods of 40 minutes each	
Classroom Arrangement	Flexible Seating arrangement	
Material Required	Textbooks, Blackboard, chalk, laptop / desktop, internet connection, Projector to display the questions of quiz.	
Pre – Preparation Activities	A teacher would ask for the different examples of mineral and energy resources they usually find in their day to day life. Examples: salt, Talcum powder, granite in pencil, Gold and Silver in Jewelary, Iron and aluminum in utensils.	
Previous Knowledge	• Location of different states on Indian political map. • Location of Continents on World map.	
Methodology	• Students are divided in Five groups basis different type of Minerals and Power Resources such as Ferrous Metal, Non ferrous Metal (Precious Metal), Non Metallic metals, Conventional energy resources and Non Conventional Energy Resources. • Students are asked to collection the data regarding Distribution of minerals and Energy resources worldwide and in India. (Data Acquisition). • Students are asked to visualised the data to determine the pattern, relationships between geographical area and distribution of resources. (Data Exploration) • Students will demonstrate the presentation and ask for queries from the audience students.	(Data Acquisition). (Data Exploration). https://datavizcatalogue.com

Learning Outcomes	• The students would be able to identify different types of minerals and Power Resources. • The students would be able to Know Distribution of Minerals and Power Resources in World and India. • The students would be able to understand different uses of minerals in day to day life. • The students would be able to understand the importance of conservation of Minerals and Power Resources. • The students would be able to check the understanding about Distribution of Mineral and Power resources and their different facts and aspects through AI app	
Follow up Activities	Teacher will conduct a quiz to assess the understanding of students about Distribution and different aspects of Minerals and Power Resources. http://kuhoot.it/	
Reflections	Students are making report on Use of resources, their advantages and disadvantage.	www.inkle.writer

GLOSSARY:

AI Tools Terminologies

Data Acquisition

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/ platforms that is required for the AI model. There can be various ways to collect data.

Data Exploration

Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

https://datavizcatalogue.com

Inklewriter

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

SOCIAL SCIENCE
CLASS 8

3.21 British Administration in India

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: British Administration in India**	
Name of the Book	**Our Past, Class 8, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the changes made by the British in Indian Administration system and various causes and effects of changed administrative system with the help of AI Project Cycle tools.	
Learning Objectives	• Students will be able to understand the changes brought by British in India. • Students will also understand the effects of those administrative changes on people of India. • Students will be able to identify how colonial people lost their control on their own political, social and economical life in colonisation. • Students will be able to compare the administration of government before British, after their arrival and the Present day	.
Time Required	4-5 periods 40 min each	
Classroom Arrangement	Flexible	
Material Required	Textbooks, Smart Board/ screen and projector, Laptops , internet, Google	
Pre – Preparation Activities	Use the internet and collect pictures of some British Official who played an important role in the Administrative structure of British India. Share little information about them with your fellow classmates. • A video will be shown to the students to make them curious to learn about the topic https://www.youtube.com/watch?v=AdJIAB9H-90	Data Acquisition
Previous Knowledge	Some questions will be asked to understand their previous knowledge. • Name any movie where you have watched the style of administration of the British. • How would people feel when after being highly educated they could not get the desired post in the government services?	

Methodology	The teacher will discuss with the students how India was ruled by different rulers in different regions before the British arrived. The teacher will also tell them how the administrative structure also was different from each other's'. The whole class will be divided into Four group: Group 1, Group 2, Group 3 and Group 4 Group 1 will work on 'What' were the changes made. Group 2 will find out 'Who' were the people affected? Group 3 will find out 'Why' those changes were made and Group 4 will find out 'Where' those changes were made. They will mention the fields where changes were made. After the discussion between groups they will be asked to do the follow up activities.	Edraw- free AI History timeline template Problem Scoping 4 W Canvas- Who, What, Where, Why
Learning Outcomes	Students will be able to understand that time conditions of common people who were affected by the changed structure of administration in their country. Students will be able to compare the administration of government before British after their arrival and the Present day.	
Follow up Activities	A Story on the events will be created on the topic "whether all the changes made by the British were good/bad for the development and modernisation of the country" using My Story Time and will be shared with the students. Draw Timeline of 1765-1857 using Jam board Make a newspaper of events and happenings of that period e.g. Newspaper of Date: 3 january 1784	My Story time Jam board
Reflections	Imagine if you were a student in that era what kind of life you would be living? Students could talk to their Grandparents and document their experience of Colonialism with the help of Inkelwriter. How your life along with your family member would have changed because of the changed administration in the country.	Inkle Writer www.inklewriter.com

GLOSSARY:

AI Related Terminologies

Problem Scoping

Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What, When/Where and Why. The answers to these questions lead to a problem statement.

Data Acquisition

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

MY Storytime

My Storytime is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant.

JamBoard- AutoDraw

JamBoard-AutoDrawis a new drawing tool in JamBoard that auto-detects sketches you make and pairs them with images. This works with both local and rooms using JamBoard (or G-suite apps) as well as rooms with JamBoards or users with G-suite to connect into a meeting from anywhere in the world.

Inklewriter

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

SOCIAL SCIENCE
CLASS 8

3.22 Judiciary

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 5: Judiciary – Political Science**	
Name of the Book	**Social and Political Life-III, Class 8, NCERT**	
Subject and Artificial Intelligence Integrated	AI Project Cycle integrated with Structure of Indian judiciary and Legal proceeding of judiciary system	
Learning Objectives	Students will be able to understand: • The structure and process followed by the judiciary: Trace a case from lower to higher courts. • Indicate the rationale of the process. • Distinguish between civil and criminal cases.	https://play.google.com/store/apps/details?id=com.slsct.represent
Time Required	4 periods of 40 minutes each	
Classroom Arrangement	Seating arrangement – For Theory Session Flexible – for Activities	
Material Required	Pen, paper, Black Board, chalk, Laptops and Internet connections, Power Point, Smart Board.	
Pre – Preparation Activities	Lets play game How to represent in court. Through this app/game students will be able to play through a simulation of court and in the mean process they will also be able to learn the judiciary process and how to represent in court. Students will be asked to play this game one day before the start of lesson.	https://play.google.com/store/apps/details?id=com.slsct.represent
Previous Knowledge	What is FIR? Food for Thought I think, this chapter wants to teach us... We need judicial system, because… An independent judiciary mean... A person can appeal to a higher court if... Difference between criminal court and civil court is...	Problem scoping

Methodology	Based on the above-mentioned activities students will get familiar with the basic terms of judicial process, flow of judiciary and basic functions of Indian Judiciary. Now students will be divided into groups of 4students: 2 public prosecutors and 2 defense lawyers and hypothetical cases will be presented to them to be solved as public prosecutors.	https://www.waikato.ac.nz/students/student-learning/academic/law_hypos/hypo1.shtml
Learning Outcomes	Students will be able to understand: • Role of judiciary. • The structure and process followed by the judiciary: Trace a case from lower to higher courts. • Indicate the rationale of the process. • Distinguish between civil and criminal cases	
Follow up Activities	Power point presentation of • Flow of legal proceeding that students followed in solving the hypothetical cases. • Arguments that they would make in the court to represent their case and what should be the verdict as per them on the basis of their representation.	https://www.edrawsoft.com/edraw-max/?gclid=CjwKCAjw4rf6BRAvEiwAn2Q76vYyrYuQd8ns-rVKNEOY4Fye4qw1-4187B0OGVrBn7vv9E1O6CsyXhoCxDcQAvD_BwE
Reflections	ta visualisation module to show how transfer of cases from ver court to higher courts creates a burden on the judiciary stem. And if possible, show a solution on the same loop.	Data Acquisition Data Exploration https://datavizcatalogue.com/methods/treemap.html

GLOSSARY:

AI Related Terminologies

Problem Scoping

Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What , When/Where and Why. The answers to these questions lead to a problem statement.

Data Acquisition:

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

Data Exploration:

Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

AI Modelling:

Data is the fuel of artificial intelligence. A machine is said to be artificially intelligent if it gets trained and can make decisions/ predictions on its own and learns from its own experience and mistakes. In the modelling stage, data is split to training set and testing set. The model is trained on the training set from which it makes its own rules that helps the machine to give an output and the model is then evaluated on the testing set.

Classification:

Classification is a part of supervised learning model. Classification models work on labelled dataset and are used to predict the label/class of the testing dataset which is unknown to the machine. For example, an AI model is trained on a labelled dataset of 100 images of apples and 100 images of bananas. The machine gets trained on the dataset by extracting features from the dataset and understands what features will classify an image as an apple or a banana. To test the machine, random images of an apple/banana are fed to the AI model and the output will be classification of apples and bananas

SOCIAL SCIENCE
CLASS 8

3.23 From Trade to Territory

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 2: From Trade to Territory**	
Name of the Book	**Our Pasts-III, Class 8, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding How Trade led to Battles and how did the company rule expands with help of My Story Time and Inkle Writer.	● My Story Time ● Inkle Writer
Learning Objectives	• Students will be able to rationalise how the consolidation of British power was linked to the formation of colonial armies and administrative structures. • Unravel the story of a trading company becoming a political power. • Students will learn about various policies adopted by Britishers.	https://experiments.withgoogle.com/my-storytime www.inklewriter.com
Time Required	4 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, blackboard, chalk,, internet websites for data acquisition & laptops and performing the activity	
Pre – Preparation Activities	Students will be introduced to AI tools Inkle writer and My story Time.	
Previous Knowledge	● Students will be asked about Mughal Rulers. ● What were their policies?	
Methodology	● The teacher will narrate a story in the class to tell students about how East India Company come to India and how they started their trade ● They were only interested in trade, not in ruling the country. So, this trade finally led to battles. ● Teacher will show a video to show Battle of Buxar and Plassey (https://youtu.be/8HEl9E70SxU) ● The teacher will ask the students to do an activity. They will be asked to present their	

	stories about The Tiger of Mysore and Maharaja Ranjit Singh . ● Students will be divided in the groups and present their stories. . ● They will use My Storytime. ● Students can use **My Map** tool to mark locations in the outline map of India as what all states were under British control during different times.	My Storytime. Google my maps
Learning Outcomes	● Students will able to know how trade related issues led to the Battles . ● They will get to know about the lives of Tipu Sultan and Maharaja Ranjit Singh . ● Students will be able to understand the policies adopted by the East India Company like Subsidiary Alliance and Doctrine of Lapse. .	
Follow up Activities	● They will be asked what are the other problems faced by Women in the society. ● They will be asked to write or record story relate to any other contemporary ruler of India in AI tool.	www.inklewriter.com
Reflections	Students will be asked to mark various locations which were under British Control in 1797 , 1840 and then 1857	My Map

GLOSSARY:

AI Related Terminologies

Inklewriter

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

My Storytime

My Story time is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant

https://experiments.withgoogle.com/my-storytime

My Map

https://www.google.co.in/maps/

SOCIAL SCIENCE
CLASS 8

3.24 The Making of the National Movement: 1870s-1947

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 9: The Making of the National Movement: 1870s-1947**	
Name of the Book	**Our Pasts -III, Class 8, NCERT**	
Subject and Artificial Intelligence Integrated	AI integrated with different happenings of the Nationalist Movement from 1870-1947 linking with constitutional changes.	
Learning Objectives	The Students will be able to: • Outline the major developments within the national movement, with focus on a detailed study of one major event. • Identify the causes that led to the rise of nationalism in India. • Trace the emergence of Indian national congress. • Discuss the various stages of the national movement in India. • List the names of prominent leaders of Indian National Movement and role of Gandhi in this movement. • Understanding the circumstances leading to the formation of Indian National Congress and its demands. • Differentiate between the Moderates and Radicals.	
Time Required	10 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	• Pictures of Various Freedom Fighters • PowerPoint Presentation • Movies and shows • Videos on Nationalist Movement • Articles on and about the lives of people at that period of time	
Pre – Preparation Activities	The students will be told about the struggles faced by the Indians during the British rule.	Google Lens
Previous Knowledge	Students will be asked certain questions based on their previous knowledge about Nationalism and the freedom fighters.	
Methodology	**Activity 1:** Character Dramatisation The students will dramatise the important characters of the freedom struggle. **Activity 2: Source Study** The students will study the various sources given in the chapter and brainstorm on the questions given by the teacher.	E draw for making timelines My Story time

	Activity 3: Timeline activity The students will make a timeline of the important events during the British rule. **Activity 4: My story time** With the help of this AI tool, the students will be taught various movements of the freedom struggle.	
Learning Outcomes	Students will be able to: • Identify the causes that led to the rise of nationalism in India. • Discuss the various stages of the national movement in India. • List the names of prominent leaders of Indian National Movement and role of Gandhi in this movement. • Understanding the circumstances leading to the formation of Indian National Congress and its demands. • Differentiate between the Moderates and Radicals. • Understand the different happenings of the Nationalist Movement from 1870-1947 linking with constitutional changes. • Trace the journey of National Movements within the political boundaries of India.	
Follow up Activities	A follow up worksheet or assignment will be given to the students. Students who will not perform well in the feedback worksheet will be called for remedial where teachers will provide notes on the chapter in the form of points and explain difficult concepts.	
Reflections	The students will be shown some pictures of the famous freedom fighters and some unsung heroes. They will identify them with the help of Google Lens and will research on the unsung heroes of the National Movement and use of Inkle writer to prepare a report.	Google Lens Inkle Writer

GLOSSARY:

AI Related Terminologies

My Storytime
It is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant. With the help of this tool, the teacher will record stories related to National movements and that will be used as AI tool for the students.

E Draw
E Draw will be used to create Timelines of the events that took place during the freedom struggle.

Google Lens & Inklewriter
The students will be shown some pictures of the famous freedom fighters and some unsung heroes. They will identify them with the help of Google Lens and will research on the unsung heroes of the National Movement and use of Inklewriter to prepare a report.

SOCIAL SCIENCE
CLASS 8

3.25 Land, Soil, Water, Natural Vegetation and Wildlife

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 2: Land, Soil, Water, Natural Vegetation and Wildlife Resources**	
Name of the Book	**Social Science Resource and Development, Class 8, NCERT**	
Subject and Artificial Intelligence Integrated	AI Modeling and Data Acquisition & Exploration; AI tools integrated with Soil resources, Soil erosion and conservation of Soil.	
Learning Objectives	Students will be able • to understand the concept of soil as a resources • to identify the causes of Soil erosion. • to enlist the Human activities responsible for soil degradation • to understand the methods to conserve soil	
Time Required	2 periods of 40 minutes each.	
Classroom Arrangement	Flexible·	
Material Required	White board, marker, laptop/desktop and internet connection	
Pre – Preparation Activities	Students are asked to list down the uses of soil and natural agents of soil erosion	
Previous Knowledge	The students will discuss the uses of soil and soil erosion and ways to prevent it.	
Methodology	• The students are asked to collect data on recent landslides. • The Students are asked to interpret the data on the basis of : - Reason of landslide - Name the state which has high risk of landslides. - Precautions to be taken in landslide prone areas. • The Students are asked to make a GO of different methods to conserve soil • The Students are asked to evaluate the ways to prevent soil erosion and which method is suitable in which particular area.	Data Acquisition Data Exploration Modeling Evaluation

Learning Outcomes	• Students will learn about theways to conserve soil. • Students will learn about reason behind landslide and need to have precautions measures in landslides prone areas. • Students will learn about the importance of soil and reasons responsible for soil erosion.	
Follow up Activities	Students have to create a story in which they will talk about their journey in hills and they encounter a landslide and they did not see any landslide prone sign on the road. So from this story writing they will learn about the importance of road signs	Inklewriter
Reflections	Students can assess their performance by comparing the stories with other ones and try to use the AI features into an interesting way·	My Storytime

GLOSSARY:

AI Related Terminologies

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired could then be divided into two categories: Training Data and Testing Data.

The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which you can collect data. Some of them are:

- Surveys
- Web Scraping
- Sensors
- Cameras
- Observations
- Application Program Interface

Data Exploration: After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

AI Modelling: Data is the fuel of artificial intelligence. A machine is said to be artificially intelligent if it gets trained and can make decisions/ predictions on its own and learns from its own experience and mistakes. In the modelling stage, data is split into a training set and a testing set. The model is trained on the training set from which it makes its own rules that help the machine to give an output and the model is then evaluated on the testing set.

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

My Storytime: My Storytime is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant
https://experiments.withgoogle.com/my-storytime

SOCIAL SCIENCE
CLASS 8

3.26 Women, Caste and Reforms

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 8: Women, Caste and Reforms**	
Name of the Book	**Our Pasts - Part III, Class 8, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the status of women, impact of the caste system and the reforms undertaken to overcome social practices in India during the nineteenth century and appreciating the work done by social reformers in bringing about a change in the social customs and practices with AI Project Cycle and AI Ethics.	
Learning Objectives	• Understanding the status of women in the 19th century and the reforms that helped in improving their condition. • Understanding the vicious cycle of the caste system and its impact on society. • Understanding the task taken by various social reformers in cleansing our society from the clutches of evil social customs and practices like untouchability, widow remarriage, sati etc. • Comparing the status of existing social conditions with conditions prevailing during the 19th century. • Understanding the various Movements started by Social Reformers in bringing about a change in the society.	
Time Required	4 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Textbook, PPT, Map of India Pen, paper, white board/smart board, marker, Laptops and Internet connection.	
Pre – Preparation Activities	Video showing the condition of Indian society 200 years back. https://www.toppr.com/content/story/amp/introduction-to-women-caste-and-reform-88347/	https://datavizcatalogue.com/methods/brainstorm.html
Previous Knowledge	The students shall be asked questions: • Have you ever thought of how children lived about two hundred years ago? • What is Right to Education?	4 W CANVAS • Who was affected? • What were the social issues?

		• When and where were they ill treated? • Why were they considered as inferior? https://research.google.com/semantris/
Methodology	• The students will be asked to role play any social problem that existed in the past and the solution for the same. • The teacher will explain the status of women two hundred years back. • The teacher will discuss the reforms introduced in the society by various social reformers. • The various reform movements started to bring changes in the society.	Using AI Model training and classification https://teachablemachine.withgoogle.com/
Learning Outcomes	● Students will understand the status of women and children existing in the past. ● Students will compare the past with the present and draw conclusions as to how fortunate they are to live in a society which is free of unwanted social customs and practices. ● Students will learn to differentiate what is right to equality. ● Students will understand the difficulties faced by the reformers in making the society a better place to live and how they can contribute towards a better society in the future.	
Follow up Activities	The students will be given topics for discussion. ● Why does caste remain such a controversial issue today? ● Write down the different arguments you may have heard around you on the worth of women. In what ways have the views changed?	AI Ethics https://www.moralmachine.net/
Reflections	Students will be asked to present the ideas of any one of the social reformers.	www.inklewriter.com

GLOSSARY:

AI Related Terminologies

AI Classification

Ask the students to understand the work of various social reformers and ask them to collect theirimages. Let the students explore these images and ask them to classify each of the images on the basis of the work done by them. Once they are able to classify them, ask students about their approach to classification and how the AI machine does it.. The AI models get trained on the basis of instructions given to them and then give the desired classification output.

https://research.google.com/semantris/

The students will be providing similar meaning words to a group of words taking the theme of the lesson into consideration so that they can understand the comparison.

Data Acquisition through 4 W Canvas

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What , When/Where and Why. The answers to these questions lead to a problem statement.

https://datavizcatalogue.com/methods/brainstorm.html

Inklewriter:

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

AI Ethics

Students can take up any social issue and ask the opinions of others as well to derive at a consensus. https://www.moralmachine.net/

Students can derive at important issues after brainstorming the past and the present scenario prevailing in our society.

SOCIAL SCIENCE
CLASS 8

3.27 When People Rebel

Chapter Covered	**Chapter 5: When People Rebel**	
Name of the book	**Our Pasts- III, Class8, NCERT**	
Subject and Artificial intelligence integrated	AI- tools: Data Acquisition, Problem scoping-4Ws, E draw and inkle writer integrated with topic “When people rebel”.	
Objectives	Students will be able to understand: ● Analyse the reasons for 1857 revolt ● Understand the course of 1857 revolt ● Understand the policies of East India company ● Analyse the cause for the failure of 1857 revolt.	
Time Required	4 periods of 40 minutes each	
Class room arrangement	Flexible	
Materials Required	Pen, paper, black/green board, chalk, smart board, internet, laptops	
Pre preparation activity	Students are asked to see the video Bharat ekkhoj episode https://www.youtube.com/watch?v=D9xxnzfODE8	
Previous Knowledge	Students know about Indigo plantation, Taxation policies of East India Company, Subsidiary policy and Doctrine of Lapse policy	
Introduction	Teacher will ask questions based on their previous knowledge. ● Explain Doctrine of Lapse policy. ● Who all were affected? ● What is subsidiary alliance? ● Two systems of Indigo cultivation. ● Three main taxation policies	
Methodology	The students are asked to read the text book and from the video they watched to find the causes of 1857 revolt. Based on the data collected by students –causes of revolt will be discussed in the class Students are asked to make a flow chart/ timeline of the course of the revolt Students are asked to find reasons for the failure of 1857 revolt. ● Who all are involved in revolt? Name all sections of people involved. ● What do you know about them? How are they affected due to East India company? ● Where these revolt took place Name the places. ● Why it was failed? Reasons for failure. Students will write a report –Causes for the failure of 1857 revolt. based on 4Ws Canvas	Data Acquistion Edraw-Free—AI history timeline template Problem scoping: 4Ws canvas-- Who, what, where and why. Inklewriter-AI writing tool

Discussion on the text	There will be discussion on ● Why were farmers unhappy? ● Why were sepoys unhappy? ● Social customs prevalent in that period. ● When disatisfaction turns into revolt? ● Reasons for failure.	
Learning outcomes	Students will be able to: ● Analyse the reasons for 1857 revolt. ● List the places where the revolt took place. ● Prepare a time line of events of 1857 revolt. ● Analyse the reason of the failure of 1857 revolt.	
Self evaluation and follow up	Teacher will analyses the responses of students and the data collected by students	
Reflection	Students will prepare a report on Reasons for the failure of 1857 revolt.	Inklewriter.com

GLOSSARY:

1. AI Related Terminologies

Data Acquistion

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required: for the AI model. There can be various ways to collect data.

E draw: E draw is an AI tool used to draw flow charts and timelines

Problem Scoping
Problem scoping refers to understanding a problem and find various factors which affect the problem. Under problem scoping, we use the framework of 4Ws problem canvas where we look into the WHO, WHAT, WHERE and WHY of a problem. After obsrving these factors, students get clarity towards the issue or problem**.**

4Ws
WHO?
The who block helps in analysing the people getting affected/involved directly /indirectly due to it.
WHAT?
The what block helps in understanding exactly what problem they are experiencing.
WHERE?
This block tells us where the stakeholders experienced the problem/the incident took place.
WHY?
Finally list all elements that cause the problem

Inklewriter
Inkle writer is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.
www.inklewriter.com**.**

2. AI Activity Description

Ask students to collect the data regarding the people who are affected due to the different policies of THE EAST INDIA COMPANY. Students will gather information from the text book and video (Link is mentioned). Students will draw a time line/ flow chart using e draw. Students will find the reason for the failure of 1857 revolt with the help of -4WS Problem Canvas and relate it with AI model of PROBLEM SCOPING.

SOCIAL SCIENCE
CLASS 9

3.28 Poverty

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: Poverty**	
Name of the book	**Economics, Class 9, NCERT**	
Subject and Artificial Intelligence Integrated	AI integrated with Poverty Trends in India: Causes of Poverty and Anti-Poverty Measures.	
Objectives	• To understand the concept and Dimensions of Poverty with the help of problem Scoping concept of AI project cycle. • To understand the poverty trends in India and Global Poverty Trends. • To understand the Poverty Line and Poverty Estimation. • To study two typical cases of Poverty: Urban case & Rural case. • To understand Interstate disparities. • To understand the various causes of Poverty • To understand the Anti-Poverty Measures taken by the Government for poverty eradication.	4 W Canvas: Who, What, Where and Why Data Acquisition and Data Exploration Decision Tree: Rule Based AI Model
Time Required	2 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, Black Board chalk, Laptops and Internet connections.	
Pre- Preparation Activity	The students are divided into two different groups to deliberate about the Poverty Trends, Causes and Measures.	
Previous Knowledge	The students are asked to research about poverty and different issues related to poverty: Landlessness, Unemployment, Illiteracy, Malnutrition, Child Labour etc.	
Introduction	The teacher will initiate a discussion about two typical cases of Poverty in the Urban and Rural Context. She/He assigns a case study of different vulnerable groups.	Problem scoping: Who, What, Where and Why

Methodology	• The students are asked to collect data on different vulnerable groups. • The students are asked to discuss the concept of Poverty? How is poverty line estimated in India? • The students are asked to discuss Inter State Disparities and Global Poverty Scenario. • The students are asked to discuss the causes of Poverty. • The students are asked to collect the data and interpret the state wise trends of poverty in India. • The students are asked to discuss Anti-Poverty Measures taken by Government.	Who? What? Where? Why? Data Acquisition and Data Exploration
Discussion on the Text	There is an open discussion and group wise presentation on: • How poverty line is estimated in India • Whether the present methodology of Poverty Estimation is appropriate • Poverty Trends in India. • Global trends of Poverty. • Interstate Disparities of Poverty in India. • Causes of Poverty • Government strategy of Poverty alleviation.	
Learning Outcomes	• The students will understand the concept and Dimensions of Poverty with the help of problem Scoping concept of the AI project cycle. • The students will understand the poverty trends in India and Global Poverty Trends. • The students will understand Poverty Line and Poverty Estimation. • The students will understand the various causes of Poverty and Anti-Poverty Measures taken by the Government for poverty eradication. • The students will be able to learn Data acquisition and exploration.	
Self-Evaluation and Follow-Up	Students are asked to make presentations to compare the situation in different groups and states in India	
Follow-up Activity	Students will be asked to analyze the various challenges ahead in poverty reduction and alleviation.	

GLOSSARY:

1. AI Related Terminologies

AI Project Cycle: AI Project cycle is a framework which is used to design an AI project taking all the crucial factors into consideration. The project cycle consists of 5 steps namely: problem scoping, data acquisition, data exploration, modeling and evaluation. Each of the stages holds importance in the framework.

Problem Scoping: Problem Scoping refers to understanding a problem and finding out various factors which affect the problem. Under problem scoping, we use the framework of 4Ws problem canvas where we look into the Who, What, Where and Why of a problem. After observing these factors, students get clarity towards the issue to be solved which leads them towards data acquisition.

4Ws Problem Canvas:

The 4Ws Problem canvas helps them in identifying the key elements related to the problem.

Who?
The “Who” block helps in analyzing the people getting affected directly or indirectly due to it. Under this, they find out who the ‘Stakeholders’ to this problem are and what they know about them. Stakeholders are the people who face this problem and would be benefitted with the solution.

Who canvas consists of:

- Who are the Stakeholders?
- What do you know about them?

What?
Under the “What” block, they need to look into what they have on hand. At this stage, they need to determine the nature of the problem. What is the problem and how do they know that it is a problem? Under this block, they also gather evidence to prove that the problem they have selected actually exists. Newspaper articles, Media, announcements, etc. are some examples.

What canvas consists of:

- What is the problem?
- How do you know that it is a problem? (Is there any evidence?)

Where?
Now that they know who is associated with the problem and what the problem actually is; they need to focus on the context/situation/location of the problem. This block will help them look into the situation in which the problem arises, the context of it, and the locations where it is prominent.

Where canvas consists of:

- What is the situation/context where the stakeholders experience the problem?
- Where is the problem located?

Why?
They have finally listed down all the major elements that affect the problem directly. Now it is convenient to understand who the people that would be benefitted by the solution are; what is to be solved; and where will the solution be deployed. These three canvases now become the base of why they want to solve this problem. Thus, in the “Why” canvas, they think about the benefits which the stakeholders will get from the solution and how it will benefit them as well as the society.

Why canvas consists of:

- Why will this situation be of value to the stakeholders?
- How will the solution improve their situation?

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired can then be divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data.

There can be various ways in which you can collect data. Some of them are:

- Surveys
- Web Scraping
- Sensors
- Cameras
- Observations
- Application Program Interface

Data Exploration: After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in a user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use it at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

2. AI Activity Description

In this activity, students will start scoping the problem of Poverty while going through the chapter and would simultaneously fill up the 4Ws Problem Canvas. After filling the canvases, the students would have acquired enough knowledge about poverty and factors related to it.

After this, students would start acquiring authentic data from various reliable sources to understand various trends and patterns observed around poverty and will explore the same in the form of visual representations. They will also be able to relate their searches to various government initiatives taken towards poverty.

SOCIAL SCIENCE
CLASS 9

3.29 Electoral Politics

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: Electoral Politics**	
Name of the Book	**Democratic Politics – I, Class 9, NCERT**	
Subject and Artificial Intelligence Integrated	AI Tools: Data Acquisition & Data Exploration and Inkle Writer integrated with Electoral Politics with special reference to topic: What is our system of Elections?	
Learning Objectives	• To get familiarization with our electoral System and the reason as to why we have chosen this system. • To identify the need for elections in democratic countries like India. • To make them aware about steps involved in election process. • To be able to use AI supported Tool for casting the votes and getting the results. • To make familiar with Data exploration through AI.	https://datavizcatalogue.com
Time Required	3 Periods of 40 minutes each (Two periods for initial process and casting the vote and one period for Data Exploration of Election results & Declaration of Results)	
Classroom Arrangement	Flexible *Seating arrangement*	
Material Required	Textbooks, Blackboard, chalk, laptop / desktop, internet connection, Voting List and a marker.	
Pre – Preparation Activities	A video on casting vote with EVM would be shown to students in order to make them understand the election process. **Activity 1:** Students are asked to offer Candidature for Class Representative position. They are asked to fill Nomination Form in stipulated time keeping all the eligibility criteria in mind. A group of students would act as Election Commission who will provide Symbol to the selected candidates. A voter list is also prepared by EC. Selected candidates will start their Campaign and publish their Manifesto.	https://youtu.be/spOWG6pjBb8
Previous Knowledge	Discussion about Constituencies and Political parties. (Reference Chapter 3 Class VIII)	

Methodology	**Activity 2: Polling Day** Students will be asked to cast their vote online thought the link. https://www.zingpoll.com/6xnjjcbl All the aspect of One Person One Vote – Political Right and Free and fair Election would be introduced to students through real life experience. **Activity 3: Counting Day** Students are asked to collect the data about Election polls basis on their survey. They were asked to go for analysis and exploration of Data using AI tools. https://datavizcatalogue.com **Activity 4: Result Declaration Day** Result would be declared basis on number of highest votes, which is already counted by App.	https://www.zingpoll.com/6xnjjcbl https://datavizcatalogue.com
Learning Outcomes	• The students would be able to get familiarization with our electoral System and the reason as to why we have chosen this system. • The students would be able to identify the need for elections in democratic countries like India. • The students would be able to understand the steps involved in election process. • The students would be able to be able to use AI supported Tool for casting the votes and getting the results. • The students would be able to make familiar with Data exploration through AI.	
Follow up Activities	Students would be asked to submit a report on Indian Election System.	www.inkle.writer
Reflections	What role does the Election Commission play in getting free and fair elections through the entire Election process?	

GLOSSARY:

AI Tools Terminologies

Data Acquisition: Data Acquisition refers to acquiring authentic data from reliable and authentic sources/ platforms that is required for the AI model. There can be various ways to collect data.

Data Exploration: Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

https://datavizcatalogue.com

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

Zingypoll app: This app will facilitate the students to cast their vote online thought the link https://www.zingpoll.com/6xnjjcbl

SOCIAL SCIENCE
CLASS 9

3.30 Climate

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 4: Climate**	
Name of the Book	**Contemporary India – I, Class 9, NCERT**	
Subject and Artificial Intelligence Integrated	Monsoon winds with the help of Data Acquisition and Data Exploration	
Learning Objectives	• To identify various factors affecting the arrival and retreating of monsoon winds. • Students will also be able to understand the relation between temperature and atmospheric pressure. • To understand the concept of system map. The system map Loopy will be able to make them understand the cause and effect relationship of temperature and pressure.	Data acquisition and Data exploration https://datavizcatalogue.com
Time Required	3-4 Periods of 40 minutes each	
Classroom Arrangement	Flexible Classroom Arrangement	
Material Required	• Textbooks, pen and paper, smart board/screen and projector, thematic map of rainfall in India • Internet access for data acquisition and laptops	
Pre – Preparation Activities	Students will be shown a video in which regional variation in climatic conditions will be described. It will make them curious to learn the reason behind these variations. https://www.youtube.com/watch?v=gAMPJyOY34s Video Time -2:00 Min to 5:15 Min	
Previous Knowledge	Students will be asked few questions – • Students will be asked about their personal experience about the variation in weather conditions of a place if they have experienced while travelling from one place to another. • They will be asked few questions to know their previous knowledge about the winds and pressure belts.	
Methodology	Students will be shown the loopy of the given link to make them understand the relation between atmospheric pressure and winds (using the LOOPY) https://bit.ly/3b7bzQf	Data Acquisition Data Exploration https://datavizcatalogue.com/

	The students will be asked to collect month wise data of the average temperature and rainfall of the city they live in for a particular year. Students will be asked to present their collected data of temperature and rainfall through a bar graph or line graph.	
Learning Outcomes	• Students will be able to understand the relation between temperature pressure and rainfall. • They will also be able to represent their collected data through Bar or Line graph. • They will also be able to learn the factors Indian Climate is affected with	
Follow up Activities	Make a graphical representation of your data. A follow up worksheet will be given in which they have to study the table and give the answers.	
Reflections	A discussion with students how climate affects vegetation, behaviour of people, clothing style, cuisine, festivals and lifestyle of people. After the discussion students will be asked to write a report on the basis of their learning using inkelwriter.	http://www.inklewriter.com/

GLOSSARY:

AI related Terminology

Loopy: Loopy is an open source tool to understand the concept of system maps. A system map shows the components and boundaries of a system and the components of the environment at a specific point in time. With the help of system maps, one can easily define a relationship amongst different elements which come under a system. The map shows the cause & effect relationships of elements with each other with the help of arrows. The arrow-had depicts the direction of the effect and a sign (+ or -) shows their relationship. A + sign indicated positive relationship and a - sign indicates negative relationship between the elements. Considering the data features of any problem to be solved, a system map can be drawn.

Data Acquisition: It refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

Data Exploration: Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

https://datavizcatalogue.com

Inklewriter: It is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

SOCIAL SCIENCE

CLASS 9

3.31 The French Revolution

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 1: The French Revolution**	
Name of the Book	**India and the Contemporary World, History Class 9, NCERT**	
Subject and Artificial Intelligence Integrated	AI Project Cycle Integrated with Subsistence crisis and Cause and effect of Subsistence crisis	
Learning Objectives	• Students will be able to identify the causes of the French Revolution with the help of loopy • Students will be able to identify the main events of the French Revolution • Students will be able to identify the outcomes of the French Revolutions • Students will be able connect emotions (such as fear) and life events (such as poverty) to a tendency for citizens to want to rebel. • Students will be able to describe how revolutions are not uniformly supported in a country.	http://ncase.me/loopy/
Time Required	One period of 40 minutes class to clear Subsistence crisis topic 10 periods of 40 minutes each period to complete the lesson.	
Classroom Arrangement	·Seating arrangement - Theory Sessions Flexible arrangement -for activity	
Material Required	Pen, paper, Black Board chalk, Laptops and Internet connections, Power Point French Revolution, Smart Board.	
Pre – Preparation Activities	watching the video The French Revolution: Timeline & Major Events, pausing to discuss the following questions at these times: 3:48--Had the Revolution ended here, before war broke out between France and a coalition of other countries, how might France be a different country than it is today? How might the history of Europe had been different? 6:48--Many of the Enlightenment thinkers were themselves quite wealthy and powerful. How might they have fared under the French Revolution?	

Previous Knowledge	Students will be asked to think about the following questions How would you define an unjust government? What, if anything, would lead you to take part in a violent revolution?	
Methodology	Who - The students are asked to collect data on different vulnerable groups. What - How does high prices and taxes influence a tendency for people/citizens to want to rebel? Is there anything about the three estates that seems unfair to you? Why did the nobles and clergy want each estate to only have one vote? Where – where is the problem in French society prior to revolution? Why do you think it is a problem? Data acquired- students are asked to make time line of the event from crowning of Louis XVI till fall of Directorial rule.	4W Canvas: Who, What, Where and Why Google Jamboard
Learning Outcomes	The students will be able • To analyze the situation giving rise to various factors of Revolution through problem scooping method. • To understand the ideals of the French Revolution • To comprehend the legacy of the revolution represent the same through loop diagram.	
Follow up Activities	Problem scoping worksheet will be given to students.	
Reflections	Discussion with Students on the role of AI application Any other AI application that can be used as an alternative. – www.inklewriter.com https://datavizcatalogue.com	www.inklewriter.com https://datavizcatalogue.com

GLOSSARY:

1. AI Related Terminologies

LOOPY:

Link for Loop of Subsistence Crisis :-
https://ncase.me/loopy/v1.1/?data=[[[5,175,89,0,%22Bad%2520harvest%22,0],[6,176,331,0,%22%2520scarcity%2520of%2520grain%22,0],[7,152,605,0,%22%2520rising%2520food%2520prices%22,0],[8,539,551,0,%22Poorest%2520Can%27t%2520buy%2520bread%22,0],[9,854,572,0.5,%22Food%2520riots%22,0],[10,638,410,0.5,%22Disease%2520epidemics%22,0],[11,916,73,0.5,%22%2520increas%2520death%22,0],[13,741,232,0.5,%22weaker%2520bodies%22,0]],[[5,6,-5,1,0],[6,7,-5,-1,0],[7,8,19,1,0],[8,10,8,1,0],[8,9,13,1,0],[10,13,-10,1,0],[13,11,-14,1,0],[9,11,-21,1,0]],[[512,86,%22How%2520a%2520Subsistence%2520Crisis%2520Happens%250A%22]],13%5D

AI Project cycle:
AI Project cycle is a framework which is used to design an AI project keeping all the crucial factors into consideration. The project cycle consists of 5 steps namely:problem scoping, data acquisition, data exploration, modelling and evaluation. Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources.

The data acquired could be then divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which you can collect data. Some of them are:

• Web Scraping • Observations

4Ws Problem Canvas:

The 4Ws Problem canvas helps them in identifying the key elements related to the problem.

Who? The “Who” block helps in analyzing the people getting affected directly or indirectly due to it. Under this, they find out who the ‘Stakeholders’ to this problem are and what they know about them. Stakeholders are the people who face this problem and would be benefitted with the solution. Who canvas consists of: • Who are the Stakeholders? • What do you know about them?

What?

Under the “What” block, they need to look into what they have on hand. At this stage, they need to determine the nature of the problem. What is the problem and how do they know that it is a problem? Under this block, they also gather evidence to prove that the problem they have selected actually exists. Newspaper articles, Media, announcements, etc. are some examples. What canvas consists of: • What is the problem? • How do you know that it is a problem? (Is there any evidence?)

Where?

Now that they know who is associated with the problem and what the problem actually is; they need to focus on the context/situation/location of the problem. This block will help them look into the situation in which the problem arises, the context of it, and the locations where it is prominent. Where canvas consists of: • What is the situation/context where the stakeholders experience the problem? • Where is the problem located?

Why?

They have finally listed down all the major elements that affect the problem directly. Now it is convenient to understand who the people that would be benefitted by the solution are; what is to be solved; and where will the solution be deployed. These three canvases now become the base of why they want to solve this problem. Thus, in the “Why” canvas, they think about the benefits which the stakeholders will get from the solution and how it will benefit them as well as the society. Why canvas consists of: • Why will this situation be of value to the stakeholders? • How will the solution improve their situation? 120

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired can then be divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which you can collect data.

Some of them are: • Surveys • Web Scraping • Sensors • Cameras • Observations • Application Program Interface Data Exploration: After acquiring data there come the need to analyze the data.

- For this, they need to visualize the acquired data in a user-friendly format so that they can:
- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use it at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

2. AI Related Activity:

PROBLEM SCOOPING – FRENCH REVOLUTION				
DOMAINS OF PROBLEMS	SUBSISTENCE CRISIS	INCREASE IN TAX AS PER ESTATE GENERAL MEETING	FEUDAL SYSTEM	DECLARATION OF RIGHTS OF MEN.
WHO PEOPLE GETTING AFFECTED DIRECTLY OR INDIRECTLY DUE TO IT. WHO ARE THE STAKEHOLDERS? WHAT DO YOU KNOW ABOUT THEM?				

WHAT NEED TO DETERMINE THE NATURE OF THE PROBLEM. WHAT IS THE PROBLEM? HOW DO YOU KNOW THAT IT IS A PROBLEM? IS THERE ANY EVIDENCE?				
WHERE LOOK INTO THE SITUATION IN WHICH THE PROBLEM ARISES. WHERE IS THE PROBLEM LOCATED?				
WHY WHAT IS TO BE SOLVED AND WHERE WILL THE SOLUTION BE DEPLOYED				

SOCIAL SCIENCE
CLASS 9

3.32 People as Resources

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 2: People as Resources**	
Name of the Book	**Economics, Class 9, NCERT**	
Subject and Artificial Intelligence Integrated	AI Tools: Data Acquisition & Data Exploration integrated with Human Capital Formation	
Learning Objectives	To understand the trends in Education and Health in India. To critically analyse the policies taken in the field of Health and Education in India To classify the economic activities into various sectors To define unemployment and its various types in rural and urban areas To recognise the effects of unemployment	Data Acquisition and Data Exploration https://datavizcatalogue.com
Time Required	2 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, blackboard, chalk,, internet websites for data acquisition & laptops	
Pre – Preparation Activities	The students are divided into four groups and collect data related to education levels,Health, effectiveness of policies in the field of Education and Health	
Previous Knowledge	The students should be aware of the importance of Human capital or entrepreneur as a factor of production	
Methodology	The students are asked to discuss the ways in which people can be converted to Human capital. The students are asked to collect thedata and interpret the education and health scenario in India The students are asked to present the effectiveness of the education and health policies through the data collected. The students will be explained the various sectors of the economy and will classify the images shown	Data Acquisition and DataExploration

	The student will be given case study and define unemployment and its various types in rural and urban areas The students will discuss the effects of unemployment	
Learning Outcomes	The students will understand theconcept of Human Capital Formation The students will understand the education and health trends in India and its growing importance The students will understand how policies in the education and health sector have been effective. The students will be able to classify various economic activities into sectors The students will be able to define unemployment and its various types in rural and urban areas The students will be able to recognise the effects of unemployment The students will be able to learn Data acquisition and exploration.	
Follow up Activities	Students are asked to make presentationsto the education and health sector performance andpolicy effectiveness	
Reflections	Students will be asked to analyze thevarious challenges ahead in Human capital Formation	

GLOSSARY:

1. AI Related Terminologies

Data Acquisition

Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired can then be divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data.

There can be various ways in which you can collect data. Some of them are:
• Surveys
• Web Scraping
• Sensors
• Cameras
• Observations
• Application Program Interface

Data Exploration

After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in a user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use it at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

Classification

Classification is a part of supervised learning model. Classification models work on labelled dataset and are used to predict the label/class of the testing dataset which is unknown to the machine. For example, an AI model is trained on a labelled dataset of 100 images of apples and 100 images of bananas. The machine gets trained on the dataset by extracting features from the dataset and understands what features will classify an image as an apple or a banana. To test the machine, random images of an apple/banana are fed to the AI model and the output will be classification of apples and bananas.

2. AI Activity Description

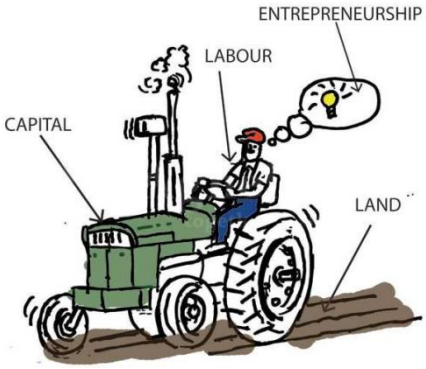
Students would start acquiring authentic data from various reliable sources to understand various trends and patterns observed around Education and Health and will explore the same in the form of visual representations. They will also be able to relate their searches to various government initiatives taken towards education and health. The students will be shown images of various economic activities and asked to classify them into the three sectors of the economy.

SOCIAL SCIENCE

CLASS 9

3.33 The Story Of Village Palampur

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 1: The Story Of Village Palampur**	
Name of the Book	**Economics, Class 9, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the situation of a hypothetical village Palampur using the AI tools: My Storytime and Loopy	https://bit.ly/3jz4QBD
Learning Objectives	**The students will be able to :** • Understand the story/situation of village Palampur using the AI tool "My Story Time". • To familiarize the students with some basic economic concepts related to production through an imaginary story of a village. • Differentiate the concept of Economic and Non-Economic Activities • The changes that occurred due to the Green Revolution in India. • Land distribution pattern in Indian villages. • Sustainability of land. • Cropping seasons in India. • Measures to increase farm production.	Introduction of "MY Storytime" AI Tool and relating it to The story of a hypothetical village Palampur Introducing "Loopy" to explain the cause and effect of the Green Revolution and its impact on the life of people of Palampur.
Time Required	6 periods and 40 minutes	
Classroom Arrangement	Flexible	
Material Required	Pen, Paper, Whiteboard, Marker, screen and projector, desktop, internet websites for data acquisition, you tube videos	

Pre – Preparation Activities	The students are given instructions on how the cause and effect relationship works and how does Loopy work relating it to the different factors of production.  	
Previous Knowledge	The students will be asked about the sharing of experiences of children who have been to a village, about different aspects of village life.	
Methodology	• **Introduction of the village Palampur** The students will be introduced to a hypothetical village Palampur with the help of AI tool my story time. • **Introduction to Different Factors Of Production** The students would be asked to create a mindmap on the modern farming methods and relating it to how other things are related and later https://youtu.be/WiYscnj_L7A **Song: Mere deshkidharti of Upkar** • **Green Revolution** Students will be shown a speech by M.S.Swaminathan related to Green Revolution. Then the impact of Green Revolution will be shared by LOOPY (https://www.youtube.com/watch?v=e7NpaII-0hgVideohttps://www.youtube.com/watch?v=KBQVEfCsN4c) • **P.M Modi's Interview Video** will be shown as a specific reference to the agricultural crisis and the need to try innovative techniques like drip irrigation etc https://www.youtube.com/watch?v=0smk06TvKF 5. Students will be asked to think about **Non Farming Activities** and share the same with the class (pair share think) - and the data collected so far will be presented in the form of bar graph (interpretation)	Integration with English https://bit.ly/3jz4QBD
Discussion on the Text	**There will be discussion on:** • What problems do the villagers of palampur have? • What was the impact of the Green Revolution in the lives of farmers? • Why was there a need for the second green revolution? **https://www.youtube.com/watch?v=BZu2Qp06osU** • Why are women paid less wages as compared to men?	

Learning Outcomes	The students will be able to : • understand the life of the people in the villages • appreciate the development that has taken place in the villages • understand that production of goods and services require factors of production • identify the basic factors of production.	
Follow up Activities	Interaction with the farmers on the basis of a self prepared questionnaire	
Reflections	Students will be asked to think about **Farming and Non Farming Activities** in their respective area and share their report with the class,	Inkle writer

GLOSSARY:

AI Related Terminologies

Loopy:

Loopy is an opensource tool to understand the concept of system maps. A system map shows the components and boundaries of a system and the components of the environment at a specific point in time. With the help of system maps, one can easily define a relationship amongst different elements which come under a system. The map shows the cause & effect relationships of elements with each other with the help of arrows. The arrow-had depicts the direction of the effect and a sign (+ or -) shows their relationship. A + sign indicated positive relationship and a - sign indicates negative relationship between the elements. Considering the data features of any problem to be solved, a system map can be drawn**.**

http://ncase.me/loopy/

My Storytime:

My Storytime is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant

https://experiments.withgoogle.com/my-storytime

Inklewriter:

Inkle writer is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

SOCIAL SCIENCE
CLASS 9

3.34 Natural Vegetation and Wildlife

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 5: Natural Vegetation and Wildlife**	
Name of the Book	**Contemporary India-1, Class 9, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the significance of wildlife in maintaining ecological balance using AI Project Cycle.	
Learning Objectives	• Student will be able to understand the need of wildlife reserves. • Student will be able to locate and label the wildlife sanctuaries in India. • Student will become more sensitive towards animals.	
Time Required	2 periods of 35 minutes.	
Classroom Arrangement	Flexible	
Material Required	Marker, smart board, pen, chart, colors, internet connection, laptop, atlas, political map.	
Pre – Preparation Activities	Students will be asked to play Mystery animal AI game in pair. Students are asked to list down the animals, birds and mammals that are going to be extinct in near future .	Mystery Animal http://bit.ly/iai4yma
Previous Knowledge	Students will be asked to recall any visit to wildlife sanctuary and asked which animals were protected there. They will share their experiences with each other in classroom setting and relate to the need of wildlife reserves.	
Methodology	**Activity 1** Students will be divided into pairs and they will collect data from various sources about the animals, birds and mammals who are on the edge of extinction. They will give graphical representation of that data and critically analyze the reasons of increasing trend of extinction. **Activity 2** Student will be given different projects such as project tiger ,project rhino ,project great Indian bustard, project	. **Data acquisition and data exploration.** **Problem scoping**

	elephant ,crocodile conservation project to understand the need of conservation They will write a report covering these aspects- W= Who has started? W=Where it was started? W=Why it was started? W=What was the aim?	**4W s problem canvas**
Learning Outcomes	Students will have a greater knowledge of how wildlife can be conserved and create awareness among people in society.	
Follow up Activities	Students will mark the wildlife sanctuaries on political map of India.	
Reflections	·Poster making competition will be done in the class between the students to check how creatively they can spread the awareness message in the society.	

GLOSSARY:

AI Related Terminologies

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired could be then divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which students can collect data. Some of them are:

• Surveys
• Web Scraping
• Sensors
• Cameras
• Observations
• Application Program Interface

Data Exploration: After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations could be used by the students like diagrams, charts, graphs, flows, etc.

- **Problem Scoping:** Problem Scoping refers to understanding a problem and finding various factors which cause and affect the problem. Under problem scoping, we use the framework of 4Ws problem canvas where we look into the Who, What, Where and Why of a problem. After observing these factors, students get clarity regarding the issue to be solved which leads them towards data acquisition.
- **4Ws Problem Canvas:**

The 4Ws Problem canvas helps in identifying the key elements related to the problem.

Who? The “Who” block helps in analyzing the people getting affected directly or indirectly due to the problem. Under this, they identify who the ‘Stakeholders’ of this problem are and what is known about them. Stakeholders are the people who face this problem and would be benefited with the solution.

Who canvas consists of:

- Who are the Stakeholders?
- What do you know about them?

What?

Under the “What” block, they need to look into what they have on hand. At this stage, they need to determine the nature of the problem. What is the problem and how do they know that it is a problem? Under this block, they also gather evidence to prove that the problem they have selected actually exists. Newspaper articles, Media, announcements, etc. are some examples.

What canvas consists of:

- What is the problem?
- How do you know that it is a problem?

(Is there any evidence?)

Where?

Now that they know who is associated with the problem and what the problem actually is; they need to focus on the context/situation/location of the problem. This block will help them look into the situation in which the problem arises, the context of it, and the locations where it is prominent.

Where canvas consists of:

- What is the situation/context where the stakeholders experience the problem?
- Where is the problem located?

Why?

They have finally listed down all the major elements that affect the problem directly. Now it is convenient to understand who the people that would be benefitted by the solution are; what is to be solved; and where will the solution be deployed. These three canvases now become the base of why they want to solve this problem. Thus, in the “Why” canvas, they would think about the benefits 63 which the stakeholders would get from the solution and how would it benefit them as well as the society.

Why canvas consists of: ·

- Why will this situation be of value to the stakeholders?
- How will the solution improve their situation?

Mystery Animal

Students should play the Mystery monster game to understand that difference do exist in all living beings but they all have some common traits which make it hard to separate or classify one from another until we do stereotype based on physical features.Teacher should not focus on the result of game but the focus should be only and only on the process.

http://bit.ly/iai4yma

SOCIAL SCIENCE

CLASS 9

3.35 India Size & Location

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 1: India Size and Location**	
Name of the Book	**Social Science Contemporary India - 1, Class 9 NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the location of India in the world and to understand its importance using Google Maps Using the concept of maps in Artificial Models for understanding India's location, size in the world	https://datavizcatalogue.com/ https://mapwith.ai/rapid#background=OpenTopoMap&disable_features=boundaries&map=4.00/19.59/59.61
Learning Objectives	• Understanding what India's location in the world (Latitudinal and longitudinal extent) • Understanding Size of India and its position in the world in terms of size • Understanding the relationship between distance and time through different longitudes • Understanding the importance of India's central location in the World for trading • • Understanding India's relations with its neighbouring countries.	
Time Required	3 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Textbook, globe, World Map, PPT, Pen, paper, white board/smart board, marker, Laptops and Internet connection.	
Pre – Preparation Activities	Video showing India's location in the world, Latitudinal, longitudinal extent and standard Meridian of India. https://www.youtube.com/watch?v=B7Cf7jwlguc https://www.youtube.com/watch?v=7o4XtLhPnzw	
Previous Knowledge	The students shall be asked questions such as What is latitude and longitude? What is Indian Peninsula? Why is India called a subcontinent? Why do we have standard time? Which are the neighbouring countries of India?	

Methodology	The teacher will discuss about • Latitudinal & longitudinal extent of India through Hands on activity using map & atlas • Indian sub-continent using discussion and map activity • Indian's position in the world in terms of size through bar graph • Importance of Indian Standard Meridian using video • Importance of India's location through Discussion/brainstorming • Neighbouring countries through • Visual technique using ppt & map of India	Using AI Model datavizcatalogue And Google Map
Learning Outcomes	At the end of the lesson students will be able to: • Appreciate the importance of India's relation with the world through ages and its size through bar graph and will learn to use datavizcatalogue. • Develop the skill to locate important latitudes & longitudes passing through India & the neighbouring countries of India on the map. • Appreciate & understand the implication of vast longitudinal & latitudinal extent of India. • Appreciate the reason why an ocean is named after India using google map.	
Follow up Activities	The students are asked • To make a map of India showing different states and UTs. • To label and locate all the neighbouring countries, Bay of Bengal, Arbian sea and Indian ocean on map. • To find out latitudinal and longitudinal extent of your state.	
Reflections	The students will be asked to identify India's neighbouring countries, Indian states and UTs on a globe. To identify and names the states through which Standard Meridian is passing	

GLOSSARY:

AI Activity Description

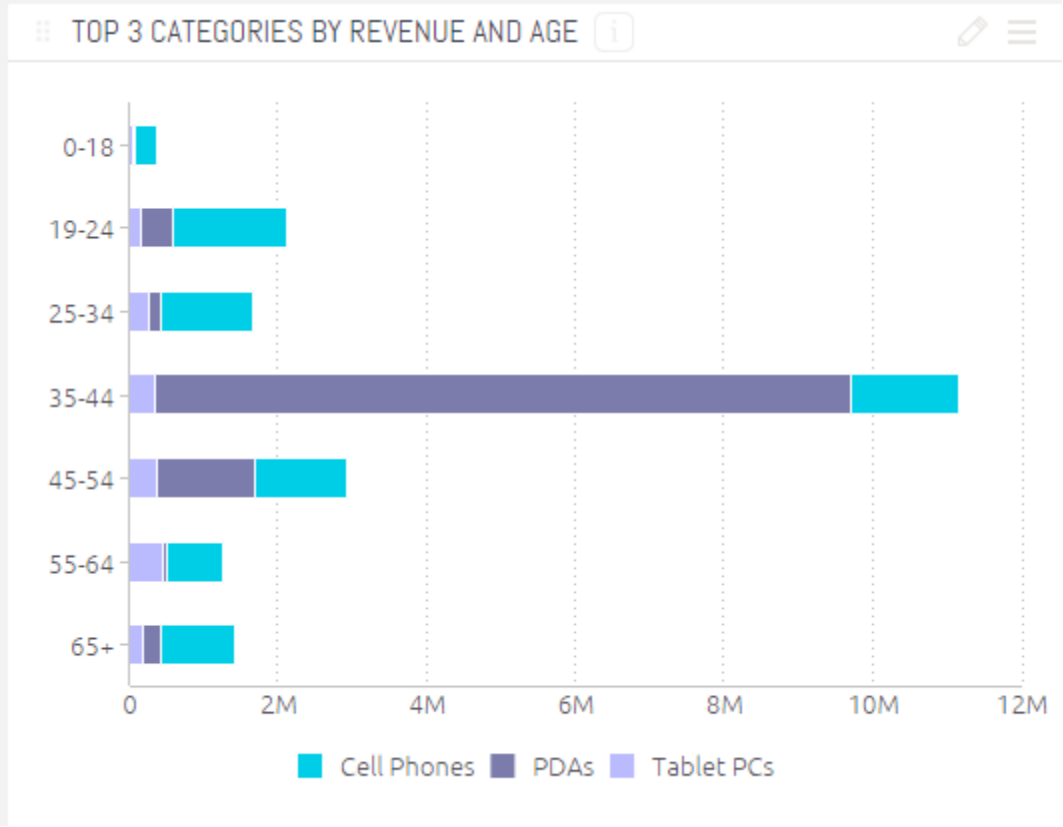
Google Map: **Google Maps** is a web **mapping** service developed by **Google**. It offers satellite imagery, aerial photography, street **maps**, 360° interactive panoramic views of streets (Street View), real-time traffic conditions, and route planning for traveling by foot, car, bicycle and air (in beta), or public transportation.

Data vizcatalogue: A handy guide and library of different data visualization techniques, tools, and a learning resource for data visualization.

In general, there are **two basic types of data visualization**: exploration, which helps find a story the **data** is telling you, and an explanation, which tells a story to an audience.

Bar chart

Use the bar chart to compare many items. The bar chart typically presents categories or items displayed along the Y axis, with their values displayed on the X axis. You can also break up the values by another category or group.



We need data visualization because a visual summary of information makes it easier to identify patterns and trends than looking through thousands of rows on a spreadsheet. It's the way the human brain works. Since the purpose of **data** analysis is to gain insights, **data** is much more valuable when it is visualized

RapiD is an enhanced version of the popular OSM editing tool iD.**RapiD** is designed to make adding and editing roads quick and simple for anyone to use; it also includes data integrity checks to ensure that new **map** edits are consistent and accurate.

The RapiD editor allows human reviewers to visualize the conflated roads, highlight new changes, and use new commands and shortcuts for the most common data cleanup tasks, such as adjusting the road's classification to fit in the surrounding context. Because we extended an existing editing tool, iD, mappers are able to use familiar tooling to work with new data.

SOCIAL SCIENCE
CLASS 9

3.36 Forests Society and Colonialism

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 4: Forests Society and Colonialism**	
Name of the Book	**India and the Contemporary World, Class 9, NCERT**	
Subject and Artificial Intelligence Integrated	AI Tools: Data Acquisition & Data Exploration, Inkle writer and AI ethics used to understand the Topic "Forests Society and Colonialism"	
Learning Objectives	• To understand the importance of forests and its impact on human, animals and environment. • To understand the causes and effects of deforestation in the colonial period with the help of AI methods. • To understand the importance of data and using data in establishing a trend and finding out reasons for deforestation. • To understand the anti deforestation measures during the British period and now.	**(Data Acquisition & Data Exploration) Use of Sketchy Graphs to represent data sets**
Time Required	3-4 periods of 45 minutes	
Classroom Arrangement	Flexible	
Material Required	Text book, Reference books, Questionnaire, presentation – through PowerPoint/charts, Computers with internet	
Pre – Preparation Activities	Teacher to discuss/ show a chart /explain about • forest covers in India and the world • data and its importance. Examples in collecting, classifying and recording data to be shared.	
Previous Knowledge	Learners have an understanding about data interpretation in Mathematics in the form of graphs.	

Introduction	Questions • Do you think the forests are an important part of our lives? Why? • How much are we dependent on the forests? • Do you think the forest cover of the world is decreasing? • If forests are so important in our lives, why the forest cover is decreasing? • What will happen if the forest cover gets decreased? • What effect will it have in the lives of the tribals who are dependent on the forests? • How do you know that the forests are decreasing? • Do you think that there are different ways to collect information? • Do you think that the official records of the British Administration tell us something about the cause and effect of deforestation in India during that time? • What other information do you think you would need to collect to get a complete information of how forests are exploited? • Will AI be of some benefit in predicting the trend of deforestation and its solution?	**Problem Scoping using 4W Canvas**
Methodology	Children are divided into groups of 5. • They would be asked what are the reasons for deforestation- during the colonial period and now. • They would be asked to make mind maps /system mapping using LOOPY for cause- effect relations between deforestation, lives of people, wildlife and environment during the British period and now • http://ncase.me/loopy/ • They would be asked what data would they require to know about deforestation in the world and in India? Some examples – data about the- Rate of annual deforestation in pre 1700 CE/ 1700-1800 CE/1800-1900CE/ 1900-2000CE/2000-2050 CE-predicted Rate of increase in the cultivable lands in these years. Rate of killing of animals and wildlife habitat . • After collecting the data for any one of the above the students will be asked to prepare a bar graph and a presentation. • They would be asked -What resources will you use to collect this data? • Library resources, interviewing experts/ historians/ecologists/environmentalists/, Government data sets /Research on the internet etc. • They would be asked -What solutions to deforestation were given by the British? How can this problem be solved now? • They would be asked-Imagine you are a poor tribal man who shares a strong cultural and spiritual bond	**Data Acquisition & Data Exploration) Use of Sketchy Graphs to represent data sets** Loopy

	with forests that never allowed you to exploit and degrade it out of choice. You get the job of logging under a government contract. You need the money to run your family whereas denying the job will allow someone else to do it. What will you do? Discussion on the text • How important are the forests in our lives, the tribals who are culturally bonded with the forests and wildlife? • What are the probable dominating reasons of deforestation? Any differences in the trend in the pre colonial, colonial and post colonial periods? • How much deforestation happened in India during the British period? Why? • How can AI help to collect data? • Why is it important to understand the importance of Data for understanding AI? • How can AI help in solving the problems of deforestation and poaching?	Introduction to AI Ethics https://www.moralmachine.net/
Learning Outcomes	Students will be able to • Explain the importance of forests in our lives • Analyse a cause effect relationship with deforestation and lives of people, animal, their habitat and environment with the help of AI tools • Explain the reasons of deforestation during British India and now. • Explain the importance of data in collecting information • Interpret the data through graphs and presentation • Establish a connection with the past and relate it to present and future. • Enlist measures taken by the British to solve the problems of deforestation • Enlist the ways to curb down deforestation and poaching • Analyse the ethical issues regarding deforestation and relate it to AI ethics.	
Follow up Activities	They will talk about the importance of forests and how AI can be used to stop deforestation or illegal logging and poaching.	https://youtu.be/yYY0Jg0qGH0 Trailguard
Reflections	How the urban elite and the state force upon the forest people by denying basic, subsistence-level access to their traditional resource and continue with intensive commercial exploitation of the forest Students will write their views using Inklewriter	Inklewriter www.inklewriter.com

GLOSSARY:

AI Related Terminologies

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired could then be divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data.

There can be various ways in which you can collect data. Some of them are:

- Surveys
- Web Scraping
- Sensors
- Cameras
- Observations
- Application Program Interface

Data Exploration: After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

Loopy - Loopy is an opensource tool to understand the concept of system maps. A system map shows the components and boundaries of a system and the components of the environment at a specific point in time. With the help of system maps, one can easily define a relationship amongst different elements which come under a system. The map shows the cause & effect relationships of elements with each other with the help of arrows. The arrow-had depicts the direction of the effect and a sign (+ or -) shows their relationship. A + sign indicated positive relationship and a - sign indicates negative relationship between the elements. Considering the data features of any problem to be solved, a system map can be drawn

http://ncase.me/loopy/

AI Ethic:- If an AI machine makes a mistake, who should be held responsible for it? The Developer, The AI developing firm, The User, or The AI machine itself?

There are a lot of ethical issues which exist around AI since AI is a domain which is boundless at this point of time. Hence, it is important to have ethical guidelines which can guide us in such conditions where there is no clear definition of what is right and what is wrong.

https://www.moralmachine.net/

Problem Scoping: Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What , When/Where and Why. The answers to these questions lead to a problem statement

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

SOCIAL SCIENCE

CLASS 10

3.37 Water Resources

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: Water Resources**	
Name of the book	**Contemporary India- II, Class 10, NCERT**	
Subject and Artificial Intelligence Integrated	AI integrated with Water Scarcity and Need for water conservation and management	
Objectives	• To understand the concept of AI project cycle. • To understand the concept of water cycle using AI application and how water is a renewable resource. • To understand the concept of water scarcity and need for water conservation and management. • Multi Purpose River Projects and Rain water Harvesting as tools of Water management. • To understand the advantages and disadvantages of the Multipurpose River Projects. • To understand how Rain water harvesting method is being carried out to conserve and store water.	AI project cycle System mapping using Loopy App. (http://ncase.me/loopy/)
Time Required	3 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, Black Board chalk, Laptops and Internet connections.	
Pre- Preparation Activity	Students are asked to list down the area affected by water scarcity and the possible reasons behind the present situation of water scarcity.	
Previous Knowledge	The students are asked to discuss the various usage of water and to devise how water wastage can be controlled.	
Introduction	The teacher will initiate a discussion about latest facts and figures about water scarcity.	Problem scoping: Who, What, Where and Why
Methodology	• The students are asked to collect data on availability and Distribution of fresh water resources at different places. • The students are asked to interpret the data on the basis of: - Pre and Post Industrialization - Pre and Post Urbanization - State wise Analysis • The Students are asked to develop different models in order to ensure Water Conservation and management. (Multi-Purpose River Projects and Rain Water Harvesting) • The students are asked to evaluate each and every model (Advantages and disadvantages) and choose the best model which gives the most efficient and reliable results. Also, they need to find specific AI enhancements which can be used to enhance their model.	Data Acquisition Data Exploration Modelling Evaluation

Discussion on the Text	There is an open discussion on: • Water as a renewable resource. • Water Scarcity: Causes and Effects. • Water conservation and management techniques. • Multi-Purpose River Projects: Advantages & Disadvantages. • Rain Water Harvesting: Support for Semi-Arid Areas.	
Learning Outcomes	• The students will understand the concept of AI project cycle with regard to water scarcity and need for water conservation and management. • The students will understand the concept of water cycle using AI application • The students will understand Multi-Purpose River Projects and their advantages and disadvantages. • The students will understand Rain water harvesting as tools of Water management and how Rain water harvesting method is being carried out to conserve and store water.	
Self-Evaluation and Follow-Up	The Teacher analyses the responses and flow of thoughts of students.	
Follow-up Activity	Students will be asked to analyze the situation in their surroundings Colony, Village or City, and submit the report on Water Management mechanism.	

GLOSSARY:

1. AI Related Terminologies

AI Project Cycle: AI Project cycle is a framework which is used to design an AI project taking all the crucial factors into consideration. The project cycle consists of 5 steps namely: problem scoping, data acquisition, data exploration, modelling and evaluation. Each of the stages holds importance in the framework.

Problem Scoping: Problem Scoping refers to understanding a problem and finding various factors which affect the problem. Under problem scoping, we use the framework of 4Ws problem canvas where we look into the Who, What, Where and Why of a problem. After observing these factors, students get clarity towards the issue to be solved which leads them towards data acquisition.**4Ws Problem Canvas:**

The 4Ws Problem canvas helps them in identifying the key elements related to the problem.

Who?
The “Who” block helps in analyzing the people getting affected directly or indirectly due to it. Under this, they find out who the ‘Stakeholders’ to this problem are and what they know about them. Stakeholders are the people who face this problem and would benefit from the solution.

Who canvas consists of:

- Who are the Stakeholders?
- What do you know about them?

What?
Under the “What” block, they need to look into what they have on hand. At this stage, they need to determine the nature of the problem. What is the problem and how do they know that it is a problem? Under this block, they also gather evidence to prove that the problem they have selected actually exists. Newspaper articles, Media, announcements, etc. are some examples.

What canvas consists of:

- What is the problem?
- How do you know that it is a problem? (Is there any evidence?)

Where?
Now that they know who is associated with the problem and what the problem actually is; they need to focus on the context/situation/location of the problem. This block will help them look into the situation in which the problem arises, the context of it, and the locations where it is prominent.

Where canvas consists of:

- What is the situation/context where the stakeholders experience the problem?
- Where is the problem located?

Why?
They have finally listed down all the major elements that affect the problem directly. Now it is convenient to understand who the people that would benefit from the solution are; what is to be solved; and where will the solution be deployed. These three canvases now become the base of why they want to solve this problem. Thus, in the “Why” canvas, they would think about the benefits which the stakeholders would get from the solution and how would it benefit them as well as the society.

Why canvas consists of:

- Why will this situation be of value to the stakeholders?
- How will the solution improve their situation?

Data Acquisition:

Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired can then be divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data.

There can be various ways in which you can collect data. Some of them are:

- Surveys
- Web Scraping
- Sensors
- Cameras
- Observations
- Application Program Interface

Data Exploration: After acquiring data, the students need to analyze it. For this, they need to visualize the acquired data in some user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

Modelling: Once the data has been explored and various trends/patterns have been visualized, students can now think of various methods/techniques to solve the issue. According to the technique that they choose, they need to select the most appropriate way to depict it.

Evaluation: After creating the model, the students will now evaluate it on the basis of the results expected versus the actual results obtained. On the basis of this comparison, they will be able to identify if the model which they have created is efficient or not. Also, at this stage, the students will identify the leverage points where AI can possibly be integrated in their model to enhance its efficiency. At this stage, the students will explore various possibilities around which AI can be used to leverage a condition to solve an issue.

2. AI Activity Description

Ask the students to collect data regarding availability and distribution of freshwater at different places. Students can gather data through various sources online or offline. Ask them to collect authentic data from reliable sources. After acquiring data, the students will explore it on the basis of the following parameters:

- Pre and Post Industrialization
- Pre and Post Urbanization
- State wise Analysis

Ask the students to visualize data and recognize certain patterns or trends out of the data explored. With the help of the patterns recognized, students will then work on various models which can help in water conservation.

Ask the students to select an idea to conserve water and make a model/presentation on it. Once they come up with their model, students will evaluate it on the basis of its efficiency. They can analyze the efficiency of their model on the basis of comparing the actual results with the results obtained from the model.

Ask the students to explore leverage points in their model where they can incorporate AI to make their model more efficient and to solve the problem.

SOCIAL SCIENCE
CLASS 10

3.38 Nationalism in India

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 2: Nationalism in India**	
Name of the Book	**India and Contemporary World – II, Class 10, NCERT**	
Subject and Artificial Intelligence Integrated	AI Tools: Inkle Writer and My Story Time integrated with Nationalism in India.	
Learning Objectives	• To identify the causes that led to Nationalism in India. • To know the various stages of National Movement in India. • To understand the spread and impact of National Movements on different social groups. • To analyse the comparison between Non Cooperation Movement and Civil Disobedience movement. • To make them able to establish comparison with respect to similarities and dissimilarities among these movements. • To understand and record the timelines, reasons and impact of Different National Movement through AI app	www.inklewriter.com
Time Required	3 Periods of 40 minutes each	
Classroom Arrangement	Flexible Seating arrangement	
Material Required	Textbooks, Blackboard, chalk, laptop / desktop, internet connection.	
Pre – Preparation Activities	Students are asked to list down all the national movements they are able to recall and the possible reasons behind the growth of nationalism in India. Teacher will explain three major National Movements Satyagraha, Non Cooperation Movement, Civil Disobedience Movement in detail to the students.	
Previous Knowledge	Students are encouraged to discuss about Anti Colonial Movements and how these different notion of freedom brought together as National Movements.	

Methodology	• Each Student is assigned three National Movements – Satyagraha, Non Cooperation Movement, Civil Disobedience Movement. • Students are asked to records Timeline & initiation, causes behind the movement, participation of different social groups, impact and withdrawal of these movements. • Students are asked to establish comparison with respect to similarities and dissimilarities among these movements. • Students would be able to record and present their report through AI app.	Edraw AI App www.inklewriter.com
Learning Outcomes	• The students would be able to identify the causes that led to Nationalism in India. • The students would be able to Know the various stages of National Movement in India. • The students would be able to understand the spread and impact of National Movements on different social groups. • The students would be able to analyse the comparison between Non Cooperation Movement and Civil Disobedience movement. • The students would be able to establish comparison with respect to similarities and dissimilarities among these movements. • The students would be able to understand and record the timelines, reasons and impact of Different National Movement through AI app	
Follow up Activities	Students would present their report in the class with help of my story time	
Reflections	Find out the anti colonial movements in different countries. Compare and contrast them with Nationalism in India. Record and play the story with MY Story Time.	My Story Time https://experiments.withgoogle.com/my-storytime

GLOSSARY:

AI Tools Terminologies

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

My Storytime: My Story Time is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant

https://experiments.withgoogle.com/my-storytime

SOCIAL SCIENCE
CLASS 10

3.39 Political Parties

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 6: Political Parties**	
Name of the Book	**Democratic Politics-II, Class 10, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the role of Political Parties in the rise of democracies, in electoral politics, and in the making and working of governments with help of AI Project Cycle.	
Learning Objectives	• To define Political Party, compare and contrast Political Parties and analyze the candidates and platforms of the Political Parties • To introduce students to major National and State Political Parties. Links used :https://www.myneta.info/ https://eci.gov.in/ https://adrindia.org/ • To understand and analyse party systems in democracies. • To know about Defection and toppling of Governments	·.
Time Required	3 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, Paper, Smart board, wi-fi connection for data acquisition and reference materials, Recent Articles in Newspapers	
Pre – Preparation Activities	• Students will be shown a video on Political Parties and why do we need Political Parties https://www.myneta.info/ https://www.youtube.com/watch?v=gp7L-wrMBaI&t=56s • Students will be then asked to evaluate their reasons for identifying with a specific political party based on the video lesson. • Students will be told to find out the name of the representatives from their constituency. • Students can use Google Lens for recognising the symbols of Political Parties	Google Lens
Previous Knowledge	Students will be asked about their representatives from their constituency and the work done by the representative.	

Methodology	The Manifestos of some of the parties would be read out. Students could create their own Political Parties and create their own Manifestos. Students would be asked to read out their manifestos in class.	
Learning Outcomes	By the end of this students will be able to define Political Party, compare and contrast Political Parties and analyze the candidates and platforms of the Political Parties Defection and toppling of Governments.	Data Acquisition and data Exploration
Follow up Activities	Students can run a Mock election in class with students divided across party lines. Students can survey their parents and relatives on Political party affiliation. They can ask them why they identify with that particular party. Students will report their findings to the class.	
Reflections	Students could reflect on few questions. • Should an individual fluctuate in terms of Political Party affiliations? Defection could be discussed. • What happens when a person agrees with some of the positions of both the parties? Students can take the help of Inklewriter and write their reflections https://www.google.com/search?q=inklewriter&rlz=1C1CHBD_enIN779IN779&oq=inklewriter&aqs=chrome..69i57j0l7.5645j0j7&sourceid=chrome&ie=UTF-8	Inklewriter

GLOSSARY:

AI Related Terminologies

Data Acquisition: Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

Data Exploration: Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.
https://datavizcatalogue.com

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.
www.inklewriter.com

AI Related Activities

Links for reference:

- Election Commission of India: https://eci.gov.in/
- Association for Democratic Reforms: https://adrindia.org/
- Myneta: https://www.myneta.info/
- Google lens: https://lens.google.com/

SOCIAL SCIENCE
CLASS 10

3.40 Democracy and Diversity

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: Democracy and Diversity**	
Name of the Book	**Democratic Politics II, Class 10, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding Diversity by using AI Project Cycle and AI Modeling.	
Learning Objectives	The objective of the lesson is: • To understand the importance of democracy and accept diversity in society. • To accept the presence of diversities in the world. • To Value democracy as a form of government which accommodates diversities • To respect diversity at home, school and neighborhood.	
Time Required	4 period of 40 minutes each	
Classroom Arrangement	Regular classroom arrangement	
Material Required	Pen, paper, Black Board chalk, Laptops and Internet connections, Power Point , Smart Board.	
Pre – Preparation Activities	Play a game- Mystery Animal Through this game I would like my students learn that "differences do exist but until we stereotype them, we cannot spot this difference in animals as well as in humans."	Mystery Animal
Previous Knowledge	Learners dwell upon their understanding about democracy and diversity and incident of USA and Mexico Olympic. Ques 1; How do you think we know about different events that happened in the past? Ques 2;Do you thing official records tell us the story from the prospective of oppressed people?	https://www.audible.com/blog/playlisted/an-antiracism-listening-list Ai tool - https://ncase.me/polygons/

Methodology	Children are divided into groups of 5(7students each group) and asked what data would they like to collect about the lesson. Story of Mexico Olympic Origins of social differences Overlapping differences cross-cutting differences Politics of social divisions After collecting the data for any one of the above the students will be asked to prepare a presentation emphasis onWhat resources will you use to collect this data? Library resources, interviewing historians, old people and their experiences, Government data sets etc.	Data Acquisition Data Exploration
Learning Outcomes	The students will be able to: • Understand the importance of democracy and accept diversity in society Accept the presence of diversities in the world. • Value democracy as a form of government which accommodates diversities • Respect diversity at home, school and neighborhood.	
Follow up Activities	Discussion on • How can they make this process simpler with the help of using AI? • How can AI help to collect data? • Why is it important to understand the importance of Data for understanding AI?	
Reflections	Create a project on how do we stereotypevarious types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc. to teach a machine to differentiate between things and in the process also understand the ways we stereotype and why should we try to avoid it. Using these representations, students need to understand the patterns of lifestyle in the past in USA and deliver a presentation on the same.	https://teachablemachine.withgoogle.com/

GLOSSARY:

AI Related Terminologies

Problem Scoping:

Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What, When/Where and Why. The answers to these questions lead to a problem statement

Data Acquisition:

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

Data Exploration:

Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

https://datavizcatalogue.com

AI model training:

An algorithm is said to be artificially intelligent if it gets trained and can make decisions/predictions by its own. The intelligence which a machine gains, comes by the training the machine with the appropriate dataset. For example, a machine is to be created which needs to classify an image as either for example apple or banana.

To achieve this task, the machine is trained with the images we required. The machine is tested by providing image.

https://teachablemachine.withgoogle.com/models/WU_llfNfJ/

Classification

Classification is a part of supervised learning model. Classification models work on labelled dataset and are used to predict the label/class of the testing dataset which is unknown to the machine. For example, an AI model is trained on a labelled dataset of 100 images of apples and 100 images of bananas. The machine gets trained on the dataset by extracting features from the dataset and understands what features will classify an image as an apple or a banana. To test the machine, random images of an apple/banana are fed to the AI model and the output will be classification of apples and bananas

Mystery Animal

Students should play the Mystery monster game to understand that difference do exist in all living beings but they all have some common traits which make it hard to separate or classify one from another until we do stereotype based on physical features.

Teacher should not focus on the result of game but the focus should be only and only on the process.

Mystery Animal http://bit.ly/iai4yma

SOCIAL SCIENCE
CLASS 10

3.41 Globalisation

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 4: Globalisation**	
Name of the Book	**Economics, Class 10, NCERT**	
Subject and Artificial Intelligence Integrated	AI Project Cycle integrated with Globalisation	
Learning Objectives	• To understand the concept of Globalisation and link it with foreign trade using Mentimeter • Globalization,YouTube video: • https://www.youtube.com/watch?v=JJ0nFD19eT8\ • To understand the factors responsible for globalisation in India and also present graphically the influx of MNCs in India after 1990s • To analyse the positive and negative effects of globalisation • To create the list ofcountries who aremembers of WTO and depict them on Google my maps • To classify the MNC logos into domestic and MNC companies • To understand the role of WTO.Discuss about the reasons for SEZ in India.	Data Acquisition a Data Exploration https://datavizcata logue.com Google my maps Google Lens
Time Required	3 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, paper, blackboard, chalk,, internet websites for data acquisition & laptops	
Pre – Preparation Activities	The students are divided into two groups and collect data of countries who aremembers of WTO andinflux of MNCs in India after 1990s.	
Previous Knowledge	The students should be aware of the various companies existing in the country	
Methodology	The students are asked to write one word when they hear Globalisation The students are asked to discuss factors responsible for globalisation in India and also present graphically the influx of MNCs in India after the 1990s. The students are asked to analyse the positive and negative effects of globalisation The students are explained the role of WTO and asked to the reasons for SEZ in India. The students are asked to collect the data and identify countries who are members of WTO.	Data Acquisition a Data Exploration

Learning Outcomes	• The students will understand the concept of globalization • Examine the process ofLiberalization as a factor thathas enabled globalization. • Distinguish between Positiveand negative impact ofglobalization. • Discuss about the role ofSEZ in India. • Describe the objectivesand functions of WTO.	
Follow up Activities	Students are asked to identify countries who aremembers of WTO on google MyMaps and make presentations depicting graphically about the trends in influx of MNCs in India after 1990s	
Reflections	Students will be asked to analyze to what extent globalisation can be incorporated in a developing country like India.	

GLOSSARY:

1. AI Related Terminologies

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired can then be divided into two categories: Training Data and Testing

Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which you can collect data. Some of them are:
• Surveys
• Web Scraping
• Sensors
• Cameras
• Observations
• Application Program Interface

Data Exploration: After acquiring data there comes the need to analyze the data. For this, they needto visualize the acquired data in a user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use it at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

Google Lens: Google Lens is an image recognition technology developed by Google, designed to bring up relevant information related to objects it identifies using visual analysis based on a neural network.

2. AI Activity Description

Students would start acquiring authentic data from various reliable sources to understandvarious members of WTO and also their MNCs working in India and will explore the same in the form of visual representations. They will also be able to relate their searches to identify which country has major investment in India. The students will be shown images of various company logos and asked to classify them into domestic and MNC companies.

SOCIAL SCIENCE
CLASS 10

3.42 Money and Credit

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 3: Money and Credit**	
Name of the Book	**Understanding Economic Development, Class X, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding the functions of Money and vicious circle of Credit using the AI tools: INKLE WRITER (to explain Barter System) & AI PROJECT CYCLE	
Learning Objectives	**The students will be able to :** • Understand the concept of AI Project Cycle • Mention the functions of money • Enlist the modern forms of money • Examine the functions of bank • Distinguish between formal source and informal source credit • Focus on the need of expansion of formal source of credit in rural areas • Criteria to avail a loan • Comparative study between Self Help Group of India &Gramin Bank Of Bangladesh Cooperatives	Introduction of "INKEL WRITER" AI Tool and explaining the Barter System and Double Coincidence of Wants 4 W Canvas to explain the need & role of money Data Acquisition (About SHG &Gramin Bank of Bangladesh) LOOPY- Vicious circle of Credit
Time Required	8 periods of 40 minutes	
Classroom Arrangement	Flexible	
Material Required	Pen, Paper, Whiteboard, Marker, screen and projector, desktop, internet websites for data acquisition, you tube videos	

Pre – Preparation Activities	The students are divided into three different groups of Bankers, lenders and borrowers to understand the banking system, generation of money, link b/w and they will have a role play activity. The students will be given instructions to get two cheques i.e. one cancelled and one blank cheque for cheque activity. 	
Previous Knowledge	The students will be asked about their visit to a bank and sharing of their experiences, about different aspects of workings of a bank.	
Methodology	• **Introduction of the Barter System** The students will be introduced to a hypothetical story with the help of AI tool Inkel Writer. • **Introduction to Different Forms of Money** The students would be asked questions related to the need and role of money in Indian Economy with the help of 4W Canvas. Students will be asked to name the different parts of a cheque in the form of a mindmap. • **Cheque Activity** • Students will be asked to label the different parts of a cheque and will be taught how to fill a cheque. • **Role Play** The Students will be divided into three groups and will be asked to present a role play to understand the generation of money, banking system and the link between borrowers, lenders and bankers. Students will be asked to think about Formal and Informal Source Of Credit in Rural and Urban Areas using AI tool **Classification.** • **Vicious Circle Of Credit** The students will be explained how to use LOOPY to understand the vicious circle of Credit in a better way. • **Data Acquisition & Data Exploration** Students will be asked to collect the data related to SHG &Gramin Bank of Bangladesh and then discussion on the data collected.	www.inkelwriter.com Integration with English https://bit.ly/3jz4QBD

Discussion on the Text	**There will be discussion on :** • Distinguish between formal source and informal source credit • Need of expansion of formal source of credit in rural areas • Why is the circle of credit known as a vicious circle?	
Learning Outcomes	The students will be able to: • understand the functions of money • recognise the significance of modern forms of money • realise the virtuous and vicious aspects of credit • - develop the spirit of inquiry and research	
Follow up Activities	Debate on Why there is a need for the Expansion of Formal Source Of Credit in Rural Areas	
Reflections	Make areport on most popular sources of credit available in students' area.	

GLOSSARY:

AI Related Terminologies

Data Acquisition refers to acquiring authentic data from reliable and authentic sources/platforms that is required for the AI model. There can be various ways to collect data.

Various sites will be referred for the acquisition of the data.

Data will be related to Self Help Groups &Gramin Bank of Bangladesh.

Data Exploration refers to visualising the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualise the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.

A discussion will be conducted after Data exploration.

https://datavizcatalogue.com

Inklewriter

Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

With the help of the Inkle writer, the students will present their data collected.

www.inklewriter.com

SOCIAL SCIENCE
CLASS 10

3.43 Sectors of the Indian Economic

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 2: Sectors of the Indian Economic**	
Name of the Book	**Understanding Economic Development, Class X, NCERT**	
Subject and Artificial Intelligence Integrated	AI Project Cycle integrated for understanding of economic activities of different sectors.	
Learning Objectives	Students will be able: • to classify the sectors of economic activity • to explain about the activities of different sectors of economic activity	
Time Required	2 period 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Smart board, world map, laptop/desktop,internet connection, projector and marker.	
Pre – Preparation Activities	Pictures of different economic sectors will be shown to the students.	
Previous Knowledge	Ask students to • observe the picture and identify the activity. • classify the activities of people living in urban areas and activities of rural people	Problem Scoping
Methodology	• The student will be asked to make a list of the occupations in which their family members are engaged. • On the basis of collected information, students will be asked: - In which area do you and your family live? - Your family members are engaged in which sector of economic activity • Students will be asked to make a table and will be given the list of occupations and they will classify them under the three sectors of economic activity.	Data Acquisition Data Exploration Evaluation
Learning Outcomes	Students will be able to classify the activities of three sectors of economic activity.	

Follow up Activities	Students will be shown a bar graph to interpret. Students will be asked questions on the basis of the bar graph. • Which was the largest producing sector in 1973-74? • Which is the largest producing sector in 2013-14? • Can you say which sector has grown the most over forty years? Students will be asked to analyse the bar graph and compare between these 3 sectors and find out why there is rising Importance of the Tertiary Sector in Production?	Data Acquisition Data Exploration Data Evaluation
Reflections	Students will be able to differentiate between these three sectors of economic activity.	

GLOSSARY:

AI Related Terminologies

Data Acquisition: Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired could be then divided into two categories: Training Data and Testing Data.

The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which you can collect data.
Some of them are:

- Surveys
- Web Scraping
- Sensors
- Camera
- Observations
- Application Program Interface

Data Exploration: After acquiring data there comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can:

- Quickly get a sense of the trends, relationships and patterns contained within the data.
- Define strategy for which model to use at a later stage.
- Communicate the same to others effectively.

To visualize data, various types of visual representations can be used by the students like diagrams, charts, graphs, flows, etc.

Problem Scoping: Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What , When/Where and Why. The answers to these questions lead to a problem statement.

SOCIAL SCIENCE
CLASS 10

3.44 Agriculture

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 4: Agriculture**	
Name of the Book	**Social Science Contemporary India - II, Class 10, NCERT**	
Subject and Artificial Intelligence Integrated	Understanding Agriculture and its importance and about the major crops grown in India and the geographical conditions required using the concept of AI Project Cycle, Problem Scoping and Data Analysis.	
Learning Objectives	• Understanding about integration of AI and agriculture • Understanding what is agriculture • Understanding the importance of agriculture for our country • Understanding types of agriculture • Understanding different cropping seasons and patterns • Understanding the problems of agriculture and farmers • Understanding the major initiatives of govt to overcome the agricultural challenges.	
Time Required	8 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Textbook, PPT, Map of India, Pen, paper, white board/smart board, marker, Laptops and Internet connection, You tube.	
Pre – Preparation Activities	The students can be taken to a farm and can talk to the farmers about crops they grow and the problems they face and the measures they take to increase production.	
Previous Knowledge	The students shall be asked questions • What is the main source for the food humans eat daily? • How many years ago did agriculture begin? • What is the definition of agriculture? • What did humans do before agriculture? • What are the main types of agriculture? • How can we use AI to increase agriculture production?	

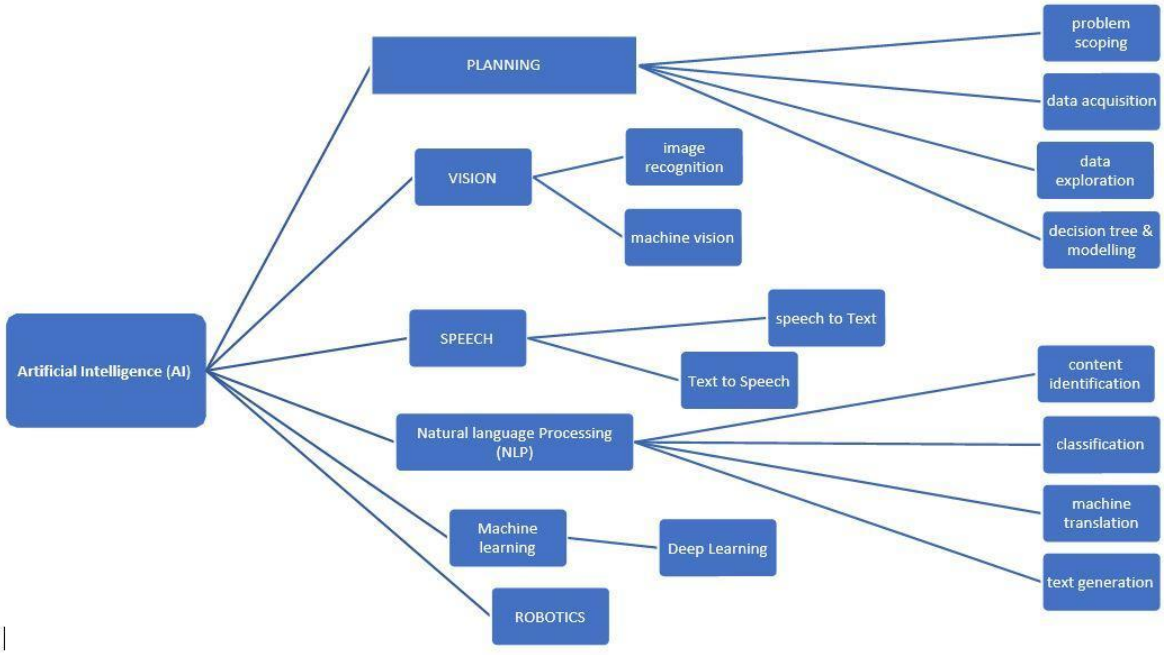
Methodology	Introduction - There is a video on agriculture shown to students in preparation for the lesson. ● The teacher will explain about agriculture and will do brain storming and will ask students about importance of agriculture for India and for other sectors. ● The teacher will show one video on different types of crops grown in India and various cropping seasons then the students will be asked to differentiate theses like https://youtu.be/YGfCWpgygTk (Types of crops) What is the difference between commercial and subsistence farming? ● The students will ask about the major problems of farmers and agriculture. The students will be asked to collect data on geographical conditions required for growing these crops The students will be asked to see state wise production of various crops The students will be asked to collect the information on the various steps taken by govt to increase production and to check which initiatives of the govt are actually helping the farmers https://youtu.be/ODyT65htFLY(Technological and institutional reform) and the video of the same will be shown Video showing the use of AI in agriculture. https://youtu.be/KpZMEU9wIb8(For integration of AI and agriculture)	AI project cycle and Problem Scoping (Who what Where and why) Data Acquisition Data Exploration
Learning Outcomes	At the end of the chapter students will be able to understand different cropping seasons and the various types of crops grown in India Students will be able to understand Major challenges of agriculture and its solutions Students will be able to understand importance of agriculture for our country and the world Students will be able to use AI in agriculture or the integration of both	
Follow up Activities	The students will be asked to make a chart showing the major crops like wheat rice and its geographical requirements and distribution in the form of a table The students will be asked to make mind Maps using Tree Diagram The students will be asked to make maps of major crops by pasting real material like wheat rice on the states of high production Or Using Datavizcatalogue Choropleth Maps	Datavizcatalogue Datavizcatalogue Tree Diagram Choropleth Maps
Reflections	Students will be shown images of different crops and will be asked to classify them under food, fibre,commercial or beverage crops and to write geographical condition of each crop.	

GLOSSARY:

AI Activity Description

Problem Scoping: Problem Scoping refers to understanding a problem and finding out various factors which affect the problem. Under problem scoping, we use the framework of 4Ws problem canvas where we look into the Who, What, Where and Why of a problem. After observing these factors, students get clarity towards the issue to be solved which leads them towards data acquisition.

AI Project Cycle: AI Project cycle is a framework which is used to design an AI project taking all the crucial factors into consideration. The project cycle consists of 5 steps namely: problem scoping, data acquisition and data exploration. Each of the stages holds importance in the framework.



AI has been an academic area of study for many years with lots of dips on the way to its progress; in recent times it is increasingly becoming an enabler for a variety of technologies and appliances that impact our daily lives. Also, with the ever-*increasingcomputingpower,lessercostof data storage* and *immensedata available,* there is a boom of technological innovations, which should make us believe that '**AISpring'** has arrived. So, AI is marching ahead to be the mainstream of the mainstream disciplines of study that it connects.
Tree Diagram:A Tree Diagram is a way of visually representing hierarchy in a tree-like structure. Typically the structure of a Tree Diagram consists of elements such as a **root node**, a member that has no superior/parent. Then there are the **nodes**, which are linked together with line connections called **branches** that represent the relationships and connections between the members. Finally, the **leaf nodes** (or end-nodes) are members who have no children or child nodes.

Tree Diagrams are often used:

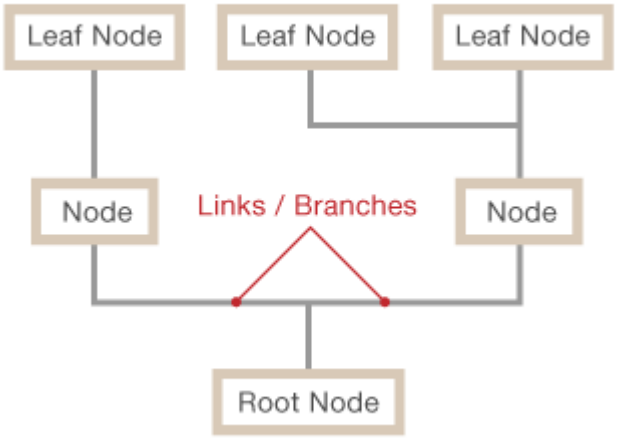
To show family relations and descent.

In taxonomy, the practice and science of classification.

In evolutionary science, to show the origin of species.

In computer science and mathematics.

In businesses and organisations for managerial purposes.

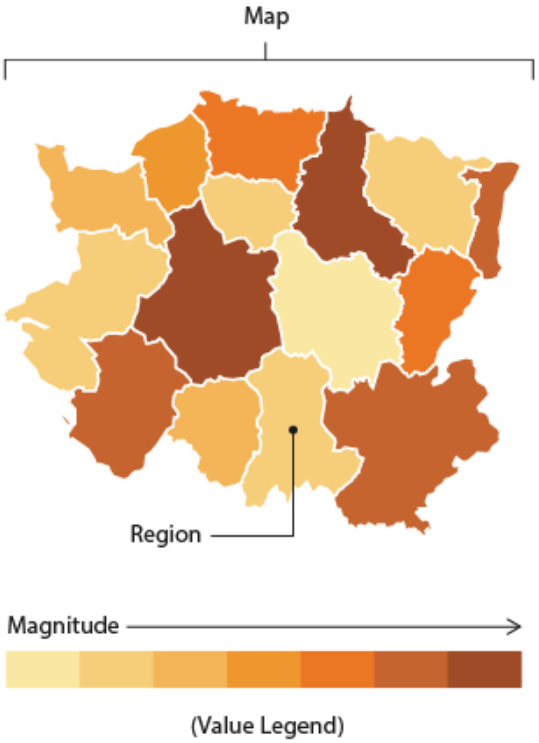


Choropleth Maps display divided geographical areas or regions that are coloured, shaded or patterned in relation to a data variable. This provides a way to visualise values over a geographical area, which can show variation or patterns across the displayed location.

The data variable uses colour progression to represent itself in each region of the map. Typically, this can be a blending from one colour to another, a single hue progression, transparent to opaque, light to dark or an entire colour spectrum.

One downside to the use of colour is that you can't accurately read or compare values from the map. Another issue is that larger regions appear more emphasised then smaller ones, so the viewer's perception of the shaded values are affected.

A common error when producing Choropleth Maps is to encode raw data values (such as population) rather than using normalized values (calculating population per square kilometre for example) to produce a density map.



SOCIAL SCIENCE
CLASS 10

3.45 Nationalism in Europe

PARAMETERS	DESCRIPTION	AI CONCEPTS INTEGRATED
Chapter Covered	**Chapter 1: Nationalism in Europe**	
Name of the Book	**India and the Contemporary World - 2, Class 10, NCERT**	
Subject and Artificial Intelligence Integrated	AI Tools: Problem scoping Decision tree, Inkle writer or Dungeon, Google lens integrated with Nationalism in Europe	
Learning Objectives	To understand the role of middle class in the making of Nationalism in Europe in the Post Napoleonic period	
Time Required	2-3 periods of 40 minutes each	
Classroom Arrangement	Flexible	
Material Required	Pen, Paper, Black/Green Board, chalk, Map of Europe, Smart board, Internet, Laptops	
Pre – Preparation Activities	Teacher to discuss and explain about What do the students understand about nation- state? What is nationalism? Students will observe a Map of mid eighteenth century Europe	
Previous Knowledge	The factors that led to French revolution, Rise of Napoleon and the impact of his reforms on Europe	
Introduction	Questions for Discussion: • Who are the middle class people? • How did the middle class emerge in the late eighteenth century? • Do you think they were happy with the ways the aristocrats in Europe lived? If not, why? • What were the changes the middle class wanted to bring? • Why do you think the middle class always want a change in the society? • How do they bring changes? • Were there any changes in the European society during the reign of Napoleon? • Did the situation change after Napoleon's defeat? • Why people revolt? In what ways?	**Problem scoping by 4W Canvas**

Methodology	Children are divided into groups of 5 • They would be asked to discuss in the group the idea of Liberalism and how was it developing the feeling of nationalism in the minds of the Middle class Europeans. • They will make mind maps /system mapping using **LOOPY/ Problem scoping by using 4w Canvas** to build up the idea of Liberalism in the context of social, political and economic factors http://ncase.me/loopy/ • They will now be asked to discuss in groups and each group will develop a story based on the Treaty of Vienna (1815) after the defeat of Napoleon. They can use **Inkle writer to develop their stories.** **www.inklewriter.com** **https://play.aidungeon.io/** • The students discuss about the rise of the revolutionaries and their operations in the post Napoleonic period. They can discuss about their modus operandi (insurrection and/ or education to the people) by using the **Decision tree.** • The Students can also use the **Google Lens** to study about the pictures of caricatures and paintings as a source of history • The students relate the maps of 19th century map of Europe with the recent one with the help of **Google Map**	**Problem scoping by 4W Canvas** **Loopy** **Inklewriter** **Decision tree.** **Google Lens** **Google map**
Learning Outcomes	Students will be able to ● Explain the rise of middle class in the second half of 18th century. ● Explain the demands of the middle class. ● Analyse the idea of Liberal Nationalism in the context of social, political and economical issues. ● Explain the topics with the help of **4W Canvas and Loopy** ● Analyse the reasons for the rise of revolutionaries after the Treaty of Vienna. ● Develop stories and write report with the help of **Inklewriter or Dungeon** ● Explain the work of secret revolutionaries under the leadership of Giuseppe Mazzini against the conservative order ● Explain the operations of the revolutionaries with the help of **Decision Tree** ● Explain the topics with the help of caricatures and paintings with the help of **Google Lens** ● Relate the mid Nineteenth century map of Europe and the recent map with the help of **Google Map**	

Follow up Activities	Students will listen to each other and learn from their peers during the presentation They will write a report on the Problems arising after the reinstatement of Conservative Order of 1815 and the rise of Nationalism in Europe during that period with **Inklewriter www.inklewriter.com**	**Inkle write**r
Reflections	• They will research about the political condition of India from late Eighteenth Century till mid Nineteenth Century. • Discuss on the feeling of nationalism among the Indians and its backdrop. • Research on rise of Revolutionaries and their operations in India. • 4. Relate the empires and regions of Europe in the mid Nineteenth Century with the present countries with the help of **Google Map**	**Google Map**

GLOSSARY

AI Related Terminologies

Problem Scoping: Problem Scoping refers to understanding a problem and finding various factors which cause and affect the problem. Under problem scoping, we use the framework of 4Ws problem canvas where we look into the Who, What, Where and Why of a problem. After observing these factors, students get clarity regarding the issue to be solved which leads them towards data acquisition.

4Ws Problem Canvas:

The 4Ws Problem canvas helps in identifying the key elements related to the problem.

Who?

The “Who” block helps in analyzing the people getting affected directly or indirectly due to the problem. Under this, they identify who the ‘Stakeholders’ of this problem are and what is known about them. Stakeholders are the people who face this problem and would be benefited with the solution.

Who canvas consists of:

- Who are the Stakeholders?
- What do you know about them?

What ?

Under the “What” block, they need to look into what they have on hand. At this stage, they need to determine the nature of the problem. What is the problem and how do they know that it is a problem? Under this block, they also gather evidence to prove that the problem they have selected actually exists. Newspaper articles, Media, announcements, etc. are some examples.

What canvas consists of:

- What is the problem?
- How do you know that it is a problem? (Is there any evidence?)

Where?

Now that they know who is associated with the problem and what the problem actually is; they need to focus on the context/situation/location of the problem. This block will help them look into the situation in which the problem arises, the context of it, and the locations where it is prominent.

Where canvas consists of:

- What is the situation/context where the stakeholders experience the problem?
- Where is the problem located?

Why?

They have finally listed down all the major elements that affect the problem directly. Now it is convenient to understand who the people that would be benefitted by the solution are; what is to be solved; and where will the solution be deployed. These three canvases now become the base of why they want to solve this problem. Thus, in the “Why” canvas, they would think about the benefits which the stakeholders would get from the solution and how would it benefit them as well as the society.

Why canvas consists of:

- Why will this situation be of value to the stakeholders?
- How will the solution improve their situation?

Loopy: is an open source tool to understand the concept of system maps. A system map shows the components and boundaries of a system and the components of the environment at a specific point in time. With the help of system maps, one can easily define a relationship amongst different elements which come under a system. The map shows the cause & effect relationships of elements with each other with the help of arrows. The arrow-had depicts the direction of the effect and a sign (+ or -) shows their relationship. A + sign indicated positive relationship and a - sign indicates negative relationship between the elements. Considering the data features of any problem to be solved, a system map can be drawn.

https://ncase.me/loopy/v1.1/?data=[[[1,487,59,1,%22Autocratic%2520Monarch%22,4],[2,576,253,1,%22%2520no%2520freedom%2520of%2520press%22,5],[3,769,125,0.5,%22censorship%22,0],[4,887,305,1,%22%2520no%2520freedom%2520of%2520speech%22,5],[6,321,284,0.5,%22social%2520hierarchies%22,0],[7,366,497,1,%22Aristocracy%2520and%2520nobility%22,5],[8,166,217,0.66,%22Church%22,0],[9,812,542,0.66,%22Liberty%2520and%2520Equality%22,3]],[[1,2,89,1,0],[1,3,82,1,0],[3,2,57,-1,0],[3,4,12,-1,0],[4,1,337,-1,0],[6,1,69,1,0],[6,7,-58,1,0],[8,1,97,1,0],[3,9,-48,-1,0],[6,9,-42,-1,0],[8,9,-244,-1,0],[9,1,-355,-1,0]],[],9%5D

Inklewriter: Inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

www.inklewriter.com

Google Lens: Google Lens is an image recognition technology developed by Google, designed to bring up relevant information related to objects it identifies using visual analysis based on a neural network.

Decision Tree: Decision Tree is a rule based AI model to solve classification or regression problems which helps the machine in predicting the element with the help of various rules fed to it. A decision tree looks like an inverted tree where root is at the top and the tree further divides into branches, nodes and leaves. Root is the starting point of a decision tree. Depending on the rules, the tree splits further into various branches that lead to an end point known as a leaf. Each leaf of the tree is labelled with a class.

CHAPTER 4

Appendix 1

AI Curriculum

ARTIFICIAL INTELLIGENCE CURRICULUM
(Class 8 & 9)

OBJECTIVE

The objective of this unit is to develop a readiness for understanding and appreciating Artificial Intelligence and its application in our lives. This unit focuses on:

1. Helping learners understand the world of Artificial Intelligence and its applications through games, activities, and multisensorial learning to become AI-Ready.
2. Introducing the learners to three domains of AI in an age appropriate manner.
3. Allowing the learners to construct meaning of AI through interactive participation and engaging hands-on activities.
4. Introducing the learners to AI Project Cycle.
5. Introducing the learners to programming skills - Basic python coding language.

LEARNING OUTCOMES

Learners will be able to:

- Identify and appreciate Artificial Intelligence and describe its applications in daily life.
- Relate, apply and reflect on the Human-Machine Interactions to identify and interact with the three domains of AI: Data, Computer Vision and Natural Language Processing and Undergo assessment for analyzing their progress towards acquired AI-Readiness skills.
- Imagine, examine and reflect on the skills required for futuristic job opportunities.
- Unleash their imagination towards smart homes and build an interactive story around it.
- Understand the impact of Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship.
- Gain awareness about AI bias and AI access and describe the potential ethical considerations of AI.
- Develop effective communication and collaborative work skills.
- Get familiar and motivated towards Artificial Intelligence and Identify the AI Project framework. Learn problem scoping and ways to set goals for an AI project and understand the iterative nature of problem scoping in the AI project cycle.
- Brainstorm on the ethical issues involved around the selected problem
- Foresee the kind of data required and the kind of analysis to be done, identify data requirements and find reliable sources to obtain relevant data.
- Use various types of graphs to visualize acquired data.
- Understand, create, and implement the concept of Decision Trees.
- Understand and visualize computer’s ability to identify alphabets and handwritings.
- Understand and appreciate the concept of Neural Network through gamification and learn basic programing skills
- Acquire introductory Python programming skills in a very user-friendly format.

UNIT WISE DISTRIBUTION

No.	UNIT	SUB-UNIT	DURATION	MARKS	
				Theory	Practical
1	Introduction to AI	Excite	2.4 Hours (4 Periods)	10	10
		Relate	02 Hours (3 Periods)		
		Purpose	02 Hours (3 Periods)		
		Possibilities	02 Hours (3 Periods)		
		AI Ethics	3.6 Hours (6 Periods)		
2	AI Project Cycle	Problem Scoping	14 Hours (21 Periods)	10	10
		Data Acquisition	02 Hours (3 Periods)		
		Data Exploration	04 Hours (6 Periods)		
		Modelling	06 Hours (9 Periods)		
3	Neural Network		04 Hours (6 Periods)	10	10
4	Introduction to Python		70 Hours (105 Periods)	20	10
5	Co-curricular Skills				10
TOTAL			**112 Hours (168 Periods)**	**50**	**50**

Total: **100** Marks

COURSE OUTLINE

UNIT	SUB-UNIT	SESSION/ACTIVITY/PRACTICAL	LEARNING OUTCOMES
Introduction to AI	Excite	**Session**: Introduction to AI and setting up the context of the curriculum	To identify and appreciate Artificial Intelligence and describe its applications in daily life.
		Ice Breaker Activity: Dream Smart Home idea Learners to design a rough layout of floor plan of their dream smart home.	
		Recommended Activity: The AI Game Learners to participate in three games based on different AI domains. ● **Game 1: Rock, Paper and Scissors** (based on data) ● **Game 2: Mystery Animal** (based on Natural Language Processing - NLP)	To relate, apply and reflect on the Human-Machine Interactions. To identify and interact with the three domains of AI: Data, Computer

		● **Game 3: Emoji Scavenger Hunt** (based on Computer Vision - CV)	Vision and Natural Language Processing.
		Recommended Activity: AI Quiz (Paper Pen/Online Quiz)	To undergo an assessment for analyzing progress towards acquired AI-Readiness skills.
		Recommended Activity: To write a letter Writing a Letter to one's future self ● Learners to write a letter to self keeping the future in context. They will describe what they have learnt so far or what they would like to learn someday	To imagine, examine and reflect on the skills required for futuristic job opportunities.
	Relate	**Video Session: To watch a video** **I**ntroducing the concept of Smart Cities, Smart Schools and Smart Homes	Learners to relate to application of Artificial Intelligence in their daily lives.
		Recommended Activity: W**rite an Interactive Story** Learners to draw a floor plan of a Home/School/City and write an interactive story around it using **Story Speaker** extension in Google docs.	To unleash their imagination towards smart homes and build an interactive story around it. To relate, apply and reflect on the Human-Machine Interactions.
	Purpose	**Session:** Introduction to **sustainable development goals**	To understand the impact of Artificial Intelligence on Sustainable Development Goals to develop responsible citizenship.
		Recommended Activity: Go Goals Board Game ● Learners to answer questions on Sustainable Development Goals	
	Possibilities	**Session: Theme-based research and Case Studies** ● Learners will listen to various case-studies of inspiring start-ups, companies or communities, where AI has been involved in real-life. ● Learners will be allotted a theme around which they need to search for present AI trends and have to visualize the future of AI in and around their respective theme.	To research and develop awareness of skills required for jobs of the future. To imagine, examine and reflect on the skills required for the futuristic opportunities.
		Recommended Activity: Job Ad Creating activity ● Learners to create a job advertisement for a firm describing the nature of job available and the skillset required for it 10 years down the line. They need to figure out how AI is going to transform the nature of jobs and create the Ad accordingly.	To develop effective communication and collaborative work skills.

	AI Ethics	**Video Session: Discussing about AI Ethics**	
		Recommended Activity: Ethics Awareness ● Students play the role of major stakeholders and they have to decide what is ethical and what is not for a given scenario.	To understand and reflect on the ethical issues around AI.
		Session: AI Bias and AI Access ● Discussing about the possible bias in data collection ● Discussing about the implications of AI technology	To gain awareness around AI bias and AI access.
		Recommended Activity: Balloon Debate ● Students divide in teams of 3 and 2 teams are given same theme. One team goes in affirmation to AI for their section while the other one goes against it. ● They have to come up with their points as to why AI is beneficial/harmful for the society.	To let the students analyze the advantages and disadvantages of Artificial Intelligence.

AI Project Cycle	Problem Scoping	**Session: Introduction to AI Project Cycle** ● Problem Scoping ● Data Acquisition ● Data Exploration ● Modelling ● Evaluation	Identify the AI Project Cycle framework.
		Activity: Brainstorm around the theme provided and set a goal for the AI project. ● Discuss various topics within the given theme and select one. ● List down/ Draw a mind map of problems related to the selected topic and choose one problem to be the goal for the project.	Learn problem scoping and ways to set goals for an AI project.
		Activity: To set actions around the goal. ● List down the stakeholders involved in the problem. ● Search on the current actions taken to solve this problem. ● Think around the ethics involved in the goal of your project.	Identify stakeholders involved in the problem scoped. Brainstorm on the ethical issues involved around the problem selected.
		Activity: Data and Analysis ● What are the data features needed? ● Where can you get the data? ● How frequent do you have to collect the data? ● What happens if you don't have enough data? ● What kind of analysis needs to be done? ● How will it be validated? ● How does the analysis inform the action?	Understand the iterative nature of problem scoping for in the AI project cycle. Foresee the kind of data required and the

			kind of analysis to be done.
		Presentation: Presenting the goal, actions and data.	Share what have the students discussed so far.
	Data Acquisition	**Activity: Introduction to data and its types.** ● Students work around the scenarios given to them and think of ways to acquire data.	Identify data requirements and find reliable sources to obtain relevant data.
	Data Exploration	**Session: Data Visualization** ● Need of visualizing data ● Ways to visualize data using various types of graphical tools.	To understand the purpose of Data Visualization
		Recommended Activity: Let's use Graphical Tools ● To decide what kind of data is required for a given scenario and acquire the same. ● To select an appropriate graphical format to represent the data acquired. ● Presenting the graph sketched.	Use various types of graphs to visualize acquired data.
	Modelling	**Session: Decision Tree** ● To introduce basic structure of Decision Trees to students.	Understand, create and implement the concept of Decision Trees.
		Recommended Activity: Decision Tree ● To design a Decision Tree based on the data given.	
		Recommended Activity: Pixel It ● To create an "AI Model" to classify handwritten letters. ● Students develop a model to classify handwritten letters by diving the alphabets into pixels. ● Pixels are then joined together to analyze a pattern amongst same alphabets and to differentiate the different ones.	Understand and visualize computer's ability to identify alphabets and handwritings.
Neural Network		**Session: Introduction to neural network** ● Relation between the neural network and nervous system in human body ● Describing the function of neural network.	Understand and appreciate the concept of Neural Network through gamification.
		Recommended Activity: Creating a Human Neural Network ● Students split in four teams each representing input layer (X students), hidden layer 1 (Y students), hidden layer 2 (Z students) and output layer (1 student) respectively. ● Input layer gets data which is passed on to hidden layers after some processing. The output layer	

		finally gets all information and gives meaningful information as output.	
Introduction to Python		**Recommended Activity: Introduction to programming** using Online Gaming portals like Code Combat.	Learn basic programming skills through gamified platforms.
		Session: Introduction to Python language ● Introducing python programming and its applications	Acquire introductory Python programming skills in a very user-friendly format.
		Practical: Python Basics ● Students go through lessons on Python Basics (Variables, Arithmetic Operators, Expressions, Data Types - integer, float, strings, using print () and input () functions) ● Students will try some simple problem-solving exercises on Python Compiler.	
		Practical: Python Lists ● Students go through lessons on Python Lists (Simple operations using list) ● Students will try some basic problem-solving exercises using lists on Python Compiler.	

ASSESSMENT

After completion of each unit, the students can be evaluated on the basis of the following skills:

Conceptual Skills	Technical Skills	Life Skills
Conceptual understanding of AI AI applications and three domains of AI Knowledge Enhancement in 3 AI Domains: Data, Computer Vision & Natural Language Processing Mind mapping Problem Identification Data Acquisition Data Exploration Graphical Representation Neural Network	Ability to use AI Powered Tools Troubleshooting Skill Basic programming skills Basic Python	Thinking Skills Problem Solving Creative thinking Critical Thinking Decision Making Skills Social Skills - Teamwork Team Building Skills Leadership Self-Awareness Empathy Effective Communication Skills Oral & Written Presentation

Appendix 2

Artificial Intelligence Curriculum

(Class 10)

UNIT	SUB-UNIT	SESSION/ ACTIVITY/ PRACTICAL
INTRODUCTION TO AI	Foundational concepts of AI	**Session**: What is Intelligence?
		Session: Decision Making. ● How do you make decisions? ● Make your choices!
		Session: what is Artificial Intelligence and what is not?
	Basics of AI: Let's Get Started	**Session**: Introduction to AI and related terminologies. ● Introducing AI, ML & DL. ● Introduction to AI Domains (Data, CV & NLP)
		Session: Applications of AI – A look at Real-life AI implementations
		Session: AI Ethics
AI PROJECT CYCLE	Introduction	**Session:** Introduction to AI Project Cycle
	Problem Scoping	**Session:** Understanding Problem Scoping & Sustainable Development Goals
	Data Acquisition	**Session:** Simplifying Data Acquisition
	Data Exploration	**Session:** Visualizing Data
	Modelling	**Session:** Introduction to modelling ● Introduction to Rule Based & Learning Based AI Approaches ● Introduction to Supervised Unsupervised & Reinforcement Learning Models ● Neural Networks
	Evaluation	**Session:** Evaluating the idea!
ADVANCE PYTHON	Recap	**Session:** Jupyter Notebook
		Session: Introduction to Python
		Session: Python Basics
DATA SCIENCES	Introduction	**Session:** Introduction to Data Science
		Session: Applications of Data Science
		Session: Revisiting AI Project Cycle
	Concepts of Data Sciences	**Session**: Python for Data Sciences
		Session: Statistical Learning & Data Visualization
		Activity: Personality Prediction

UNIT	SUB-UNIT	SESSION/ ACTIVITY/ PRACTICAL
	K-nearest neighbour model	**Session:** Understanding K-nearest neighbour model
COMPUTER VISION	Introduction	**Session:** Introduction to Computer Vision
		Session: Applications of CV
	Concepts of Computer Vision	**Session & Activity:** Understanding CV Concepts ● Pixels ● How do computers see images? ● Image Features
	OpenCV	**Session:** Introduction to OpenCV
		Hands-on: Image Processing
	Convolution Operator	**Session:** Understanding Convolution operator
		Activity: Convolution Operator
	Convolution Neural Network	**Session:** Introduction to CNN
		Session: Understanding CNN ● Kernel ● Layers of CNN
		Activity: Testing CNN
NATURAL LANGUAGE PROCESSING	Introduction	**Session:** Introduction to Natural Language Processing
		Session: NLP Applications
		Session: Revisiting AI Project Cycle
	Chatbots	**Activity:** Introduction to Chatbots
	Language Differences	**Session:** Human Language VS Computer Language
	Concepts of Natural Language Processing	**Hands-on:** Text processing ● Data Processing ● Bag of Words ● TFIDF ● NLTK
EVALUATION	Introduction	**Session:** Introduction to Model Evaluation
	Confusion Matrix	**Session & Activity:** Confusion Matrix
	Evaluation Score Calculation	**Session:** Understanding Accuracy, Precision, Recall & F1 Score
		Activity: Practice Evaluation

Appendix 3

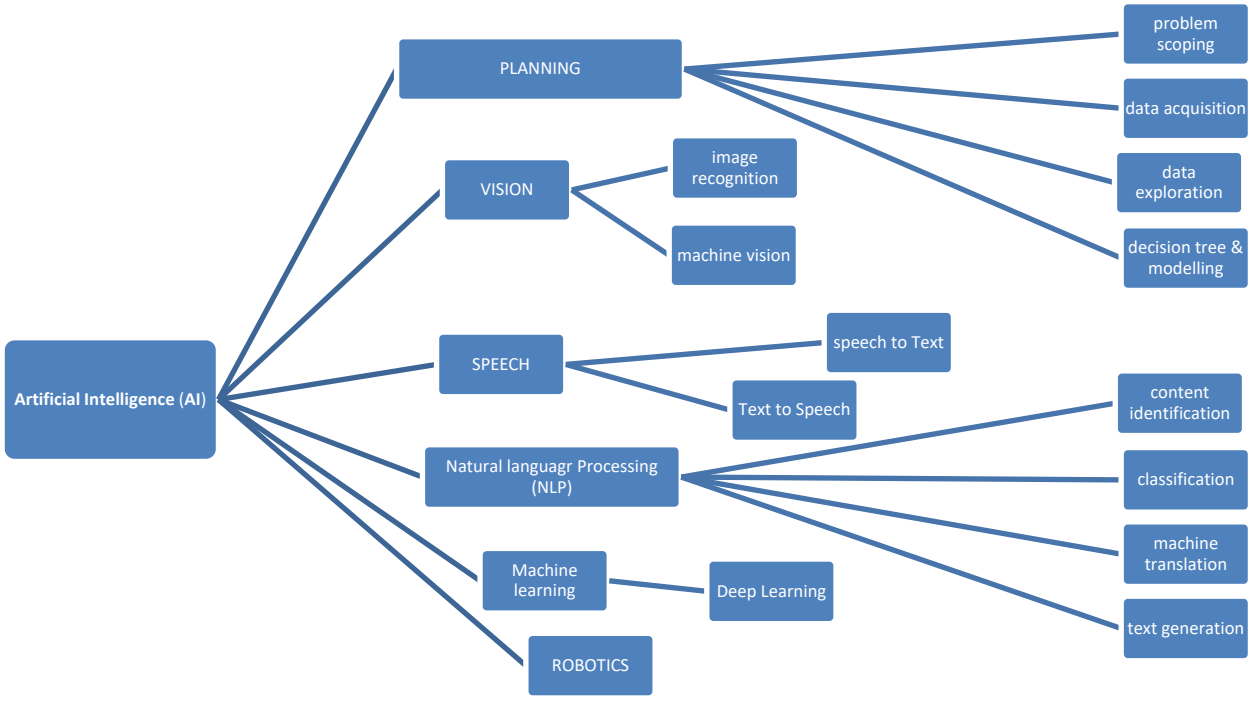
AI Learning Indicators

Areas	Class 8	Class 9/10
Knowledge Understanding AI	What is AI? Why? Pedagogy- Brainstorming/Concept maps, Venn Diagrams	Why AI /Why not AI? What other possibilities? Pedagogy- Discussion/Debate Questioning, NLR- Comparison Matrix
Skills Prerequisite skills Skills to be acquired/developed	Inquiry / Questioning Skills Generating Ideas – Critical & Computer skills	Inquiry / Questioning Skills Communicating Creative thinking Critical Thinking
Technical Competencies for Artificial Intelligence (AI) Data Computer Vision (CV) Natural Language Processing (NLP)	Through Creative games /Skills based problem solving challenges /Designing Introduction to all three domains Data CV NLP Using all three domains in different challenging games to identify AI in different context	Through Creative games /Skills based problem solving challenges /Designing Building conceptual understanding and skill development in one domain of AI - Data CV NLP- Gaining competency in NLP. Learning basics of Python
Attitude	Initiative Positive Thinking	Initiative Success Vs failure Positive Thinking
Life Skills to be developed	Thinking Skills Social Skills	Thinking Skills /Social Skills Emotional Skills
Program course to be covered	In one academic session	In one academic session
Mentoring & feedback Suggestive Activities	Face to face Online Online Newsletter for all levels on the work in AI all across participating schools	Face to face Online Online Newsletter for all levels on the work in AI all across participating schools

Appendix 4

AI Capabilities

AI has been an academic area of study for many years with lots of dips on the way to its progress; in recent times it is increasingly becoming an enabler for a variety of technologies and appliances that impact our daily lives. Also, with the ever-*increasing computing power, lesser cost of data storage* and *immense data available,* there is a boom of technological innovations, which should make us believe that '**AI Spring'** has arrived. So, AI is marching ahead to be the mainstream of the mainstream disciplines of study that it connects.



Appendix 5

AI Integrated Lesson - Assessment Rubric

Given below are the indicators that can be used if teacher needs to assess students' performance for their AI Integrated lesson plan activity. They may modify it suited to the needs of the lesson and student needs.

Content	**30–19** **Clearly** shows understanding of topic content. Provides **suffi cient** supporting evidence when needed. Understands applications of AI in subject learning.	**18–7** **Somewhat** shows understanding of topic content. Provides **some** supporti ng evidence when needed.	**6–0** **Minimally** shows understanding of course content. Provides **little** supporting evidence though needed.
Application	**5–4** **Clearly** makes connections to other relevant ideas, concepts, texts, and/or real-world examples of AI as appropriate.	**3–2** **Somewhat** makes connections to other relevant ideas, concepts, texts, and/or real-world examples of AI as appropriate.	**1–0** **Minimally** makes connections to other relevant ideas, concepts, texts, and/or real-world examples of AI though needed.
Practice	**5-4** **Clearly** demonstrates preparation & practice of AI based applications	**3-2** **Somewhat** demonstrate s preparation & practice of AI based applications	**1-0** **Minimally** demonstrates preparation & practice of AI based applications
Participation	**5-4** **Fully** participates in AI integrated lesson.	**3-2** **Somewhat** participates in AI integrated lesson.	**1-0** **Minimally** participates in AI integrated lesson.
Commitmen t	**5-4** **Initiates and experiments** with AI tools.	**3-2** **Completes** the AI based research in a timely manner.	**1-0** **Does not complete** the AI research in a timely manner.
Total Points	**/50**		

Appendix 6

AI versus Virtual Reality (VR); AI versus Internet of Things (IOT);

Artificial Intelligence VS Virtual Reality

Artificial intelligence is using an artificial obsolete intelligence to function the same way as we humans want it to work. We program it the way we want to, we specify the limits, we specify the loops; it's like giving a machine an artificial human brain so it can function on those areas where human interception is difficult. AI is directly related to machine learning, it's like the things we teach to them is what we will get in return as feedback.

Virtual Reality, on the other hand is to make virtual environment a form of reality for human needs - may be for an entertainment point of view. VR is a gadget technology which focuses on 3d visualization of graphics and generating a view which tops the graphic user interface. It's like creating an environment which we've always wanted in true reality.

Artificial Intelligence VS Internet of Things

Artificial Intelligence is a field of computer science in which a machine is equipped with the ability to mimic cognitive functions of a human (or any being that is capable of cognitive thinking) that can make decisions based on its past experiences or responding to an action that it was completely unaware of until that time. It is given a goal and it continuously tries to improve its performance from its past actions to the best reach of the goal. An AI machine will be equipped with a learning mechanism and a neural network -something similar to a brain- which enables a cognitive ability, where the machine will learn by understanding and adapting to the environment that it is surrounded with and making rational decisions. You can never know what an AI machine is capable of until it actually does that.

Internet of Things is the internetworking of physical devices like vehicles, buildings, electronic devices, sensors, actuators etc. that are capable of communicating among themselves (sensor1 to sensor2, sensor2 to sensor3 and so on) or with the external environment (sensor to vehicles, vehicles to humans) that are equipped with devices capable of communicating over a network. In IoT, the devices are given a fixed set of commands like:

Switch off the lights when a person leaves the room. (let's say communication between a light and a wearable device on the person based on GPS)

Open the garage door when a car approaches (communication between a sensor 1 on garage door and a sensor 2 on the car)
In IoT, the capabilities of a machine already exist and you use it according to your feasibility.

Appendix 7

Translating AI on Ground

Creating the Mindset

The aim is to familiarize students into understanding the AI Program. The foundation on which AI is built upon is Patterning; Data Interpretation; Sorting; Comparing; Classifying; Identifying. The AI Applications that surround us are proof of innovation; we need to prepare ourselves to unlearn, learn and relearn!

Preparatory Groundwork

Reading and gathering all the information one can get about 'what is AI and what is not' - is imperative for a better understanding of the subject. We need to be prepared to connect to new learning on the basis of our previous knowledge. – Read, Research, Inquire, Ask Questions, Watch Videos, Discuss, walk through Malls, Airports, Hospitals and try to figure out where do you find AI in operation.

To be a Good Facilitator

Learning to facilitate is learning to know the difference between when to guide/suggest and when to allow students to figure out and understand for themselves, question, hypothesize and take the challenge.

Being a Facilitator is mostly about how to motivate, encourage and simplify.

Learning to use appropriate vocabulary while giving feedback, is the skill set, most required by a Facilitator. Give feedback in a positive manner to inspire students to explore and persevere in their learning.

Mentoring & Monitoring

Ensure that continuity is maintained in mentorship and monitoring the students' learning. Online feedback, Interactive discussions on problems and challenges are some of the effective ways to assist this.

Appendix 8

Artificial Intelligence Tools – a ready reference

S, No.	AI Tool	Explanation	Link
1	Autodraw	Autodraw is an AI enabled tool which is based on the domain of Computer Vision in which the machine identifies the pattern of your drawing and accordingly maps it with the most similar image. This tool shows various options trying to predict what the user is trying to draw. For example, if a user is trying to draw a tent and he starts with drawing a basic triangle, the machine will compare his/her drawing and show the possible outcomes for the same. The user can then select out of them which one is the most appropriate for him/her.	https://autodraw.com
2	Quickdraw	Quickdraw is a google experiment, an AI tool based on neural network in which the machine learns to recognize doodles/objects from the user's drawings. By playing this game, you will be adding your drawings to the world's largest doodling data set. After clicking on let's draw! the player will see the name of the object on the screen. While drawing the object within a timer of 20 seconds, the machine analyses the pattern and the shape of the drawing and simultaneously tries to guess the object that the player is trying to draw.	https://quickdraw.withgoogle.com/
3	Rock, Paper & Scissors	In this game, an artificially intelligent system learns to identify patterns of a person's behaviour by analyzing their decision strategies in order to predict future behaviour. This game is based on the AI domain "**Data**" where the machine collects and analyses data to predict future outcomes. Click on play the game to get started!	https://www.afiniti.com/corporate/rock-paper-scissors
4	Cosine Similarity	Words are considered to be n-dimensional entities in the AI domain of "NLP" which can have more information than we can visualize. The statements which are to be processed in an AI algorithm are considered as vectors that have an amplitude and a direction by definition of a vector. In order to compare two statements to identify how similar they are, the cosine angle between the two statements is calculated. According to the cosine similarity model, the statements whose cosine angle is the smallest are closest to each other in terms of the words used in them.	

5	Data Acquisition	Data acquisition refers to acquiring authentic data crucial for the AI model from reliable sources. The data acquired can then be divided into two categories: Training Data and Testing Data. The AI model gets trained on the basis of training data and is evaluated on the basis of testing data. There can be various ways in which students can collect data. Some of them are: • Surveys • Web Scraping – data.gov.in, kaggle.com • Sensors • Cameras • Observations • Application Program Interface	
6	Data Exploration	After acquiring data comes the need to analyze the data. For this, they need to visualize the acquired data in some user-friendly format so that they can: ● Quickly get a sense of the trends, relationships and patterns contained within the data. ● Define strategy for which model to use at a later stage. ● Communicate the same to others effectively. Data Exploration refers to visualizing the data to determine the pattern, relationships between elements and trends in the dataset that gives a clear meaning and understanding of the dataset. Data exploration is important as it helps the user to select an AI model in the next stage of the AI project cycle. To visualize the data, various types of visual representations can be used such as diagrams, charts, graphs, flows and so on.	https://datavizcatalogue.com
7	Inkle Writer	Inkle writer is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.	www.inklewriter.com
8	Kuki Chatbot	Mitsuku, or Kuki the world's best conversational chat bot (according to folks like Google AI Research). It can be used to chat on any topic and see the visualized form of the subject.	https://www.pandorabots.com/mitsuku/
9	GoArt AI Photo Effects	It uses an algorithm inspired by the human brain. It uses the stylistic elements of one image to draw the content of another.	https://goart.fotor.com/

10	Mystery Animal	An AI experiment developed by Google based on the AI domain **"NLP"** In this game, the computer pretends to bean animal and the player needs to guess the animal by asking 20 yes/no questions. The player asks questions to the machine via microphone to which the machine will respond either in Yes or No and according to the answers, the player needs to modify his/her questions to guess the animal. Upon opening the website, click on preview it now! to start.	https://mysteryanimal.withgoogle.com/
11	Semantris	A Google experiment, Semantris is a word association game powered by machine learning. Each time you enter a word that is associated with the target word, the AI looks at all the words in play and chooses the ones it thinks are most related.	https://research.google.com/semantris/
12	Ethics in AI	Artificial intelligence is a field that is boundless in today's time. There are a lot of scenarios that tell us that ethical issues exist around AI. Hence, it is important to have an understanding of ethics in AI and to have ethical guidelines which can guide us in such conditions where there is no clear definition of what is right or wrong.	https://www.moralmachine.net/
13	AI Project Cycle	AI Project cycle is a framework which is used to design an AI project. The project cycle consists of 5 stages namely: Problem scoping, Data acquisition, Data Exploration, Modelling and Evaluation.	
14	Problem Scoping	Problem scoping refers to understanding a problem and finding out various factors that affect the problem. In this stage of the AI project cycle, 4W problem canvas method is used that helps the user answer questions related to the problem thereby arriving at a definite problem statement. The 4Ws are Who, What , When/Where and Why. The answers to these questions lead to a problem statement.	
15	AI Modelling	Data is the fuel of artificial intelligence. A machine is said to be artificially intelligent if it gets trained and can make decisions/ predictions on its own and learns from its own experience and mistakes. In the modelling stage, data is split to training set and testing set. The model is trained on the training set from which it makes its own rules that helps the machine to give an output and the model is then evaluated on the testing set.	https://teachablemachine.withgoogle.com/

16	Classification	Classification is a part of supervised learning model. Classification models work on labelled dataset and are used to predict the label/class of the testing dataset which is unknown to the machine. For example, an AI model is trained on a labelled dataset of 100 images of apples and 100 images of bananas. The machine gets trained on the dataset by extracting features from the dataset and understands what features will classify an image as an apple or a banana. To test the machine, random images of an apple/banana are fed to the AI model and the output will be classification of apples and bananas.	https://teachablemachine.withgoogle.com/
17	Possibilities in AI	To understand the possibilities that AI has to offer to us, an activity to research about various companies or organizations who are working towards incorporating AI into their respective fields.	Research Template
18	Google Map	Google Maps is a web mapping service developed by Google. It offers satellite imagery, aerial photography, street maps, 360° interactive panoramic views of streets (Street View), real-time traffic conditions, and route planning for traveling by foot, car, bicycle and air (in beta), or public transportation.	
19	My Story Time:	My Story time is a new Google Experiment web application which allows users to record stories to play back on Google assistant devices. Record stories from anywhere and play them back at home with Google assistant	https://experiments.withgoogle.com/my-storytime
20	Google Lens	Google Lens is an image recognition technology developed by Google, designed to bring up relevant information related to objects it identifies using visual analysis based on a neural network.	https://lens.google.com/
21	Emoji Scavenger Hunt	Emoji Scavenger Hunt is a browser-based game built with machine learning that uses your phone's camera and a neural network to try and guess what it's seeing. ... js, the game is built to run efficiently on your phone's web browser without needing to access backend servers.	https://emojiscavengerhunt.withgoogle.com/

22	Akinator	Akinator is a computer game and mobile app. During gameplay, it attempts to determine what fictional or real-life "character" the player is thinking of by asking a series of questions. It uses an artificial intelligence program that learns the best questions to ask through its experience with players. To begin the questionnaire, the user must press the play button and think of a popular character, object or other things that frequently come to mind (musician, athlete, political personality, video game, mother or father, actor, fictional film/TV character, Internet personality, etc.). Akinator, a cartoon genie, begins asking a series of questions (as many as required), with "Yes", "No", "Probably", "Probably not" and "Don't know" as possible answers, to hack down the potential character. If the answer is narrowed down to a single likely option before 25 questions are asked, the program will automatically ask whether the character it chose is correct. If the character is guessed wrong three times in a row (or more, usually in intervals of 25, 50, and 80), then the program will prompt the user to input the character's name, to expand its database of choices	https://en.akinator.com/
23	Google Earth	**Google Earth**, formerly Keyhole Earth, is a computer program that renders a 3D representation of Earth based primarily on satellite imagery. The program maps the Earth by superimposing satellite images, aerial photography, and GIS data onto a 3D globe, allowing users to see cities and landscapes from various angles. Users can explore the globe by entering addresses and coordinates, or by using a keyboard or mouse	https://www.google.com/earth/
24	Photo Creator	Photo Creator is AI enabled tool that lets creators make custom photos for their specific stories instead of searching for the ready-made images that suit their goals more or less.	https://photos.icons8.com/creator
25	Neural Network	Neural networks are loosely modelled after how the human nervous system works. A neural network is essentially a system of organising machine learning algorithms to solve problems for which the dataset is very large. Simply put, a neural network is divided into multiple layers and each layer is further divided into several blocks called nodes. The first layer is the input layer where no processing occur. The whole processing operation occur at the hidden layers. Each node of the hidden layer is a machine learning algorithm. the output from each node is then passed to the subsequent nodes	Human Neural Network activity

		in the hidden layer. Lastly, an output layer that gives a result based on the analysis conducted from the hidden layer.	
26	Loopy	Loopy is an opensource tool to understand the concept of system maps. A system map shows the components and boundaries of a system and the components of the environment at a specific point in time. With the help of system maps, one can easily define a relationship amongst different elements which come under a system. The map shows the cause & effect relationships of elements with each other with the help of arrows. The arrow-had depicts the direction of the effect and a sign (+ or -) shows their relationship. A + sign indicated positive relationship and a - sign indicates negative relationship between the elements. Considering the data features of any problem to be solved, a system map can be drawn.	http://ncase.me/loopy/
27	Evaluation	Evaluation is a stage in the AI project cycle where the performance of the model is evaluated based on certain metrics such as accuracy, precision and so on. This gives a clear idea to the user to compare the expectations with the actual results.	
28	Decision Tree	Decision Tree is a rule based AI model to solve classification or regression problems which helps the machine in predicting the element with the help of various rules fed to it. A decision tree looks like an inverted tree where root is at the top and the tree further divides into branches, nodes and leaves. Root is the starting point of a decision tree. Depending on the rules, the tree splits further into various branches that lead to an end point known as a leaf. Each leaf of the tree is labelled with a class.	
29	Infinite Drum Machine	Infinite Drum Machine is an AI experiment developed by Google to understand how unsupervised learning works. In this experiment, thousands of known sounds are fed to the machine. The sounds are not labelled and the machine does not have any information on the sounds in the dataset. The AI system analyses the data fed to it and clusters similar sounds together. These clusters are visible on the screen as different colours. The dots appearing on the screen are the sound clips and they have been clustered together on the basis of factors such as frequency, amplitude, pitch.	https://experiments.withgoogle.com/ai/drum-machine/view/

30	Quillionz	For assessing and improving the efficiency of question generation (except HOTS), this software can be used to generate questions efficiently.	https://www.quillionz.com/
31	swiggy.com	Swiggy is India's largest and most valuable online food ordering and delivery platform. Once you enter your preferences, you will get delivery of food at your doorstep. This is one of the AI tools as it takes the data from the user according to his liking and deliver the food items.	https://www.swiggy.com/
32	VOKI	Voki is an AI based educational tool for teachers and students, that can be used to enhance instruction, engagement, and lesson comprehension. Voki can be used in class (for student work), as an animated presentation tool, for student assignments, and as a virtual supervised discussion forum (Voki Hangouts).Voki characters can look like historical figures, cartoons, animals, and more	https://www..voki.com/
33	AI Dungeon	The learner should enter the link, start a new game, as a single player, with custom settings. They may not begin conversing with the AI. The facilitator prompts certain keywords that can be used by the learners, to initiate a conversation with the AI. The response from AI is noted by the learner, and discussed with the facilitator	https://play.aidungeon.io/
34	Virtual Mirror	Virtual mirror/Virtual trial room: Globally, the fashion industry is a huge industry so it's no surprise that AI technologies are being used across a wide range of applications from helping design clothes, optimizing manufacturing, and hyper personalized marketing.	https://www.veromoda.in/upto-50-vm?gclid=CjwKCAjwkdL6BRAREiwA-kiczPCPI0wIaRgEZEsk1Wvl4r6jq6vPVCuKEf0Pl1GNOB7ruNTUr0e5KhoCcXEQAvD_BwE
35	AI Thing Translator	This experiment lets you take a picture of something to hear how to say it in a different language. It's just one example of what you can make using Google's machine learning API's, without needing to dive into the details of machine learning.	https://thing-translator.appspot.com/
36	Google Assistant	It is an AI powered virtual assistant which can engage in two-way conversation. Users can interact with this tool through natural voice. It offers voice commands,	

		voice searching letting you complete a number of tasks by saying “OK Google” or “Hey. Google” wake words.	
37	Quizlet	It can be used to display hints about a pet animal and the children have to guess it and then the correct option may be viewed by them to check.	https://quizlet.com/en-gb/features/live
38	Poem Portraits	POEMPORTRAITS is an experimental, collective artwork, woven at the intersection of AI and human creativity - combining poetry, design and machine learning - conceived by artist and designer Es Devlin in collaboration with Google Arts & Culture Lab and creative technologist Ross Goodwin. In this, the user is required to feed in a word to begin the interaction after which the tool gives out two lines which can be used by the users to continue writing a poem.	https://artsexperiments.withgoogle.com/poemportraits
39	Imaginary Soundscape	“Imaginary Soundscape” is a web-based sound installation, focusing on this unconscious behavior, where viewers can freely walk around Google Street View and immerse themselves into imaginary soundscapes generated with deep learning models. The soundscapes generated by the AI sometimes amaze us by meeting our expectation, but occasionally ignore the cultural and geographical context (the sound of waves on an icy field of Greenland for instance). These differences and mistakes lead us to contemplate how the imagination works and how fertile the sound environments surrounding us are. By externalizing our synesthetic thinkings, we tried to shed lights on the power of imagination we all share.	http://www.imaginarysoundscape.net/
40	Scribbling Speech	Language and images are closely intertwined: We think in pictures and we explain facts as spatial constellations. What if the spoken word could be transformed into dynamic visual worlds in real time? Speech input, machine learning and recurrent neural networks for image generation allow computers to generate complex imaginary worlds that follow the narrator and thus create complex animations controlled by linguistic structures.	https://experiments.withgoogle.com/scribbling-speech