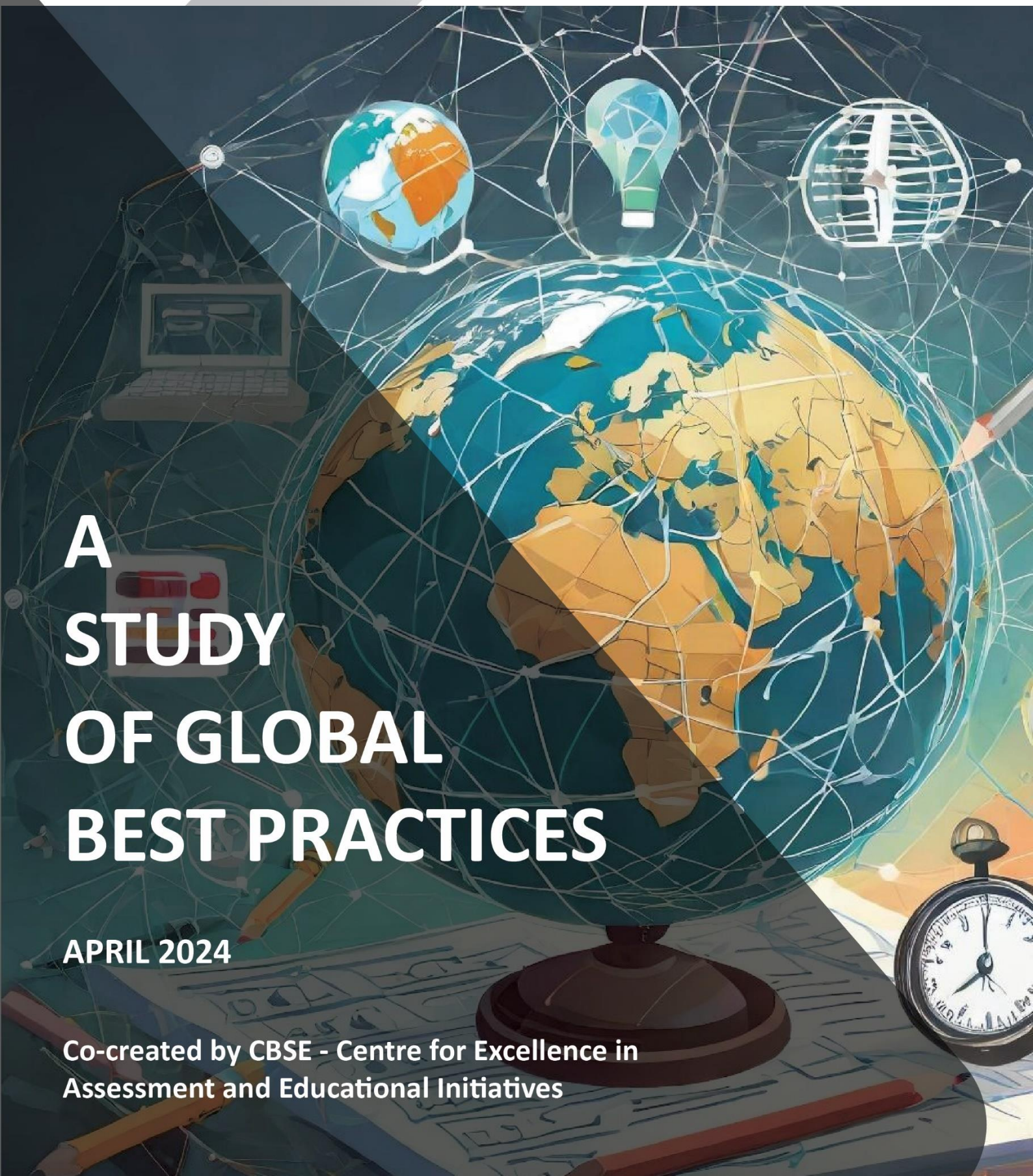

A STUDY OF GLOBAL BEST PRACTICES

APRIL 2024

Co-created by CBSE - Centre for Excellence in Assessment and Educational Initiatives

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First Edition: April 2024

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and

Educational Initiatives

ACKNOWLEDGEMENT

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Education provides a foundation for development, the groundwork on which much of our economic and social wellbeing is built. And assessments, by way of examinations, play a pivotal role in informing policy and affecting actions in the country's educational ecosystem, comprising schools, students, and parents. The board exams taken in classes 10 and 12 (also known as school-leaving examinations) represent the goal post for students, parents and schools. Performing well in the board exams is important because it determines the choice of streams, future higher education and college choices, and is believed to affect employment prospects and life outcomes of pupils. So much so that the teaching methods used in schools are geared towards achieving success in the board exams right from lower classes.

Evidently, the high-stakes nature of the exam causes stress among students, parents, teachers, and schools —all of whom are focused on scoring well on the exam. Rote-based learning, despite its scholastic limitations, is the most effective way of achieving this goal. In a slow but evident churn, it is being recognized that school-leaving exams need to become much less rote-based without sacrificing their rigour or quality, and be more competency-based instead. Doing this would require a great shift, not only in the mindset, but via changes in the pattern and types of questions asked in the board exams itself. Unless this goal post is shifted, where rote-based examinations are replaced by understanding-based examinations, real educational reform may remain a distant dream.

Given this context, the Central Board of Secondary Education (CBSE), being one of the most prominent boards in India, and Educational Initiatives (Ei), has undertaken the study to facilitate an inquiry into studying international practices in school leaving examinations that can enable in identifying actionable solutions for the CBSE. It is also important to note that this inquiry is being undertaken with the awareness that the environment within which the CBSE operates is far more challenging than those presented in other nations. Having said that, in the spirit of improvement, one can agree that there are surely small changes that can continually be made in the existing system with a view to improve long-term efficiency and efficacy.

The study looks at school leaving examinations as a basis for analysis. It is because the examinations undertaken at this level indicates a student's level of basic and formal education achieved, and informs their (the students') decision to opt for tertiary education. This study undertakes a comparative study to review school-leaving examinations. At the outset, for the purpose of benchmarking, the study looks at the school leaving examination system of seven countries: Canada, Estonia, Vietnam, South Korea, Singapore, Finland and Hong Kong. These are amongst the top rankers in the Programme for International Student Assessment (PISA). It also looks at two international boards: the Cambridge Assessment International Education (CAIE), which administers the IGCSE, and the International Baccalaureate or IB. While the CAIE is the provider of international education programmes and qualifications for 5 to 19 year olds, and plays an important role in shaping curriculum and education systems around the world; students of the IB have consistently been the best performers at the PISA.

The study treats each of these as independent case studies. Each case explores and draws out relevant information from case studies to glean best practices basis the two undermentioned enquiries.

1. **What structures & processes support a smooth facilitation of school leaving examinations?**

   Here, it looks at the defined purpose of assessment and the structure followed that caters to the subjects offered, and the nature of examinations (external or internal), the frequency and duration of assessments, grading and passing criteria, and the remarking & rechecking policy. Besides, it also looks at the process followed to develop and administer the assessment, their evaluation, grading and reporting. The key insights with exhibits of quality question papers and items are also enlisted in this.

2. **What do these examination boards do well and what best practices can be explored in our context?**

   This question caters to the distillation of good practices that worked for the countries and the boards, and can thereby be considered for adoption.

   The end of the report also provides a tabulated summary of all of the case studies to enable key decision makers to establish an overall understanding and identify with distinction such practices that should be further explored from the relevant cases.

   In charting the roadmap for improvement, the study invokes a shift from rote-based learning and assessment to a competency-based one as the means of achieving desired results.

KEY FINDINGS

School-leaving examinations across countries and education boards have a number of key structural differences. These variations are present not only in-between nations and their respective boards but also within countries, where multiple boards function within the same geography. For instance, India has three national boards and several state boards. And more recently, some schools have opted for internationally-affiliated certifications as well. The aforementioned structural differences can be further classified into purpose (to determine the next steps in a student's educational lifecycle)'[1]; the educational stage at which these exams are conducted; the design of the test (in view of aptitude); mode/format of the test (online and/or pen-and-paper); the choice of subjects available to students; the number of attempts a student gets to improve their score; and, lastly, the final score review process.

It was discovered that nations who had up to this point continuously fared well on international comparative examinations had given their pupils freedom of choice regarding the curriculum and examination level. Secondary School Examinations in different countries often provide a large range of subjects for students to choose from. These are often grouped into compulsory core subjects, and electives (students can pick and choose from this). [2] This means flexibility is offered not only in terms of the number of subjects offered but also in the option to opt for the same subject at varied proficiency levels. Thus, the same subject is offered at different levels of depth/difficulty. Accordingly, the board designs the assessments. [3] Apart from this, within the same Examination Board the student is offered the same subject but with divergent learning outcomes, so they can decide and choose the format which is more in line with their aptitude. [4]

In many countries, apart from outlining the pass percentage, students can retake the exam to improve their scores. This may only be undertaken within a set period of time, a single academic year or throughout secondary school life. [5]

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[1] For example: assessments at the end of secondary-level may either be for the sole purpose of certification (as in Singapore, UK and the US) or they could serve the dual purpose of certification as well as serve as a criterion for determining access to post-secondary education, that is, admission to a college or university education (as in Finland, Russia and Brazil). In countries where the score/ grade in the secondary assessments is not the major criteria for determining college admissions, students are expected to take university-level admission exams (such as the SAT and ACT in the US, GAO KAO in China, CSAT in South Korea and NUCEE in Japan).

[2] For instance, in Hong Kong, the subjects offered are divided into three categories A, B and C. Category A includes 24 senior secondary subjects (4 core subjects, such as Chinese, English, Maths and Liberal Studies and 20 elective subjects like Physics, History, Music, Visual Arts, etc.). Category B includes applied learning subjects such as (Creative studies, Media and Communication, Business, Management and Law, Services, Applied Sciences, Engineering and Production). Category C includes other language subjects (French, German, Hindi, etc.).

[3] Students of International Baccalaureate-affiliated schools who wish to develop a deeper understanding of a subject matter and pursue that subject as a career can choose to study for a higher-level curriculum, whereas other students are provided a standard-level curriculum, which assesses the students' basic understanding of the subject. Similarly, Finland offers advanced courses in certain subjects.

[4] In Alberta, Canada, students can choose a "pure science subject" or a "combined science subject". Similarly, in Hong Kong, students studying science subjects can choose either "integrated science/ combined science" or "Individual Science" subjects such as physics, chemistry and biology.

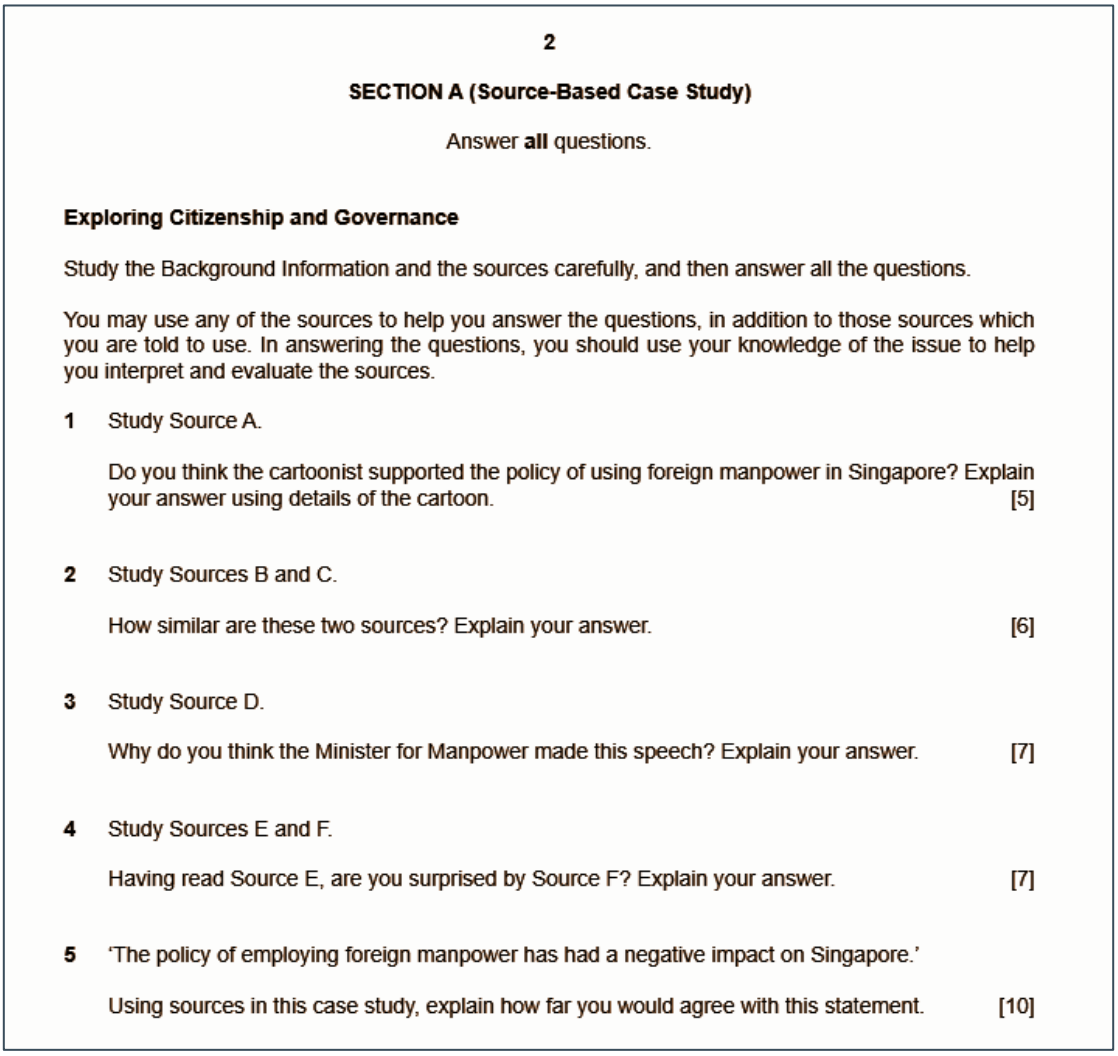
[5] In China and Finland, students can improve their scores (even if they have made the minimum grade needed to pass). The best attempt is then counted towards the total marks. In New Zealand, a student can reappear for an unsuccessful internally assessed standard within the same academic year

[6] Hong Kong's and IB Diploma papers were found to be using relevant text(s) or extracts from the sources for comprehension, thereby testing students' application of learning with much greater rigour. Here, it is important to emphasize that International assessments, such

An important difference between different school-leaving examinations is the nature of questions in the examination papers. A qualitative analysis of the test papers and processes of Hong Kong, Finland and one international board, the International Baccalaureate (IB), suggested that quality of the question papers vary greatly among different systems. For instance, the school-leaving examination papers of Hong Kong and Finland were found to be very effective towards assessing learning outcomes in mathematics, science and social science.

Based on our analysis of the testing material and methodology we made the following observations:

1. Good quality questions based on students' daily life contexts were found in exam papers of the different boards studied. Such questions primarily serve two purposes, from the samples given below, you will see that the questions aim to assess if students are merely recalling information, or are actually able to connect what is learnt in the curriculum with real life. Secondly, they push the students to link theoretical knowledge with real life application of that knowledge – and in that way, makes learning more interesting.



2

SECTION A (Source-Based Case Study)

Answer **all** questions.

Exploring Citizenship and Governance

Study the Background Information and the sources carefully, and then answer all the questions.

You may use any of the sources to help you answer the questions, in addition to those sources which you are told to use. In answering the questions, you should use your knowledge of the issue to help you interpret and evaluate the sources.

1 Study Source A.

Do you think the cartoonist supported the policy of using foreign manpower in Singapore? Explain your answer using details of the cartoon. [5]

2 Study Sources B and C.

How similar are these two sources? Explain your answer. [6]

3 Study Source D.

Why do you think the Minister for Manpower made this speech? Explain your answer. [7]

4 Study Sources E and F.

Having read Source E, are you surprised by Source F? Explain your answer. [7]

5 'The policy of employing foreign manpower has had a negative impact on Singapore.'

Using sources in this case study, explain how far you would agree with this statement. [10]

as PISA also place emphasise on the importance of questions structured in a way that it tests a student for conceptual understanding and not just recall of facts and procedures.

3

How far have Singaporeans welcomed foreign manpower into the country?

BACKGROUND INFORMATION

Read this carefully. It may help you to answer some of the questions.

Foreign manpower in Singapore has been closely associated with the country's development. Due to her small population, it would be difficult for Singapore to be competitive based solely on the efforts of Singaporeans alone. The Singapore government has invited foreigners, from professionals to those in lower-skilled sectors, to work in Singapore. This also included bringing in 'foreign talents' with special skills to supplement the local workforce, or to make up for the lack of local expertise in sports or the arts. In 2009, foreign manpower in Singapore comprised almost 1.1 million workers. By December 2014, the foreign workforce had grown to almost 1.4 million.

Over the years, Singaporeans have had mixed feelings about the government's policy of employing foreign manpower. Study the following sources to assess how far Singaporeans have welcomed foreign manpower into the country.

Source A: *A local cartoonist's view on Singapore's foreign manpower policy, The Straits Times, 10 February 2015.*

4

Source B: *Extract from a study on attitudes towards emigration* based on two thousand Singaporeans aged 19 to 30, published in March 2011 by the Institute of Policy Studies, Singapore.*

Survey Question	Disagree (%)	Neutral (%)	Agree (%)
Our job security is compromised due to the influx of foreign talent	23.9	31.2	44.8
Singaporeans want to emigrate because there are too many foreign talents here	31.2	31.7	37.0
There will be sufficient jobs and opportunities for every Singaporean in the next 10 years	24.0	33.4	42.7

* Emigration is the act of leaving one's own country to settle permanently in another.

Source C: *Part of the comments on foreign manpower by a Singaporean on a blog posted in 2013.*

Many Singaporeans are worried that they would not be able to find a job because of foreign talents here. Foreigners, however, take up jobs that we Singaporeans do not want. These jobs include bus drivers, domestic maids and construction workers, which are high in demand, but are regarded by Singaporeans as low class. Companies have to hire foreigners to take up these jobs. Some Singaporeans have also decided to leave Singapore to spare their children the painful stress of going through our competitive education system. Thus, with foreigners working here, Singapore's loss of talent could be replaced. Even so, we still complain about them although they contribute to Singapore's economy.

Government policies have been introduced to reduce the amount of foreign manpower. In Budget 2013, it was announced that foreign worker levies* will go up from 2014, making it more expensive and difficult to hire foreign workers.

* Foreign worker levies are taxes imposed on employers for hiring foreign workers.

Source D: *An extract from the speech by Mr Tan Chuan-Jin, Minister for Manpower, at the International Migrants Day celebrations, 7 December 2014.*

Foreign workers, and there are many of you here, you make up about one-third of our workforce. You make important contributions across so many different jobs and capacities, whether in construction, in the shipyards, factories, schools, departmental stores, restaurants, hospitals and even our homes. You have all played a significant role in our progress and development.

As you can see here tonight, the highlight of tonight's celebrations is a heart-shaped installation made up of 3000 message cards which carry words of appreciation for the contributions of the foreign workers. This represents just a fraction of the Singaporeans who are grateful for your contributions. There are some who are critical and negative, but we know that there are many more Singaporeans out there who share the same feelings of appreciation that are showcased here today.

5

Source E: *A photograph taken at the Labour Day demonstration about the foreign manpower policy in Singapore in 2013.*

Source F: *A comment by a foreign worker who has worked and lived in Singapore for 11 years, posted on an online forum, November 2009.*

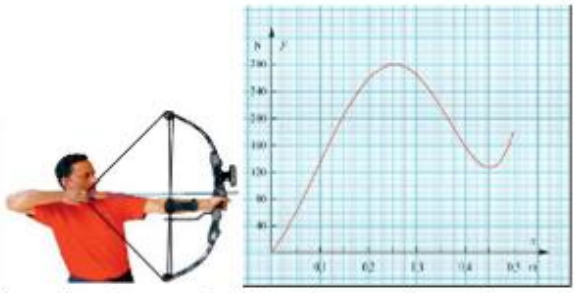
The Singapore government has been trying its best to maintain calm by assuring its citizens that foreigners are essential for Singapore's future. Being a foreigner myself and having stayed in Singapore for a significant portion of my life I would like to share my experience.

I am proud to say that I have experience of Singapore and, most importantly, Singaporeans across a wide spectrum of its society. During the course of my career I have worked with people from a variety of professions. I have more local friends than friends from my own land. Many of them are glad that foreigners like me have made Singapore our home and are contributing actively to the country.

Figure 1: Source based case study from Social Sciences Specimen Paper for Singapore-Cambridge GCE(O) Level Exam[6]

[6] https://www.seab.gov.sg/docs/default-source/national-examinations/syllabus/olevel/2024syllabus/2260_y24_sp_1.pdf

Taljajousessa is a pulley system, which reduces the spring tensioning force required to the final stage strain. Graph shows the power dependence on the length of the one tow of *taljajouselle*.



a) How much work does the shooter do when he stretching the spring 45 cm length of pull?
b) The shot spring-loaded with an arrow of 31.5 g, the output of the speed measured at 63 m/s. What proportion of the spring tensioning work was used to change the direction of arrow as kinetic energy?

Question sample from Finnish Matriculation Exam, Physics, Grade 12

(b) A survey carried out on behalf of a television station to investigate the popularity of a certain show.

I. A random sample of 1560 television viewers were surveyed. Find the margin of error of the survey. Give your answer as a percentage, correct to 1 decimal place.

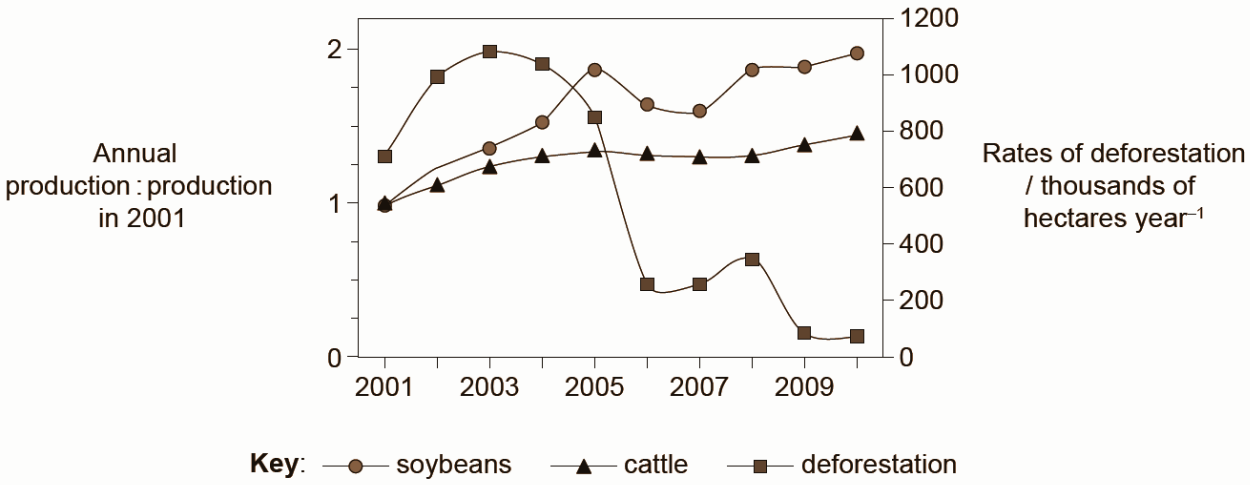
II. In the survey, 546 of the 1569 viewers surveyed said that they liked the show. Use your answer to part b(i) above to create a 95% confidence interval for the percentage of viewers who liked the show.

III. An executive for the television station has claimed that 40% of the viewers liked the show. Use your answer to part b(ii) above to conduct a hypothesis test, at the 5% level of significance, to test the executive's claim. State your null hypothesis, your alternative hypothesis, and give your conclusion in the context of the question.

Figure 2: Usage of daily life contexts in question samples from Finland and Estonia school leaving examinations

2. Use of content that quotes authentic and credible sources taken from seems to be a common practice in the test papers of some examination boards. Content sourced from credible sources can provide engaging and authentic experience to test takers. Since the published material is authored by experts in their respective fields, and is rooted in real-world process, one can rely on the technical correctness of the facts. Items based on such content can help in checking application of concepts in a meaningful way. Such items were found in the school-leaving examinations. Some of the IB board papers even used content from original research papers published in popular journals.

16. Deforestation and agricultural activities including the production of crops and livestock are thought to play a major role in the greenhouse effect. The graph shows annual trends in rates of deforestation and the production of soybeans and cattle in the state of Mato Grosso in Brazil in the period from 2001 to 2010.



[Source: 'Decoupling of deforestation and soy production in the southern Amazon during the late 2000s.' Marcia N. Macedo, Ruth S. DeFries, Douglas C. Morton, Claudia M. Stickler, Gillian L. Galford, and Yosio E. Shimabukuro *PNAS* January 24, 2012, 109 (**4**) 1341–1346; https://doi.org/10.1073/pnas.1111374109, used with permission]

What conclusion can be drawn from the information in this graph?

A. The decline in rates of deforestation led to an increase in production of CO_2.

B. Soybean production accounted for a greater proportion of deforestation than cattle production.

C. Forest habitats declined during the first few years of the study.

D. The decline in rates of deforestation is due to an increase in soybean production.

Figure 3: Source based question sample from Biology, Grade 12, International Baccalaureate

3. Questions used relevant and engaging contexts when testing higher order thinking skills in their examinations. For instance, in English literature, students answered questions comparing texts and analyzing them. They also wrote proposals and open-ended essays. In Math and Science, questions involved critical thinking and combining concepts. In Social Sciences, students interpreted news, political cartoons, and recent amendments, defending their analytical stance.

Answer **one** essay question only. You must base your answer on both of the part 3 works you have studied. Answers which are **not** based on a discussion of both part 3 works will **not** score high marks. Your answer should address the ways in which language and context contribute to your reading of each work.

1. Discuss the ways in which philosophical or aesthetic ideas are represented in the **two** works you have studied.

2. There is no love without suffering. Discuss the extent to which the **two** works you have studied support this view.

3. In the **two** works you have studied, discuss the means as well as the effectiveness with which power or authority is exercised.

4. Pleasure is often deferred, delayed or denied. Discuss why this is so by analysing examples in the **two** works you have studied.

5. In what ways are the contradictory or the paradoxical significant aspects of the **two** works you have studied?

6. Consider why writers create characters who do not conform to norms in the **two** works you have studied.

Figure 4: Question from International Baccalaureate (IB) English, Grade 12

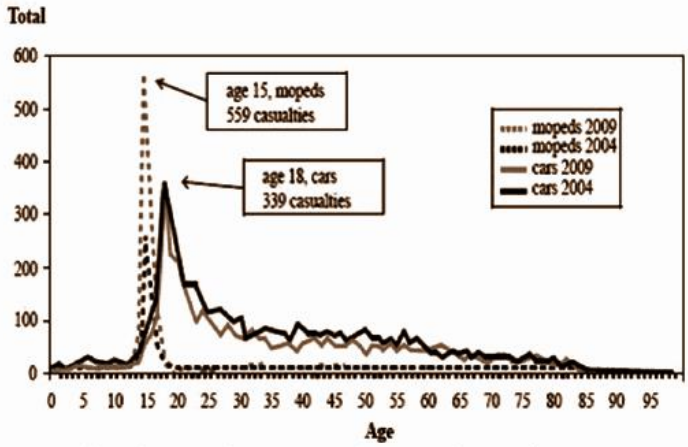
Nowadays, keeping pets (such as dogs and cats) is becoming popular in Hong Kong. Some people prefer pure-bred pets to hybrid pets. However, pure-bred pets usually have higher risks of suffering from genetic diseases than hybrid pets because of the ways they are bred. Pure-bred pets are produced by crossing close relatives to keep a pure bloodline. Explain why genetic diseases are often carried by recessive alleles. By comparing the effects of the two breeding processes on the genetic composition of the offspring, discuss why pure-bred pets are at a higher risk of suffering from genetic diseases than hybrid pets. (11 marks)

Figure 5: Question from Hong Kong Diploma of Secondary Education (HKDSE) - Biology Grade 12

4. Many of the boards did not have a separate 'grammar' section in the language subject question papers. However, the in-depth and high-quality writing tasks given to test takers ensured that students were equipped with a thorough knowledge of the rules of grammar of a particular language (being tested) on which they were quizzed in an application-oriented way.

Improving safety in traffic

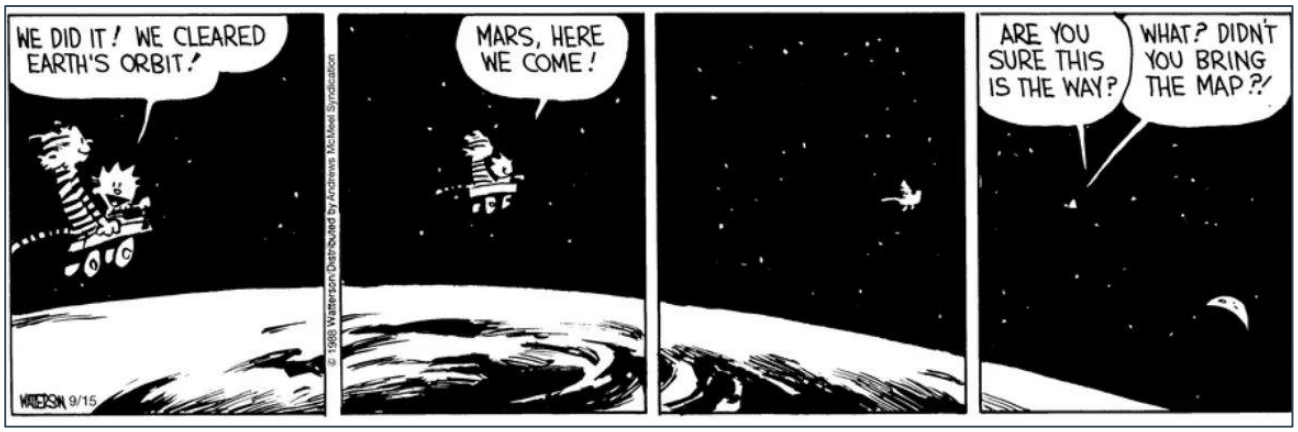
A magazine has asked young people to give their opinions on how safety in traffic could be improved. Look at the statistics below and suggest some concrete measures.



Car and moped drivers in Finland: casualties according to drivers´ ages, 2004 and 2009.

Figure 6: Question from Finland Matriculation Examination– English Grade 12

5. The use of art/cartoons/comic strips was found to be an interesting and engaging way to ask questions and develop visual literacy. This is because visual cues when presented in diverse formats such as videos, photographs, advertisements, works of art, enable students to see and think between and beyond the lines to critically think, reason, draw inferences, reflect and analyze. Many boards, such as the Finnish Matriculation Examination Board and International Baccalaureate (IB), incorporate visuals in assessments to develop evaluative skills. Some examples are mentioned below.



Question: Present four legitimate reasons why the operation described is not possible in the prevailing physical conditions in space

Released Reading from the January 2012
English Language Arts 30–1 Diploma Examination

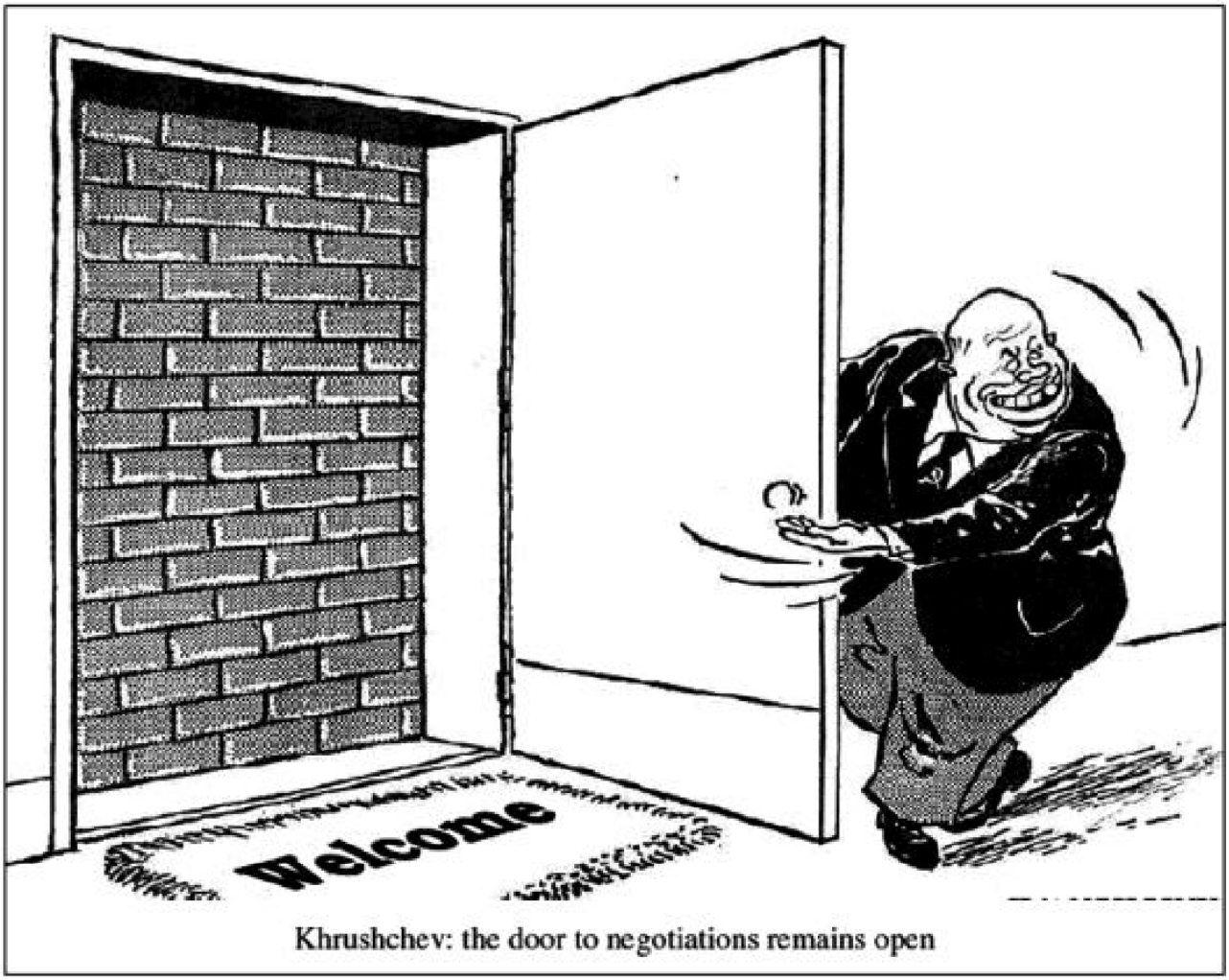
IV. Question 28 in your Questions Booklet is based on this painting.
Question 29 requires you to consider this image together with Reading III.

Edge City

Olive Ayhens ©

Figure 7: Visual based question from Finland and Canada[7] – Physics Grade 10 and English Grade 12

[7] https://workdrive.zohopublic.in/external/033254d427dfc498983b2e656b1522d618b8dfbb7bafbb6bbb3fd216a9130e95



Question: What is the cartoonist's view of the USSR's policy towards the West in 1962? Explain your answer with reference to source.

Figure 8: Visual based question from Hong Kong Diploma of Secondary Education (HKDSE), Sociology Grade 12

6. Computer-based assessments are also being adopted at school-leaving examination level: Finland started along this path in 2016, and by 2019 all of its subjects had switched over to digital assessment**.** It has also put in place guidelines that ensure that each student can attempt the digital assessment and at the same time, ensure error-free exam conduction. The process further enables the answers to be captured in a digital format and this data collection can then ease the process of evaluation. Mentioned below is a part of the basic guidelines put in place for digital examination.

The digital student exam

Graduation is performed with a computer. During the tests, a test environment is used, which consists of three parts:

- Examiners' computers
- Two servers (dedicated to this)

- Closed local network (test network)

The test network is a local network separated from the internet. The network can be wireless or with a fixed connection. With the local test network, a disturbance-free network is created. According to the board's regulations, each examinee must also be offered electrical contact during the student exams.

Use of the test environment can be practiced with Abitti*. The test environment meets the following requirements:

- The examinees work with a computer, which contains for all the same versatile programs that may have similar functionalities to each other
- The test is taken with your own computer, which you should not have to make permanent changes to (E.g., software installations)
- The requirements for the computer used in the test must be so low that they can be easily acquired and are available throughout Finland
- During the exam, the examiner's user rights for functionalities in the computer can be restricted
- During the test, you can technically monitor how the computer is used
- The test system and the supervisors who arrange the test must be able to cope with state of emergency (computer or network failure, power failure) without the need for special technical knowledge of the supervisors
- The answer given by the examinees must under no circumstances disappear

Source: https://www.ylioppilastutkinto.fi/sv/studentexamen/den-digitala-studentexamen

*Abitti – digital examination platform where students take the examination

7. Irrespective of the mode of test conduction, multiple countries are moving to digital evaluation of student answers. Digital storing and evaluation of student answers offer multiple advantages over the traditional scoring on paper. On the logistical front it helps in avoiding physical transfer of answer sheets between centers/evaluators. It also enables secure, easy access from any location. It also enables real-time monitoring of the progress of evaluation and can help address any delays/inaccuracies. On the quality of the evaluation, it can help in easy, random allotment to independent evaluators, thereby, allowing for inter-evaluator reliability measurement. Any errors arising due to manual entry of marks can also be avoided. On the data availability front, it can allow easy processing of data and post-examination analysis of data. Hong Kong's Examinations and Assessment Authority employ such an '**online marking system**' to evaluate student answers. A similar system is also used in Finland for its school-leaving examination. Other boards like the Singapore Examination and Assessment Board (SEAB) allow **both Paper-Based and On-Screen Marking** (OSM)[8], IB uses an **Online Marking Tool**[9] that randomly allocates responses, and Cambridge Board's[10] scans most scripts that are marked on a computer screen by

[8] An overview of on-screen marking at SEAB

[9] https://www.ibo.org/contentassets/8ecbee9f96af4db98293b97c133516f5/teachers-and-coordinators-amended.pdf

[10] https://www.cambridgeinternational.org/Images/321435-marking-and-grading.pdf

examiners. Here some scripts are marked on paper and some, such as multiple-choice exams, are marked automatically by a computer.

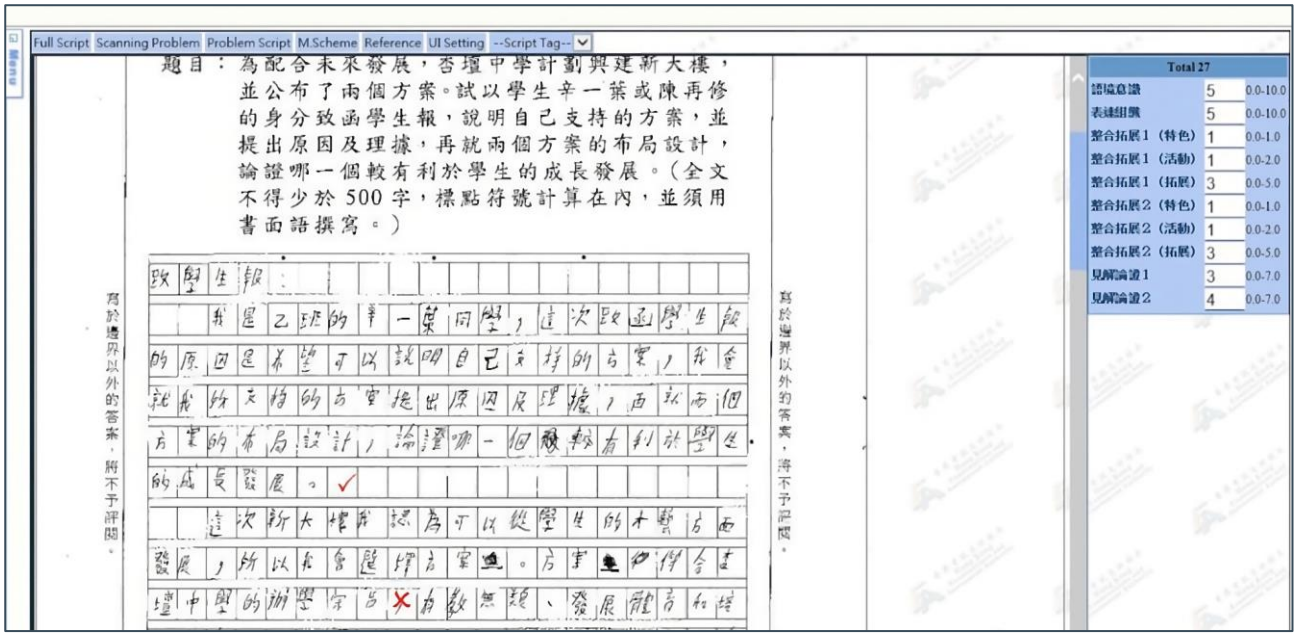


Figure 9: Snapshot of the onscreen marking portal used for student answer marking in Hong Kong

8. With the adoption of digital assessments, school-leaving examinations are exploring item types that can leverage technology in a meaningful way. One such example is Finland which includes audio/video-based items, in form of questions or aides, in its assessments. These assessments are held on a local network that can be accessed through a Linux based operating system from USB memory.

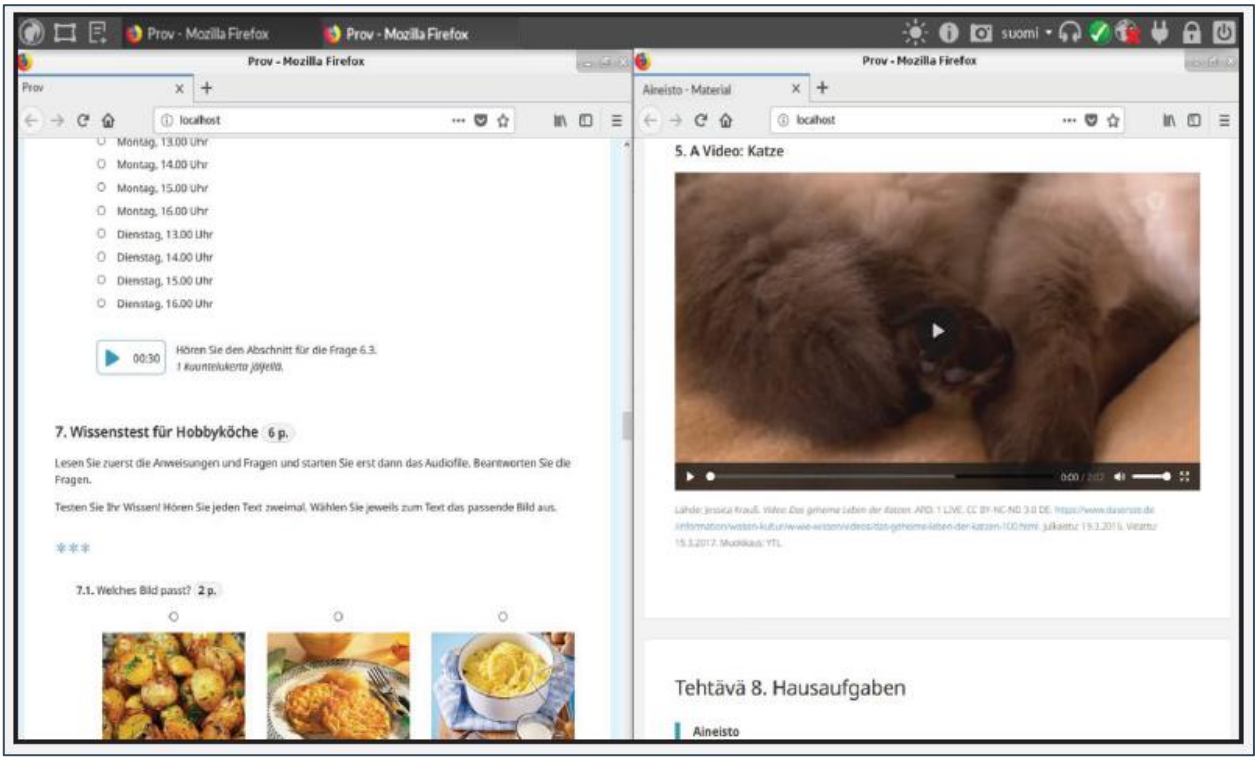


Figure 10: Sample language test using audio and video-based items

9. Use of approved calculators for all students seems to be a common practice in the studied school-leaving examinations. School leaving exams administered by boards in Hong Kong, Finland, Singapore and IB board were found to be allowing students to use calculators in one or more subject examinations. In Hong Kong Examinations and Assessment Authority (HKEAA), the calculators are required to be pad-printed with “HKEAA approved” label. They all regulated the use by releasing an approved list of models and making the list available for students. Singapore Examination and Assessment Board (SEAB) also allows calculator models approved by them. Additionally, this board also allows an approved list of dictionaries to be used in the examinations.

Other forms of resources are also provided by boards to support students. For example: IB board lets students use a formula booklet[11] in certain subjects like mathematics. This helps in ensuring that the focus of assessment is not on the knowledge of the formula but more on identifying the relevant formula to use in a given context.

[11] Analysis and Approaches Formula Booklet

REVIEW OF THE EXAMINATION SYSTEMS: THE METHODOLOGY

1. REVIEW OF THE EXAMINATION SYSTEMS: THE METHODOLOGY

Education forms the bedrock of societal advancement, and with assessments, particularly board exams, it has helped shape policies and actions in schools, affecting students, parents, and institutions. These exams, held at the end of classes 10 and 12, hold immense significance, influencing educational and career paths. However, as per the National Education Policy 2020, the high-stakes nature of these exams lead to a culture of stress and rote memorization, hindering learning with understanding.

Board examinations in India, given their high-stakes nature, have the potential of being the biggest drivers for change in the education system. The pattern for these examinations can act as a lever in transforming teaching and learning across all grades. With educational reforms being proposed in the country, it is crucial that students across all classes are acquainted with these changes and are equipped to navigate competency-based questions. Teachers also need to be familiarised with high-quality questions that tests for skills, and the changes in the pattern and types of questions asked in the board exams need to continually undergo a change.

Recognizing these limitations, the Central Board of Secondary Education (CBSE) and Educational Initiatives (EI) conducted a study to identify international best practices in school-leaving examinations, aiming to reform India's educational landscape. The study examines educational systems in seven nations and two international boards, seeking insights for improvement. Despite the limitations, international benchmarking assessments provide relevant reference points for educational reform. Emphasizing a shift from rote learning to competency-based assessment, the study advocates for a more holistic educational approach, towards innovation and adaptability within the educational ecosystem.

THE METHODOLOGY

Two key questions have been explored to draw the relevant information from case studies to glean best practices:

1.1. What structures & processes support a smooth facilitation of school leaving examinations?

1.2 What do these examination boards do well and what best practices can be explored in our context?

Each of these two questions are understood in more depth in the remainder of this chapter. It is important to note that the answer to each of these questions is vital to the review. Having said that, one should also bear in mind that in the context of the Indian schooling system, all of these may or may not be implementable, given the scale and size of the nation. This analysis will, either way, augment and inform the CBSE’s future attempts at building an ecosystem geared towards driving competency-based education and assessments in India. In this vein, the goal of this study is to focus on the bigger picture where the incremental gains in a large and multifaceted system will inform positive change in the long run.

1.1: What structures & processes support smooth facilitation of school leaving examinations?

While there can be a plethora of factors that affect the quality of school-leaving examinations in India, in the interest of coming up with actionable solutions, following factors were identified to have a high impact on the outcome of the assessment system, and aims to offer some suggestions; some of these are mentioned below:

1.1.1. Purpose of the assessment: The assessments at the end of higher secondary level may either be for providing end of school certification or determining the criterion for post-secondary placements, i.e., admissions to a college, or both. In countries like the US, and to some extent in India these examinations serve the sole purpose of providing certification of a high-school graduation", whereas in countries like UK, Singapore, Finland, Russia, Brazil etc., High-School Exit Examinations serve the dual purpose of certification and admission to universities. In a few countries like South Korea and China, students have to sit for other high-stakes "university entrance exams". The assessments also serve as a means to assess knowledge, skills, and expertise students should master to succeed in work and life in the 21st century. This may also include the overview of the board/country and education journey taken by a student in a country or with a board.

1.1.2 Structure of the Assessment: While the question paper and the items impact how effective the assessment is towards achieving the stated objective, the manner in which the assessment itself is structured and presented to the student is equally vital. This will include choice of subjects, assessment structure that elucidates the share of internal and external assessments, frequency and flexibility of assessments that are offered to the students (*e.g., continuously or annually*), the grading system, etc. are some of the aspects that play an important role in how students perform in these assessments.

Since school-leaving examinations, more often than not, play a deciding role in the career trajectory of the students, the structure of the assessment is a significant tool to prepare the students for what lies beyond the formal, high-school education system. The foundations for success at universities or vocational programmes, it is believed, are set at the high school level. Therefore, we must study the structure of the assessment which grants students a certificate for displaying certain basic competencies, as they leave the schooling system.

1.1.2(a) Subjects offered: Many of the countries researched offer a variety of subjects to the students. Some of the boards have core subjects which are compulsory for all students. In the HKDSE (Hong Kong) Examination, students need to opt for four subjects: Chinese Language paper, mathematics, English (foreign language) and liberal studies. Some Boards allow students to opt for different combinations of the same subjects. For example, in Alberta, Canada, for High-school Examinations students can either opt for "pure science" papers or "combined science" papers. Sometimes the choice is between higher and lower difficulty, and a higher and standard level paper of the same subject. This optionality allows students to make a choice based on the career trajectory that they may want to pursue. For e.g., Finland allows a choice between basic and advanced mathematics. Likewise, the CBSE offers mathematics (standard) and mathematics (basic) to its students. Some boards, like Cambridge, provide differentiated objectives in the curriculum for basic and advanced concepts while some boards provide different syllabi, like IB.

1.1.2(b) External or internal assessment: An overview of secondary assessments reveals that some assessments may be external while some may be fully or partially internal or school-based. Singapore "O" Level Exams and Finland's "Matriculation" Examination are all

external exams. On the other hand, examinations in South Korea and China are either school-based or assessed internally with broad guidelines. A third group of examinations is one which gives different weightage to internal components. For example, Hong Kong's Diploma of Secondary Examinations (HKDSE) gives 15-20 per cent weightage to internal assessment. Similarly, the International Baccalaureate (IB) Diploma Programmes have an average of 20 per cent to 30 per cent internal assessment component.

One can wonder if in order to preserve the impartiality of the assessment procedure, the educational entity in charge of developing the curriculum and question papers should also be grading the students. There is a case to be made for assessment agencies since they will bring in more objectivity and more fair procedures and administration, and the assessment data will also be better analyzed and researched upon. Both Hong Kong and Singapore have independent assessment agencies.

1.1.2(c) Frequency and duration of assessments: Among the countries studied as part of the project, not all assessments are annual. The Finnish Matriculation Board's Examination is biannual. Many examination boards allow students to "improve" their scores, and in such cases, the "best score" is studied as the students' final achievement in that subject. Another critical feature related to frequency is the flexibility with which each board allows unsuccessful students to obtain a passing grade. Finnish students need to clear the core subjects in a maximum of three consecutive attempts, within three successive years. Such students may also opt for a different "difficulty" level than attempted before in subsequent attempts. This also covers the duration of examinations for different subjects that try to study the rationale of assigning duration to the assessment depending on the nature of the questions and cognitive domains tested.

1.1.2(d) Grading and Passing Criteria: Grading and passing criteria vary significantly among different educational boards and countries, reflecting diverse approaches to evaluating student performance. For instance, in the Cambridge Board, grades are determined based on a letter scale, and each grade corresponds to a specific range of marks. The grading system includes a percentage uniform mark, providing a common scale across all syllabuses. In Finland, it is done by taking the average of standardized total scores based on which distribution is formed of all the participants of two successive examination periods. In IB this is a point system where subject grades and internal components both contribute to the total points that range from 0 to 45.

1.1.2(e) Remarking and Rechecking policy: Students invest significant effort and time in preparing for these high-stakes exams, and errors or oversights in grading can have profound consequences on their academic futures. The provision for remarking allows students to request a re-evaluation of their answer scripts, providing them with an opportunity to address potential discrepancies or overlooked achievements. While there are boards that have provisions for both remarking and rechecking like Finland and Cambridge, some boards/countries provide only one of the two, mostly remarking.

1.1.3. Process followed to develop and administer the assessment: It is a task of immense consequence to conduct an assessment for thousands of students annually, especially in the Indian context. It is even more challenging considering the huge scale at which it is conducted. We studied boards from around the world to understand how they handle operational challenges in exam conduction; what structures and processes they have put in place to draft question papers that are of highest quality, ensuring students do not use unfair means to write their exams; sound management of answer scripts post examination;

efficient marking of answer scripts by evaluators; and the processes followed to collect/consolidate correction data.

It needs to be acknowledged that no other country in the world, with the exception of China, comes even close to the problem of scale that authorities conducting the board examinations face in India. However, we have analyzed processes that many international boards use that can lend themselves to easy scalability.

By leveraging technology in the 21st century, numerous boards have taken a number of steps towards automating a considerable chunk of the assessment processes, without losing the nuance the correction process demands. We believe, ironing out these critical kinks in the process of exam conduction and correction will bring a great deal of operational efficiency, and provide a much- smoother experience for the students studying in the schools affiliated to the CBSE.

1.1.3(a) Question paper setting: The process used for creating question papers is also varied across the globe. Many boards hire contractual question creators to create question papers based on the blueprint established in the curriculum in order to maintain objectivity in the process, while many others use their existing teachers to fulfill this requirement. For example, the IB Board gets one person to create the entire question paper for one subject from start to finish, while the CBSE ropes in multiple people to create a question paper which is then used to create the final draft of the question paper.

1.1.3(b) Administration and invigilation of tests: It is relevant to understand the structures that the different exam boards put in place to conduct the tests, especially when the external assessments are a significant component of the final result. Boards are advised to use impartial and neutral invigilators with standardized procedural guidelines to conduct assessments that maintain the sanctity of the examination process. This is in the hope that they are able to prevent cheating/mass assistance among students. In smaller countries, like Finland and Singapore, it is much easier to put such structures in place. But they pose a grave logistical challenge in countries where such examinations are conducted at scale.

In the next few pages, this study will dive deeper into countries and boards as it intends to review to expand one’s understanding of the systems that have been put in place. As we undertake this analysis, we also extract certain best practices that should work well within the context of India, both at the levels of creating question papers as well as implementing structures and processes. We have shared some of those practices in the next chapter.

1.1.3(c) Evaluation of tests: The evaluation processes employed in school leaving exams involve a combination of internal and external assessments. Internal assessments often include coursework, projects, assignments, and practical work conducted over an extended period, allowing students to demonstrate their understanding of subjects in a holistic manner. External assessments, commonly in the form of standardized exams, evaluate students on a broader scale and are often marked by external examiners. This section in this study only focuses on external examinations evaluated by external examiners and highlights best practices like marking by item in IB and Onscreen marking in SEAB & Hong Kong.

1.1.3(d) Grading & Reporting: The grading and reporting processes utilized in school leaving exams are fundamental components of the educational assessment system, playing a crucial role in summarizing and communicating students' academic achievements. This section highlights grading and reporting processes used by various countries and boards to

arrive at a fair grade for a student. It also focuses on how student grades are reported to the public and school ecosystems.

1.1.4 Quality of question papers and question items: Many researchers have studied the impact of “good quality” extracts and questions on the ability of an assessor to understand and decode the learning gaps in student learning assessments (Toksöz and Ayşe, 2017) (Talebi et al., 2013). This forms the crux of any critical study about an examination system since it provides the most crucial information about the effectiveness of a school-leaving assessment. Even if examinations are conducted with utmost operational efficiency, any compromise in the quality of the assessment questions affecting students’ transition into tertiary and/or vocational education would lead to the school-leaving examination not serving its intended purpose.

Hence, in this study, the type and quality of items that different boards prepare for their assessments are studied. Items that are precise, unambiguously framed, well-supported, and unfamiliar yet aligned to their learning objectives, and grade appropriate are judged the best candidates in the race for “good quality” items.

A well-crafted question can help the assessor decide if the student has understood the concept or mastered a particular concept or not. It can also encourage and hone a pupil’s problem-solving skills and creativity. In fact, it is unanimously accepted in academic circles[12][13] that the quality of items has the highest degree of impact in identification of students intellectually operating at a higher order as compared to students that excel at mere procedural and mechanical thinking.

1.2 What do these examination boards do well and what best practices can be explored in our context? The Sino-Japanese philosophy of “Kaizen”, or "change for the better" and "continuous improvement" holds value with respect to framing policy and making recommendations with respect to public policy, as perfection is neither absolute nor static. Learning from the Japanese lean manufacturing systems, where Kaizen was first applied, it is important to note that a system or process cannot achieve a perfect state in a world that is constantly evolving. Hence, it is essential that the system keeps evolving – continuously improving operations and processes to remain relevant and increasing productivity and satisfaction for all its stakeholders and users.

Learning from what others have done successfully, attempting to implement it, and perhaps succeeding is a good way to get there. As part of the review, we have studied *multiple international examination boards* and shortlisted some to dive deeper by way of treating them as case studies. This exercise is geared towards understanding what has worked across the globe towards achieving the goal of learning. At the same time, it seeks to analyse the socio-economic contexts of specific cases in order to understand the modifications that one can make with respect to the existing Indian examinations framework.

[12] Crisp V, Johnson M, Constantinou F. A question of quality: Conceptualisations of quality in the context of educational test questions. Research in Education. 2019;105(1):18-41.

[13] Rush, B.R., Rankin, D.C. & White, B.J. The impact of item-writing flaws and item complexity on examination item difficulty and discrimination value. BMC Med Educ 16, 250 (2016).

The final part of the review involves extracting valuable information that can indicate which strategies can be applied in our context to achieve the ambitious objective of transforming school-leaving examinations based on competencies rather than just knowledge.

Often, organizations adopt “isomorphism”—looking like successful organizations—to enhance their legitimacy. Novelty in systems would often be evaluated strictly through whether the novelty aligns with agenda conformity rather than enhanced functionality. Ecosystems in which isomorphic mimicry is an attractive organizational strategy can sustain capability traps because once a system is locked into a closed and agenda conforming ecosystem and organizations, and once leaders and front-line workers have adapted to that ecosystem, the usual strategies for improvement of organizations—training, reform, generating better evidence, forcing compliance—will fail. As Rome was not built in a day; likewise, it would be impractical to expect a transformation in just one or two academic years. However, deliberate and impactful steps, regardless of how small, would definitely lead towards achieving, even if incremental, improvements.

CASE STUDIES OF SCHOOL-LEAVING EXAMINATION SYSTEMS

2. CASE STUDIES OF SCHOOL-LEAVING EXAMINATION SYSTEMS

Studying international practices can provide a good basis to check *which practices 'we should continue*, *which we should stop and which we should start anew'*. It is an undeniable fact that students in many countries fare better in international standardized assessments as compared to Indian students, and learning from their internal assessment practices may inform and benefit us.

However, it is important to keep in mind that not every practice is guaranteed to be successful in a country with a socio-cultural makeup and scale as India, and hence context is of utmost importance. With this in mind, the end goal of all endeavors should be to improve student learning outcomes, build skills that are, and will be relevant, for students in the future and prepare them for higher studies, and for life overall.

The case studies that follow brings out details of various school-leaving examinations of the secondary education systems and the assessments linked to these systems. A close attention on each of these provides insights around the key structural differences and the commonalities employed by different school-leaving examinations. The "best practices" employed in different examination boards, both in terms of question types as well as in the processes set up to conduct examinations at scale, are explored in the study.

SELECTION OF COUNTRIES FOR THE STUDY

To augment our understanding of how different countries and education boards assess their students, especially at the secondary schooling level, a few countries and boards were meticulously selected based on a set of key performance indicators that were deemed relevant and appropriate, keeping the background of our larger undertaking with CBSE in mind. They are detailed as follows:

i. *Percentage of per capita GDP* allocated towards educational programmes in the participant countries
ii. Overall ranks and performance trends of the participant countries in the Programme of International Student Assessment (PISA) test (2018 cycle)

While Gross Domestic Product (GDP) per capita and Purchasing Power Parity (PPP) seem useful when comparing generalized differences in living standards between nations, they are not true indicators of the intent of governing bodies towards the improvement of educational programmes. It is the percentage of the GDP per capita that is allocated towards education that allows us to identify countries that have a clear and deliberate intention of impacting the overall access and attainment of quality education.

PISA is an international student assessment which assesses 15-year-old students on their acquisition of "real-life" skills pertaining to reading, mathematics and science, as well as cross-disciplinary competencies. More than 75 countries participated in the PISA 2018 round of study. India's singular participation was back in the 2009 cycle. The overall performance of the selected countries, chosen as part of this study, in the PISA 2018 cycle and their corresponding per capita GDP expenditure towards education is detailed in Table 1.

Country	PISA Rank '18 - Math	PISA Rank '18 - Science	PISA Rank '18 - Literacy	Per Capita GDP (in US$)	Per cent Expenditure on Education	Expenditure per capita
United States	38	19	14	$ 63,064	6.0%	$ 3,784
Finland	16	7	6	$ 50,038	6.4%	$ 3,192
Canada	12	9	6	$ 46,454	5.5%	$ 2,555
Israel	42	43	38	$ 41,705	6.0%	$ 2,502
Singapore	2	2	2	$ 66,679	2.8%	$ 1,900
Hong Kong	4	10	4	$ 48,543	3.3%	$ 1,615
South Korea	7	8	9	$ 33,423	4.3%	$ 1,437
Japan	6	6	16	$ 39,159	3.2%	$ 1,245
Estonia	8	5	5	$ 23,171	5.0%	$ 1,152
United Kingdom	18	15	15	$ 42,996	2.5%	$ 1,075
Hungary	37	33	34	$ 16,411	4.7%	$ 766
Argentina	72	66	64	$ 11,633	5.4%	$ 634
Croatia	41	37	30	$ 15,014	3.9%	$ 589
Brazil	71	67	58	$ 9,151	6.3%	$ 577
Russia	31	34	32	$ 11,287	4.7%	$ 529
Lithuania	36	32	35	$ 19,176	2.5%	$ 479
Turkey	43	40	41	$ 9,453	5.0%	$ 473
China	1	1	1	$ 9,977	3.5%	$ 350
Belarus	39	38	37	$ 6,330	4.8%	$ 304
Lebanon	69	73	75	$ 8,013	2.4%	$ 192
Morocco	75	75	74	$ 3,227	5.2%	$ 169
Ukraine	44	39	40	$ 3,097	5.4%	$ 167
Georgia	67	74	71	$ 4,723	3.5%	$ 166

Indonesia	73	71	73	$ 3,894	3.5%	$ 136
Philippines	78	78	78	$ 3,252	2.5%	$ 81
India	Non-participant			**$ 1,997**	**3.0%**	**$ 60**

Table 1: Scores in PISA 2018 Cycle and percentage of GDP per capita allocated towards education.[14]

From the data in Table 1, it can be clearly observed that almost all countries which allocated *less than $1000* as per capita GDP towards education have not exhibited a strong performance on PISA. While on the other side of the $1000 spending mark, most countries have shown a considerably good performance with the exception of the United States and Israel. It should be noted that the education spending data does not show the split between primary, secondary, and tertiary education levels. Though Israel has not performed well at PISA over the years, it is still regarded highly for advancement and achievements of its tertiary-level education programmes. Further, it should also be noted that results from China have been marred with controversy due to allegations of selective representation to attain a higher ranking. Likewise, critics of the PISA have for long argued about the PISA's narrow, western-centric, quantitative approach to measuring educational outcomes that force governments, policy-makers, schools, and already stressed establishments to overhaul their education systems. But, we believe, in the absence of a seemingly better alternative benchmarking system, going with a tried, globally recognized and a well-accepted entities' measurement index will help us to set or at least formulate, in earnestness, a roadmap.

Finland, Singapore, Hong Kong, Japan and South Korea are often among the top performers in international assessments such as the *Programme of International Student Assessment* (PISA) and *Trends in Mathematics and Science Study* (TIMSS). The United Kingdom's performance is fairly competitive, while the USA performs at an average level. Brazil and Indonesia have comparable socio-economic indicators as India and they perform poorly as well. Vietnam has featured among the better performing countries over the last decade. While in 2018 it's ranking were not officially released owing to certain considerations, even as it is said to have performed well, the PISA 2022 showed it ranked around 34 of 81 participating nations. The education system employed by Finland, Singapore, and Estonia have consistently been judged as best performers on PISA, despite several iterations.

Keeping some of these observations in mind to review the school-leaving examinations, the following section provides case studies of seven countries (Canada, Estonia, Vietnam, South Korea, Finland, Hong Kong and Singapore) and two international boards (Cambridge Assessment International Education and International Baccalaureate).

[14] *Reference: World Bank website, OECD data on education spending, 2018 PISA results*

CANADA

2.1 Canada

2.1.1: What structures & processes support smooth facilitation of school leaving examinations?

2.1.1.1. Purpose of the Assessments (includes Overview & Education Journey)

Canada is known for having a strong and well-developed education system, and its students consistently perform well in international assessments such as the Programme for International Student Assessment (PISA). Canada's education system is generally well-regarded for its emphasis on critical thinking, creativity, and a holistic approach to learning. The country has provinces and territories with a significant degree of autonomy in education policy, so the practices may vary across regions.

Secondary education in Canada is decentralized. Canada is divided into provinces and territories, each with their own government. The Canadian constitution gives the provinces jurisdiction over education and the three territories (The Northwest Territories, the Yukon and Nunavut) have comparable delegated powers. As such, provinces and territories are responsible for setting and regulating education standards for their respective education institutions. Through the Council of Ministers of Education Canada, a national organization, they make major policy decisions and design initiatives. This ensures quality and consistency in the education system. The purpose of school leaving examinations in Canada, like in many other countries, is certification and selection in colleges or the workforce.

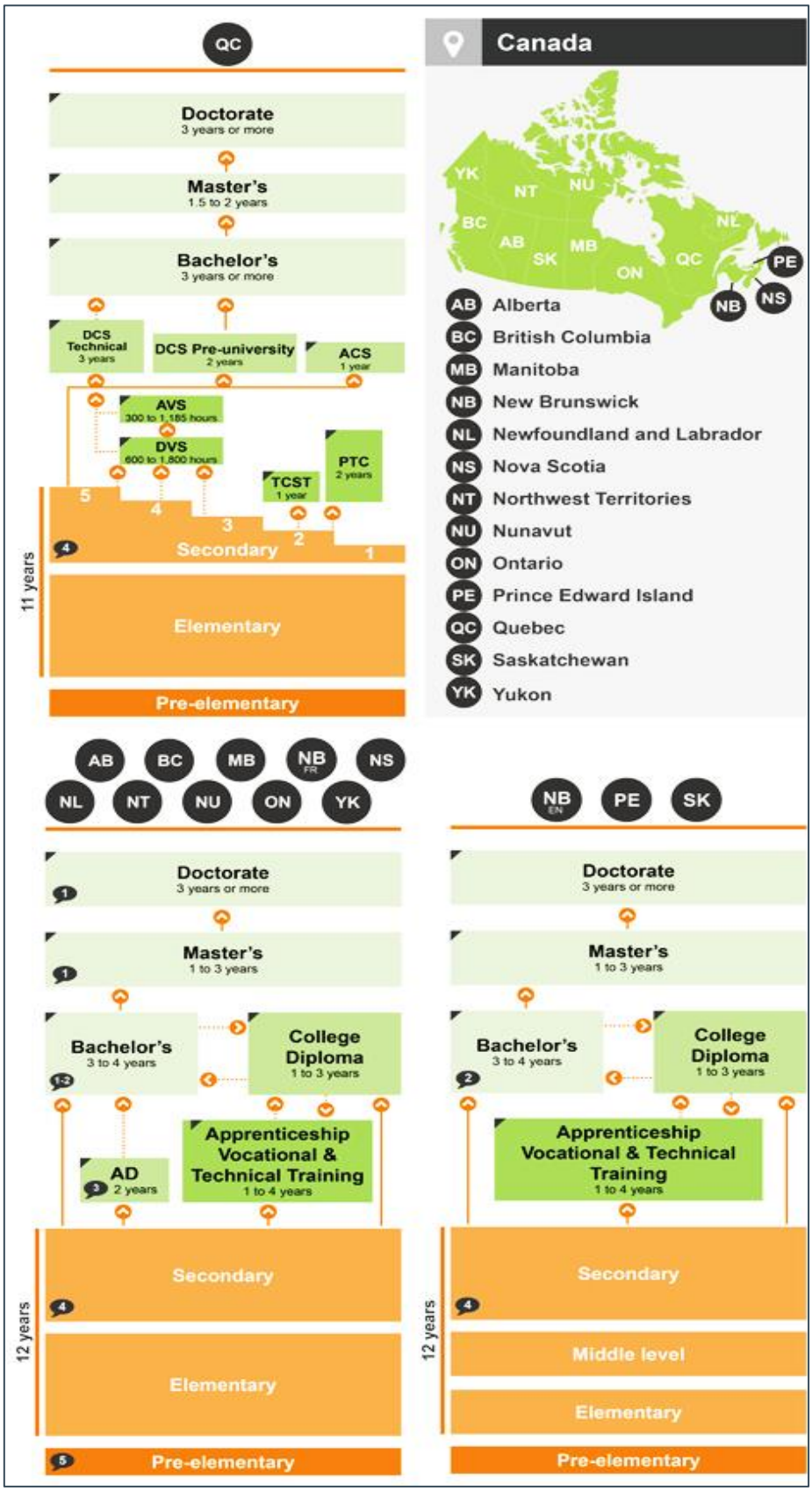


Figure 11: Canada's Education System by Province/Territory[15]

[15] https://cbie.ca/infographic-making-sense-of-canadas-education-systems-by-provinceterritory/

The matriculation exams are developed provincially and hence, they are unique to each respective province. Such exams can be important factors in the determination of final grades and therefore in college and university admissions as well. The territories mostly elect to adopt the curriculum of their most closely related adjacent provinces. This includes adopting the related provinces examination policy. The reason for the territories adopting the curriculum of provinces is because the provinces have both, greater means to create the curriculum and populations to ensure the curriculum's acceptance by tertiary institutions.

The educational journey can vary from province to province, with students graduating from high-school at the age of 16 (in Quebec), 17 or 18 (in other provinces). Grade 12 presently serves as the final grade in all provincial secondary curricula, except Quebec, where secondary schools end with Grade 11. After these students who wish to pursue further studies may attend a post-secondary institution. Quebec is currently the only province where it treats Grade 12 as a part of the tertiary level of education. Post high-school education, students have options to either opt for a Bachelor's degree spanning 4 years or for special vocational colleges that are geared towards developing highly specific targeted skills, with employability as a goal for the duration of up to 4 years. The students in Canada have options to either attend publicly-funded schools, where education is free for all residents, or private schools that generally follow an international curriculum like Cambridge GCE or International Baccalaureate (IB).

2.1.1.2. Structure of the Test:

2.1.1.2(a) Subjects offered: The subjects offered for school leaving examinations vary across provinces. However, a combination of compulsory and elective courses is offered. Common study areas include subjects such as English, mathematics, sciences, social sciences, and humanities. Students are offered education in English as the first language along with a flexible choice from a set of other subjects like Mathematics, sciences, social sciences, French, American Sign Language (ASL), business studies, world studies etc. Some provinces include a course like Career and Life Management (CALM) which is offered in Alberta and focuses on preparing students for various aspects of life beyond high school, including career planning and personal finance. There is no information available on subject tiers offered in school leaving exams across various provinces in Canada.

2.1.1.2(b) Internal and External Component: The structure of school leaving examinations in Canada, including the components of internal and external assessments, can vary across provinces and territories due to the decentralized nature of the Canadian education system. Broadly, internal assessments include coursework in the form of assignments and projects and are often continuously evaluated to gauge a student's progress. This may involve quizzes, tests, presentations etc. External examinations are standardized in nature. Information on percentage-based components across provinces and subjects is unavailable and unverified.

2.1.1.2(c) Frequency and duration of the tests: The academic year starts in September and ends in June. The school leaving examination is held annually once a year. The duration of the tests varies across provinces and territories.

2.1.1.2(d) Grading and Passing Criteria: Grading and passing criteria for school leaving examinations in Canada can vary by province and territory due to the decentralized nature of the Canadian education system. The passing criteria for school leaving examinations typically involve meeting the minimum requirements for credits in specific subjects. To earn a diploma or certificate (e.g., Ontario Secondary School Diploma or British Columbia

Certificate of Graduation), students usually need to accumulate a certain number of credits by successfully completing the required courses. Grades often range from A (Excellent) to F (Fail), with intermediate grades such as B (Good), C (Satisfactory), and D (Minimally Acceptable). Some provinces may also use numerical grades on a scale, such as a percentage, like Ontario, or a 4.0 scale.

Due to this variety in assessment processes, tertiary education institutes in Canada either accept normalised grades[16] from matriculation exams or a blended form of admission criterion (using combined results from university-specific exams and class grades).

2.1.1.2(e) Remarking and Rechecking Policy: The remarking and rechecking policies for school leaving examinations in Canada can vary by province and territory. Requests for rechecking or remarking are typically submitted through the school the student attended. Canada commonly uses a letter-grade system to assess student performance.

2.1.1.3 Process followed to develop and administer the assessment

Considering Canada's decentralized system, there isn't a nationwide standardized assessment methodology that serves the purpose of either awarding high-school graduate certification or qualification to college admissions. Each province conducts their own set of standardized assessments, such as that administered by the Alberta Graduation Examination (Alberta province), and the Graduation Literacy and Numeracy Assessment (British Columbia) and Ministère de l'Éducation, de l'Enseignement supérieur et de la Recherche (MEESR) for Quebec etc.

2.1.1.3(a) Question Paper Setting: While question paper setting is done manually in British Columbia and Quebec, Alberta has slowly started conducting its assessments to a digital[17] test environment[18]. This is part of a measured and incremental transition with opportunities for students and schools to participate in optional implementation activities.

2.1.1.3(b) Administration and Invigilation: In Quebec, materials, including question booklets, answer sheets, and guides, are shipped to institutions based on registration. Procedures for distribution vary for school boards and private schools. Specific guidelines ensure confidentiality and secure transportation. Unauthorized absence results in an "ABS" code on the achievement record, allowing the student to sit for the exam in a subsequent session. Only authorized materials specified in examination guides are allowed. Calculators are permitted with specific restrictions; computers, tablets, and certain calculators are prohibited. Use of dictionaries is allowed in specific cases. In Alberta, School administrators complete a Technical Readiness Checklist to prepare for virtual assessments, ensure access for students, and manage student groupings on the platform.

[16] Adjusting values measured on different scales to a notionally common scale, often prior to averaging.

[17] https://abed-pat6.vretta.com/#/en/test-auth/public-test-runner/268

[18] https://www.alberta.ca/writing-diploma-exams#jumplinks-0

2.1.1.3(c) Evaluation: In Alberta, Exams marked centrally by teachers, with personal identification removed whereas in British Columbia, superintendents are free to determine the best models for local marking provided the markers have required qualifications. [19]

2.1.1.3(d) Grading and Reporting: In Quebec, exam results are transmitted to the Charlemagne system after correction. Educational institutions retain copies of administered exams and related materials for a specified period. Students may consult their exam copies in the presence of school staff but cannot reproduce them. Requests for the review of exam marks must be made within specific timelines and include a fee. Deletion of a fail mark is possible under certain circumstances during transitional periods. Examination results are posted approximately three to four weeks after an exam session across main provinces.

2.1.1.4. Question Paper Quality

2.1.1.4(a) Integration of High-order thinking questions and strong distractors: In a sample study of the English question paper from Alberta, a good set of higher-order questions with no recall questions was seen. Questions nudge students to consider the import of words/phrases/ in the text while reading between the lines as well and provide strong distractors.

from THE TRAGEDY OF KING RICHARD THE SECOND, Act V, scene ii

Enter Duke of YORK *and the* DUCHESS.

DUCHESS: My lord, you told me you would tell the rest,
When weeping made you break the story off
Of our two cousins coming into London.
YORK: Where did I leave?
DUCHESS: At that sad stop, my lord,
Where rude misgoverned hands from windows' tops
Threw dust and rubbish on King Richard's head.
YORK: Then, as I said, the duke, great Bolingbroke,
Mounted upon a hot and fiery steed
Which his aspiring rider seemed to know,
With slow but stately pace kept on his course,
Whilst all tongues cried, 'God save thee, Bolingbroke!'
You would have thought the very windows spake,
So many greedy looks of young and old
Through casements darted their desiring eyes
Upon his visage; and that all the walls
With painted imagery had said at once,
'Jesu preserve thee! Welcome, Bolingbroke!'
Whilst he, from the one side to the other turning,
Bareheaded, lower than his proud steed's neck,
Bespake them thus, 'I thank you, countrymen.'
And thus still doing, thus he passed along.

[19] https://files.eric.ed.gov/fulltext/ED559690.pdf

1. In context, the details involving "hands" (line 7), "tongues" (line 13), and "eyes" (line 16) serve to depict the

   A. universal ambivalence of people toward change
   B. vigorous nature of the people's response to recent events
   C. people's general feeling of indifference toward leadership
   D. people's sense of chaos regarding the current state of affairs

2. The image of Bolingbroke "Bareheaded, lower than his proud steed's neck" (line 21) reinforces his presentation of himself as

   A. a humble leader
   B. an arrogant soldier
   C. a weakened prince
   D. an impoverished rebel

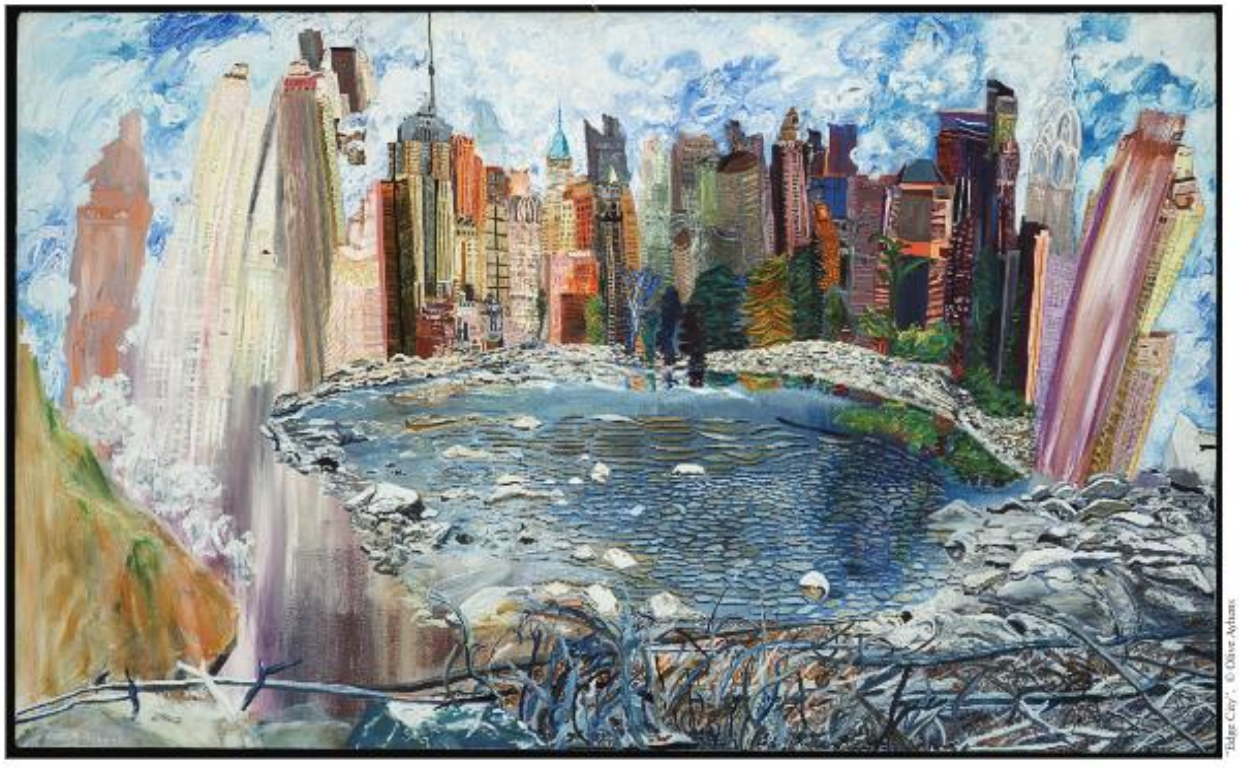
Figure 12: Question from Canada Alberta's English Paper -Grade 12

4(b) Integration of visuals and art: In the same question paper, there are image-based questions that challenge students to analyze two texts within the paper and compare:

Released Reading from the January 2012
English Language Arts 30–1 Diploma Examination

IV. Question 28 in your Questions Booklet is based on this painting.
Question 29 requires you to consider this image together with Reading III.

Edge City



Olive Ayhens ©

III. Questions 20 to 27 in your Questions Booklet are based on this poem. Question 29 requires you to consider this reading together with Reading IV.

At a nameless bend in the river

We don't understand the first thing
about most of what goes on around us.
The operating system
without which the disk drive won't boot.
The inner workings
of the sewage treatment plant downstream.

Currents that lead fish to this reedy spot
where we cast our lines from shore.
How to cleanse the putrid
streams of Eastern Europe.
How a dollar is still worth a dollar
after all that's gone down. Even this:

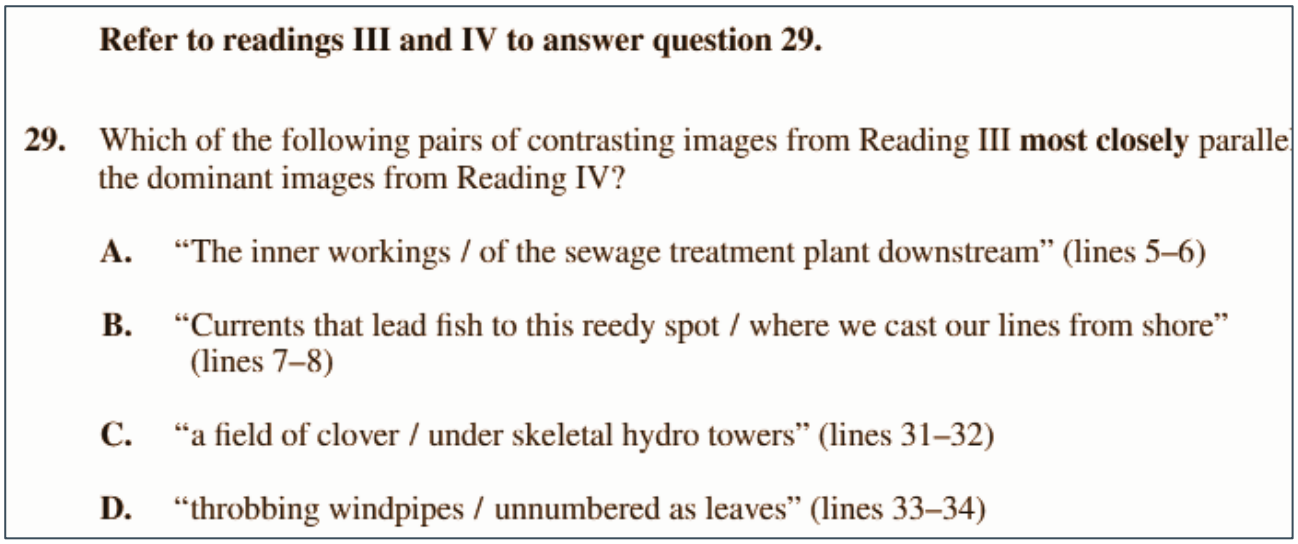
why at sunset white-tailed deer
come down to the river and graze
unconcerned at our presence
where all the parched afternoon
they hid in shadow.
The heaviness of flesh and bone
we dream of more often than hold, and hold
too tight sometimes, not quite believing. You.

The simple rise and setting of the sun
confound our pretensions. The way we still
dial a touch-tone phone, confide our secrets
more readily to pollsters than lovers.
How we can speak in any voice
other than our own. The constitution.
How the fish we counted on slip our hooks
and glide away into darkness.

The red sky is omenless, our string bag
empty. White-tailed deer
lie panting in a field of clover
under skeletal hydro towers.
On the far shore throbbing windpipes
unnumbered as leaves on the trees
sing the only tune they know
to the waning light.

Colin Morton

[29] string bag—bag used to contain caught fish



Refer to readings III and IV to answer question 29.

29. Which of the following pairs of contrasting images from Reading III **most closely** paralle the dominant images from Reading IV?

A. "The inner workings / of the sewage treatment plant downstream" (lines 5–6)

B. "Currents that lead fish to this reedy spot / where we cast our lines from shore" (lines 7–8)

C. "a field of clover / under skeletal hydro towers" (lines 31–32)

D. "throbbing windpipes / unnumbered as leaves" (lines 33–34)

Figure 13: Visual based question from Canada Alberta's English Paper -Grade 12

2.1.2: What do these examination boards do well and what best practices can be explored in our context?

Canada consistently performs well in international assessments such as PISA, TIMSS, and PIRLS. High scores in these assessments indicate the quality of education and student achievement. Canadian students performed above the OECD average in reading. The country ranked fifth out of 79 countries and economies that participated in the assessment. Canada also performed well in mathematics and science, ranking 10th and 4th out of the participating countries and economies, respectively. The Canadian education system is known for its diversity and flexibility. Provinces and territories have the autonomy to design their own curriculum, allowing for customization based on regional needs and priorities.

The British Columbia curriculum emphasizes personalized learning, critical thinking, and collaboration. It focuses on competencies rather than just content, encouraging students to develop a deeper understanding of subjects. Alberta's "Inspiring Education" initiative demonstrates a commitment to adaptability. The province regularly reviews and updates its curriculum to ensure it aligns with emerging educational trends and the needs of a changing society. British Columbia invests in educational research through initiatives like the BC Education Plan and partnerships with research organizations. Manitoba's Positive School Climate initiative focuses on creating safe and supportive environments for students. Schools in Nova Scotia actively engage with the community through initiatives like service-learning projects, volunteering programs, and partnerships with local businesses. These efforts help students connect their learning to real-world experiences.

Given that both Canada and India have decentralized education systems allowing for regional variations in curriculum and assessment practices, the following best practices can be explored that can be contextualized to local settings. Some of the best practices are already being implemented as per the mandate highlighted in NEP 2020. Some of them include:

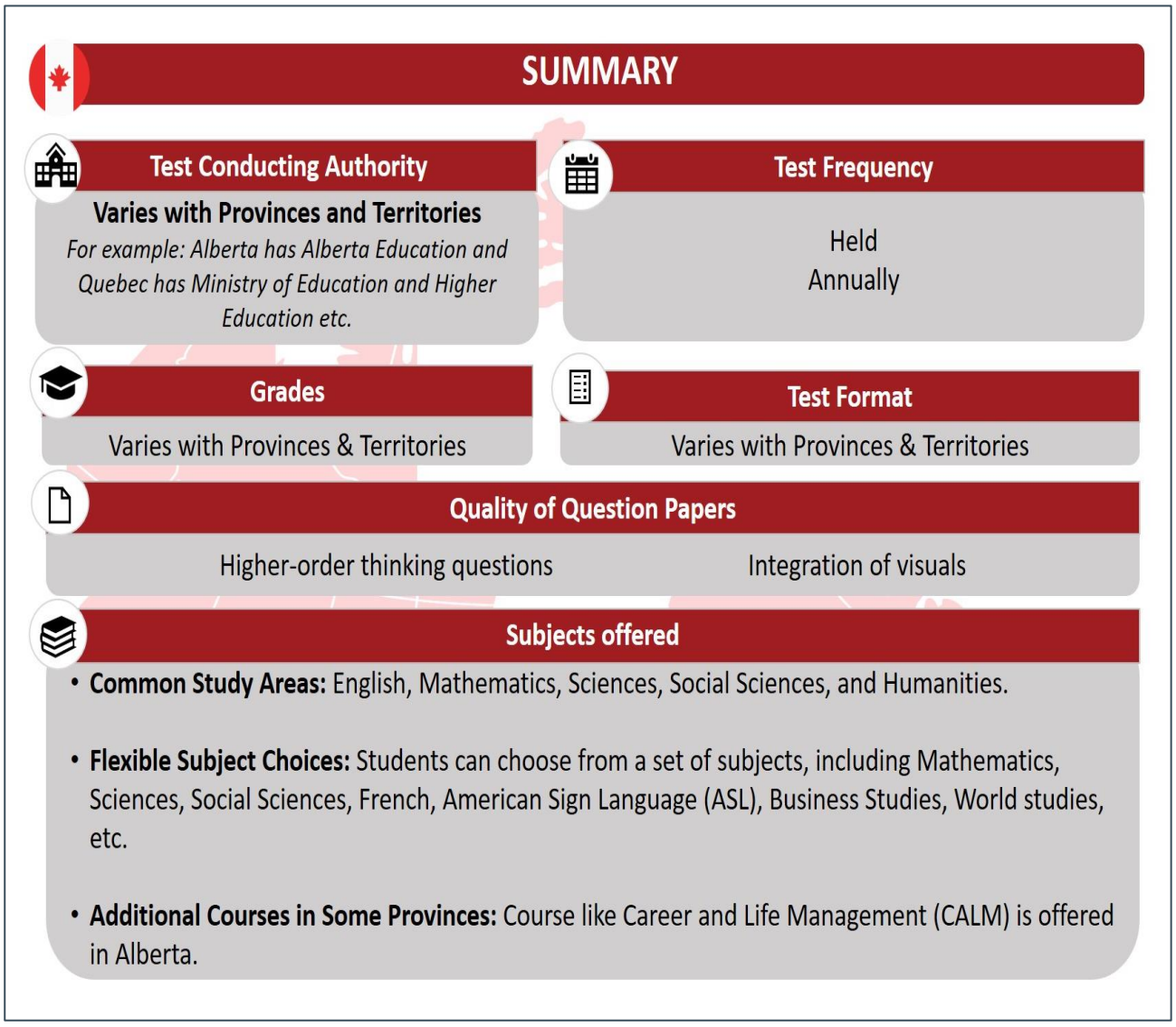
1. Holistic Assessment Methods that include a mix of continuous evaluation, coursework, and standardized testing are outlined in provincial curriculum guidelines and education ministry documentation.

2. Student-centred approaches like Curricular frameworks used in provinces like British Columbia emphasize competencies and skills development alongside content knowledge, encouraging student engagement and critical thinking.

3. Encouraging parental involvement through initiatives like the Parent Engagement Committee seen in Saskatchewan where schools actively seek parental input, fostering collaboration between parents and educators.

4. Policies addressing equity and access are evident in measures such as targeted funding for schools in socio-economically disadvantaged areas and initiatives to reduce educational disparities. Nova Scotia's SchoolsPlus program provides integrated services within schools, offering support for students and families. In Manitoba, there is a commitment to equitable funding for schools. The province allocates resources based on student needs, ensuring that schools in different regions have access to adequate funding for educational programs and infrastructure.

5. Flexible and adaptable curriculum adapted by Alberta's, known as "Inspiring Education," involves ongoing updates to ensure relevance. The curriculum emphasizes competencies like critical thinking and creativity to prepare students for a changing world.



ESTONIA

2.2 Estonia

2.2.1: What structures & processes support smooth facilitation of school leaving examinations?

2.2.1.1. Purpose of the Assessments (includes Overview & Education Journey)

According to the 2018 PISA study, Estonia's 15-year-olds ranked 1st in Europe. In addition, by and large, all Estonians' performance is relatively equitable with respect to socioeconomic background. This is a remarkable achievement for a country of just over one million citizens that gained independence only in 1991. Since that year, the Estonian economy has grown nearly eightfold, with its information technology sector at the centre of that growth. Estonia deliberately created an education system equipped to support the high-tech, high-skill, high-wage economy it was focused on building. As part of this national strategy to create an information society, it created the Tiger Leap project to provide all schools with computers and internet access.

Secondary education in Estonia is centralized and standardized. The purpose of school leaving examinations in Estonia, like in many other countries, is certification (Certificate of General Secondary Education), benchmarking student performance against national or regional standards, and selection for further education and college.[20]

Education Journey

In Estonia, the structure of the education system provides opportunities for everyone to move from one level of education to the next. Levels of education comprise preschool education, basic education, upper-secondary education and higher education. The obligation to attend school applies to children who have turned 7 until the age of 17.

Preschool education is generally acquired in childcare institutions (*koolieelne lasteasutus*). Basic education is the minimum compulsory general education, which is acquired in the basic school (*põhikool*) and which gives the right to continue studies at the upper-secondary education level. The basic school includes grades 1–9. Successful completion of the curriculum and passing the final examinations are the conditions for acquiring basic education. Secondary education is based on basic education and is divided into general secondary education, which is acquired in upper-secondary schools (*gümnaasium*), and vocational upper-secondary education, which is acquired in vocational schools (*kutseõppeasutus*).

[20] https://harno.ee/sites/default/files/documents/2021-02/Higher_Education_in_Estonia_2010.pdf

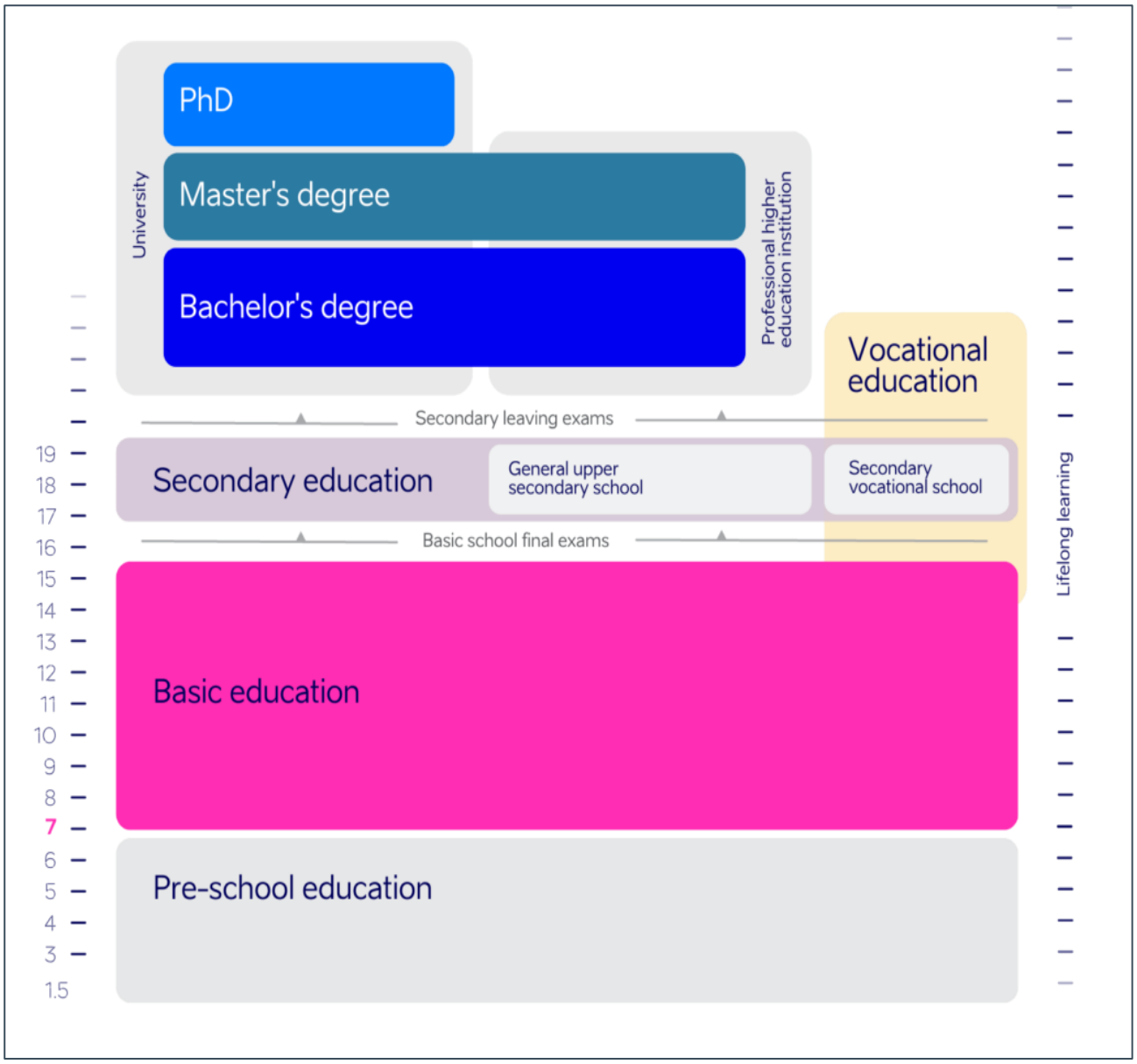


Figure 14: Estonia's Education System by Province/Territory[21]

The upper-secondary schooling is followed by basic school and has a study period of three years. Everyday learning is based on the school curriculum, prepared based on the national curriculum for upper-secondary schools. Upper-secondary schools are designed to help students become creative, multi-talented, socially mature and reliable citizens who have discovered a field of endeavour that is best suited to their individual interests and capacities for continuing their future educational path. The study programme at upper-secondary school is arranged into mandatory and voluntary courses. "Gümnaasiumi lõpueksam" refers to the Upper Secondary School Leaving Examination.

The volume of the vocational education curriculum is calculated in VET credit points. One credit point corresponds to 26 hours of work spent by a student studying. The yearly study volume is 60 credit points; while the study volume of vocational secondary education (ISCED 3) is 180 credit points. Successful completion of the curriculum, taking necessary tests and

[21] https://www.educationestonia.org/about-education-system/

passing all required assessments, practical training and the final examination is needed for graduating from a vocational school. Acquisition of upper-secondary education gives the right to continue studies at a higher education level as well.

The new national curriculum (Gümnaasiumi riiklik õppekava, 2010), gives more importance to achieving the goals, competencies and subject integration set in the curriculum. The study load has been reduced, the learning outcomes have been expressed more clearly and there is more freedom of choice for the students.

The Upper Secondary School Leaving Examination in Estonia is typically conducted by the Estonian Ministry of Education and Research.

2.2.1.2. Structure of the Test:

2.2.1.2(a) Subjects and Tiers offered: In the national curriculum for upper secondary schools, the subject syllabi are compiled in the form of courses, whereas the word "course" refers primarily to a 35-hour (á 45 minutes) study unit. The national curriculum for upper secondary schools determines the list of compulsory subjects and the number of compulsory courses per subject, as well as the volume of elective subjects in 12 fields. Schools may choose between a narrow and broad course of mathematics. Depending on this choice, there are 64 or 70 compulsory courses in schools with Estonian language of instruction and 68 or 74 in schools with Russian or other language of instruction. The difference is caused by the fact that in a school with Russian or another language as the language of instruction, one compulsory foreign language (5 courses) must be replaced with Estonian as a second language (9 courses). In total, it is compulsory to pass at least 96 courses at the upper secondary school level.[22] An upper secondary school may plan and carry out elective courses in cooperation with other schools and organizations, including using Estonian and international networks and information technology solutions.

Subject	No. of Courses	Subject	No. of Courses
Estonian	6	Biology	4
Literature	5	Chemistry	3
Russian	6*	Physics	5
Estonian as a second language**	9*	History	6
Foreign language (at B2 language proficiency level)	5	Personal, social and health education	1
Foreign language (at B1 language proficiency level)	5	Civics and citizenship education	2
Mathematics *(narrow)*	8	Music	3
Mathematics *(broad)*	14	Art	2

[22] Subjects offered under Estonia's Gümnaasiumi lõpueksam

Geography	3	Physical Education	5
Elective Course (Student investigation paper or practical work)	1		

Table 2: Subjects offered under Estonia's Gümnaasiumi lõpueksam

2.2.1.2(b) Internal and External Component: The Upper Secondary School Leaving Examination ("Gümnaasiumi lõpueksam") in Estonia typically consists of both internal and external examination components. The details of the subject wise component for internal and external examination are unavailable.

2.2.1.2(c) Frequency & Duration of the tests: A school year includes no less than 175 days (35 weeks) of study and the school leaving examination is typically conducted once a year at the end of the three-year upper secondary school program. Test duration varies between 3-5 hours where Estonian language, Mathematics, Humanities have a higher test duration (4-5 hrs) and Sciences, Foreign languages have a comparatively low-test duration (3-4 hrs).

2.2.1.2(d) Grading and Passing Criteria: Students are assessed on a five-point scale. According to the assessment regulation, a school may also use a different assessment system but when a student is graduating from upper secondary school or changing schools, the grades have to be converted into the five-point system. The majority of upper secondary schools using a different system have adopted assessment practices that are similar to the ones used in higher education institutions. A 100-point system is used for marking state examination papers. Course grades and study stage grades are given at the upper secondary school level.

2.2.1.2(e) Remarking and Rechecking Policy: There is no information available on remarking and rechecking of answer scripts on demand.

2.2.1.3 Process followed to develop and administer the assessment

Estonia is considering a transition from paper-based exams to electronic exams for students graduating from basic school and upper secondary education. This transition is considered to enable more objective assessment, increased efficiency and security in administration, and the use of learning analytics.

So far, all school leaving exams have been conducted on paper, and the electronic format has been used only with national low-stakes tests in different subjects and for different grades. With the implementation of e-exams, paper-based exams will be discontinued.

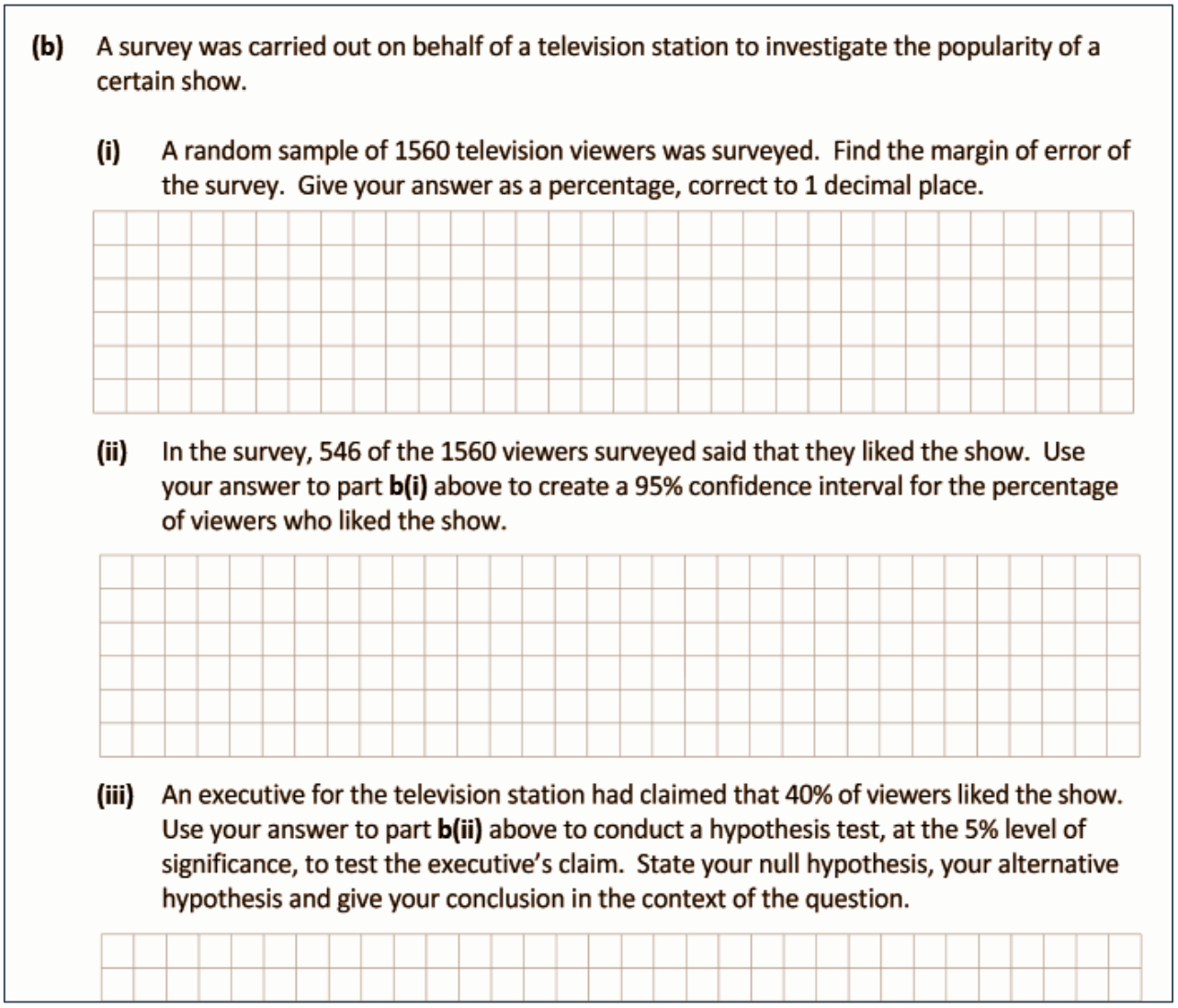
A survey is conducted to assess the technical and administrative readiness of schools, as well as to map the accommodations made for students with special educational needs so far. It is assumed that electronic exams can be more accessible to students with special needs, as they can be customized more easily than paper exams.

To assess and develop the readiness of stakeholders to organise and conduct e-exams, trial exams are conducted for students in grades 9 and 12 before the mandatory final exams this spring. The result of the trial exam does not affect the result of the actual exam. The

pace of transition from paper-based exams to e-exams will depend on the feedback received. There is not enough information on the detailed paper setting and administration processes followed.

2.2.1.4. Question Paper Quality

2.2.1.4(a) Integration of questions that are relevant and authentic: In a sample study of the Math question paper from Estonia, almost all questions were representing an authentic context and nudging students to solve a real-life problem. For example, stating and testing hypothesis, evaluating salary contracts, and using functions to chart the flow of drugs into the bloodstream.



(b) A survey was carried out on behalf of a television station to investigate the popularity of a certain show.

(i) A random sample of 1560 television viewers was surveyed. Find the margin of error of the survey. Give your answer as a percentage, correct to 1 decimal place.

(ii) In the survey, 546 of the 1560 viewers surveyed said that they liked the show. Use your answer to part **b(i)** above to create a 95% confidence interval for the percentage of viewers who liked the show.

(iii) An executive for the television station had claimed that 40% of viewers liked the show. Use your answer to part **b(ii)** above to conduct a hypothesis test, at the 5% level of significance, to test the executive's claim. State your null hypothesis, your alternative hypothesis and give your conclusion in the context of the question.

Section A — Concepts and Skills — 150 marks

Answer **all six** questions from this section.

Question 1 **(25 marks)**

When Sean joined a sales company he was offered a choice of two different salary contracts. The details of the contracts are outlined in the table below.

	Salary	End of year commission on total sales
Contract A	€35 000	2%
Contract B	€30 000	3%

(a) Find how much Sean would earn under **each** contract in a year where his total sales were €400 000.

Contract A

Contract B

(b) Another employee, Mary, earned €50 000 in a particular year. She is on Contract A. Find her total sales for that year.

(c) Find the total sales for which a salesperson would earn the same amount of money under each contract.

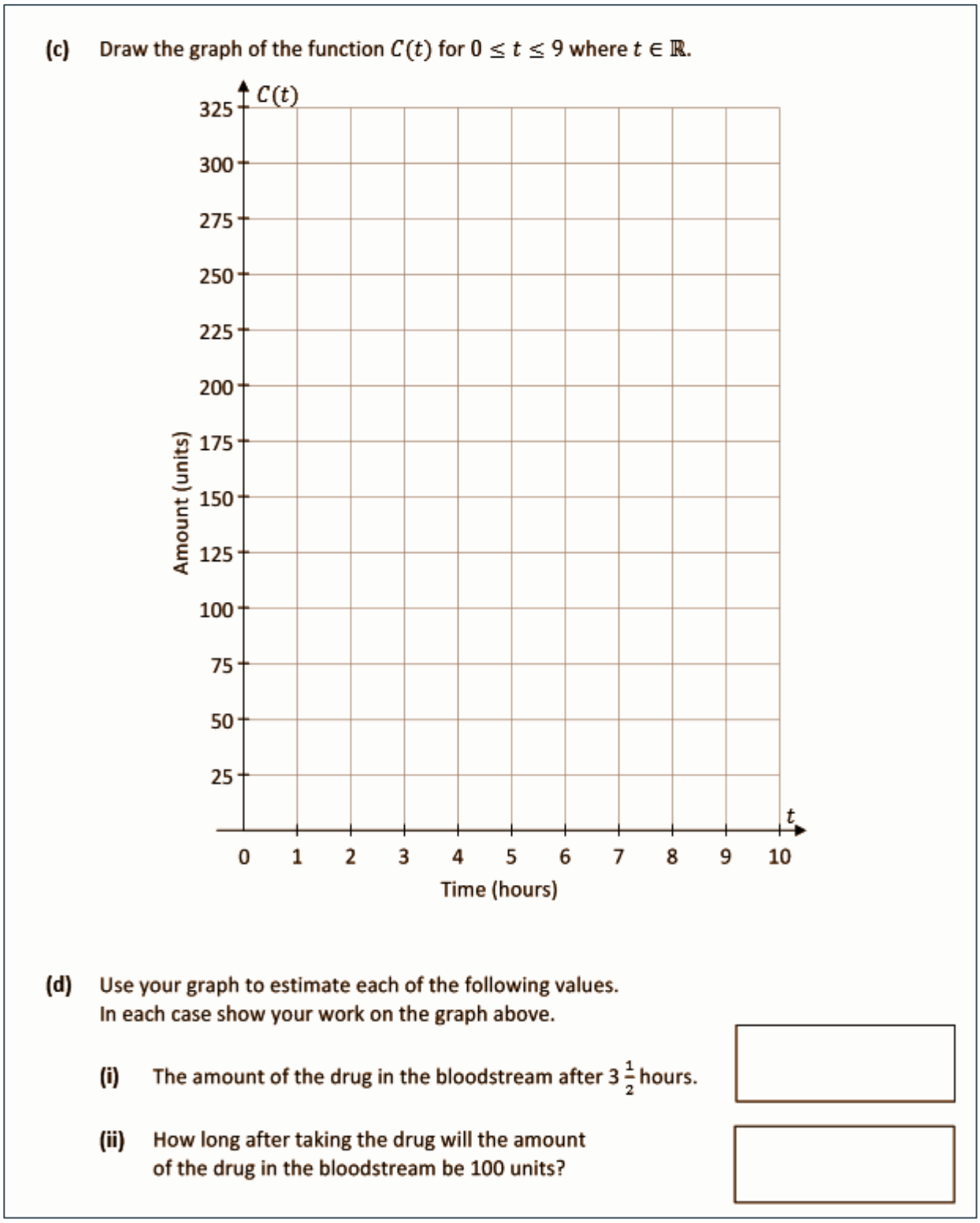
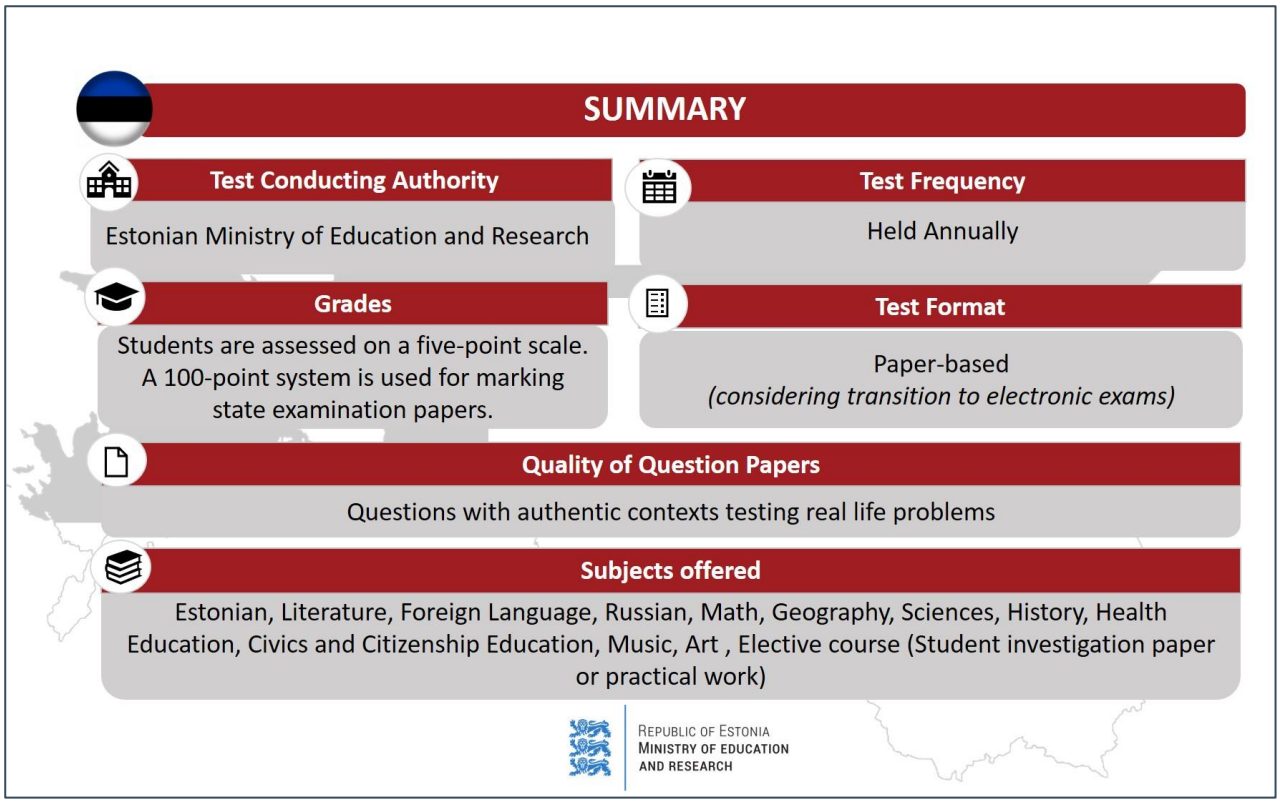


Figure 15: **Question from Grade 10 Math Leaving Certificate Examination 2018**[23]

[23] **Estonia Question sources for the Television question and bloodstream (page 2) and Sean in sales company**



2.2.2 What do these examination boards do well and what best practices can be explored in our context?

In PISA 2018, in addition to performing well across reading, math and science, Estonia has done remarkably well in reducing the gap between a student's socioeconomic background and their access to quality education. The country's push toward providing equal access to learning technology is a modern example of the culture's dedication to equity in education.[24]

One of the things that Estonia has done well is operating with a strategic and ecosystemic lens when it comes to learning and assessments. In 2014, Estonia adopted the *Lifelong Learning Strategy 2020* to guide education reforms for preschool, primary and secondary education, higher education, and adult learning. The strategy called for a focus on the acquisition of learning skills and creativity; developing competent and motivated teachers and school leaders; and creating lifelong learning opportunities in line with the needs of the labour market. In doing this, they have ensured a digital focus and equal opportunities to participate in lifelong learning. A new education strategy for 2021-2035 has been adopted to guide the next period and is part of a larger national plan known as Estonia 2035: A Smart and Active Estonia plan. The *Lifelong Learning Strategy 2020* called for revising national assessments to measure key competencies and problem-solving skills.

Another positive is that Estonia is known for its advanced e-governance systems. There has been a trend towards digitizing examination processes, making them more efficient and accessible. This includes online submission of assignments, computer-based testing, and the use of digital tools for assessment. The ProgeTiger programme, introduced in 2012, expanded on Tiger Leap by offering educational materials and chances for professional development in digital literacy to schools. The ongoing ProgeTiger program is focused on

[24] https://www.educationestonia.org/equity-made-estonia-an-educational-front-runner/

building skills in three areas: design and technology; engineering sciences; and information and communication technologies.

Additionally, as a further counterweight to overemphasize school-leaving examination data, Estonia relies on several survey instruments that have been developed to measure student, teacher, and parent satisfaction with education. Since 2011, Estonia has been moving towards formative assessments. According to principles of assessment at both the national and school level, the teacher is responsible for choosing suitable assessment methods (including formative assessment), timing, tasks and tools.[25]

India and Estonia both have a centralized-systems for school leaving examinations which in India are conducted by Central and State Boards. Both countries also recognize the importance of technology in education, have piloted digital assessments and are focusing on competency-based learning. However, there are some aspects that India can explore in the interest of leveraging collective intelligence. Some of them include:

1. Strengthening policies to ensure equal access to technology in schools, reducing the gap between students from different socioeconomic backgrounds. The Tiger Leap project, initiated in the late 1990s, aimed to provide all schools with computers and internet access, creating a more equitable learning environment.

2. Exploration of alternate methods of collecting data through various instruments like surveys for measuring intangible metrics like student, teacher, and parent satisfaction with education and providing valuable insights into the overall learning experience.

[25] https://www.educationestonia.org/wp-content/uploads/2023/12/AimHighEstoniaCaseStudy.pdf

VIETNAM

2.3 Vietnam

2.3.1. What structures & processes support smooth facilitation of school leaving examinations?

2.3.1.1 Purpose of the Assessments (includes Overview & Education Journey)

In the book *World Class (2018)*, author Andreas Schleicher states that "the learning outcomes among the 10 per cent most disadvantaged Vietnamese students now compare favorably with those among the 10 percent wealthiest families in most of Latin America, and are on a par with those of the average student in Europe and the United States" – testimony to the success of its education system and the reforms carried out by multiple political organizations over the last decades. Despite being the poorest or second poorest participant, Vietnam outperformed all other developing countries, and many wealthier countries, on the 2012, 2015, and 2018 PISA assessments.[26] However, it has also been stated that Vietnam Education is very good on paper, but good exam results alone will not prepare pupils for the next industrial revolution (Reed, 2018). There is the presence of rote learning where students are said to be taught to memorize knowledge, instead of being shown how to apply knowledge.

Education Journey:

Vietnam's education system is highly competitive, with a rigorous curriculum. "High-schools for the Gifted" are prestigious institutions that demand high test scores for admission. Higher education is fundamental, and entrance to university is determined through the centralized National High-school Graduation Examination. The examination, regulated by the Ministry of Education and Training (MOET), serves both selection and certification purposes.

Education is managed by the state and divided into five levels: preschool, primary school, secondary school, high-school, and higher education. Basic education lasts for 12 years, including five years of primary education, four years of secondary education, and three years of high-school education.

Children start primary education at six, and lower secondary education (grades 6-9) covers diverse subjects, including Vietnamese language, mathematics, science, history, and physical education. Secondary vocational exams at the end of grade 8 provide extra marks for the 10th-grade examination.

High-school education (grades 10-12) involves an entrance examination, determining enrollment possibilities. All subjects are compulsory, including literature, mathematics, natural science, history, geography, foreign language, technology, informatics, physical education, and music/arts. Advanced classes and specialist classes are available, offering specialized subjects with heavier workloads.

At the end of grade 12, students must take the National High School Graduation Examination to obtain the Graduation Diploma of General Upper-Secondary Education. This diploma is crucial for pursuing higher education, emphasizing the importance of standardized testing in Vietnam's education system.[27]

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[26] https://www.sciencedirect.com/science/article/pii/S027277572300081X

[27] https://blogs.worldbank.org/eastasiapacific/vietnam-can-one-national-exam-test-all

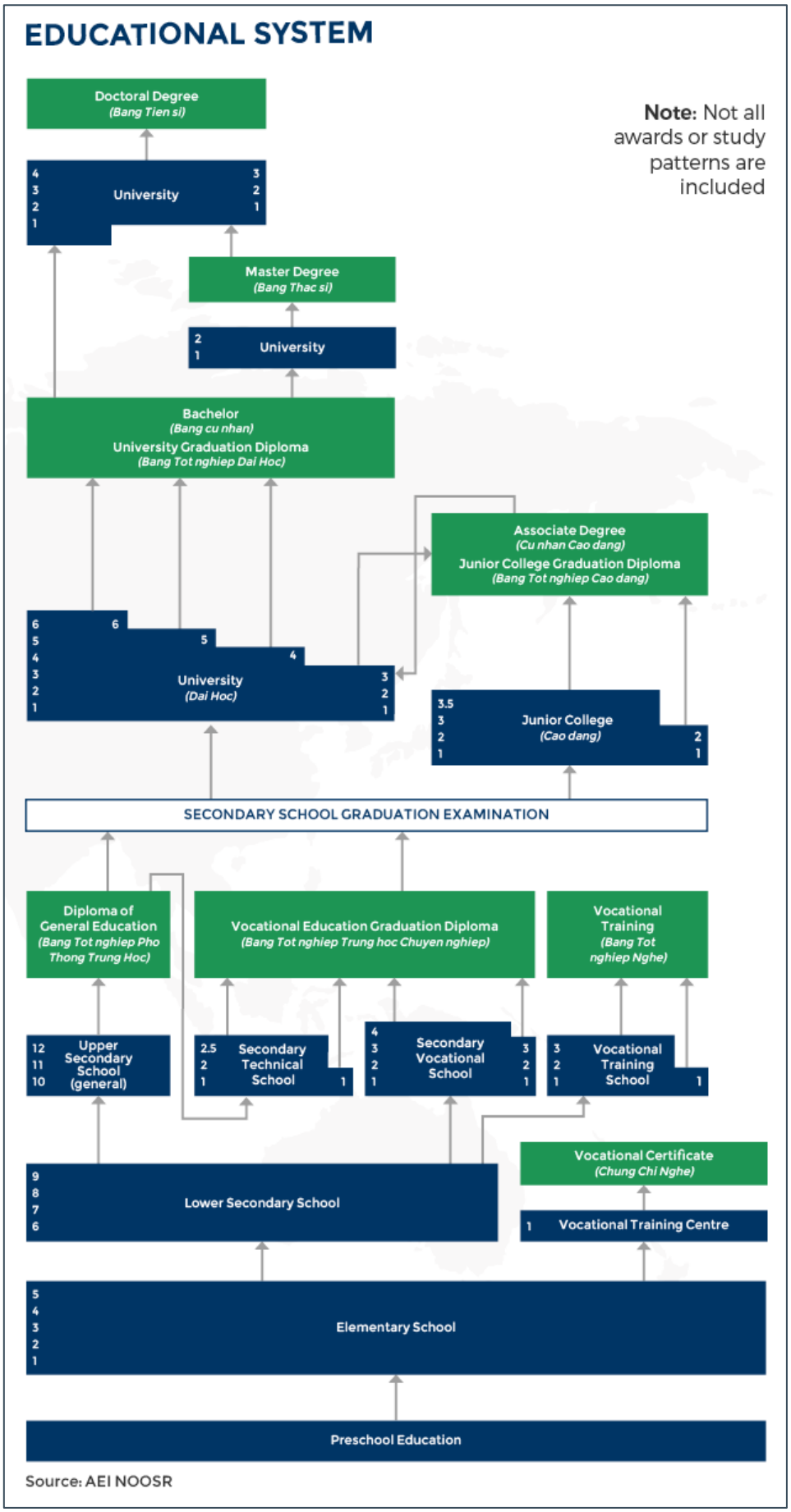


Figure 16: Graphical representation of Vietnam's education system

2.3.1.2. Structure of the Test:

2.3.1.2(a) Subjects offered: The National High School Graduation Examination exam consists of 5 papers, including 3 independent papers that are: Mathematics, Literature, and Foreign Language; 1 paper of natural science (a combination of Physics, Chemistry, and Biology) and 1 paper of social science (a combination of History, Geography, and Civic Education) with respect to students of compulsory education program at high school level or the papers of History and Geography with respect to students of continuing education program at high school level.[28]

2.3.1.2(b) Internal and External Component: Mathematics, Foreign Language, natural science and social science papers are in multiple-choice question type papers (hereinafter referred to as "multiple-choice paper"); Literature paper is a written paper.

2.3.1.2(c) Frequency & Duration of the tests: The National High School Graduation Examination is held once in a year, annually. Test duration ranges from 120 minutes for Literature; to 90 minutes for Mathematics; 60 minutes for Foreign language and 50 minutes for each subject of the natural science and social science paper.

2.3.1.2(d) Grading and Passing Criteria: Grade-point average for graduation assessment: consists of scores of papers for high school graduation assessment, bonus points, extra points (if any) and the grade-point average of 12th grade, score of each paper/subject will be converted into scale 1-10. The grade-point average (GPA) for high school students is calculated as follows:

$$\text{GPA for graduation assessment} = \frac{\frac{\text{Total score of 4 papers + Total extra score (if any)}}{4} + (\text{GPA of 12th grade}) \times 3 + \text{Bonus point (if any)}}{10}$$

Figure 17: GPA calculation for graduation assessment in Vietnam

2.3.1.2(e) Remarking and Rechecking Policy: Candidates can request for re-marking by sending re-marking application to the registered Exam Place. There is no provision for rechecking of answer scripts.

2.3.1.3. Process followed to develop and administer the assessment:

2.3.1.3(a) Question Paper Setting: Question papers must meet specified criteria, including conciseness, adherence to high school curriculum standards, and clear language. Each question paper must have official and backup versions. To ensure security, Question paper

[28] https://lawnet.vn/en/vb/Circular-15-2020-TT-BGDDT-promulgation-of-Regulation-on-high-school-graduation-exam-6CDD3.html

development is conducted in a secure, separated area, guarded by the police, and equipped with safety measures. Members working on question papers are in total isolation. The process involves strict security measures and surveillance. Dispatch and handover of question papers are supervised by the police, stored in locked containers, and sealed during the process.

The Minister of MOET establishes the question paper setting council, which includes a diverse composition of officials, educators, security personnel, and service staff. Question Paper Setting Team comprises of a leader, paper setters and paper moderators shall be established for each exam paper/subject. Question Paper Setting Teams and other members of Question Paper Setting Council work independently and directly with the leader of Question Paper Setting Council wherein each member performs his/her assigned tasks without participation in other tasks. Each member of Question Paper Setting Council holds personal liability for contents of question papers and ensuring confidentiality and security of the question papers.

According to objectives of an assigned question paper, the respective Question Paper Setting Team prepares and scrutinizes the question paper, answer key, and marking scheme (official and backup). With regard to multiple-choice question papers, the standardized question bank (hereinafter referred to as Question Bank) formulated as per regulation of the MOET is the important source of reference, which is located in the isolated area. The secretary uses a given software to withdraw randomly multiple-choice questions from the Question Bank and forward them to leaders of Question Paper Setting Teams (in the witness of the Chairperson of Question Paper Setting Council and leaders of Question Paper Setting Teams); each leader of Question Paper Setting Team assigns members in the team to evaluate every multiple-choice question; the Question Paper Setting Team works together, proofread every multiple-choice question and compiles them into a question paper and after the last proofreading, the leader of Question Paper Setting Team signs in the question papers and hand them over to the Chairperson of Question Paper Setting Council; the secretary mixes the question paper into a wide range of different versions; and after that, the Question Paper Setting Team checks every version of the question paper, answer key, marking scheme of written papers and sign in every version.

After the setting, evaluation and proofreading of question papers finish, the question papers undergo independent moderation; a moderator reads and answers the question paper, and then evaluates the question paper and proposes modification and correction when necessary and the evaluation given by the moderator is reported to the Chairperson of Question Paper Setting Council and used as a source for the Chairperson of Question Paper Setting Council to refer to during the approval of the question paper. Post which the question papers are printed, sealed, packed and stored in police-guarded areas with active security cameras.

***2.3.1.3(b) Administration and Invigilation*:** To start this process, an invigilation board is constituted which includes the Exam Council manager, Deputy Manager, and other members. The Manager of Exam Place runs invigilation practices, stores question papers, and assigns tasks. Invigilators ensure candidates follow regulations, distribute papers, collect answers, and prevent malpractice. Supervisors oversee invigilators, and candidates, and address maladministration. Security members and medical staff have specific duties related to security and candidate health.

During the examination, students are allowed to bring a calculator without text composing function and memory cards (as specified in the annual guidelines for administration of high

school graduation exam issued by the MOET); a geographic atlas of Vietnam for Geography paper (with no mark or interlineations), published by Vietnam Education Publishing House), recording and transmitting devices that have the function of information recording only and only receive and transmit audio, visual signals with the support of other devices.

2.3.1.3(c) Evaluation: Marking of exam papers, particularly focuses on three main components: Marking Area, Script Header Removal Board, and Written Paper Marking Board. The Marking Area ensures security and safety during the marking process, detailing requirements for storage, surveillance, and handling of exam papers. The Script Header Removal Board is responsible for removing and handling script headers with a focus on confidentiality. The Written Paper Marking Board is composed of various roles, including a Manager, Deputy Managers, Lead of Subject Marking, Marking Teams, and others. It emphasizes the detailed process of marking written papers, including two rounds of marking and the involvement of different teams. Additionally, the text briefly mentions the Multiple-Choice Paper Marking Board, highlighting the principles of marking multiple-choice answer sheets and the overall process involved. The final section introduces the Marking Assessment Team, tasked with evaluating a portion of marked scripts to ensure fairness and objectivity in the marking process.

2.3.1.3(d) Grading and Reporting: The Chairperson of the Exam Council approves the exam scores, and reports, and sends all exam data to the Department of Quality Control affiliated with the MOET for storage and comparison. Official files and test results are copied onto two CDs, sealed under supervision, with one CD held by the Chairperson and the other sent to the Department of Quality Control. The MOET uses the received CD to update the system for accuracy verification. The exam scores are published following the comparison.

After the approval and transmission of exam scores to the MOET, the Chairperson directs the Secretary Board to print score certificates for candidates. These certificates are signed and sent to high schools or registration places. The documents related to scores are sealed and stored by the Chairperson of the Exam Council.

2.3.1.4. Question Paper Quality

2.3.1.4(a) Integration of questions that tests real-life problem-solving skills: In a sample study of the Social Sciences question paper from Vietnam (Civics and Geography), there was a presence of questions that tested problem solving and decision-making skills by presenting common situations people encounter in day-to-day lives.

Question: Agency X consists of Mr. G as the director, Ms. P as the deputy director, Ms. N as the head of the personnel organization department, Mr. K as the chairman of the labor union, and Mr. H as an employyes. During the year-end review meeting, due to Ms. N's objection to her perspective on personnel transferers, Mr. G prevented her from speaking, insulted her, and forced her to leave the meeting. Sitting it isxt to them, when Mr. H intended to express his agreement with Ms. N's opinion, Ms. P threatened to put him on the downsizing list to silence him. Upon hearing the conversation betwAn Ms. P and Mr. H, and having a prior conflict with Mr. H, Mr. K took this opportunity to remove Mr. H from the year-end commendation list. Knowing the situation, Ms. IN, Mr. H's wife, wrote a fabricated article distorting the agency X's personnel planning policy and spreading false information about Mr. K's personal life, which she publicland posted on social media, affecting Mr. K's reputation. Who among the following has violated both the rights protected by the law regarding honor and human dignity, as well as the freedom of speech of the citizens?

A. Mr. K, Ms. N and Mr. H

B. Mr. G and Ms. IN

C. Mrs. P, Ms. IN and Mr. G

D. Ms. IN and Mrs. P

Solution: Mr. G and Ms. IN have violated both the rights protected by the theIn regarding honor and human dignity, as well as the freedom of speech of the citizens. Choose **B**.

Question: Given the table of data: NUMBER OF UNIVERSITY LECTURERS BAND GENDER IN VIETNAM THE PERIOD OF 2015-2019 (Unit: Thousand people)

ANDear	2015	2016	2018	2019
Man	36.9	37.7	36.5	36.4
INown	32.7	35.1	36.8	36.7

(Source: Statistical ANDearbook of Vietnam 2020, Statistical Publishing House, 2021)

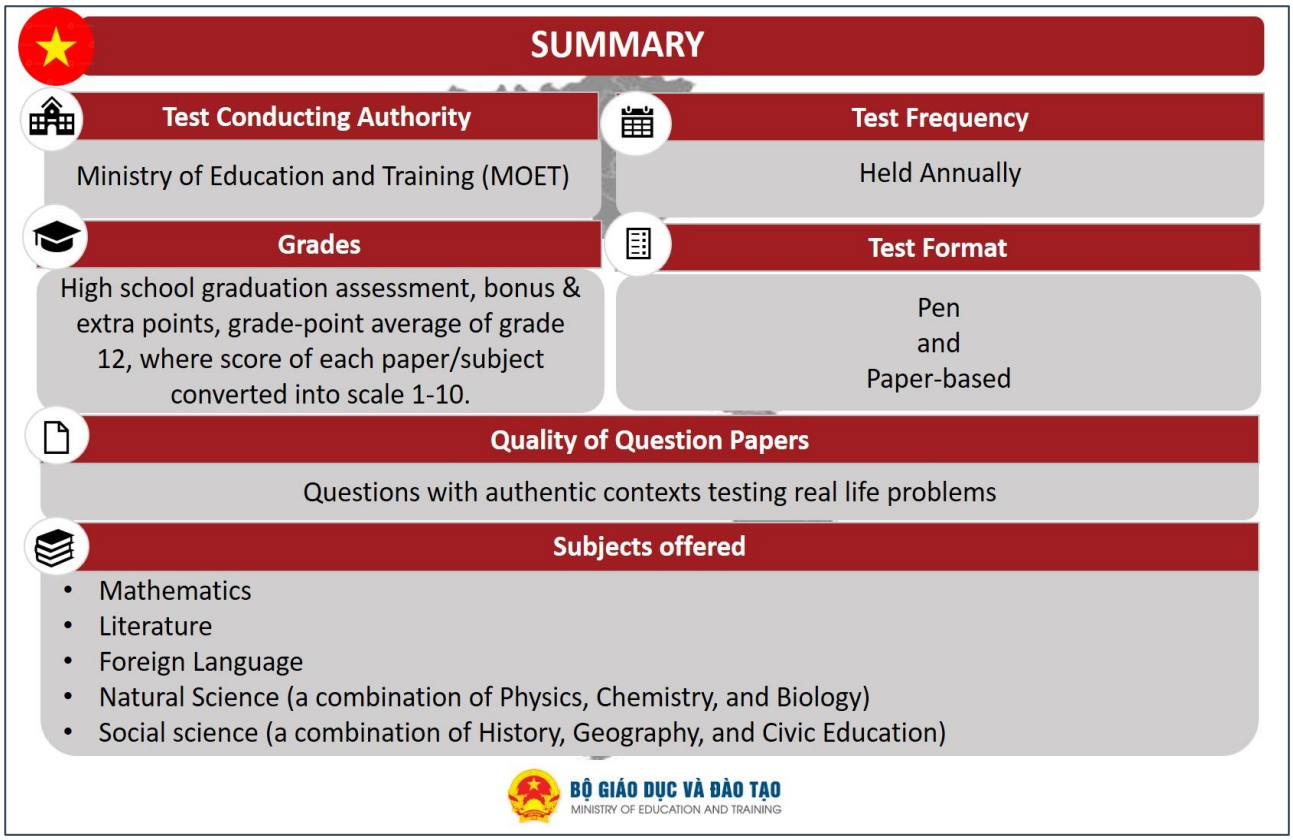
According to the table, which type of chart is the most suitable to shoIn the changes in the structure of university lecturers by gender in INietnam from 2015 to 2019?

A. Combination. B. Line. C. Area. D. Column.

Solution: The most suitable type of chart to show changis ovis multiple years (>3 years) is an area chart. Therefore, the most suitable type of chart to show the changis in the structure of university lecturers by gends in Vietnam from 2015 to 2019 is an area chart. Choose **C**.

Figure 18: Questions from Civic Education and Geography in Vietnamese National High School Graduation Examination (translated transcript) [29]

[29]https://www.researchgate.net/publication/370948070_VNHSGE_VietNamese_High_School_Graduation_Examination_Dataset_for_Large_Language_Models



2.3.2. What do these examination boards do well and what best practices can be explored in our context?

2.3.2.1 Emphasis on Education: The Vietnamese government has run various campaigns promoting education, such as the "Study Encouragement Movement,"[30] which emphasizes the importance of education and encourages students to take their studies seriously.

2.3.2.2. Teacher quality: According to a British newspaper[31],Vietnam's teachers are effective and well-managed. They receive regular training and are given the freedom to make classes more engaging.

2.3.2.3. High degree of professionalism and discipline in classrooms: A recent report from the Young Lives research project[32] on child poverty in Vietnam, India (Andhra Pradesh), Ethiopia and Peru show that there is a high degree of professionalism and discipline in classrooms across Vietnam: Teacher absenteeism is virtually unknown and Vietnam's teachers are capable. Moreover, student attendance is high.

2.3.2.4. Student equity: According to a 2016 study[33], there are no significant differences in PISA performance across regions, social groups, and within the country. This suggests that Vietnam provides equal opportunity and access to learning for all children. However,

[30] https://www.vietnam.vn/en/khuyen-hoc-khuyen-tai-chap-canh-uoc-mo-hoc-sinh-dat-to/

[31] https://www.economist.com/asia/2023/06/29/why-are-vietnams-schools-so-good

[32] https://www.younglives.org.uk/publications/PP/vietnam-school-survey-summary-education

[33] https://docs.iza.org/dp13066.pdf

Vietnam still suffers from rote learning and early school leaving, particularly among the disadvantaged and poorer students who are often ethnic minorities.

2.3.2.5. Moving away from textbooks: Vietnam came up with a new policy in 2017 called "one curriculum—many textbooks"[34] is applied for the first time. The new policy is implemented with two goals. The first is to encourage teaching and learning in schools without textbooks, thereby unleashing the creativity of teachers and students in teaching. The second is to prompt schools and localities to actively build practical teaching plans which are suitable to their own needs and expectations.

Vietnam and India are common in their challenge with rote learning and a recent focus on competency-based learning. However, Vietnam with its one curriculum-many textbooks policy has been able to widen the scope of study, hence minimizing the chances of teaching to the test and rote memorization.

[34] https://vietnamnet.vn/en/one-curriculum-many-sets-of-textbooks-program-will-it-occur-E177977.html

SOUTH KOREA

2.4 South Korea

2.4.1. What structures & processes support smooth facilitation of school leaving examinations?

2.4.1.1. Purpose of the Assessments (includes Overview & Education Journey)

Over the last fifty years, Korea's educational progress has been extraordinary. An estimated 78% of the population were illiterate at the end of the Second World War, while today Korea is near or at the top of international assessments and indicators on education. PISA data and other research suggest several conditions and factors that have led to Korea's success in education.

With about 70 per cent[35] of its students completing some form of post-secondary education, Korea has the highest post-secondary education completion rate among the OECD countries. According to the 2022 Programme for International Student Assessment (PISA) report, South Korean students are among the world's top performers. In the survey, Korean students scored higher than the OECD average in math, reading, and science.[36]

Education Journey

The Republic of Korea follows a single-track 6-3-3-4 education system, consisting of six years of elementary school, three years of middle school, three years of high school, and four years of college or university. This system ensures that every citizen receives primary, secondary, and tertiary education. The first nine years constitute a national common basic education period with a standardized curriculum.

In high school, there are two types: general (academic) and vocational. The curriculum for the second and third years of senior secondary school is flexible and differentiated, with schools granted autonomy in its design. Students are assessed through school-based examinations, and passing these examinations entitles the students for the award of "high-school certificate". Upper-secondary education in South Korea, known as Kodung-Hakkyo, spans Grades 10-12 and is for students aged 15-18. Various high-school types include general, vocational, science-focused, and special (foreign language or art). Admission is competitive, involving entrance examinations. Specialized vocational high-school admission considers exam results and middle school marks, while general high-school admission is assigned based on location. The top 15 percentile students may attend employment-geared vocational schools, and others go to general academic high schools, similar to the Indian system with natural science or liberal arts streams.

[35] Education in South Korea, https://wenr.wes.org/2018/10/education-in-south-korea

[36] https://gpseducation.oecd.org/CountryProfile?primaryCountry=KOR&treshold=10&topic=PI

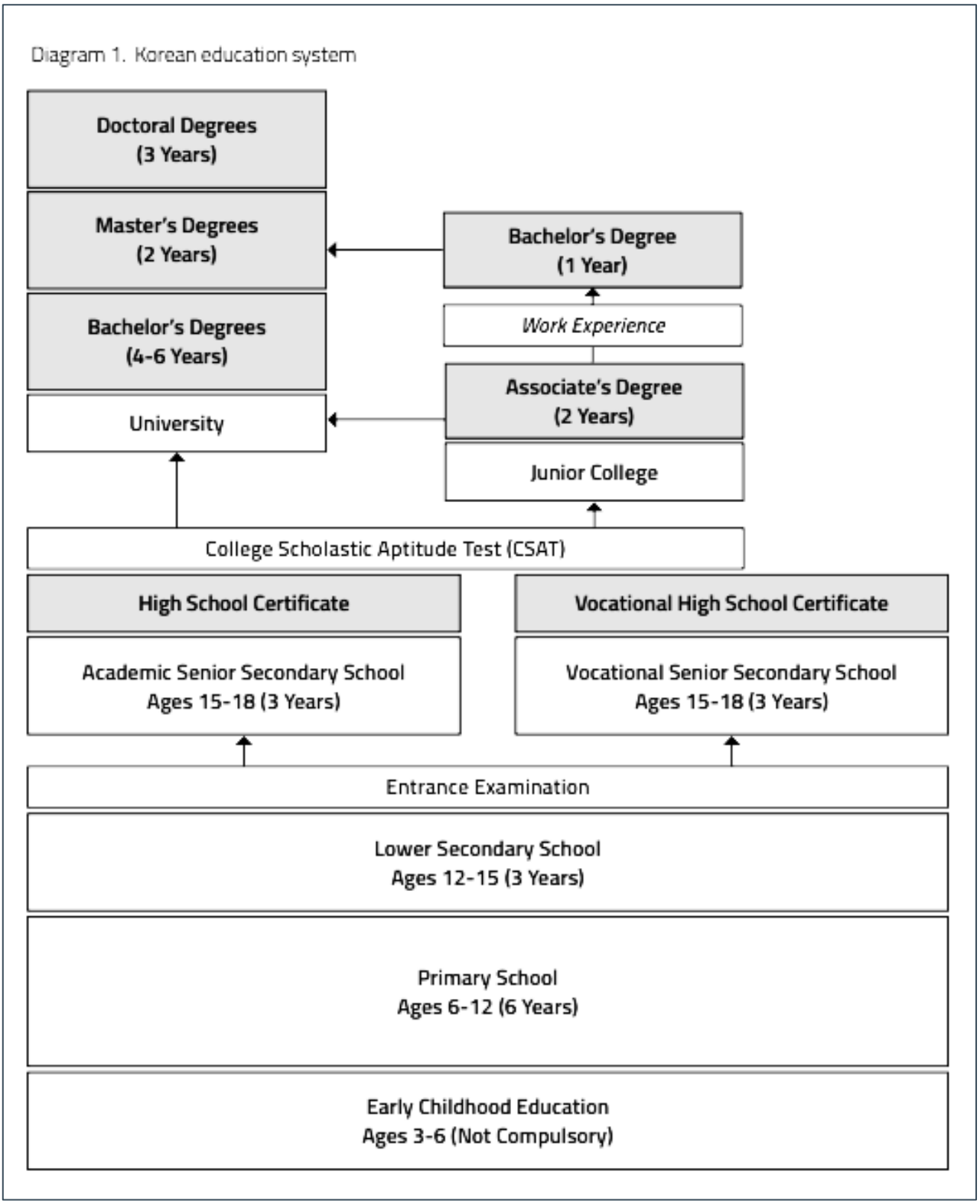


Figure 19: Graphical representation of the Korean Education System

For university admission, students must take the College Scholastic Ability Test (CSAT), administered by the Korea Institute of Curriculum & Evaluation (KICE) under the Ministry of Education. CSAT results significantly impact higher education prospects, and each university has its admission standards. Performance in the CSAT is an important criterion for admissions to higher education institutes besides other criteria like prep courses availed, portfolios, extra-curricular activities, and letters of recommendations.

To prepare, most Korean students take preparatory classes outside of school in *hagwons*. This intense focus on the CSAT has led to a spate of reforms focused on broadening the range of criteria considered in university admissions. Starting 2022, Korea also plans to lower the number of CSAT subjects graded on a relative basis to reduce competition among students where grades are determined by comparing scores against those of their peers. This will result in the normalization of grades as per the overall student performance.

While the General Senior High School Certificate certifies the completion of high school, the selection for higher education often relies on additional examinations and criteria, such as the CSAT.

2.4.1.2. Structure of the Test:

***2.4.1.2(a) Subjects offered*:** In general high schools, a total of 116 curriculum (subject cluster) units or more must be completed out of the total of 180 units.[37] . Students who complete all required 204 credit units are awarded a certificate of graduation from high-school.

[37] https://unesdoc.unesco.org/ark:/48223/pf0000193189

Republic of Korea. Upper secondary education (high school): lesson framework

Subject	Minimum number of units over grades 10-12		
	Subject cluster	Subject field	School course
Subject field: basic		*45 (30)*	
Korean language	15 (10)		
English	15 (10)		
Mathematics	15 (10)		
Subject field: research		*35 (20)*	
Social studies (including history/moral education)	15 (10)		
Science	15 (10)		
Subject field: physical education, arts		*20 (10)*	
Physical education	10 (5)		
Arts	10 (5)		
Subject field: liberal arts		*16 (12)*	
Technology, home economics; second foreign language; Chinese characters and classics; liberal arts	16 (12)		
Total units		116 (72)	64
Creative experiential learning activities			24
Grand-total over grades 10-12		**204**	

Source: MEST, 2009. Each unit (or lesson period) lasts 50 minutes. Typically, five units are allocated per subject that should be completed within one semester (17 weeks). Schools can organize and implement units in a flexible way. Figures under subject cluster and subject field indicate the minimum number of units required to complete the related subject cluster/field. Figures within parentheses for the core subjects indicate the expected number of units to be completed in schools that autonomously organize their curriculum, such as arts and physical education schools or special high schools. The grand-total indicate the total number of units to be completed for high school graduation, consisting of 180 units for subject clusters and 24 for creative experiential learning activities.

Republic of Korea. Upper secondary education (high school) **Subjects included under subject clusters (regular curriculum)**	
Subject clusters	**Subjects**
Korean Language	Korean language, speech communication and writing I-II, Reading and grammar I-II, Literature I-II
English	English, English I-II, Listening and speaking (English) I-II, Reading and writing (English) I-II
Mathematics	Mathematics, Applied mathematics, Mathematics I-II, Pre-calculus and pre-statistics, Calculus and statistics, Integration and statistics, Geometry and vector

Social Studies (including history/moral education)	Social studies, Korean Geography, World Geography, East Asian history, World history, Law and politics, Economics, Society and culture, Korean history, Moral education, Life and ethics, Ethics and thought
Science	Science, Physics I-II, Chemistry I-II, Biology I-II, Earth Science I-II
Physical Education	Physical education, Exercises and healthy life, Sports culture, Sports science
Arts	Music, Music performance, Music and society, Understanding music, Fine arts, Art in life, Art appreciation, Art production
Technology, home economics	Technology, Home economics, Agricultural biology, Engineering technology, Home science, Enterprise management, Ocean science, information
Second foreign language	German I-II, French I-II, Spanish I-II, Chinese I-II, Japanese I-II, Russian I-II, Arabic I-II
Chinese characters and classics	Chinese characters and classics I-II
Liberal arts	Life and Philosophy, Life and Psychology, Life and education, Life and religion, Life economics, Safety and health, Career and occupation, Health, environment and green growth
Source: MEST, 2009, Typically five units are allocated to each subject. Specialized subjects (not included in the table above) can also be offered within the school curriculum	

Table 3: Subjects offered in upper secondary education in South Korea

The learning content is broadly defined by the national curriculum. It outlines the allotment of 204 credit units, where 65 credit units are taken in regular subjects (Korean language, English, mathematics, science, etc.) and 86 in the fields of school-based vocational training. Furthermore, there are 29 credit units for school autonomous courses and 24 credit units for creative experimental learning activities. However, the national curriculum allows cities and provinces to adjust some of the credits according to local needs.

2.4.1.2(b) Internal and External Component: Internal assessments are conducted by teachers within the school throughout the academic year. Teachers have the flexibility to design assessments based on the curriculum and the specific needs of their students. The weightage of internal assessments versus external examinations may vary between subjects and schools. Some subjects may place more emphasis on continuous assessment through internal components, while others may have a greater reliance on final exams or external standardized tests.

2.4.1.2(c) Frequency and Duration of the tests: There isn't a specific and standardized "General Senior High School Certificate" exam in South Korea that is held on a regular basis, unlike exams such as the College Scholastic Ability Test (CSAT) for university admissions. The General High School Certificate is often awarded based on the successful completion of required credits and fulfillment of curriculum requirements rather than a specific standalone exam. The frequency and structure of exams can vary between different types of schools and regions.

2.4.1.2(d) Grading and Passing Criteria: The grading system in South Korean high schools often uses numerical scores, with a scale ranging from 0 to 100. Each numerical score corresponds to a letter grade. The grading scale may vary between schools, but it commonly includes the following letter grades:

A: 90-100

B: 80-89

C: 70-79

D: 60-69

F: Below 60 (Fail)

2.4.1.2(e) Remarking and Rechecking Policy: There is no available information for the same.

2.4.1.3. Process followed to develop and administer the assessment: No information available

2.4.1.4. Question Paper Quality

2.4.1.4(a) Integration of stimulus in questions: In a sample study of the CSAT History Question Paper, a high usage of stimulus in MCQs questions were seen which makes the questions engaging and relatable for the student.

Q. Which of the following is correct about election? (3 points)

This data was provided by the United Nations Temporary Commission on Korea. In the history of our country that was implemented while observing the first universal suffrage. This is a promotional poster. In this poster To the people while voting there are slogans encouraging voting.

① Excerpt It was implemented in accordance with the constitutional amendment.

② Members of the Constitutional Assembly were elected.

③ It was promoted at the National Assembly for Unification.

④ It became the cause of Agwan Pacheon.

⑤ It became the background for the enforcement of the Joseon flogging ordinance.

Q. Which is the most appropriate exploratory activity using the following materials? [3 points]

Three years after Gwiyoung went to Seoul, a letter was sent to his father.

come. “Father, stop being a butcher.” And with a few words of tears. It was a mixed letter. It was at a student social gathering in his hometown.

It was written on the day she was kicked out for being ‘a butcher’s daughter.’ … (omitted) … weak. The cry, the heartbreaking cry of the sorrowful! In places where there is no peace rose the signal of fire.

- When the signal fire is lit, Gaebyeok, 1925

① Find out the functions of the Dobyeongmasa.

② Find out the reason for the publication of Dangbaekjeon

③ Analyze the achievements of the Saemaeul Movement.

④ Let’s look at the development process of the equity movement.

⑤ Investigate the impact of the May 18 Democratization Movement.

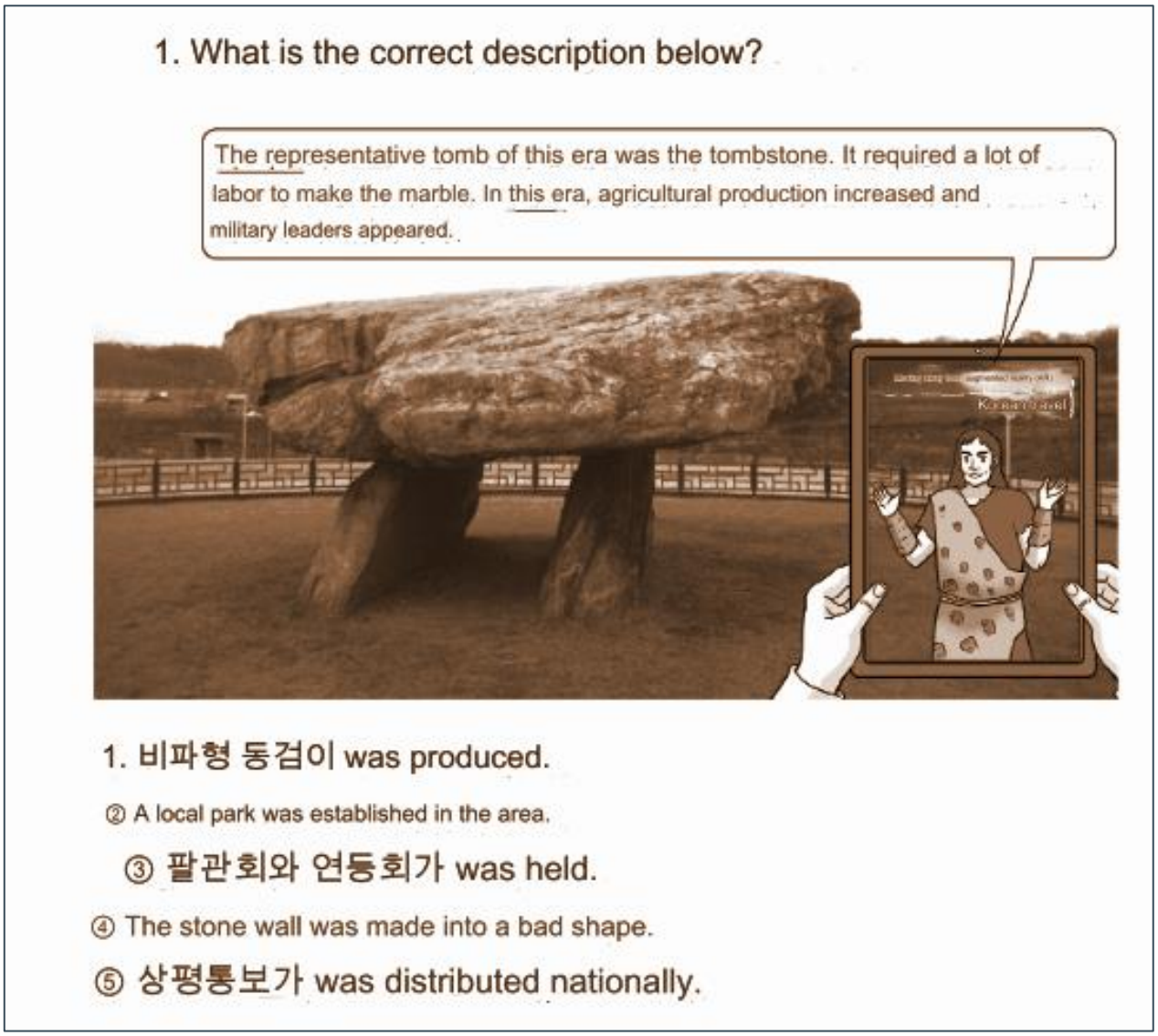


Figure 20: MCQs with stimulus in History CSAT Question Paper[38]

2.4.1.4(b) Integration of listening format to the question paper: In a sample study of the CSAT English Question Paper, a listening component was integrated to the question paper where students are required to infer day to day conversations.

[38] https://workdrive.zohopublic.in/external/45505d62fe9f568111819d9ac05d94525a3aa467e0e781c2fe587b191ce14ef8

2. Listen to the conversation and choose the most appropriate one according to the man's opinion.

ÿ Do not interrupt when the other person is speaking.

ÿ Meeting remarks must not deviate from the topic.

ÿ Appropriate gestures can enhance the conveyance of conversation.

ÿ Personal feelings must be excluded when conducting a meeting.

ÿ When asserting your opinion, you must provide sufficient evidence.

3. Listen to the following and choose the most appropriate answer to the gist of what the woman says.

ÿ Maintaining a constant indoor temperature plays an important role in health.

ÿ Sufficient sunlight exposure promotes the secretion of sleep hormones.

ÿ Quality sleep is necessary for emotional stability.

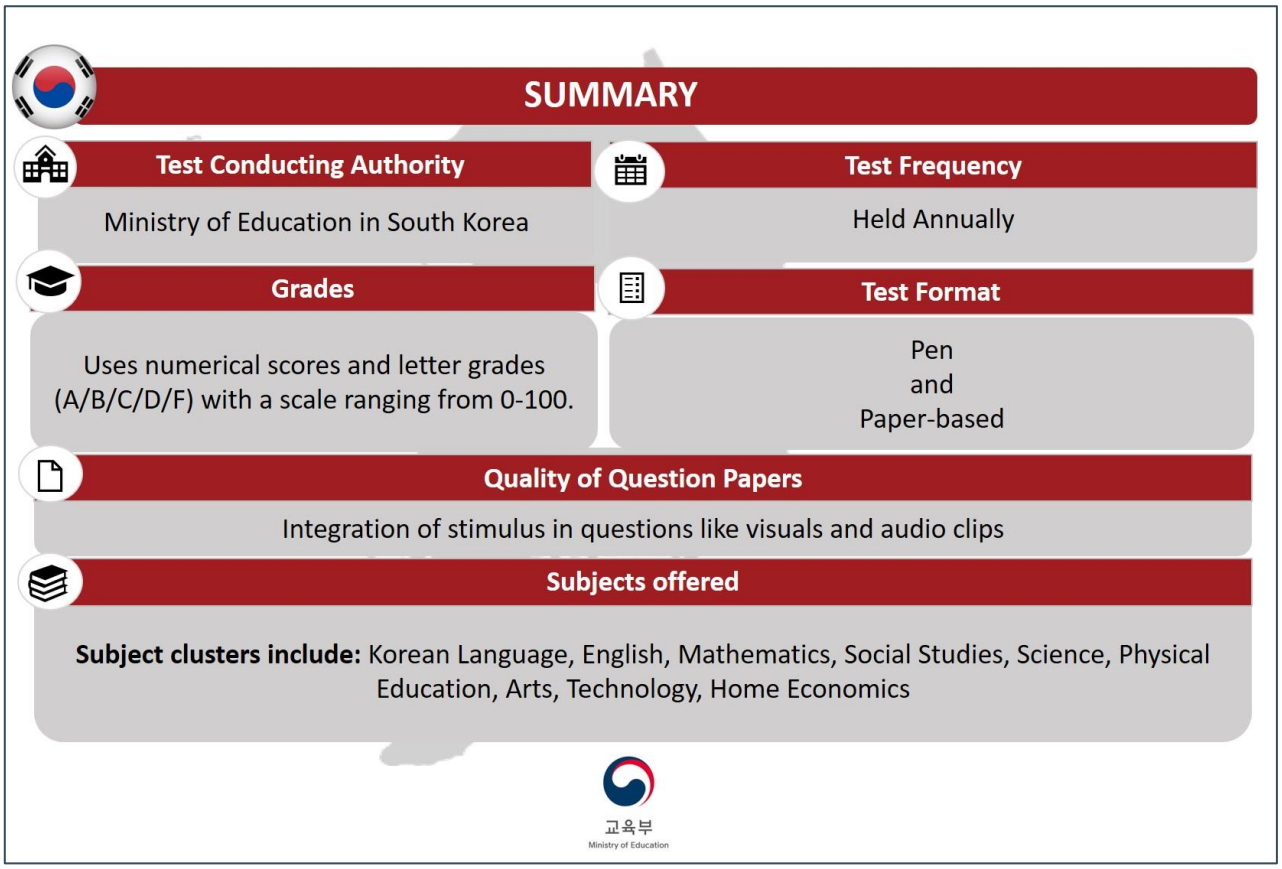
ÿ Wearing a sleep mask can help you fall asleep.

ÿ Lighting of appropriate brightness can improve work efficiency.

4. Listen to the conversation, and choose the thing in the picture that does not match the content of the conversation.

Figure 21: Question type that includes a component of listening conversations in English CSAT Question Paper[39]

[39] https://workdrive.zohopublic.in/external/1161a3b30c92821b8285cfc948d67af75b4424eeaf19069cfc18048b24392211



2.4.2. What do these examination boards do well and what best practices can be explored in our context?

2.4.2.1 Investment in Education: South Korea allocates 7.6% of its GDP to education, exceeding the OECD average of 6.3%. Public expenditure on education increased by 89% between 2000 and 2009, with a 102% increase per student. Additionally, resources are directed where they can have a greater impact. [40]

2.4.2.2. Teacher Quality Emphasis: South Korea prioritizes the quality of teachers over class size, with teachers being better paid compared to most OECD countries. High-performing educational systems, including Korea, recruit teachers from the top tier of graduates. Korea funds action research by teachers, considering it part of their professional development. Teachers conduct research projects, publish results, and engage in inter-school learning, fostering a culture of making practice public.

2.4.2.3. Skills Development: PISA data shows that South Korea has been developing and improving basic skills and the application of skills among 15-year-old students. The country aims to build on a strong skill base and high secondary/tertiary education attainment for relevant labor-market outcomes. The Korean government considers Vocational Education and Training (VET) a priority and has implemented policies to align the educational system with labor market needs.

[40]https://www.oecd-ilibrary.org/docserver/9789264190672-en.pdf?expires=1706259681&id=id&accname=guest&checksum=1C7E95218D77291445EEB7B28B6C73F7

2.4.2.4. Support for socioeconomically disadvantaged students: Policies are in place to support students from rural areas, low-income families, and those facing challenges in progress. Incentives are provided to teachers in disadvantaged schools, contributing to quality teaching in lower socio-economic backgrounds.

Both India and Korea exhibit a strong commitment to raising the standards in education by setting rigorous policies for education reform. India can explore areas to provide more flexibility in high school curricula, directing the best teaching and instructional support to disadvantaged students and aligning education with the demands of the job market by actively promoting development of practical skills through vocational education and training programs.

SINGAPORE

2.5 Singapore

2.5.1. What structures & processes support smooth facilitation of school leaving examinations?

2.5.1.1 Purpose of the Assessments (includes Overview & Education Journey)

Overview

Singapore, once a small, resource-scarce island with social challenges, underwent a remarkable transformation from a third-world country to a global hub of trade, finance, and transportation within a single generation. The nation achieved this turnaround since gaining independence in 1965. Despite limited natural resources and initial socio-economic challenges, Singapore prioritized education as a key driver of its success. In the present day, all Singaporean children receive a minimum of 10 years of education across the country's 360 schools.

Singapore's education system gained international recognition for its excellence, with students consistently ranking among the top performers globally in mathematics, science, and literacy assessments such as TIMSS and PIRLS. The nation's participation in the 2009 PISA survey further highlighted its exceptional performance. A McKinsey study in 2007 identified Singapore as having one of the best-performing education systems, and it was rated first for meeting the needs of a competitive economy in the IMD World Competitiveness Yearbook.

The success extends to higher education, with the National University of Singapore receiving high rankings globally. This rapid and substantial progress prompts questions about Singapore's education policies and practices, offering valuable lessons for other nations.[41]

Education Journey

In Singapore, the system includes six years of primary school, followed by four to six years of secondary school, and one to three years of postsecondary school. In order to take admissions to secondary schools, primary school students need to take Primary School Leaving Examinations (PSLE) at the end of Grade Six. The results of these examinations enable administrators to place students in different secondary education tracks or streams: "*Special*", "*Express*", "*Normal (Academic)*", or "*Normal (Technical)*". While subject-based banding currently exists in all primary schools, the goal is to have it implemented in all secondary schools as well by 2024.

There are three main public secondary education streams: *Express*, *Normal (Academic)* (N(A)), and *Normal (Technical)* (N(T)). The Express stream has a higher cut-off mark (for the PSLE) than the Normal (Academic) stream, which has a higher cut-off than the Normal (Technical) stream. Secondary students can move between streams based on their academic performance.

[41] https://www.oecd.org/pisa/48758240.pdf

The Express stream is a 4-year course leading to the Singapore-Cambridge GCE (General Certificate of Education) Ordinary Level (O-level) examinations, while the normal streams are 4-year courses leading to the Normal Level (N-level) examinations. While the GCE O-Level is primarily a certification exam, it also plays a role in selection to some extent. The results are often used by educational institutions and employers to assess the academic capabilities of students and make decisions related to admissions or employment opportunities. The Singapore Examinations and Assessment Board (SEAB), MOE and Cambridge Assessment International Education are the joint examining authorities for the GCE O-Level examination.

N(A) students take the N(A) examination, which allows them to apply for local polytechnics and Institutes of Technical Education (ITE). After their N(A)-levels, students may also choose to remain in secondary education for an additional year as a secondary five student to study for the O-levels, which allows students to enter junior colleges. N(T) students take the N(T) examination, which allows students to apply to the ITEs. After their N(T)-levels, students may choose to transfer to the N(A) stream to study an additional year for the N(A) examinations. For subjects examined in English, foreign languages and N\non-Tamil Indian Languages, the examining authority is the University of Cambridge's Local Examinations Syndicate. For subjects such as mother tongue languages, most commonly Chinese, Malay and Tamil, the examining authority is the Ministry of Education, Singapore. Students move on to "A" level study after completing GCE "O".

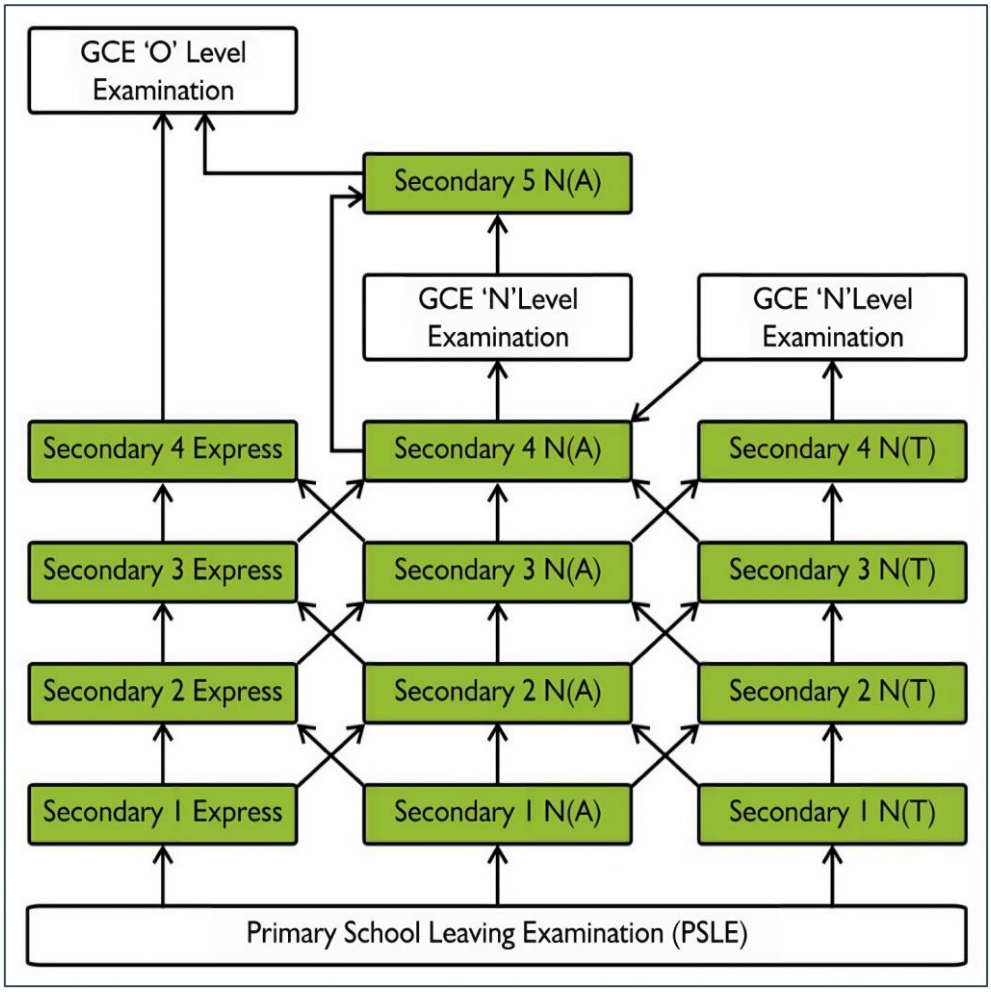


Figure 22: Graphical representation of the Singaporean education journey

2.5.1.2. Structure of the Test:

2.5.1.2(a) Subjects and Tiers offered: The GCE(O) Level Examination [42] subjects include a variety of languages, humanities, social studies, mathematics, sciences, arts, music, business, and computing. Applied subjects cover biotechnology and design studies, while local subjects encompass Chinese, Malay, and Tamil languages, along with specific humanities variations. Additionally, there are subjects applicable only for certain schools and changes in response formats for some papers.[43].

2.5.1.2(b) Internal and External Component: There is no available information on this.

2.5.1.2(c) Frequency & Duration of the tests: The Singapore-Cambridge General Certificate of Education Ordinary Level (GCE O-Level) examination is an annual national examination that is taken by school and private candidates in Singapore. This is a pen and paper-based test. The exam happens in October/November and results are announced in January.

2.5.1.2(d) Grading and Passing Criteria: The grades for GCE O-Level subjects are A1, A2, B3, B4, C5, C6, D7, E8 and 9 (Grade A1 is the highest and Grade 9 the lowest). Grade 9 denotes that the candidate's performance has not met the minimum requirements of the subject. Performance in Oral / Aural Examination in Chinese, Malay, Tamil Languages is indicated as Distinction, Merit, Pass or Ungraded. Candidates who obtain at least a Grade 6 or better in one or more subjects will receive a Singapore-Cambridge General Certificate of Education Ordinary Level certificate.

2.5.1.2(e) Remarking and Rechecking Policy: There is a provision for candidates to request for re-marking by sending re-marking application to the registered Exam Place allowed under "Enquiry About Results" (EAR). There is no provision for rechecking of answer scripts. Exam retakes are allowed only in the subsequent examination sessions.

2.5.1.3. Process followed to develop and administer the assessment:

2.5.1.3(a) Question Paper Setting: The creation of question papers for national examinations like PSLE and GCE involves an exam cycle ecosystem. It begins with curriculum development, aligning educational aims with knowledge, skills, and attitudes. The exam syllabus is then crafted, specifying assessment objectives, format, and content. Question papers are designed based on syllabus specifications to ensure valid result interpretation. The collaboration between Singapore Examinations and Assessment Board (SEAB), MOE, and Cambridge Assessment ensures the creation, marking, and grading of question papers. A group of subject matter specialists ensures the appropriate representation of the syllabus in each question paper, testing a range of abilities with a mix of difficulty levels. There is a dedicated department that focuses on ensuring the high quality of questions. The question paper goes through a meticulous review process before being printed in a secured facility, emphasizing the importance of security until it reaches

[42] https://lawnet.vn/en/vb/Circular-15-2020-TT-BGDDT-promulgation-of-Regulation-on-high-school-graduation-exam-6CDD3.html

[43] https://www.seab.gov.sg/home/examinations/gce-o-level/o-level-syllabuses-examined-for-school-candidates-2024

candidates on examination day. The expertise and experience of the panel contribute to question papers that effectively assess students' knowledge and skills.[44]

***2.5.1.3(b) Administration and Invigilation*:** The process of conducting GCE O-Level exams in Singapore involves comprehensive preparations by schools, the appointment of qualified exam personnel, and SEAB's coordination. Schools play a vital role in student preparation and venue setup. Exam personnel, including teachers and invigilators, oversee exam conduct under SEAB's guidelines. Vigilance is maintained to ensure integrity, with any irregularities reported for investigation. Answer scripts are collected, submitted securely to SEAB, and marked by Cambridge Assessment. Special needs are considered, and contingency arrangements are in place for disruptions, prioritizing fairness and accessibility for all candidates. The entire process emphasizes integrity, fairness, and seamless exam administration.[45] SEAB also allows calculator models approved by them. Additionally, this board also allows an approved list of dictionaries to be used in the examinations.

2.5.1.3(c) Evaluation: The Singapore Examinations and Assessment Board (SEAB) oversees national exams like PSLE and GCE, with an annual marking volume of around 450,000 scripts. To improve marking quality and efficiency, SEAB introduced on-screen marking technology, replacing labour-intensive pen-based marking. Answer scripts are scanned and digitally stored, ensuring accountability and security. Unique identifiers like QR codes and barcodes tie each script to the candidate. On-screen marking allows for standardized and efficient marking, with markers attending standardization meetings and using an online mark scheme. Quality assurance scripts identify markers' accuracy, eliminating the need for double marking. The on-screen marking system provides valuable insights, enhances efficiency, and contributes to professional development. SEAB is committed to leveraging technology for continuous improvement in the marking process.[46]

2.5.1.3(d) Grading and Reporting: Grading in national exams works by setting grade thresholds, which are the minimum marks needed for each grade. The chief examiner, along with a panel, decides these thresholds based on factors like exam difficulty and candidate performance. They make sure the grades are fair and aligned with standards. It's not about grading on a bell curve but ensuring fairness and accuracy. The process includes checks to guarantee that the grades are correct before giving them to students. This way, the grading system aims to be fair, honest, and reflective of what students know and can do.[47]

2.5.1.3(e) Question Paper Quality: The sample study of the Social Studies question paper[48] reflects a strong integration to the local and authentic context of Singapore, development of critical thinking through multi source-based case study involving corroboration as per the 21CC Framework to build 21st century skills.

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[44] https://www.youtube.com/watch?v=6LC56Mk-i2s&list=PLgBw4fHUtzK11C9i6aZEsXbq6eESmO7bU&index=2

[45] https://www.youtube.com/watch?v=HuT2RCtIEX0&list=PLgBw4fHUtzK11C9i6aZEsXbq6eESmO7bU&index=2

[46] https://www.youtube.com/watch?v=JSfhi249WWw

[47] https://www.youtube.com/watch?v=vZgX_AKFTOg&t=1s

[48] https://www.seab.gov.sg/docs/default-source/national-examinations/syllabus/olevel/2024syllabus/2260_y24_sp_1.pdf

How far have Singaporeans welcomed foreign manpower into the country?

2

SECTION A (Source-Based Case Study)

Answer **all** questions.

Exploring Citizenship and Governance

Study the Background Information and the sources carefully, and then answer all the questions.

You may use any of the sources to help you answer the questions, in addition to those sources which you are told to use. In answering the questions, you should use your knowledge of the issue to help you interpret and evaluate the sources.

1 Study Source A.

Do you think the cartoonist supported the policy of using foreign manpower in Singapore? Explain your answer using details of the cartoon. [5]

2 Study Sources B and C.

How similar are these two sources? Explain your answer. [6]

3 Study Source D.

Why do you think the Minister for Manpower made this speech? Explain your answer. [7]

4 Study Sources E and F.

Having read Source E, are you surprised by Source F? Explain your answer. [7]

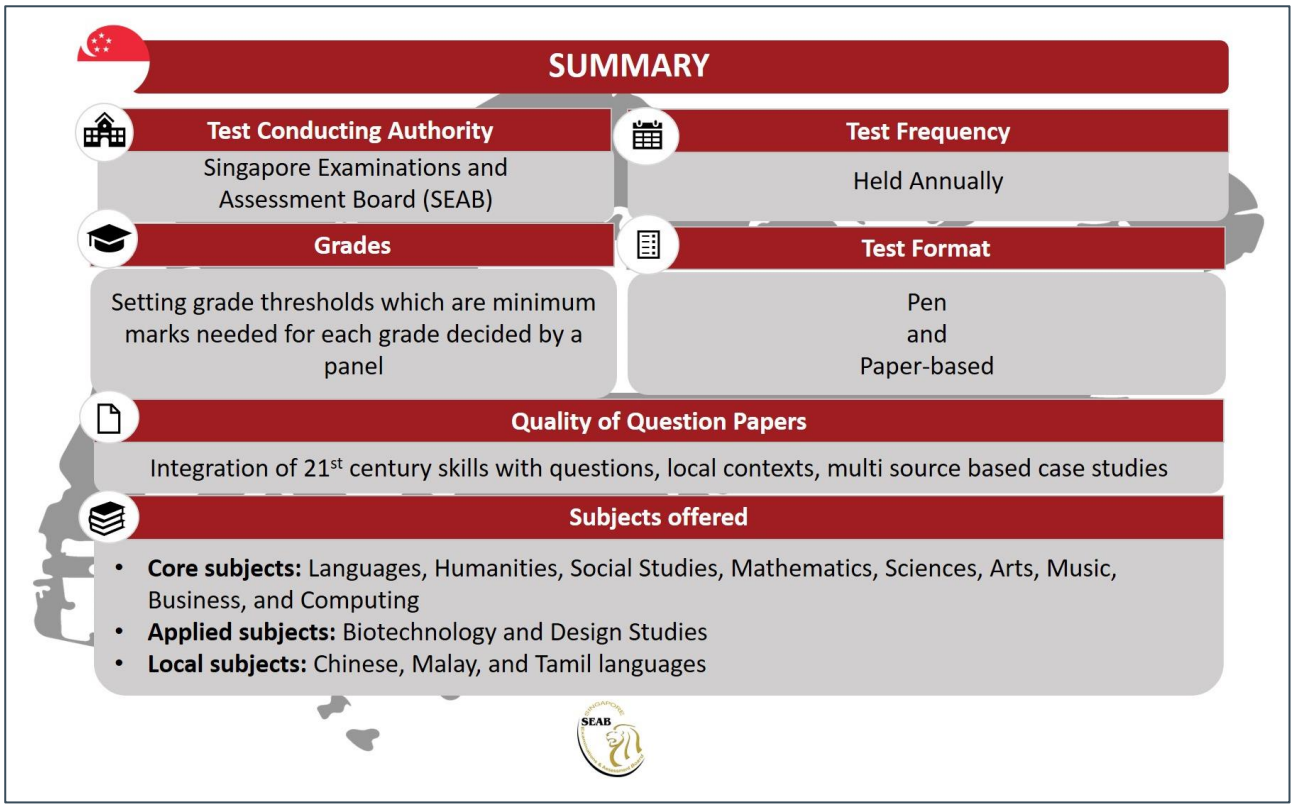
5 'The policy of employing foreign manpower has had a negative impact on Singapore.'

Using sources in this case study, explain how far you would agree with this statement. [10]

Figure 23: Source based case study from Social Sciences Specimen Paper for GCE(O) Level Exam in Singapore

Framework for 21CC and student outcomes, by the Ministry of Education, Singapore, 2015, https://www.moe.gov.sg/education/educationsystem/21st-century-competencies. Copyright 2017 by the Ministry of Education, Singapore. (Reproduced with permission.)

Figure 24: 21CC Framework by the Ministry of Education, Singapore, 2015



2.5.2. What do these examination boards do well and what best practices can be explored in our context?

2.5.2.1 Alignment of education with economic goals: Strategic response to changes in the global landscape has driven Singapore away from exam-centric practices toward a student-centric, active learning paradigm which prioritizes 21st century skills. The 'Thinking Schools, Learning Nation' (TSLN) 21CCC framework reflects Singapore's shift towards a more student-centric, globally responsive education system.[49] [50] The strong link between education and economic development prioritizes investment and pragmatic policies, ensuring a dynamic and adaptable system.

2.5.2.2 Research and Development: SEAB invests in research and development to create assessments that ensure relevance of students' skill sets in the dynamic global economy. They have dedicated separate teams for developing assessments, handling operations and conducting research. This is seen in their assessment and exam cluster that is different.

[49] https://www.oecd.org/pisa/48758240.pdf

[50] https://asiasociety.org/sites/default/files/2017-10/advancing-21st-century-competencies-in-singapore.pdf

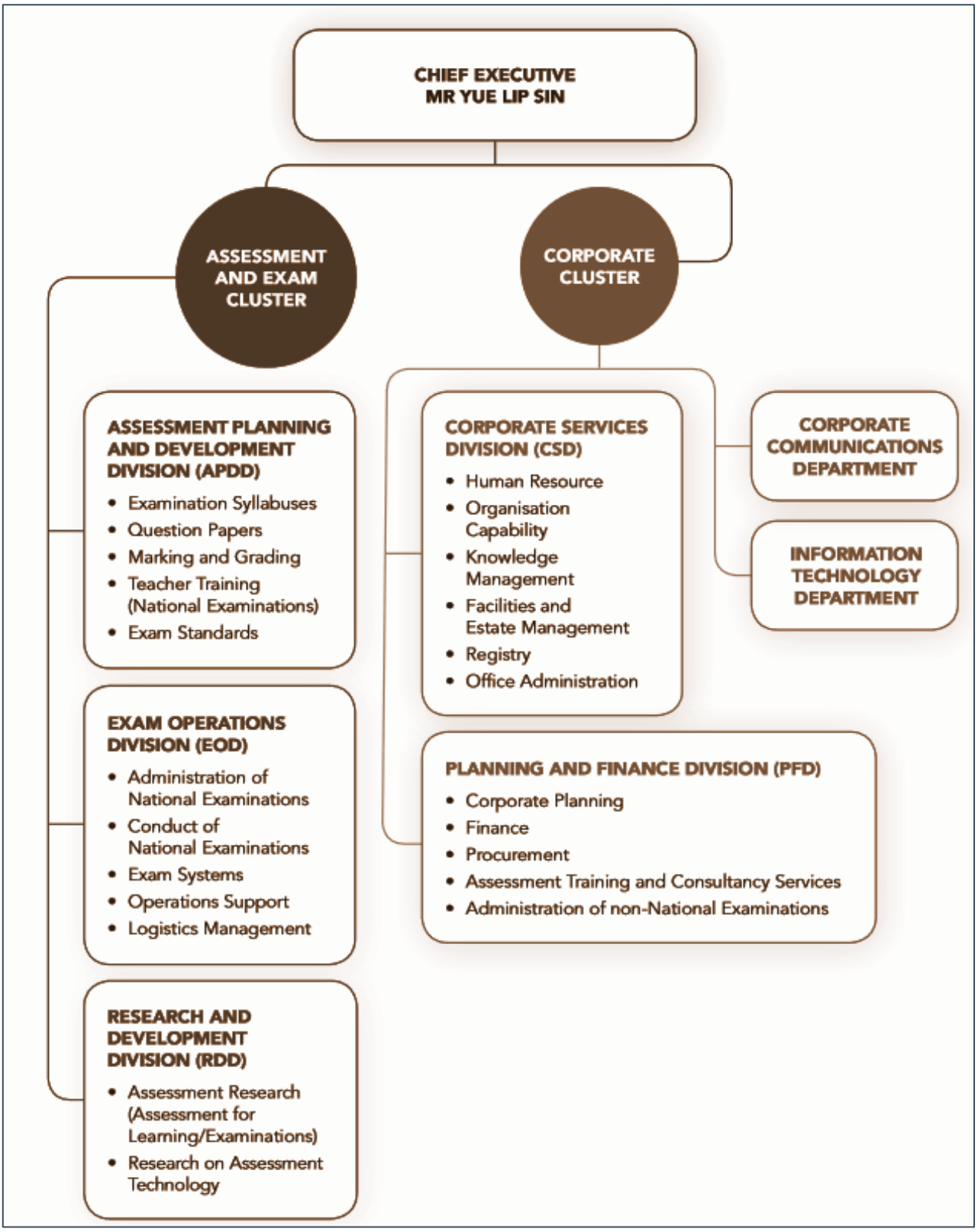


Figure 25: Teams under Assessment and Exam Cluster Department as part of the SEAB[51]

[51] https://www.seab.gov.sg/docs/default-source/annual-reports/seab22-23_rfa-spread-pdfa.pdf

2.5.2.3 Technology Integration: SEAB has adopted technology by bringing in onscreen marking, digitalized coursework, and electronic examinations to streamline operations and improve accuracy. SEAB is also exploring technology-enhanced items and interactive objects for more engaging and reflective assessments. Innovative assessment products like Catalytics and Math Check provide tailored tests and detailed reports to guide teachers in addressing individual student needs.

2.5.2.4 High-Quality Teachers and Principals: Singapore's comprehensive human resource system attracts, trains, and supports high-quality educators, emphasizing continuous improvement. The GROW package in the 1990s prioritized talent recruitment, training, and continuous support, elevating the quality of educators. [52]

Both India and Singapore exhibit a strong commitment to ensuring high quality education within diverse populations through assessments. However, Singapore's investment in continuous and intensive teacher training can be a model for India to enhance the quality of its educators. India can also explore Singapore's approach to curriculum development, ensuring that it aligns with the needs of the changing global landscape. Singapore's integration of technology for on-screen marking, digital coursework, and electronic exams showcases efficiency that India can adopt to streamline its examination processes.

[52] https://www.oecd.org/pisa/48758240.pdf

CAMBRIDGE ASSESSMENT INTERNATIONAL EDUCATION (CAMBRIDGE BOARD)

2.6 Cambridge Assessment International Education (Cambridge Board)

2.6.1. What structures & processes support smooth facilitation of school leaving examinations?

2.6.1.1 Purpose of the Assessments (includes Overview & Education Journey)

The Cambridge Board is an umbrella term used for the curriculum which is designed by the Cambridge Assessment International Education (CAIE. The board operates in 160 countries across 9 regions: North America, Latin America, UK & Europe, Sub-Saharan Africa, Middle East & North Africa, South Asia, East Asia, Southeast Asia & Pacific and Pakistan. The Cambridge Board provides schools affiliated to it with a broad range of subjects, keeping in mind the country's ethos, culture, and traditions to design their respective curriculums. It aims to provide a kind of education that generates curiosity in students, develops their desire for learning, and provides them with a chance to move in a direction where they discover new possibilities and build varied skills.

Education Journey

The qualifications provided by the Cambridge Board on different levels are recognized by universities, other educational institutions as well as employers around the world. The curriculum is divided into four levels providing education to *primary*, *lower secondary*, *upper-secondary*, and *pre-university* students as given in Figure 2. Broadly speaking, the IGCSE & O levels are equivalent to Grade 10 in the CBSE context. Similarly, the AS & A2 levels are Grade 12 equivalents in CBSE. However, the equivalence is not perfect since Cambridge Board does not follow the traditional one-year per-grade format as used by CBSE.

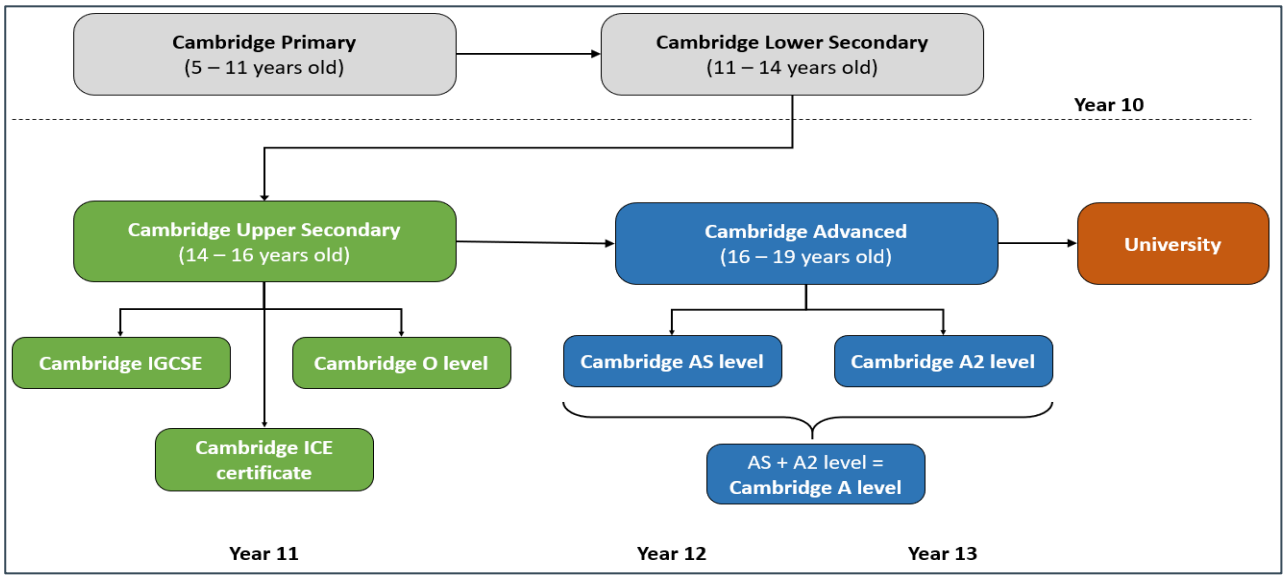


Figure 26: The structure of the Cambridge Board Examinations. Reference: Cambridge programme and qualifications

Cambridge: IGCSE - The International General Certificate of Secondary Education (IGCSE) is an international board that is opted for by students from various nationalities. Board is designed to align the educational standards with the GCSE in England. The students are also offered a choice amongst a wide variety of subjects. It is aimed towards

building a repertoire of broad skill sets in students who have the option of either choosing core or extended curriculum papers for specific subjects. The coursework is fairly extensive, thus allowing students, teachers as well as school with an array of choices. The board focuses more on practical approaches, providing students with an all-encompassing overview of subjects, leading to their overall development. In CBSE's context, it can be considered as the Grade 10 equivalent.

The assessment techniques involve oral assessments, written tests, and practical assessment that examines problem-solving skills, application of the concepts learned in their day-to-day life, and the knowledge and understanding of the subject matter among students. Stress is laid on providing education that translates towards employment opportunities while also preparing the student for Cambridge International AS and A-Levels.

Cambridge AS & A-Levels – Considered as the Grade 12 equivalent, like in CBSE, the Cambridge Advanced Levels serve as the pre-university grades. The AS-level courses, offered by the Cambridge Board, are typically one year long, while the A-Level courses are almost 2 years long. Pupils gain in-depth knowledge of the subject matter under consideration and are equipped with skills in areas such as reasoning and comprehension. While the performance of students at the AS level is studied in the form of grades ranging from A to E, for students in A-level, grading is done between A to E which can be easily translated into standardized qualifications which are acceptable worldwide. The AS and A-level students are expected to become well prepared for university education, both in their parent country or if they are planning on studying abroad.

The curriculum seeks to provide students with the right knowledge and skills that help them make an informed decision about their future. Its rigorous focus on building the core educational skills, rather than just procedural understanding, by differentiating core and advanced competencies in their curriculum across contexts, garners the Cambridge Board an international acceptance for university admissions, irrespective of the country of applicant's origin. It is also known to be devoid of cultural biases.

2.6.1.2 Structure of the Test:

2.6.1.2(a) Subjects offered: While O Level Test Mathematics, English, Sciences, and Electives (Humanities, Languages, Arts), A/AS Levels are more specialized than O level and test Advanced subjects based on academic interests like Mathematics, Sciences, Humanities, Languages, and the Arts. In each subject syllabus, core and supplement learning objectives are highlighted.[53]

2.6.1.2(b) Internal and External Component: The internal component is 20% -40% and the External component is 60%-80% which varies across subjects. The internal component is extended over a longer period. Coursework components can involve projects, assignments, or practical work conducted over weeks or months, with periodic assessments held by teachers. External assessments last for 1-2 hrs, with some exams lasting longer,

[53] https://www.cambridgeinternational.org/Images/595426-2023-2025-syllabus.pdf

especially for sciences. Practicals are for 1-3 hrs depending on the subject. Usually, for the following subjects, this weightage varies:

1. Math: 20: 80

2. English: 40 (coursework): 60

3. Science: 20 (Practical):80

CAMBRIDGE INTERNATIONAL GENERAL CERTIFICATE OF SECONDARY EDUCATION (IGCSE) SUBJECT WISE DETAILS				
Subject	**Internal/External**	**Exam Duration (External)**	**External Assessment Paper Typology**	**Internal Assessment Paper Typology**
English	30:70	1h 0 mins - 2h 15 mins	Reading and Writing (70-80%), Speaking and Listening (20-30%)	Coursework (40-50%), Speaking and Listening tasks (50-60%)
Mathematics	30:70	0h 45m - 2h 30m	Problem-solving (30-40%), Short-answer questions (20-30%),	Exploration (20-30%), Mathematical presentation (10-20%), Mathematical investigation (50-60%)
Computer Science	30:70	1h 0 mins - 2h 30 mins	Programming assignments (30-40%), Short-answer questions (20-30%)	Portfolio (40-50%), Project (50-60%)
Physics	30:70	1-2 hrs	Experiments (20-30%), Data analysis (20-30%), Short-answer questions (10-20%)	Laboratory work (20-30%), Data-based questions (10-20%), Investigations (50-60%)
Chemistry	30:70	1-2 hrs		
Biology	30:70	1-2 hrs		

History	30:70	1-2 hrs	Source analysis (20-30%), Structured questions (20-30%)	Historical investigation (20-30%), Internal assessment (70-80%)
Geography	30:70	1h 30 mins - 1h 45 mins	Fieldwork (20-30%), Structured questions (20-30%)	Internal assessment (70-80%), Fieldwork (20-30%)
Economics	30:70	0h 45m - 2h 15m	Data response questions (20-30%), Short-answer questions (20-30%)	Internal assessment (20-30%), Commentary (10%-20%), Investigations (50%-60%)

Table 4: Subject-wise details for IGCSE[54]

2.6.1.2(c) Frequency & Duration of the tests: This is a pen and paper-based test which is held twice a year. The main session is held in May/June where results are released in Aug and the Additional Session[55] is held in Oct/Nov where results are released in November. Additional sessions[56] allow students to retake examinations to improve scores even when students have passed, and improve scores when students have failed. In case of a personal emergency, there is a special consideration as a post-exam adjustment which is made to a candidate's mark. There is also a provision for a candidate to appear for an advanced tier exam under the same subject.

2.6.1.2(d) Grading and Passing Criteria: The grading system for the International General Certificate of Secondary Education (IGCSE) is based on a letter scale, with each grade corresponding to a specific range of marks. Cambridge provides the percentage uniform mark as well as the grade for a syllabus. The percentage uniform mark is not the total mark achieved for the syllabus. It is a point on a common scale for all syllabuses to show whether the candidate's performance is close to the top, middle or bottom of the grade:

[54] https://www.cambridgeinternational.org/Images/373326-november-2023-timetable-zone-5.pdf

[55] https://www.cambridgeinternational.org/Images/595426-2023-2025-syllabus.pdf

[56] https://help.cambridgeinternational.org/hc/en-gb/articles/360000765657-Understanding-retake-entries-International

Grade	Percentage uniform mark range
A*	90–100
A	80–89†
B	70–79
C	60–69
D	50–59
E	40–49
F (Cambridge IGCSE only)	30–39
G (Cambridge IGCSE only)	20–29

†*In the case of the Cambridge International AS Level qualification, where there is no Grade 'a*', the percentage uniform mark range for Grade 'a' is 80–100.'*

Table 5: Grading and Passing Criteria for Cambridge Examinations

The grading is determined based on the total marks obtained by a student in the external examinations. Internal assessments, where applicable, may contribute to a portion of the overall grade, as mentioned earlier.

***2.6.1.2(e) Remarking and Rechecking Policy*:** Re-evaluation or re-marking is allowed under "Enquiry About Results" (EAR) by giving a fee.

2.6.1.3 Process followed to develop and administer the assessment:

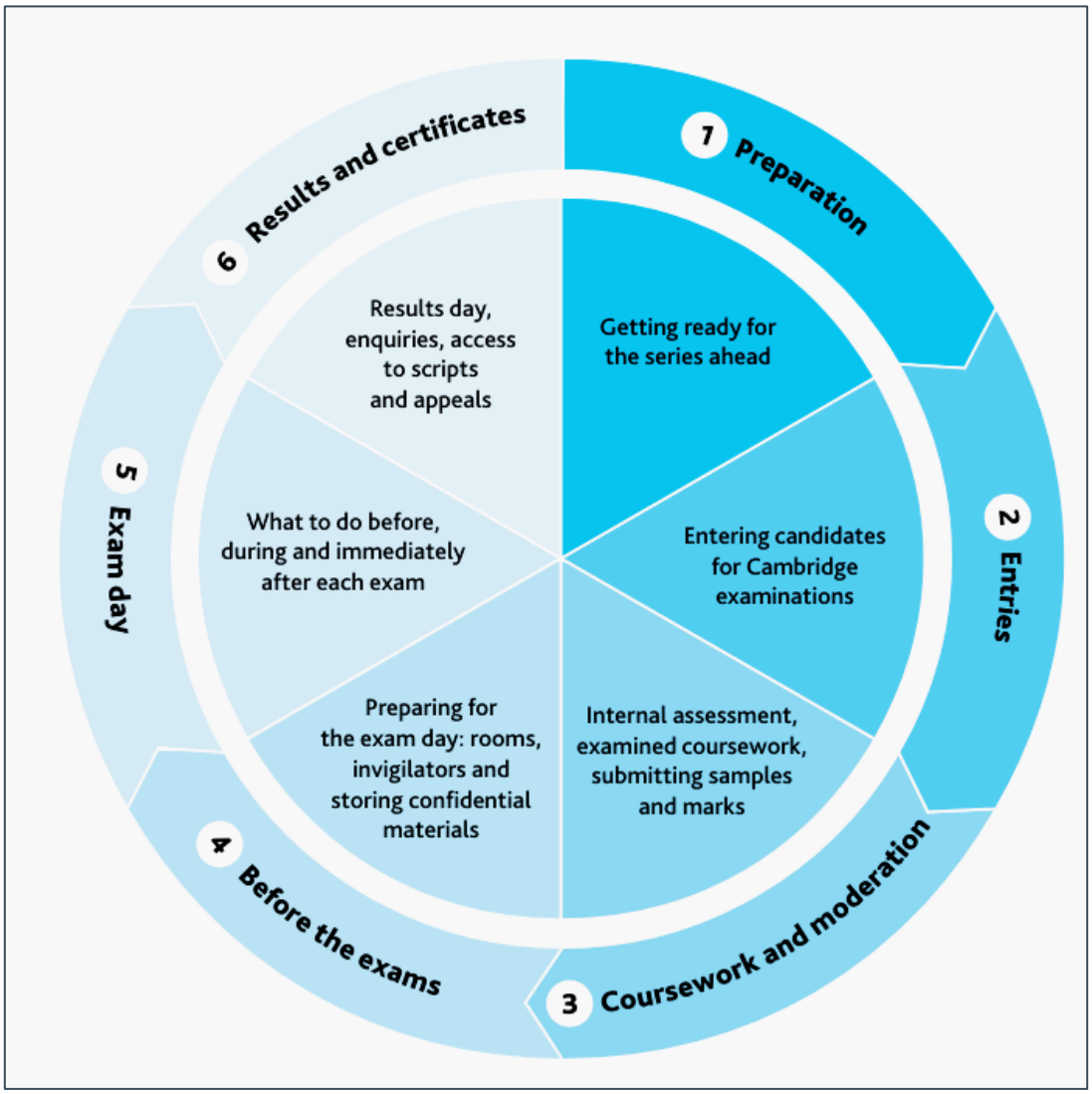


Figure 27: Assessment Process for Cambridge Examinations

2.6.1.3(a) Question Paper Setting: The creation of question papers takes 24 months. This starts with the experts looking at previous years' papers and deciding what areas of syllabus to focus on. This is followed by planning for the next few years to ensure the full content of the syllabus is assessed. Experts write new questions which offer the right level of challenge, aligned to content, clear and error-free. The same time mark scheme is developed. Then the Question papers are assembled and reviewed to ensure they are error-free, and clear, and test students according to the marking scheme. Question papers are proofread, followed by independent paper-solving. Then the question papers are sent for printing at a secure printing centre. Additionally, to ensure accessibility and inclusion, the paper is translated, and modified for braille and large prints (for students with visual impairment).

***2.6.1.3(b) Administration and Invigilation*:** During the test administration, 1 invigilator is provided for every 30 candidates or a minimum of 20 candidates. 1 supervisor and 2 invigilators are provided for the practical exam. All candidates in the exam room must be visible to one or more invigilators at all times. Invigilators are trained for this process.

2.6.1.3(c) Evaluation: Cambridge examiners are teachers or experts in their subjects, and they are carefully selected and trained. In this process, some exams are marked on paper

and some (such as multiple-choice exams) are marked automatically by a computer. But for any exam, every student's work is marked in the same way. Once the student has completed their answer script, these scripts are packaged and sent to Cambridge. Senior examiners mark sample sets of scripts and these are passed to the examiners. Scripts are then scanned and marked on a computer screen by examiners. Senior examiners monitor this process.

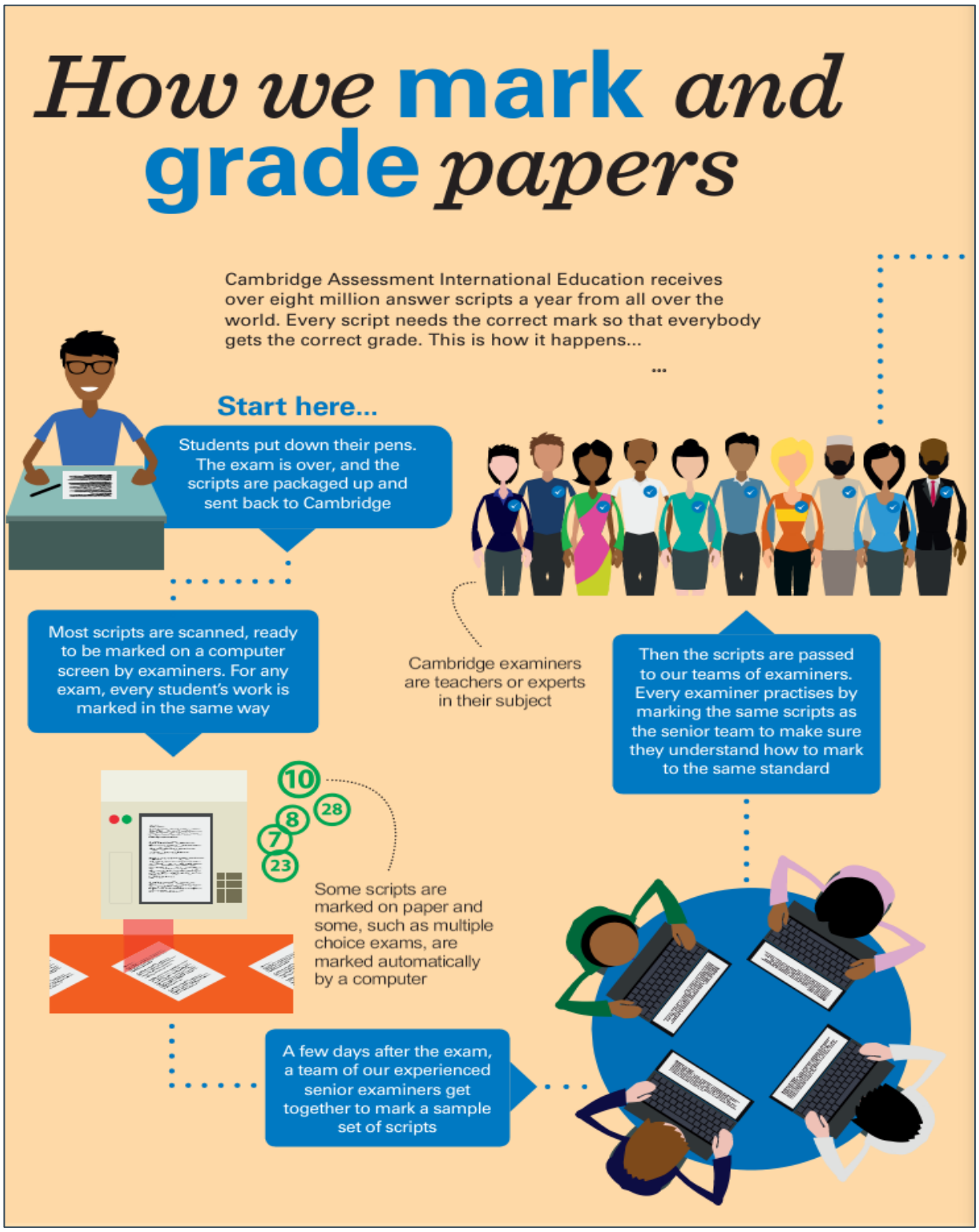


Figure 28: Marking of Sample Scripts by Senior Examiners at Cambridge International

2.6.1.3(d) Grading and Reporting: Once marking is done the grade boundaries are set after which the grades are allotted. Final checks are conducted by a senior examiner. A grade threshold[57] is the minimum number of marks that a candidate needs to obtain a particular grade in a paper or a subject. These thresholds are decided after each examination has been taken and marked. The aim in each year (or examination series) is to set each threshold in just the right place to ensure that it is no more difficult and no less difficult to obtain that grade than it was in the previous year. To fulfill that aim, thresholds are lowered from one examination to another if questions in a paper have been more difficult than last time (or raise the thresholds if we find the questions have been easier). This is to be fair to candidates from one series to another.

Cambridge Assessment International Education

Grade thresholds – November 2023

Cambridge IGCSE™ Mathematics (without Coursework) (0580)

Grade thresholds taken for Syllabus 0580 (Mathematics (without Coursework)) in the November 2023 examination

		Minimum raw mark required for grade:						
	Maximum raw mark available	A	B	C	D	E	F	G
Component 11	56	–	–	31	26	20	15	10
Component 12	56	–	–	37	30	23	16	9
Component 13	56	–	–	30	25	21	15	9
Component 21	70	56	46	37	31	26	–	–
Component 22	70	59	50	42	36	31	–	–
Component 23	70	53	43	34	27	21	–	–
Component 31	104	–	–	60	48	37	25	13
Component 32	104	–	–	72	60	48	36	24
Component 33	104	–	–	60	48	36	26	16
Component 41	130	90	72	54	43	31	–	–
Component 42	130	87	68	49	40	31	–	–
Component 43	130	90	69	47	38	28	–	–
Component 50	90	67	57	47	38	30	21	12

Grade A* does not exist at the level of an individual component.

Table 6: Cambridge IGCSE-Grade Thresholds

[57] https://www.cambridgeinternational.org/programmes-and-qualifications/cambridge-upper-secondary/cambridge-igcse/grade-threshold-tables/

2.6.1.3(e) **Question Paper Quality:** Based on the study of Biology question papers, the questions are seen to have authentic data with cited sources with varied stimuli testing a range of cross-curricular skills like data interpretation, calculation of metrics like volume, role of respiration and how it is impacted under activity.

9 **(a)** Complete the word equation for aerobic respiration.

..... + ... → ..... + ... [2]

(b) In an investigation, an athlete exercises on a running machine for 12 minutes.

The number of breaths he takes per minute is recorded every three minutes.

The average volume of each breath is also recorded.

The results are shown in Table 9.1.

Table 9.1

time / min	number of breaths per minute	average volume of each breath / dm^3
0	10	0.5
3	17	1.4
6	23	2.8
9	28	3.6
12	30	4.2

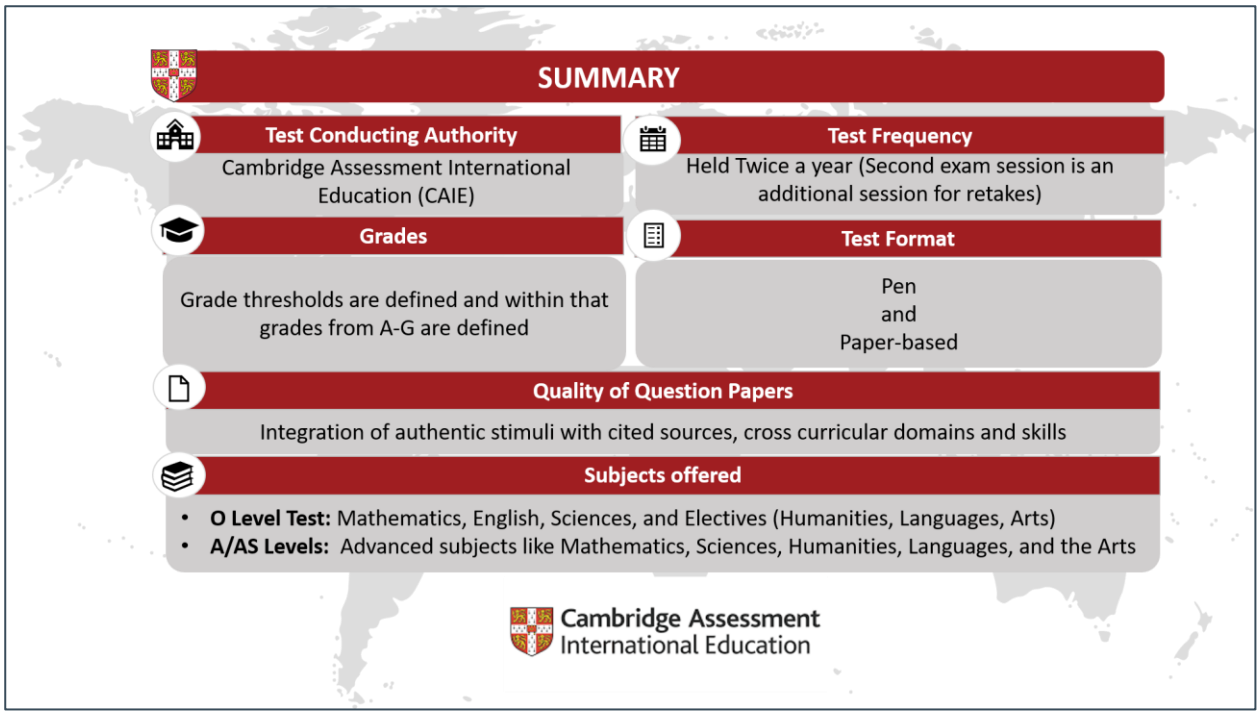
(i) Calculate the total volume of air the athlete breathes in per minute when t = 0 minutes.

volume of air breathed in at t = 0 minutes = ... dm^3 per minute [1]

(ii) Calculate the increase in the total volume of air breathed in per minute by the athlete after 12 minutes.

increase in total volume of air breathed in per minute = ... dm^3 [2]

Figure 29: Question from Cambridge Science O Level Question Paper



2.6.2 What do these examination boards do well and what best practices can be explored in our context?

2.6.2.1 Global recognition and presence: The board is recognized and present in 160 countries and provides education to students from 5-19 years of age through its 10,000 Cambridge schools. Designs curriculums considering the country's ethos, culture, and traditions. Subjects are aligned with cultural nuances.[58]

2.6.2.2 Flexibility in exams: The board provides opportunities to students to improve their scores through retake entries to improve scores when failed or passed, and by highlighting core and supplement learning objectives to appear for an advanced subject tier.

2.6.2.3 Reliable systems of fair grading: The boards use systems like the percentage uniform mark to highlight the relative performance of the student to the test-taking group, in addition to the raw marks, and grade boundaries to ensure fairness of scoring across examination sessions with varying difficulty levels.

2.6.2.4 Inclusivity: Translation and modification of exam papers for braille and large prints, demonstrating sensitivity to diverse needs.

[58] https://www.cambridgeinternational.org/cambridge-international-in-india/

FINLAND

2.7 Finland

2.7.1 What structures & processes support smooth facilitation of school leaving examinations?

2.7.1.1 Purpose of the Assessments (includes Overview & Education Journey)

Finland has often been cited as a 'classic' case of educational excellence. It has consistently ranked at the top of many international educational achievement tests. Finnish students start their secondary education (Grade 10) at the age of 15 or 16. They can choose either an academic track (*lukio*) or a vocational track (*ammattikoulu*), both of which usually take three to four years to complete.[59]

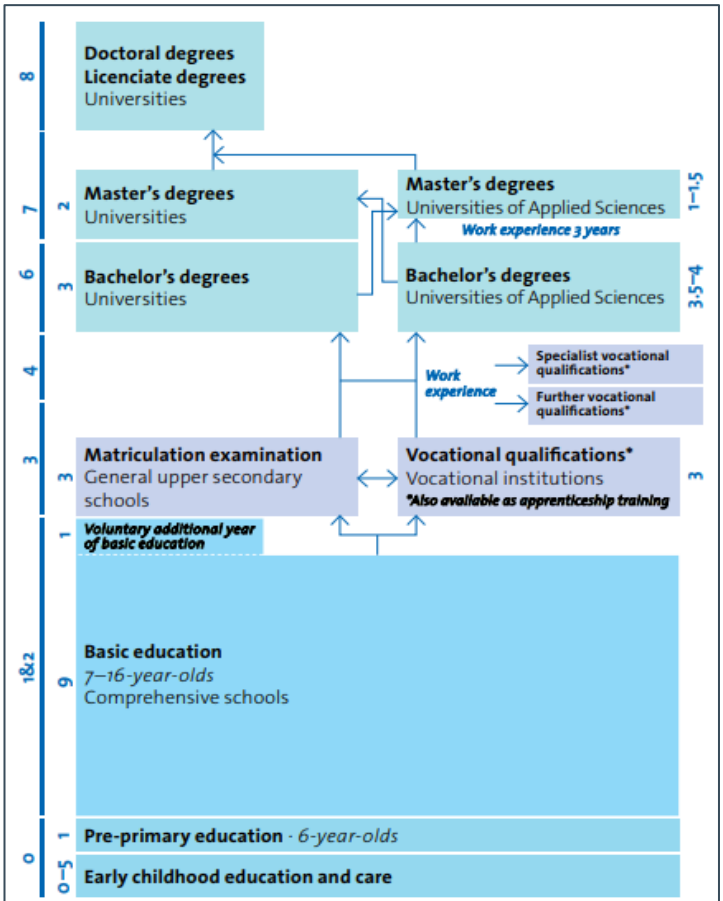


Figure 30: Graphical representation of the Finnish education journey

Admissions to academic upper schools are based on the Grade Point Average (GPA) system and, in some cases, academic tests and interviews. Admissions to vocational schools are provided to all those who apply. However, the system is not rigid and vocational school graduates may formally qualify for polytechnic or, in rare cases, university education. Academic secondary school graduates may also enroll into vocational education programs.

At the end of general upper-secondary education, students take the matriculation examination. The examination consists of at least four tests; one of which is conducted in the candidate's mother tongue and is a compulsory feature for all candidates. The candidate then chooses three other compulsory tests from among the following four tests: the test in the second national language, a foreign language test, the mathematics test, and one test in the general studies selection of tests, i.e., sciences and humanities. The candidate may include, in addition, as part of his or her examination, one or more optional tests. The objective of the matriculation examination is to better measure whether students have acquired the knowledge and skills of the upper-secondary curriculum and achieved sufficient maturity and eligibility for further studies in accordance with the objectives.

The Matriculation Examination is held biannually, in spring and in autumn. Candidates must complete the examination within three consecutive examination periods. The examination

[59] The basic formula for calculating GPA is to divide the total points earned in a program by the total number of credits attempted. The resulting figure is the GPA for that program.

may also be completed in one examination period. After passing the examination, candidates can later supplement their examination with additional tests or retake a test once. There is no time limit for doing this once passed.

Students under the academic track focus on preparation for university studies and post-graduate professional degrees in fields such as law, medicine, science, education, and the humanities. Under the vocational track, students undergo occupational training to develop vocational competence and/or prepare for a polytechnic institute.

Upon graduation, vocational school graduates receive a vocational school certificate. Academic upper-secondary school graduates receive secondary school certification and also undergo a nationally-graded matriculation examination. Polytechnic institutes require vocational school certification for admission, whereas the matriculation examination is more important in university admissions. However, some tertiary education programmes have their admission examinations, and many use a mixture of both.

Since the most critical assessment at the end of high school is often to determine the direction and quality of educational endeavors, this study analyses the Finnish Matriculation Examination process in more detail. This is the only high-stakes examination the Finnish students have to undertake as part of their schooling.

The purpose of the examination is to discover whether pupils have assimilated the knowledge and skills required by the curriculum for the upper-secondary school and whether they have reached an adequate level of maturity in line with that school's goals. Passing the Matriculation Examination entitles the candidate to continue his or her studies at university. These are based on competencies aimed towards developing ways of thinking and working, and derived from critical thinking, collaboration, communication, and creativity (also called 21st-century skills)

The Matriculation Examination Board is responsible for administering the examination, its arrangements and execution. The Board issues guidelines on the contents, the arrangements and the scoring of the tests. About 330 associate members assist the members in the work of preparing and assessing the tests.

2.7.1.2 Structure of the test

All the matriculation examinations in Finland are held online. Geography, Philosophy and German Language papers were the first to go digital. In 2019, Mathematics was the last one to go online. Since then, traditional paper tests are no longer held or offered.

The digital examination makes it possible to use more materials with test items: pictures, video and audio. Candidates are not limited to a browser-based test system that only records their answers. The laptop they are using has a variety of applications that are also used in teaching. For example, a test item may contain spreadsheet data which must be analysed using some of the statistical tools, and then be used as part of the answer. Candidates' laptops may be their own (bring-your-own-device, known as BYOD) or borrowed from the school. So far, more than 2,000 different laptop models have been used. At the start of a test, candidates boot into a Linux operating system from a USB memory that is delivered to schools by the Matriculation Examination Board. Due to the tailored operating system, candidates cannot access their local files and programmes but only those applications and materials that are pre-installed on the operating system.

Candidates' computers are connected to the server via a local network which is typically wired. The network is not connected to the Internet. Candidates get the test questions and attached materials via a browser which connects to the test system. The test system runs on the candidates' own laptops and is connected to the local server. The reason for running a distributed self-contained test system instead of cloud-based architecture is to minimise the risk of technical difficulties during a test. Candidates' answers and files are automatically backed up on the local server.

After the test, candidates' answers are sent to the Matriculation Examination Board's web service where they are marked and scored first by teachers and then by the Board's censors. Since the local servers are not connected to the Internet, the answers are exported to a USB memory and later uploaded to the web service. A similar method is used to deliver the test items from the Board to the test sites.

In order to help upper-secondary schools to practice for the digital examination, the Matriculation Examination Board has developed *a digital course exam system, Abitti*, in conjunction with the digital examination. Its functions and tools are similar to those used in the Matriculation Examination. Abitti offers a complete process for arranging a course exam: creating the USB sticks for students and servers, authoring test items, carrying out the course exam in the local network and assessing the students' answers. By carrying out course exams made with Abitti, teachers and students have been able to practice and familiarise themselves with the use of the digital examination systems beforehand.

Source:https://www.ylioppilastutkinto.fi/en/matriculation-examination/digital-matriculation-examination

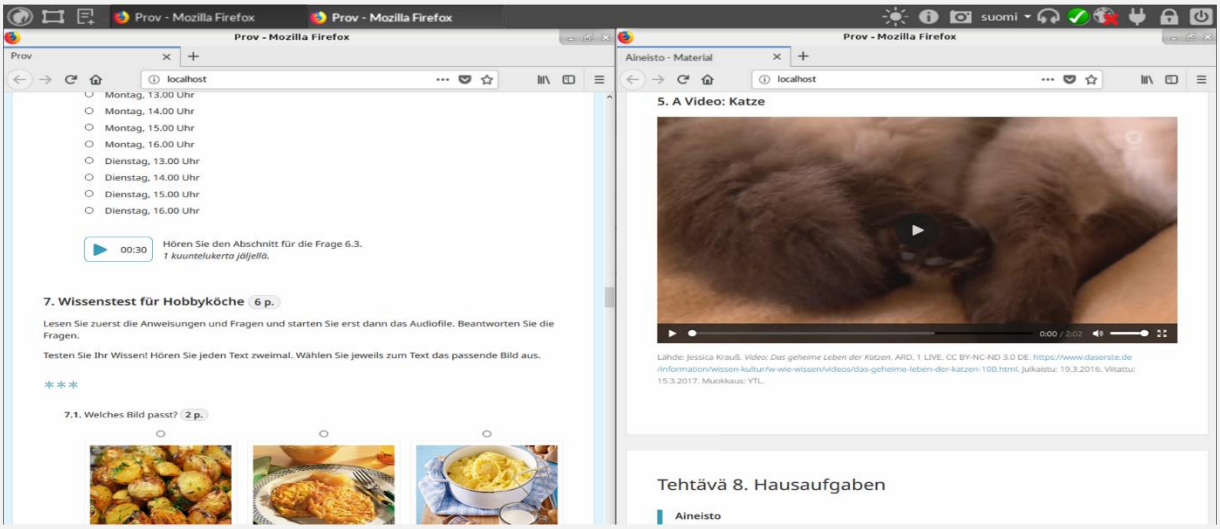


Figure 31: View from the sample language test for Finnish Matriculation Test

2.7.1.2(a) Subjects offered: The different subjects of the matriculation examination are:

i. Finnish or Swedish as a first language
ii. Finnish or Swedish as a second language
iii. Finnish or Swedish as a foreign language (for foreign students)
iv. Any number of foreign languages[60]
v. Reaali (General Studies)
vi. Mathematics

Reaali is the generalised group of subjects that deal with natural and social sciences. There is no limitation in the number of subjects that a student can select, but as tests in multiple subjects are held at the same time, it is practically possible to attend only two exams per year. The subjects have to be chosen well in advance prior to the exam and comprise questions which require answers in the form of an essay. The subjects in this category are listed below:

Religion, Evangelical Lutheran	Philosophy	Civics	History
Religion, Orthodox Christian	Psychology	Geography	Physics
Education on ethics and moral	Health education	Biology	Chemistry

Table 7: Reaali subjects in the Finnish curriculum

Each exam is divided into two levels of difficulty. For languages, the low-level exam requires basic knowledge, while the high-level exam is for a language that has been studied for nearly ten years. The first language and general knowledge exams are only on one level. Finnish as a second language is available in three levels: high, medium and low. Latin is available in high and low levels. The rest of the foreign languages are available only as a low-level

[60] Currently available are English, French, German, Latin, Russian, Spanish, Portuguese, Italian, Northern Same and Inari Same.

exam. Mathematics is available in basic and advanced courses. Subject Tiers are available for all subjects.[61]

2.7.1.2(b) Internal and External Components: Finnish matriculation exams have weightage primarily for external assessments[62] where practical components are significantly represented in the form of laboratory work, literary analysis, problem solving etc.

FINNISH MATRICULATION EXAMINATIONS -SUBJECT DETAILS			
Subject	**Internal/External Weightage**	**Exam Duration (External)**	**External Assessment - Paper Typology**
Finnish	0:100	6 Hours (If Mother Language, then two papers)	Essays (40-50%), Short Answer (20-30%), Multiple Choice (20-30%), Literary analysis (10-20%)
Swedish			
Physics		6 hours	Essays (40-50%), Short Answer (20-30%), Multiple Choice (20-30%), Practical exams (10-20%)
Chemistry			Essays (40-50%), Short Answer (20-30%), Multiple Choice (20-30%), Laboratory work (10-20%)
Biology			
History			History Essays (40-50%), Short Answer (20-30%), Multiple Choice (20-30%), Source analysis (10-20%)
Geography			Essays (40-50%), Short Answer (20-30%), Multiple Choice (20-30%), Practical exams (10-20%)
Economics			Essays (40-50%), Short Answer (20-30%), Multiple Choice (20-30%), Data response questions (10-20%)

61 https://www.ylioppilastutkinto.fi/en/matriculation-examination/description-tests

62 https://www.ylioppilastutkinto.fi/en/matriculation-examination/description-tests

Philosophy			Essays (40-50%), Short Answer (20-30%), Multiple Choice (20-30%), Structured questions (10-20%)
Psychology			
Mathematics			Mathematics Essays (40-50%), Short Answer (20-30%), Multiple Choice (20-30%), Problem-solving (10-20%)

Table 8: Subject details in the Finnish Matriculation Examination

2.7.1.2(c) Frequency and duration of the test: The Matriculation Examination is held *biannually*, in spring and in autumn, in all Finnish upper-secondary schools, at the same time. A candidate must complete the examination in not more than three consecutive examination periods, i.e., a candidate who is deemed unsuccessful in one or more subject areas must clear the corresponding examination within the subsequent three examination periods, else they have to start afresh and clear all requirements again.

A candidate who has passed a test may retake it once. There is no time limit for retaking a test that has been cleared. Retake options are available across all subjects to improve scores when a student has failed. However, it's only allowed 3 times. Candidates are also allowed to change the failed test's level of difficulty from advanced syllabus level to intermediate/basic syllabus level.

The examination consists of at least four tests; one of them, the test in the candidate´s mother tongue, is compulsory for all candidates. The candidate then chooses three other compulsory tests from among the following four tests: the test in the second national language, a foreign language test, the mathematics test, and one test in general studies (sciences and humanities). The candidate may additionally include one or more optional tests as part of his or her examination. The test duration for each subject is 6 hours.

2.7.1.2(d) Grading & Passing Criteria: In the average of standardized total scores, a distribution[63] is formed of all the participants of two successive examination periods. The participant profile of each test can then be compared to that distribution before deciding on score limits.

2.7.1.2(e) Remarking & Rechecking Policy: Both remarking and rechecking policy available for students.

2.7.1.3 Process followed to develop and administer the assessment:

2.7.1.3(a) Question Paper Setting: Questions are exported to a USB memory and later uploaded to the web service of the board.

[63] https://www.ylioppilastutkinto.fi/en/assessment-and-certificates/assessment-examination

2.7.1.3(b) Test administration and Invigilation: The test is held digitally[64] where candidates boot into a Linux operating system and local network from a USB memory delivered to schools by the Board. Candidates bring their own laptop or use school computer systems. The exams have been conducted in digital format since 2016, beginning at 9:00 am, one must be present about 20 minutes before its initiation. The time allotted for a single exam is 6 hours. At that time, students are bound to get a bit restless. Students are allowed to bring their food, but all wrappers are forbidden and text on cans must be covered with duct tape. Anything at all that could hide a note is not allowed. The students are usually split into two parts as the rooms used to take the exam aren't large enough to accommodate all of them.

While one half takes the exam, the other half must remain in quarantine, isolated in a classroom for the duration of the exam. It is highly recommended to wear clothing that is as quiet and as comfortable as possible. Accessories like hanging chains are often confiscated since they can be noisy. Clothing with a lot of text, especially in a foreign language, is forbidden. No phones are allowed inside the hall or the studio. If students are found with it they are immediately disqualified. Only one student at a time is allowed to go to the toilet and one of the monitors must follow the student. Calculators are provided on the digital platform, and no other calculators are allowed. Students are also allowed to use the *table book;* which contains all the important formulae for math, chemistry and physics, as agreed on by the Finnish Association of Science Teachers. These books too are available on the digital platform for the duration of the exam.

2.7.1.3(c) Evaluation: Answers are evaluated first by teachers and then Board's censors. Then these answers are exported to a USB memory and later uploaded to the web service of the board. The board uses an Onscreen marking system where Students' responses are collected in an online service where the teacher can read and assess them. After the teachers' assessment, the Student Examination Board takes a final call and re-evaluates the test. Shown below is a snapshot of the screen where the evaluator checks and evaluates answers. The empty boxes in the table represent information to be assessed. For any given student, the evaluator can view one answer at a time by clicking on the box.

[64] https://www.ylioppilastutkinto.fi/en/matriculation-examination/digital-test-environment

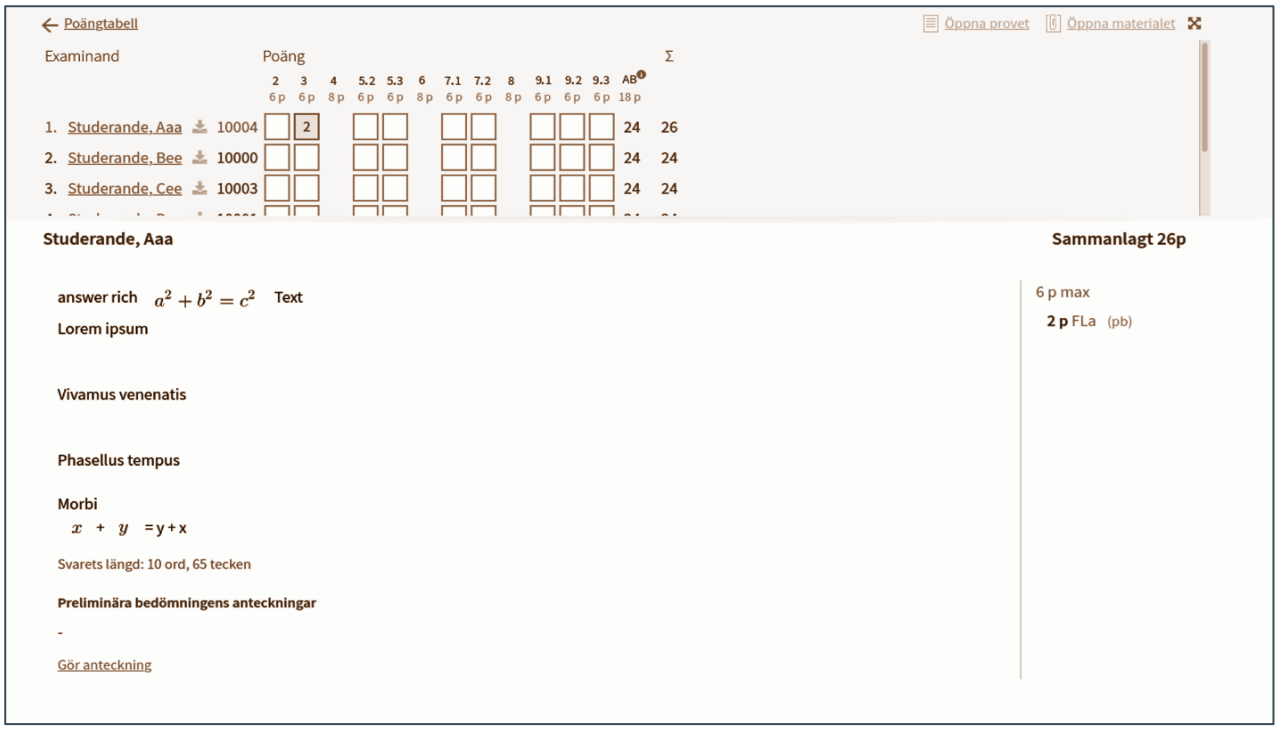


Figure 32: Snapshot of the online examination platform used by Finnish Matriculation board

The interface is also designed keeping evaluation at scale and ease of use in mind. The interface allows one to move on the scoreboard with the arrow keys as well as with the mouse. One can assess all examinees' answers to one and the same question by moving up and down the table with the arrow keys, or alternatively all the examinee's answers by moving sideways from left to right.

2.7.1.3(d) Grading and Reporting: A candidate receives a matriculation examination certificate following the examination period when all the compulsory tests have been passed. The Matriculation Examination Certificate shows the compulsory and the optional tests with their levels and grades. The grades and corresponding points are as follows:

Grade		Point
laudatur (honors) – lauded	L	7
eximia cum laude approbatur – accepted with excellent praise	E	6
magna cum laude approbator – accepted with much praise	M	5
cum laude approbator – accepted with praise	C	4
Lubenterapprobatur – gladly accepted	B	3
approbatur (Basic Level) – accepted	A	2
improbatur (Fail) – rejected	I	0

Table 9: Grading in Finnish Matriculation Exam

2.7.1.3(e) Analysis of quality of questions from the matriculation exam question papers:

1. Differential marking for Higher Order Thinking Skill (HOTS) questions: With an exception of one or two questions each of the 15 questions carries a maximum score of 6. Some two to three questions are exceptional questions which have a maximum score of 9. These questions are marked in the paper by an asterisk (*). These questions are generally higher order thinking questions.

2. Questions are specific and to the point.

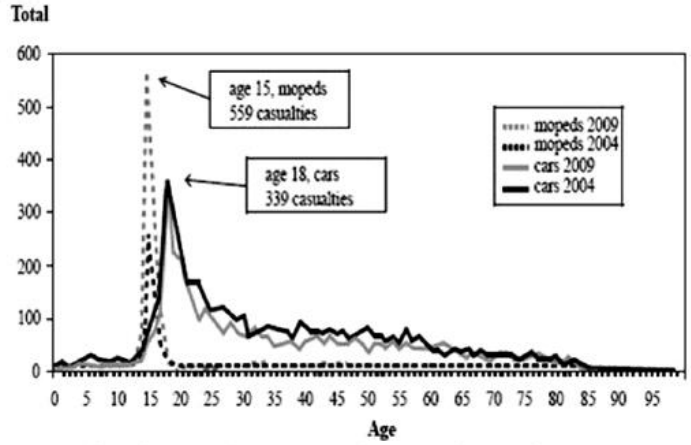
English language:

1. Relevant and varied set of writing topics: In the section on writing, the topics are varied and rich. Students are often given one or two lines (10-15 words) so as to understand the specifics of the essay topic better.

2. Contextual and authentic passages for comprehension-based questions: The reading passages are adapted from reputed magazines, periodicals and newspapers, such as *The Economist, The Oprah Magazine, and* The *Seattle Times* etc. They touch upon a variety of topics representing different contexts. The assessment items are appropriately designed. All questions, despite involving multiple choices, require in-depth interpretation of the topics.

Improving safety in traffic

A magazine has asked young people to give their opinions on how safety in traffic could be improved. Look at the statistics below and suggest some concrete measures.



Car and moped drivers in Finland: casualties according to drivers´ ages, 2004 and 2009.

1.1b Tame those taxis

The traffic in Lagos, Nigeria's chaotic business capital, is enough to make the most patient of travelers go mad. A rush-hour commuter can take three hours to go 15km (nine miles). Office workers try, often in vain, not to doze off at their desks after arduous, sweaty journeys. Globe-trotting managers are never sure they will catch their flights.

A rare beneficiary has been the *okada* rider. On his cheap motorbike taxi, named after a once-admired no-frills domestic airline of the past, he often carries an entire family or a week's groceries, ducking and weaving through the traffic. His wildly time-saving tactics include riding on the wrong side of the road and ignoring red lights.

But Babatunde Fashola, Lagos's popular governor, is clamping

Questions:

1. What in particular irritates Lagosian commuters?

   a. Missing scheduled appointments

   b. Not having fixed taxi fares

   c. Wasting time in congestion

2. Why have *okadas been* so irreplaceable in Lagos?

   a. They have lessened the need for traffic rules

   b. They have facilitated affordable transportation

   c. They have reduced carbon emissions

Mathematics:

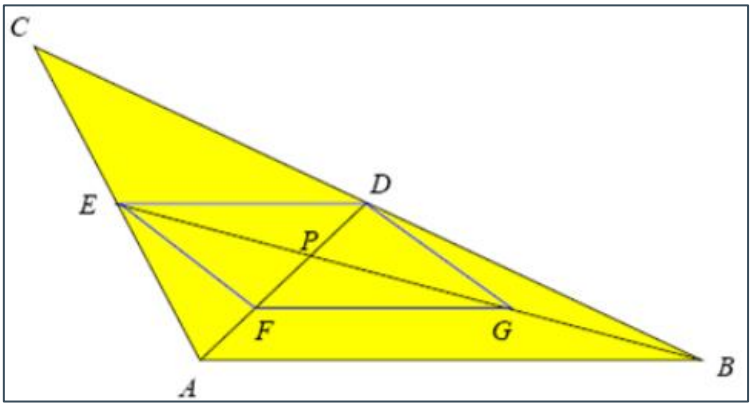
1. Logical flow of questions: Questions are appropriately placed, and the sub-questions are in a logical flow with each other. In few of the questions, the sub-questions are placed such that students need to exhibit their thorough understanding of the subject matter. Overall, these questions allow the student to present their understanding on the given topic in a holistic way.

If the letter P denotes the intersection of the medians AD and BE of the triangle ABC

If F is the focal point of the segment AP and G the centre of the segment of BP, as show that the line segment FG has length half the length of the line segment AB. (2 pts)

Show that the length of the segment DP is one third the length of AD. (2 pts)

Prove using the information given in the preceding paragraphs: mid-span of a triangle intersects each other at the same point, which divides each median in such a way, that the side of the page the length is one third of the entire length of the median. (3 pts)



2. Variety of questions: Question papers contain a rich variety of questions representing varied difficulty levels, including questions requiring substitution in the formulae, simple procedural questions, application-based questions and higher-order thinking questions. This allows a clear scaffolding[65] of skills being tested in the examination and allows students to demonstrate mastery in all these skills independently.

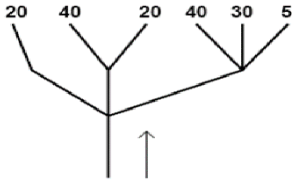
Substitute in the formulae question The length of the hypotenuse of the right triangle is 5 and the second leg length is 2. Calculate the second leg length
Simple procedural question Calculate the intersection points of line y = 2x and the circle $x^2 + y^2 = 1$.
Application based question The Poiseuille law (Jean-Louis Marie Poiseuille, 1797-1869), states that flow rate of water flowing in a tube is directly proportional to the fourth power of the diameter of the tube, while the other variables relating to the situation remain unchanged. What percentage of the diameter has to be increased if the flow rate is to be doubled?
Higher difficulty question

[65] Breaking up the material taught into chunks and providing a tool, or structure, with each chunk.

In a computer game, the player progresses to the top level of the adjacent diagram and the score is marked on the chart. In each intersection he chooses – one of the options randomly and has a level playing field and progresses to the next level up.

Find the probability that a player reaches the highest score for the 40?

Determine the expected number of points



Science:

1**. Interesting formats employed in presentation:** Some questions allow for a visual yet logical presentation of known scientific principles. For example, in the following questions, understanding of concepts of buoyancy, flotation etc. is being gauged in a simple, engaging yet interesting manner. The innovative way of using a relevant comic strip to ask questions on a scientific concept should also be noted.

Calvin and Hobbes comic adventures in space

Present four legitimate reasons why the operation described is not possible in the prevailing physical conditions in space.

2. Quantitative application of scientific concepts: Though the question paper focuses mostly on qualitative questions, it also has a fair number of questions to check the quantitative skills of the students.

3. Natural connectedness of multiple subject areas: A great deal of emphasis is given to the fact that no subject matter can be understood in isolation and needs knowledge from other fields to arrive at a deep understanding of a concept. Thus, many application-based questions are reflective of this principle.

Elasticity of bones decrease with age. Bone elasticity can be studied by loading the bone with various power-ups and by measuring the bone elongation. Under Moderate

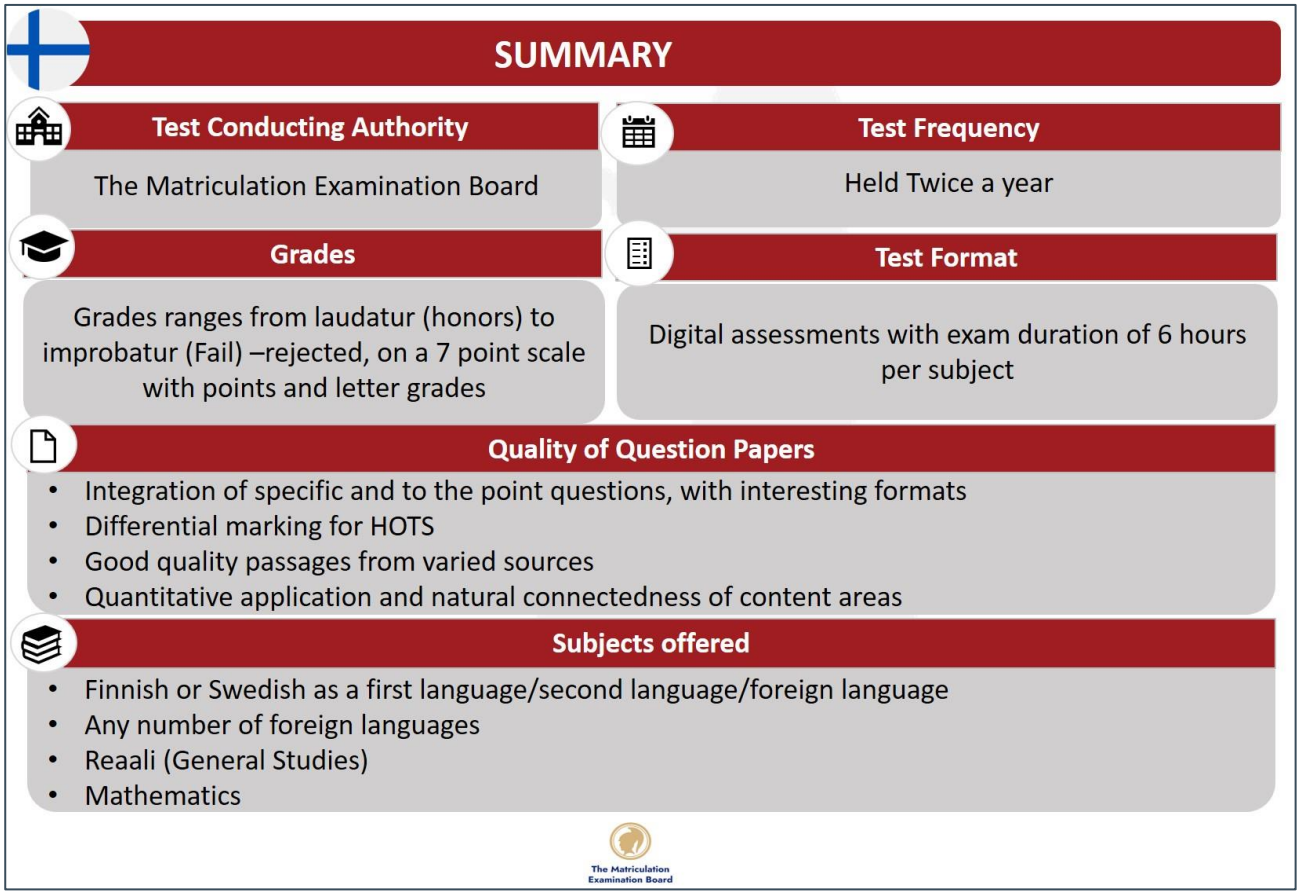
loads, the Hooke's law Eε = σ, where σ is the stress E is modulus of elasticity of the bone, and ε the relative elongation.

In one experiment on the femur bone following is the stress and the relative elongation.

σ (MN/m^2)	0,0	5,00	10,0	15,0	20,0	25,0	30,0	35,0
ε	0,0	0,00031	0,00063	0,00094	0,0013	0,0016	0,0019	0,0022

Draw the stress as a function of the relative elongation.

Specify the graph using the femoral elastic modulus.



2.7.2 What do these examination boards do well and what best practices can be explored in our context?

2.7.2.1 Preparing the ecosystem for exam digitalization: Finland has moved its school leaving examination online that allows for the use of diverse materials, such as pictures, videos, and audio, fostering a more comprehensive evaluation. It has also allowed students to use their own laptops or borrow ones that increase accessibility and comfort. The board has also developed a digital test environment that helps schools in delivering practice tests to build more familiarization and comfort with the tool. Additionally, a local network, not connected to the internet, minimizes technical difficulties and ensures a secure testing environment.

2.7.2.2. Flexibility in exams: Finnish Matriculation Board provides flexibility in its examinations to allow students to tailor their exams to their interests. They do this by offering a wide range of subjects across varying levels of difficulty, conducting exams twice a year providing flexibility for students to retake tests or improve their scores, allowing candidates to retake exams without a time limit encouraging continuous improvement, and having a rechecking and remarking policy.

2.7.2.3. Higher-Order Thinking Skills: Including questions that assess higher-order thinking skills encourages critical thinking and application of knowledge, including technology enhanced items. India can explore leveraging technology to deliver and administer high quality assessments and provide enough options to students to put their best foot forward in examinations by adopting a holistic and flexible approach to assessments.

HONG KONG

2.8 Hong Kong

2.8.1 What structures & processes support smooth facilitation of school leaving examinations?

2.8.1.1. Purpose of the Assessments (includes Overview & Education Journey)

Hong Kong has been one of the top performing regions among all international benchmarking tests like PISA, TIMSS & PIRLS. The performance of Hong Kong students ranks first in mathematics, third in science, and sixth in reading. Students, regardless of their socio-economic background, benefit from the education system. The achievement gap between the high achievers and low achievers is relatively low when compared to the OECD average. Hong Kong's success is attributed to a market-driven approach[66], active parental involvement, government commitment to education, ongoing reforms, and a thriving financial sector, despite facing challenges and tensions within the education system and broader political considerations.

Education Journey:

Secondary education in Hong Kong consists of six years of schooling, of which the first three years are junior secondary and the last three are senior secondary. In 2017, as part of a broad re-haul of Hong Kong's education system, a Task Force on Review of School Curriculum was put together and charged with the responsibility of making specific recommendations to better meet each student's diverse learning needs. The goal was to prepare all students for the future.' The recommendations of the Task Force, released in 2020, included creating more time and space for students to pursue non-academic activities to promote their holistic development, enhancing STEM education in primary and secondary schools to further promote applied learning, giving value education a higher priority by starting life planning education earlier and expanding the criteria used for university admission. The Education Bureau accepted these recommendations and plans to implement them gradually.

[66] https://oecdedutoday.com/hong-kongs-success-in-pisa-one-system-many-actors/#:~:text=They%20involved%20significant%20expansion%20of%20educational%20opportunity,and%20from%20economic%20needs%20to%20individual%20needs.

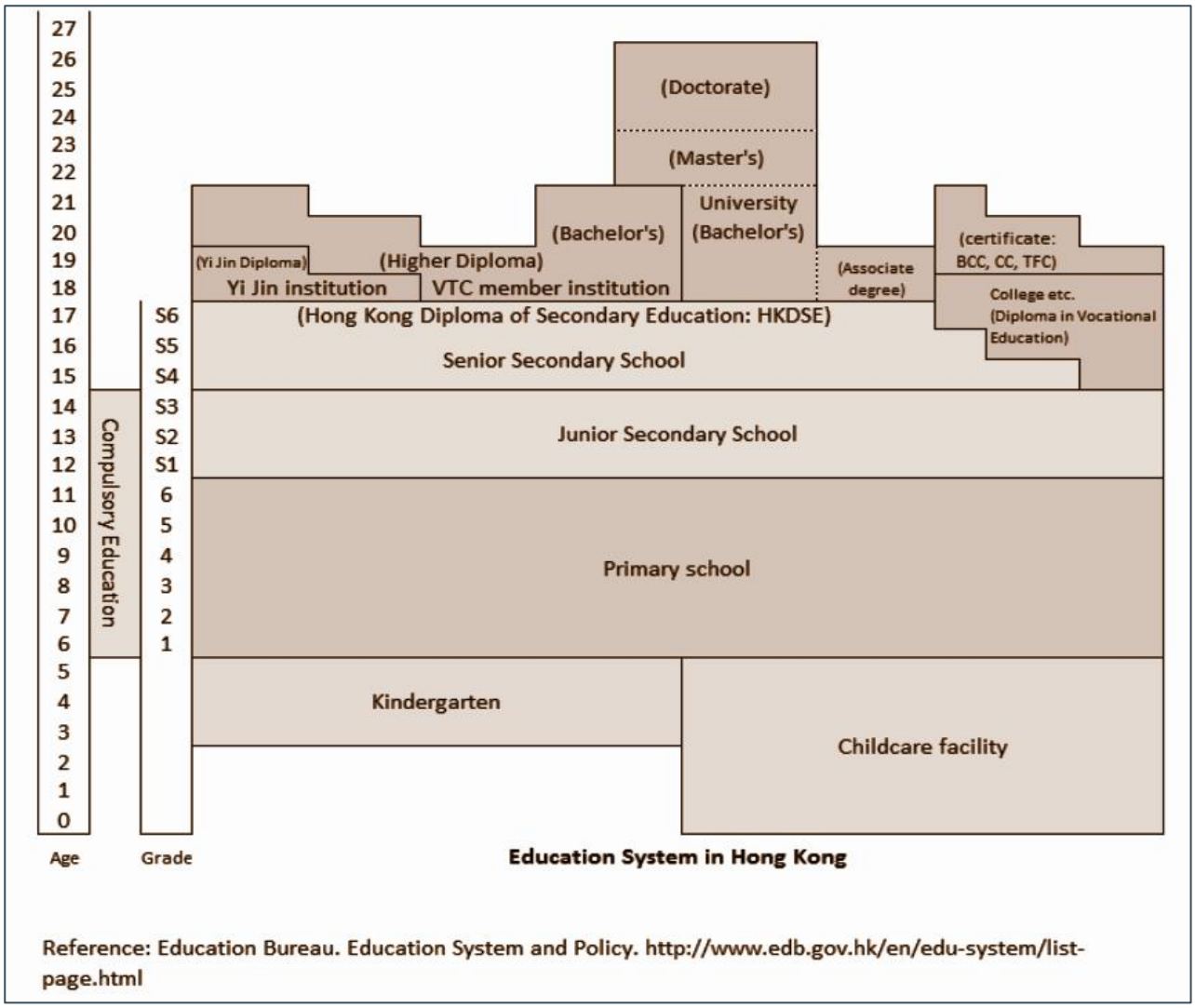


Figure 33: Graphical representation of the Hong Kong education journey

There are no high-stakes, jurisdiction-level assessments in Hong Kong until the end of upper-secondary school. Before 2009, students were required to take two high-stakes exams, one at the end of lower-Secondary School and another at the end of upper-secondary school. In 2009, these were replaced by a single gateway exam—the Hong Kong Diploma of Secondary Education (HKDSE)—at the end of upper-secondary School. The HKDSE is administered by the Hong Kong Examinations and Assessment Authority (HKEAA). The HKDSE's Certificate is a prerequisite for tertiary education. Students applying to tertiary institutions are required to prepare a Student Learning Profile, which outlines what the students have participated in and achieved in terms of whole-person development during their secondary years, including other learning experiences which are part of the new secondary curriculum. The profile is designed to include awards and achievements gained outside school, and other learning experiences, in addition to traditional academic performance records. The emphasis is on encouraging whole-person development as a means in and of itself, and also as a reference in university admissions.

The HKDSE examination is Hong Kong's university entrance examination, administered at the completion of a three-year senior secondary education, allowing students to gain admissions to undergraduate courses at local universities. The HKDSE is designed for local secondary school students in Hong Kong to measure their achievement and to enable them

to gain admission to local universities through the unified *Joint University Programmes Admissions System* (JUPAS).

The Hong Kong Examinations and Assessment Authority (HKEAA) is a statutory body of the Government of Hong Kong responsible for the administration of public examinations and related assessments. The authority is Hong Kong's only public examination board.

2.8.1.2. Structure of the test:

2.8.1.2(a) Subjects offered: HKDSE subjects are divided into three categories, including 24 senior secondary subjects (4 core subjects and 20 elective subjects), applied learning subjects and other language subjects to suit the varying interests and talents of students. Students study both core subjects and elective subjects. Most candidates in the HKDSE sit all four core subjects plus two or three electives to satisfy local university admission requirements. Students can choose one to four electives among 20 elective subjects according to their interests and strengths. However, most schools do not offer a full selection of the 20 subjects in their curriculum due to practical limitations.

Universities are not obliged to recognize results of Category B or C subjects. Category B subjects, especially for the more prestigious institutions, are usually only considered for reference in cases where two potential students are equal in other aspects.

<table>
<tr><th>Category</th><th>Type</th><th colspan="2">Subject</th></tr>
<tr><td rowspan="2">Category - A</td><td>Core subjects</td><td colspan="2">• Chinese Language
• English Language
• Mathematics
• Liberal Studies</td></tr>
<tr><td>Elective subjects ^
(choose minimum one and maximum four electives)</td><td>• Chinese Literature
• English Literature
• Chinese History
• Economics
• Geography
• History
• Biology
• Chemistry
• Physics
• Combined Science *
• Integrated Science **</td><td>• Tourism and Hospitality Studies
• Business, Accounting and Financial Studies
• Design and Applied Technology
• Health Management and Social Care
• Technology and Living
• Information and Communication Technology (ICT)
• Ethics and Religious Studies</td></tr>
</table>

			• Music • Visual Arts • Physical Education
Category-B	Applied Learning Subjects ^^ (Optional)	• Creative Studies • Media and Communication • Business, Management and Law • Services • Applied Science • Engineering and Production • Applied Learning Chinese ***	
Category-C	Other language subjects ^^^ (Optional)	• French • German • Japanese • Spanish • Hindi • Urdu	

Table 4: Subject choices in different categories offered as part of the HKDSE

^ According to HKEAA 2018 registration statistics, the most chosen subject is Physics. ~70 percent of students choose a combination of two electives, while ~17 percent choose three electives.

^^ Students may choose any number of electives from category B & category C.

^^^ May be used to replace Chinese Language for university admissions for students whose first language is not Chinese, but it may not be used to replace English.

* Combining two of the three science subjects, Physics, Chemistry and Biology

** Integrating all three science subjects, Physics, Chemistry and Biology

*** For non-Chinese speaking students

Table 5: Subject details in HKDSE

2.8.1.2(b) Internal and External Component: The internal assessment, which is typically conducted by schools, and the external assessment, which is the standardized examination administered by the Hong Kong Examinations and Assessment Authority (HKEAA), collectively contribute to the overall subject grade. The specific weightage or percentage for internal and external assessment components can differ from subject to subject. Generally,

the external examination carries a significant weight in the overall assessment, but the exact percentage varies.

2.8.1.2(c) Frequency and duration of the test: The Matriculation Examination is held *annually*, in all upper-secondary schools. examination duration varies depending on the subject. Generally, each subject paper has a specific time allocation, ranging from 1.5 hours to 4 hours. For example, core subjects like Chinese Language, English Language, and Mathematics typically have longer durations, while elective subjects might have shorter durations.[67]

2.8.1.2(d) Grading and Passing Criteria: In the HKDSE Category A subjects, candidates' performances are studied with reference to a set of standards. The performance is studied in five levels (Level 1 to 5), with 5 being the highest. The Level 5 candidates with the best performance are awarded a 5** (Five double star – top 10 percent of Level 5 achievers) and the next top group of candidates are awarded a 5* (Five star – top 30 percent of the Level 5 achievers). Performance below Level 1 is designated as *Unclassified*. This is not studied on the certificate. For each of the five levels, a set of written *descriptors* is developed that describes what the typical candidate performing at this level can do.

The assessment of Category B subjects is undertaken by course providers. After moderation by the HKEAA, the final results are recorded on the HKDSE certificate. The results are studied as "Attained" and "Attained with Distinction"; whereas Performance below "Attained" is designated as "Unattained." This is not studied on the certificate. Candidates awarded "Attained with Distinction" are deemed to have performed at a level comparable to Level 3 or above for Category-A subjects.

For Category C subjects, marking and grading are conducted by Cambridge Assessment International Education (Cambridge International). Results are studied in five grades (A-E) on the HKDSE certificate, with Grade E being the lowest and Grade A being the highest. Achievement below grade E is designated as "Ungraded". This is not studied on the certificate.

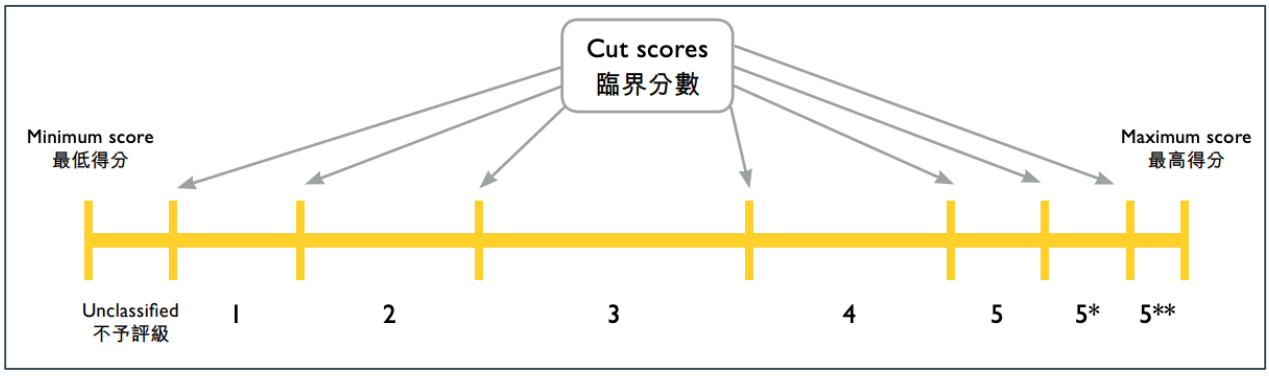


Figure 34: Visual representation of the grading scale

[67] https://www.hkeaa.edu.hk/DocLibrary/HKDSE/Exam_Timetable/2024_DSE_Timetable.pdf

Generalized grading descriptors:

Candidates at this level typically demonstrate:	
Level 5	• **Comprehensive knowledge and understanding** of the curriculum and the ability to apply the concepts and skills effectively in diverse and complex unfamiliar situations with insight. • An ability to **analyse, synthesise and evaluate information** from a wide variety of sources. • An ability to communicate ideas and express views concisely and logically.
Level 4	• **Good knowledge and understanding** of the curriculum and the ability to apply the concepts and skills effectively in unfamiliar situations with insight. • An ability to analyse, synthesise and interpret information from a variety of sources. • An ability to communicate ideas and express views logically.
Level 3	• **Adequate knowledge and understanding** of the curriculum and the ability to apply the concepts and skills appropriately in different familiar situations. • An ability to **analyse and interpret information** from a variety of sources. • An ability to communicate ideas and express views appropriately.
Level 2	• **Basic knowledge and understanding** of the curriculum and the ability to apply the concepts and skills in familiar situations. • Ability **to identify and interpret information** from straightforward sources • Ability to **communicate simple ideas** in a balanced way
Level 1	• **Elementary knowledge and understanding** of the curriculum and the ability to apply the concepts and skills in simple familiar situations with support • An ability to identify and interpret information from simple sources with guidance. • The ability to communicate simple ideas briefly.

2.8.1.2(e) Rechecking and Remarking Policy: A *re-checking and re-marking* system has been instituted for candidates who believe that they should have obtained better results. Candidates may apply for rechecking and/or remarking for up to a total of four subjects, and should make the appeal through their schools or directly to the HKEAA (in case of private candidates). Candidates are not provided a copy of the marked/remarked scripts, and they cannot apply for remarking of the same subjects for which they have applied for rechecking. However, Candidates who have valid reason(s) to query that the established rechecking/remarking procedures have not been followed may apply for appeal review within the stipulated deadline. Requests for appeal review will be dealt with by the independent Appeal Review Committee.

2.8.1.3 Process followed to develop and administer the assessment

2.8.1.3(a) Question Paper setting: In the development of examination papers for the Hong Kong Diploma of Secondary Education (HKDSE), a rigorous mechanism is employed to ensure alignment with the Curriculum and Assessment Guide. Moderation Committees, consisting of academic experts, educators, and subject specialists, are established for each subject. The committees are responsible for setting questions and drafting marking schemes, maintaining a balance of expertise and experience. The marking scheme guides the assessment focus and consistency among markers. Confidentiality is paramount, with committee members required to sign undertakings, make declarations of interest, and adhere to stringent security measures for secret documents. Regular reviews, including scrutiny by external entities like the Independent Commission Against Corruption, ensure the integrity and fairness of the HKDSE.[68]

2.8.1.3(b) Test Administration and Invigilation: The exams have been conducted in traditional pen & paper format. The exams usually begin at 8:30 am and students are expected to arrive at least 15 minutes before that.

No unauthorized articles, such as books, dictionaries, notes in written or digital form, are allowed inside the examination halls. Students are discouraged from bringing phones inside the hall. If brought, they must be turned off for the duration of the examination. If students are found with any unauthorized articles, the invigilators shall award mark penalties up to disqualification based on the severity. Special Rooms are set up for listening components of language subjects only. Electronic calculators, including programmable calculators, may be used in any examination sessions, provided that the calculators are battery powered, silent in operation, with no print-out or graphic/word-display facilities and do not use dot-matrix technology in the main display. The calculators must have been pad-printed with the *H.K.E.A.A. APPROVED* label. Calculators brought into the examination room are subject to inspection and, in case of doubt, may be taken away for further inspection. Relevant lists of formulae and important relationships are provided as part of the question papers.

In overseeing the conduct of the Hong Kong Diploma of Secondary Education (HKDSE) examinations, several key measures and protocols are implemented. The Examination Regulations, accessible on the HKEAA website, guide candidates, schools, and private candidates, covering subjects, participation requirements, rules, disqualification conditions, result reporting, and the appeals process. The Public Examinations Information Centre (PEIC) serves as the central point for information dissemination and handles queries, complaints, and irregularities reported by candidates. The use of technology includes the Public Examinations Support System (PESS) for communication between examination centres and the HKEAA and the Oral Recording System (ORS) for capturing speaking examination performances. On-site checking, audits, logistical planning, security measures, and provision for candidates with special educational needs (SEN) are integral to ensuring fair, secure, and quality-assured HKDSE examinations. A systematic approach is taken for handling irregularities and complaints, involving thorough investigation, committee review, and appeals processes to maintain the integrity of the examination system.

2.8.1.3(c) Evaluation: The Hong Kong Diploma of Secondary Education (HKDSE) employs a meticulous marking process with rigorous quality assurance procedures to ensure fairness and professionalism. Markers undergo thorough training and qualification assessments, and

[68] 3.12: https://www.hkeaa.edu.hk/DocLibrary/Media/Leaflets/QA_Framework_en.pdf

an open and transparent recruitment mechanism is in place to select qualified markers, balancing experience and new perspectives. Chief Examiners and Assistant Examiners oversee the marking work, utilizing a detailed marking scheme that outlines answer requirements, mark allocations, and acceptable answer ranges. Examiners' and markers' meetings are conducted to align on marking principles and standards before marking begins. Check marking by experienced examiners, statistical analyses, and random checks contribute to the quality and consistency of individual markers.

Onscreen Marking (OSM) enhances reliability by allowing real-time monitoring and feedback, and double-marking is implemented in certain papers to further ensure marking accuracy and fairness. The workflow followed is as given below:

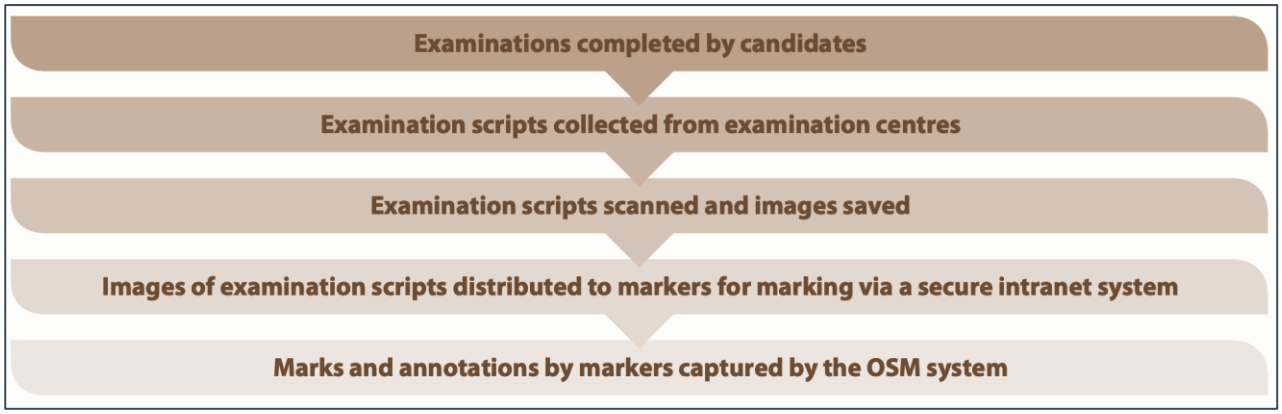


Figure 35: The process of evaluation adopted by HKEAA for assessment evaluation

2.8.1.3(d) Grading & reporting system: The grading procedures for the Hong Kong Diploma of Secondary Education (KDSE) involve a multi-stage process, including post-marking discussions, judge panel meetings, and internal meetings to determine final grading decisions. The grading sequence begins with the three core subjects (Chinese Language, English Language, and Mathematics Compulsory Part) followed by elective subjects, Applied Learning subjects, and Citizenship and Social Development. Expert judgments, level descriptors, statistical indicators, and research tests inform the grading of core subjects. Elective subjects use a group ability index (GAI) derived from core subjects for relative ability reference. Citizenship and Social Development, introduced in 2024, is graded in one level 'Attained' with GAI reference at level 2. The Applied Learning subjects involve both formative and summative assessments, moderated by the HKEAA. Quality checks, including mark adjustment, equating, and results printing, are conducted to ensure accurate processing. Examination results are released in July, with certificates issued in October, and candidates have the option of applying for rechecking and remarking if they have concerns about their results. Forums are regularly with parents and principals to discuss student performance.

2.8.1.3(e) Analysis of quality of questions:

English language

1. Clarity of instructions: Every question is preceded with clear and precise instructions on how the question needs to be attempted.

Below is a summary of paragraph 6. In five of the lines, there is ONE mistake. If you find a mistake, underline it and replace the word with one that expresses the correct idea. Write the word in the box on the right. Both grammar and spelling must be correct. In one of the lines there is no mistake; put a tick (✓) in the box. The first has been done for you. *(6 marks)*

Several actions from the text are described below, along with their consequences. Complete the information by writing ONE word taken from the relevant paragraph in each blank below. Your answers must be grammatically correct. *(4 marks)*

2. Focus on comprehension-based questions: Questions are framed such that students are required to comprehend the written material thoroughly and answer the questions based on their understanding of the text. However, the question paper lacks a balance between comprehension and evaluation and analysis-based questions.

18. Two friends are discussing the extract from the interview with Tim Harford (paragraphs 6-15). Use the information from the text to match each statement in the speech bubbles with a paragraph that contains similar ideas. Write the number of the paragraph next to the speech bubble. Each paragraph number can be used once only. Some paragraph numbers are not used. The first two have been done for you as examples. *(5 marks)*

Jenny 

Paul 

I truly dislike it when my dad tells me to tidy my bedroom – it doesn't feel like it's my room anymore, but his.

Paragraph e.g. 13

Yeah, my mum's the same. Just because she has to be hyper-organized at work at her dental surgery, it doesn't mean that's right for my things in my own room. Even when things get a bit messy, I still get things done.

Paragraph e.g. 12

You know, I've just read an interview which says we could be astonished to see how messiness might make our lives better.

Paragraph (i) 15

Really? How would that work? Last night I spent 30 minutes looking for my chemistry homework because I hadn't put it in the right folder on my desk.

Paragraph (ii) 7

Well the interview gave one or two famous historical examples where really messy people achieved great things.

Paragraph (iii) 11

But that can't really work for everyone, can it?

Paragraph (iv) 10

You know, it could save you looking for your chemistry homework next time. The writer describes how a mountain of documents has a system to it so you can quickly find exactly what you need.

Paragraph (v) 3

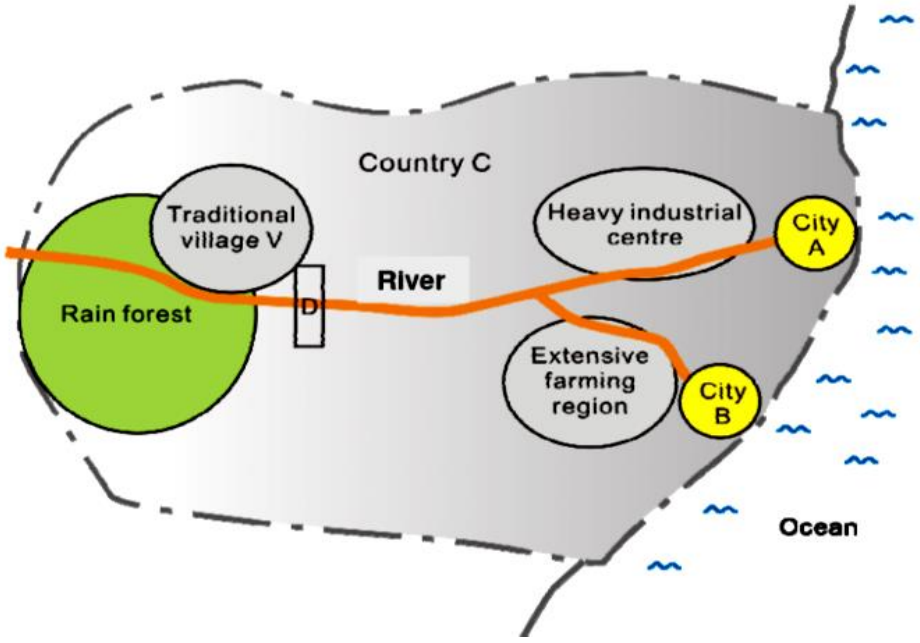
Science and Technology

1. Contemporary nature of the questions: Many of the science questions are framed with contemporary problem statements presented as its context. This ensures that the students apply skills to solve questions that represent problems that are relevant and pertinent to their current or future lives.

> Nowadays, keeping pets (such as dogs and cats) is becoming popular in Hong Kong. Some people prefer pure-bred pets to hybrid pets. However, pure-bred pets usually have higher risks of suffering from genetic diseases than hybrid pets because of the ways they are bred. Pure-bred pets are produced by crossing close relatives to keep a pure bloodline. Explain why genetic diseases are often carried by recessive alleles. By comparing the effects of the two breeding processes on the genetic composition of the offspring, discuss why pure-bred pets are at a higher risk of suffering from genetic diseases than hybrid pets. (11 marks)

Students are assessed on a number of contemporary and current-affairs topics, such as, urbanization, deforestation, depletion of fossil fuels, need for safe renewable energy sources, social and ecological problems encountered due to rapid industrialization through typical problem analysis. Students are required to analyze the case, seek out the cause and effects, and synthesize issues both through a scientific and social prism.

A simplified map of Country C is shown below. The river provides the major source of fresh water to th country.



(a) The Water Authority of the country noticed that the quality of fresh water supplied to City A and City B had worsened. Which city would have high levels of cadmium and zinc, and which city would have a high level of the bacteria. *E.coli.* in the fresh water supplied to them? Explain your answer in each case.

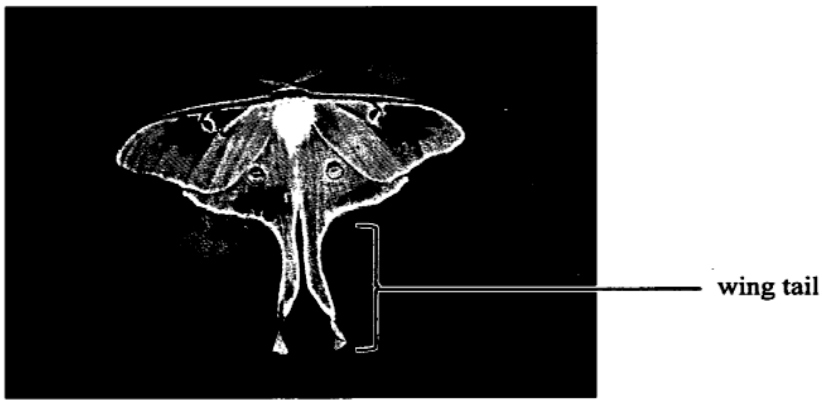
(b) The government of this country is debating whether hydroelectric power (HEP) should be developed as an alternative energy source. A proposal has been made to build a damn at site D for the provision of HEP.

(i) Give two advantages of using HEP over the combustion of fossil fuel in generating electricity.

(ii) Referring to the map, discuss ONE ecological concern and ONE social concern regarding the proposal to build the dam at side D.

2. Testing of scientific skills, such as experiment design and hypothesis formulation: Given the focus on concepts in different subjects, it is easy and often common to miss out on testing of certain subject-specific skills. Being able to design and experiment or formulate a hypothesis is one such important scientific skill that needs to be developed in students. There were questions found to be testing this important skill.

(b) Bats prey on moths. The photograph below shows a type of moth which has long wing tails:



After the discovery of ultrasound navigation in bats, scientists hypothesised that the wing tails of the moths may disturb the ultrasound emitted by bats and thus help moths to escape from a bat attack.

To test this hypothesis, scientists manipulated the wing tail length of the moths and then determined their rate of successful escape from bat attacks. The treatments of the wing tails and the results are shown below:

Treatment of wing tails	A: No treatment	B: Cut and glued back	C: Cut	D: Elongated
				
Wing tail length (cm)	5	5	2	6
Successful rate of escape (%)	57	57	26	65

(i) What can you conclude from the results of treatment A and B? What is the purpose of treatment B in the experimental design of this study? (2 marks)

Mathematics:

1. Inter-subject connectedness: It is getting more apparent that certain Mathematical questions emphasize the fact that it is not to be studied in isolation; that it is in fact *a language to express sciences*. The questions in the HKDSE question paper reflect this connection.

A researcher defined Scale A and Scale B to represent the magnitude of an explosion as shown in the following table:

Scale	Formula
A	$M = \log_4 E$
B	$N = \log_8 E$

It is given that M and N are the magnitudes of an explosion on Scale A and Scale B respectively while E is the relative energy released by the explosion. If the magnitude of an explosion is 6.4 on Scale B, find the magnitude of the explosion on Scale A. (5 marks)

2. Plentiful procedural questions: While the paper can be lauded for focusing on skills and inter-subject connectedness, it still leans heavily on simple procedure-based questions for the bulk of its testing. Below is an example.

The length and the breadth of a rectangle are 24 cm and $(13+r)$ cm respectively. If the length of a diagonal of the rectangle is $(17-3r)$ cm, find r. (3 marks)

A wallet is sold at a discount of 25% on its marked price. The selling price of the wallet is \$690.

(a) Find the marked price of the wallet.

(b) After selling the wallet, the percentage profit is 15%. Find the cost of the wallet.

(4 marks)

Straight forward application of a formula

Simplify $\dfrac{3}{7x-6} - \dfrac{2}{5x-4}$.

Factorize

(a) $4m^2 - 9$,

(b) $2m^2n + 7mn - 15n$,

(c) $4m^2 - 9 - 2m^2n - 7mn + 15n$.

Simple procedural problems

3. Application to real-life scenarios: Over the years, HKDSE mathematics question papers have ensured that some questions are put in that seek to assess the application of mathematical concepts to real-life situations.

The seats in a theatre are numbered in numerical order from the first row to the last row, and from left to right, as shown in Figure 7. The first row has 12 seats. Each succeeding row has 3 more seats than the previous one. If the theatre cannot accommodate more than 930 seats, what is the greatest number of rows of seats in the theatre?

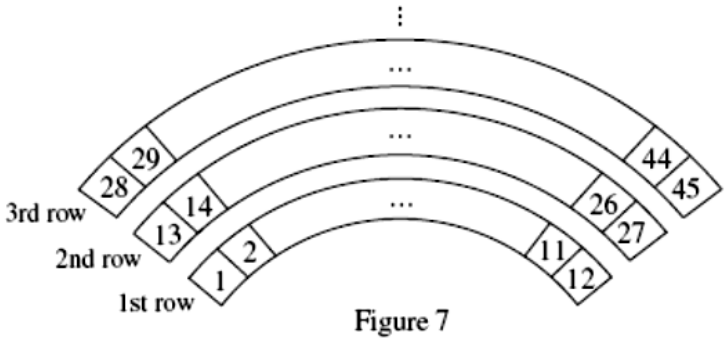


Figure 7

(4 marks)

SUMMARY

Test Conducting Authority

The Hong Kong Examinations and Assessment Authority (HKEAA)

Test Frequency

Held Annually

Grades

Grading done on 5 level scale with 5 being highest

Test Format

Pen and Paper based
HKEAA approved calculators allowed

Quality of Question Papers

- Clarity of instructions
- Contemporary nature of the questions with interconnectedness of content areas
- Good quality passages from varied sources
- Application based questions, along with plenty of procedural questions in Mathematics

Subjects offered

- **Core subjects:** Chinese, English, Mathematics, Liberal Studies
- **Elective subjects:** Languages, Economics, Geography, History, Physics, Chemistry, Biology Combined Science, Integrated Science, Tourism and Hospitality studies, Business Studies etc.
- **Applied Learning Subjects:** Creative Studies, Applied Science, Services etc.
- **Other Languages:** French, German, Japanese, Spanish, Hindi, Urdu

香港考試及評核局
Hong Kong Examinations and Assessment Authority

^ According to HKEAA 2018 registration statistics, the most chosen subject is Physics. ~70% of students choose a combination two electives, while ~17% choose three electives.
^^ Students may choose any number of electives from category B & category C.
^^^ May be used to replace Chinese Language for university admissions for students whose first language is not Chinese, but it may not be used to replace English.
** Combining two of the three science subjects, Physics, Chemistry and Biology*
*** Integrating all three science subjects, Physics, Chemistry and Biology*
**** For non-Chinese speaking students*

2.8.2. What do these examination boards do well and what best practices can be explored in our context?

2.8.2.1 Advocacy and Parental Involvement: Parents play a crucial role in Hong Kong's education system. They are actively involved in school management committees, parent-teacher associations, and home-school co-operation committees. This active participation contributes to the success of the education system. Forums with public are actively conducted on how to use public examinations data and mass public education campaigns are held like releasing videos on the HKEAA channel on “Myths about the HKDSE[69]”. Hong Kong's market-driven approach in public services, including education, has combined high levels of student performance with social equity. With a majority of schools run by private entities, the government has limited direct intervention, and parents exert significant influence on schools through choice and local control.

2.8.2.2 Education Reform: Hong Kong has undergone significant educational reforms, emphasizing a learner-centered approach. The reforms focus on expanding educational opportunities, shifting from teaching to learning, and balancing intellectual, social, moral, physical, and aesthetic aspects. Innovation in areas like Evaluation and live monitoring is a proof point in innovation and operational efficiency.

[69] Public Education Campaigns held by HKEAA (Hong Kong Examinations and Assessment Authority) https://www.youtube.com/watch?v=pujMsWOMEFI

INTERNATIONAL BACCALAUREATE (IB)

2.9 International Baccalaureate (IB)

2.9.1 What structures & processes support smooth facilitation of school leaving examinations?

2.9.1.1 Purpose of the Assessments (includes Overview & Education Journey)

Overview

Founded in 1968, the International Baccalaureate Organization (IBO) is a non-profit educational organization based in Geneva, Switzerland. This is one the most well-known school-leaving examinations globally. According to the 2018 Statistical Bulletin study by the IB, 163,173 candidates took the IB exam from 2,790 schools situated in 143 countries. This programme has an international reputation in preparing students for tertiary education in global universities, irrespective of their country of origin.

Several studies suggest that students studying in an IB-affiliated school perform well on international standardised assessments, such as the Programme for International Students (PISA) and "significantly out-perform students studying in other Boards". According to an analysis by Tan & Bibby (2011)[70], high-school students of IBDP had a mean mathematics PISA score in the range of 551 and 570, while the mean of OECD countries was in the range of 419 to 546 with medium to high effect sizes. Additionally, IB students performed better than any individual OECD country. For reading, among the same sample of IB students, the average scores were between 533 and 568, while the average scores of the OECD countries were in the range of 425 to 539. Another study by Shah, Dean & Chen (2010)[71], compared the performance of IB students against non-IB students in colleges of the University of California system. The analysis suggests that IB students consistently had higher GPAs while graduating than their non-IB peers and their Diploma Programme in school was also a good predictor of their college GPA. These results being statistically significant and having a moderately large effect suggest that students in IB-affiliated schools are being exposed to certain educational interventions that are effectively equipping them to think critically and creatively in a manner that is suitable to navigate the world.

However, it is important to note that the IB Board offers an education that is expensive and hence not accessible across all income levels. In India, a country where 121 million households have a disposable income in the range of 5–9 lakhs annually (LASI Survey, 2019), the estimated cost of doing the Diploma Programme under the IB board comes within the range of 5–8.5 lakhs INR annually (Yellow Slate, 2020). Therefore, all practices of the IB Board may not be replicable for CBSE. However, an analysis can be done to identify the most cost-effective interventions that are scalable and will have maximum effect on achieving CBSE's paradigm shift to core-competence development.

Education Journey

70 Tan, L., & Bibby, Y. (2011). Performance Comparison between IB School Students and Non-IB School Students on the International Schools' Assessment (ISA) and on the Social and Emotional Wellbeing Questionnaire. Australian Council for Educational Research (ACER).

71 Shah, S. Dean M. & Chen, Y.C. (2010). Academic Performance of IB Students Entering the University of California System from 2000-2002. Geneva: IBO

The International Baccalaureate (IB) offers three high quality programs of international education to a worldwide community of schools. These programmes, designed for students aged 3 to 19, help develop the intellectual, personal, emotional and social skills of children to live, learn and work in a rapidly globalizing world. The three programs are:

1. The IB PYP: Primary Years Programme (Kindergarten to Class 5),
2. The IB MYP: Middle Years Programme (Class 6 to Class 10), and
3. The Diploma Programme (Class 11 to Class 12)

The IB board has since then also introduced three other programmes to cover other levels of education: The *Primary Years Programme*, the *Middle Years Programme*, and the *Career Programme* for high-school students to gain opportunities for higher education on completion of the certification.

The IB program is practical and application-based. Similar to the Cambridge Board, it has a broader spectrum of subjects that lead to all-round development. IB examinations test students' knowledge, not their memory and speed. There are no externally evaluated examinations till the Middle Years Program (Class 10). The focus of the IB pedagogy is on '*how to learn'* rather than '*what to learn'*. The IB curriculum is generally viewed to be more challenging than many other educational boards, where the challenge is in the realm of expected quality of assignments, instead of the amount of work assigned. The main goal of assessments for the IBDP is to measure mastery of certain academic skills and basic skills while "encouraging an international outlook and intercultural skills". Each of the IB's programme is committed to the development of students according to the IB learner profile. The profile aims to develop learners who are Inquirers, Knowledgeable, Thinkers, Communicators, Principled, Open-minded, Caring, Risk-takers, Balanced & Reflective.

Schools following the IBDP curriculum are required to conduct regular formative assessments to help inform teachers and students on what they do not know and need to be taught (assessment for learning), and summative assessments that have the function of certification (assessment of learning).

2.9.1.2. Structure of the test:

2.9.1.2(a) Subjects offered: The IB Diploma Program (DP) is a rigorous and comprehensive two-year course designed as a pre-university program for students aged 16 to 19. Students in the DP choose one subject from each of the following six 'Subject Groups' stipulated by the board:

i. Group 1: First Language (English)
ii. Group 2: Second Language (French, German ab initio, Hindi, etc.)
iii. Group 3: Individuals and Societies (History, Economics, Business and Management, etc.)
iv. Group 4: Sciences (Biology, Chemistry, Physics and Environmental Systems)
v. Group 5: Mathematics and Computer Science
vi. Group 6: Electives (either Visual Arts or a second subject from Groups 3, 4 or 5)

In addition, all DP students must study a two-year course called *Theory of Knowledge* (TOK); work to produce one *Extended Essay* (EE); and engage in *Creativity, Action, and Service* (CAS). 'Theory of Knowledge' is an essay written on a given title, followed by a ten-minute presentation of the essay by the student in class. The 'Extended Essay' is original

independent research leading a student to produce a comprehensible written piece of 3,500-4,000 words in any chosen subject and title. Under 'Creative, Action and Service', each student must complete at least 150 hours of work spread over one-and-a-half years, engaging in some form of creativity, participating in a sport or other physical action, and doing social service.

2.9.1.2(b) Internal & External Components: There are two kinds of IB assessments: External and Internal. Some assessment methods include portfolios & dossiers, written essays, studio-work, experimental work, oral commentaries, as well as written exams. These are tailored for different learning styles. IB believes that exams may or may not reflect what a student really knows and what he or she is able to do, thus has a variety of assessment tools that allows it to fairly and accurately assess the student's true ability.

INTERNAL ASSESSMENTS

(i) Languages, Theory of Knowledge (ToK) (individual oral)

(ii) Sciences – laboratory

(iii) Mathematics – project/exploration

EXTERNAL ASSESSMENTS

Written Task (Theory of Knowledge (ToK) and Extended Essay (EE)

In addition, the grading system for all IB programs is criterion-referenced[72], to allow the performance of each student to be measured against well-defined levels of achievement. Further, assessments with oral and written components are assessed by examiners worldwide and monitored by chief examiners with ample experience.

The board has a clear aim for alignment of its curriculum and assessments. According to the official IBO website, "The IB programmes focus on fostering critical thinking and building problem-solving skills, while encouraging diversity, international mindedness, curiosity, and a healthy appetite for learning and excellence." An IB education provides students distinct advantages as they enter a world where asking the right questions is as important as discovering answers.

2.9.1.2(c) Frequency and duration of the test: All subjects, except *Creativity, Action & Service* are evaluated using both internal and external assessments. While the internal assessments are done throughout the academic year by respective schools, external examinations are conducted worldwide in May (for schools in the Northern hemisphere) and in November (for schools in the Southern hemisphere) and rigorously moderated externally to help check on marking inflation.

[72] Coined by Robert Glaser, a criterion-referenced test is designed to measure a student's academic performance against some standard or criteria. This standard or criteria is predetermined before students begin the test. First mention in: Glaser, R. (1963). Instructional technology and the measurement of learning outcomes. American Psychologist.

Few assessment tasks are conducted and overseen by teachers without the restrictions of examination conditions, but are then marked externally by examiners. For instance, written assignments for language subjects in Groups 1 and 2, the written task for the Theory of Knowledge and the Extended Essay components. Other assessments are conducted over extended time durations; varying between 1 to 3 hours per subject. Each examination comprises of multiple assessment tasks or papers.

INTERNATIONAL BACCALAUREATE DIPLOMA PROGRAM (IDBP)- SUBJECT WISE DETAILS				
Subject	**Internal/ External**	**Exam Duration (External)**	**External Assessment Paper Typology**	**Internal Assessment Paper Typology**
English	20-40-60-80	**1 to 3 hours** HL: 2h 15m SL: 1h 15m	Essays (40-50%), Oral examinations (20-30%), Language-specific assessments (30-40%)	Essays (20-30%), Oral commentaries (10-20%), Further oral activities (10-20%), Written tasks (40-50%)
Mathematics		**1 to 3 hours** HL: 2h 30m SL: 2h 10m	Essays (40-50%), Problem-solving (30-40%), Short- answer questions (20-30%)	Exploration (20-30%), Mathematical presentation (10-20%), Mathematical investigation (50-60%)
Computer Science		**1 to 3 hours** HL: 2h 10m SL: 1h 30m	Essays (40-50%), Problem-solving (30-40%), Short- answer questions (20-30%)	Portfolio (40-50%), Project (50-60%)
Physics		**1 to 3 hours** HL: 2h 15m SL: 1h 15m	Essays (40-50%), Experiments (20-30%), Data analysis (20-30%), Short-answer questions (10-20%)	Laboratory work (20-30%), Data-based questions (10-20%), Investigations (50-60%)
Chemistry		**1 to 3 hours** HL: 2h 15m SL: 1h 15m		
Biology		**1 to 3 hours** HL: 2h 15m SL: 1h 15m		
History		**1 to 3 hours** HL: 2h 30m SL: 1h 30m	Essays (40-50%), Source analysis (20-30%), Structured questions (20-30%)	Historical investigation (20-30%), Internal assessment (70-80%)
Geography		**1 to 3 hours** HL: 1h 45m SL: 1h 15m	Essays (40-50%), Fieldwork (20-30%), Structured questions (20-30%)	Internal assessment (70-80%), Fieldwork (20-30%)

Table 10: Subject-wise Examination Details for IBDP[73]

[73] https://www.ibo.org/programmes/diploma-programme/assessment-and-exams/exam-schedule/

2.9.1.2(d) **Grading and Passing Criteria:** The IB follows a grading system wherein marks for each component are converted into scaled points. Students receive grades ranging from 1 to 7, with 7 being highest. Students receive a grade for each DP course attempted. The criteria for passing are based on these points. Therefore, unlike CBSE, raw scores are not studied. For the final grade point, grades of all the main subjects are added with grades for the TOK and EE components (where 0 is the lowest and 3 is the highest). Therefore, the maximum one can score is 42 points (7 points for each of the six Subject Groups) + 3 points = 45 points. There is also a use of detailed assessment rubrics to assess open ended and higher order creative work.

The IB uses the "*mastery model*" of assessment rather than a "*compensation model*" of assessment. This means that students do not simply pass an exam if they have an overall score that meets the cut-off for passing but, rather, are expected to demonstrate a certain level of mastery on each task or item in a paper. This system ensures that students, who have successfully earned the diploma, have a certain level of knowledge, skills, and values that the programme aims to develop among them. If a student scores well on Mathematics but does not have the required points in Theory of Knowledge (a core element focusing on critical thinking), they do not have any advantage in the IB system. In addition to the pass marks criteria, there is a list of conditions that a student should fulfill in order to gain the Matriculation Certificate. These have been stated in the official assessment guide of the IB. A grade award meeting occurs at the end of the marking process in each subject, that decides the cut-offs for each grade. These cut-offs are not pre-fixed, they vary from subject to subject, and year-to-year based on difficulty of the papers for that year.

FAILING CONDITIONS:

A student will NOT receive an IB Diploma if one or more of the following occur:

- *CAS requirements have not been met.*
- *Candidate's total exam & core points are fewer than 24.*
- *An N has been given for Theory of Knowledge, Extended Essay or a Contributing Subject.*
- *Grade E has been earned for Theory of Knowledge oral exam and/or Extended Essay.*
- *There is a Grade 1 earned in any subject/level.*
- *A score of 2 has been earned three or more times in either higher level (HL) or Standard level (SL).*
- *A score of 3 or lower has been earned four or more times (HL or SL).*
- *Candidate has gained fewer than 12 points on HL subjects (for candidates who register for four HL subjects, the three highest grades count).*

2.9.1.2(e) **Remarking and Rechecking Policy:** Both the CBSE and IB have the same procedure. A student can apply for a re-check which is done by a third person/examiner, for a fee. The process does not allow the student to understand or discuss the marks given in terms of specific feedback.

2.9.1.3 Process followed to develop and administer the assessment[74]

[74] https://www.ibo.org/contentassets/4d92e48d38a4415a87e11555e143a39f/assessment-guide-for-examiners-en.pdf

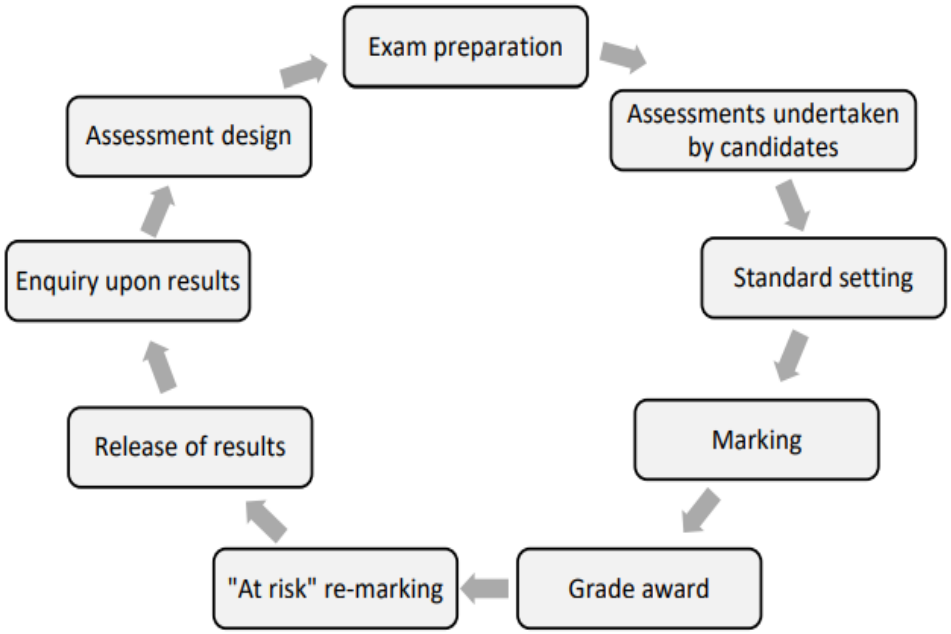


Figure 34: Assessment Process for IBDP

2.9.1.3(a) Question paper setting: Every paper is created as a whole by an author. The nature of IB questions are mostly free-response with very few multiple-choice questions (MCQs). The board also does not repeat the exact same paper at any given year. Each year, authors create a fresh paper with new items, only modeling the paper after the previous year's paper. Sample question papers are available from previous years on the official website. The paper setting process takes 18 months. Members of the senior examining team are given the responsibility of preparing one or more examinations to make up the complete set that is required for a subject.

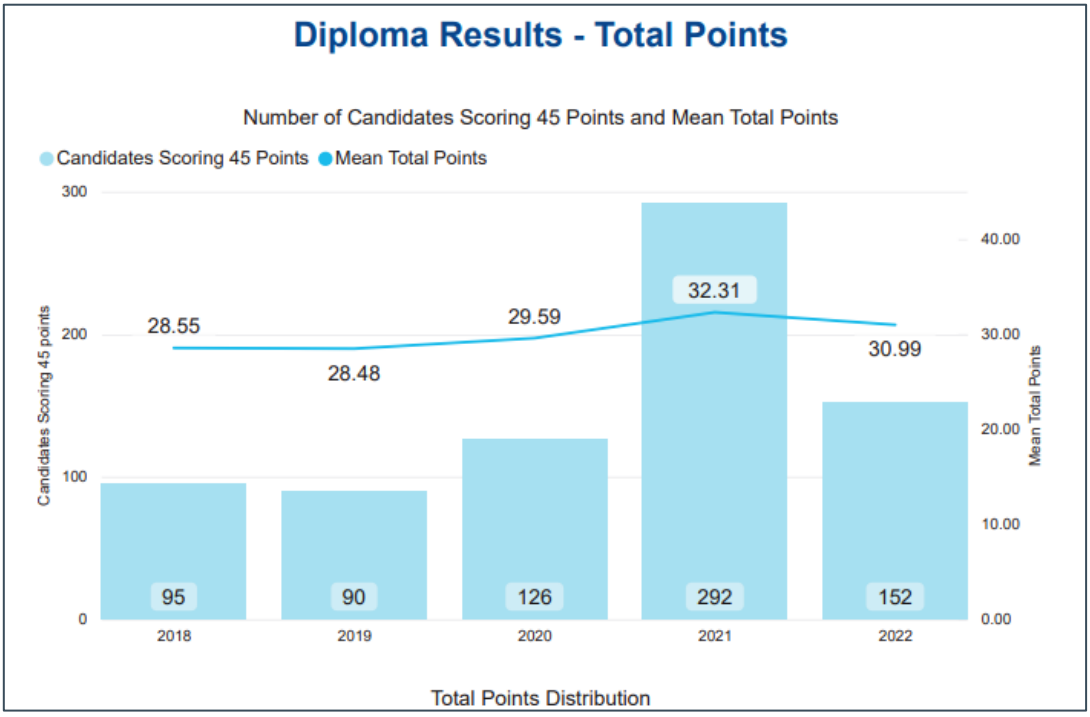
2.9.1.3(b) Test Administration & Invigilation: Materials specified by the IB as required for a particular examination, for example, an electronic calculator, a clean copy of a case study and/or data booklet is allowed. A bilingual translation dictionary for non-modern language examinations that does not contain notes of any kind is also permitted in the examination. The Coordinator/invigilator has the right to inspect and confiscate any item brought into the examination room which includes electronic calculators, which should be set to test mode (when applicable). 1 invigilator is provided for every 20 candidates with a minimum 2 invigilators per room. Invigilators have to be teaching faculty or can be responsible adults who are not teachers and appropriately trained. In rooms with fewer candidates, a "floating"[75] invigilator is used across 3 rooms. Schools are permitted to run more than one examination in an examination room.

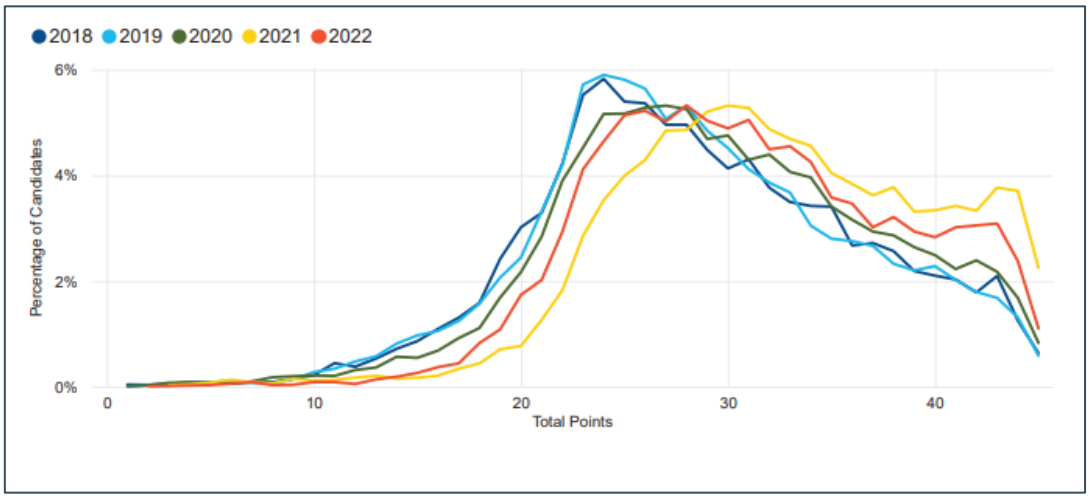
2.9.1.3(c) Evaluation: Moderation is done on Internal Assessment through dynamic sampling. For external assessment, after exams, answer scripts are scanned and tested through onscreen marking. Selection process is used for finding evaluators. Marking by item is conducted to improve efficiency in marking.

2.9.1.3(d) Grading & Reporting*:* The total points for the IB Diploma range from 0 to 45. Subject grades contribute to a maximum of 42 points (7 points per subject). The remaining

75https://resources.finalsite.net/images/v1606172899/slcschoolsorg/n3o7lqh6jsivfi6lwdmv/IBExamAdministrationInstructions.pdf

3 points come from the combined scores of the Extended Essay and Theory of Knowledge. International Baccalaureate releases Statistical Bulletin to publicly announce exam statistics.





Total Points Distribution

Total Points	2018	2019	2020	2021	2022
23 or Fewer	26.45%	25.78%	20.85%	10.14%	14.71%
24 to 29	30.99%	32.59%	30.88%	26.72%	30.38%
30 to 34	19.12%	19.22%	21.47%	24.73%	23.23%
35 to 39	13.55%	12.75%	15.01%	18.60%	16.21%
40 to 44	9.26%	9.08%	10.96%	17.57%	14.37%
45	0.63%	0.59%	0.83%	2.25%	1.10%

Figure 35: IBDP Statistical Bulletin[76]

2.9.1.3(e) Analysis of quality of questions from IB diploma programme question papers:

English Language and Literature

1. Higher Order Thinking Skills-based questions: The Literature paper included questions based on a comparison of different texts and the students needed to analyse or critique them. This is a useful question type to include since students not only have to understand details within a text but also demonstrate the ability to compare or contrast it with other texts they have read. This requires three key competencies: ability to analyse, evaluate and adequately express thoughts.

Answer **one** essay question only. You must base your answer on both of the part 3 works you have studied. Answers which are **not** based on a discussion of both part 3 works will **not** score high marks. Your answer should address the ways in which language and context contribute to your reading of each work.

1. Discuss the ways in which philosophical or aesthetic ideas are represented in the **two** works you have studied.

2. There is no love without suffering. Discuss the extent to which the **two** works you have studied support this view.

3. In the **two** works you have studied, discuss the means as well as the effectiveness with which power or authority is exercised.

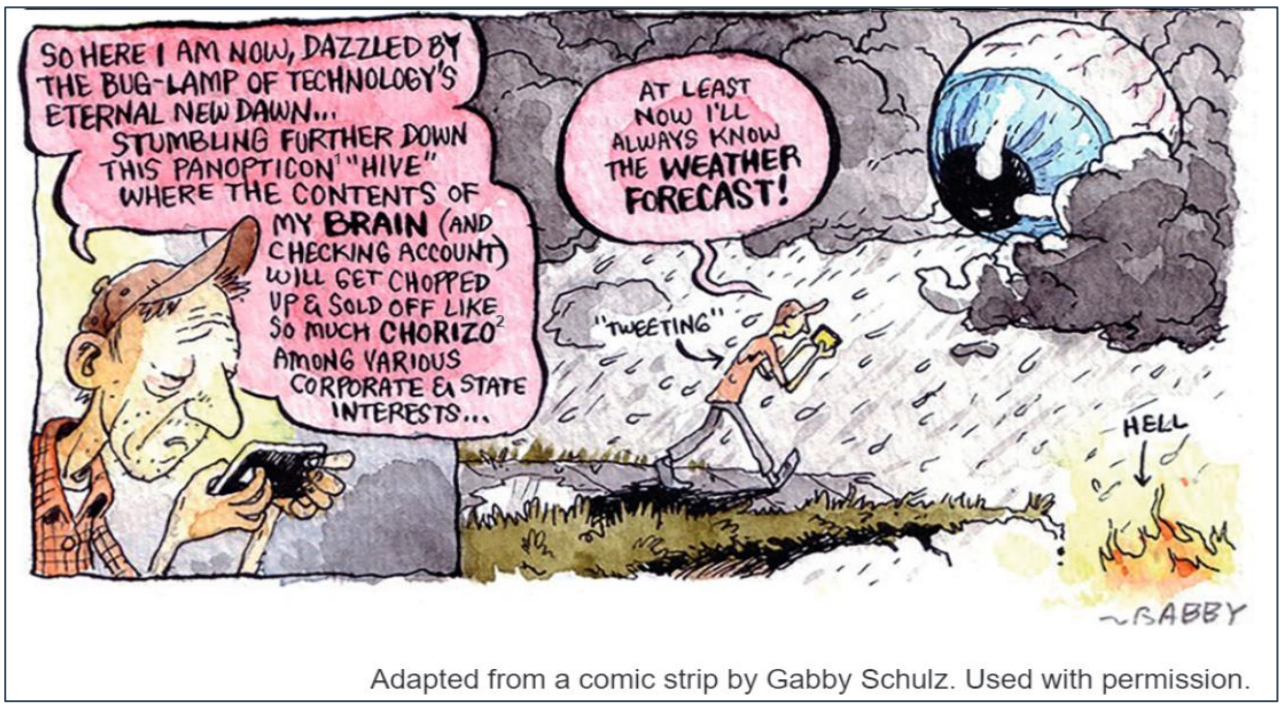
4. Pleasure is often deferred, delayed or denied. Discuss why this is so by analysing examples in the **two** works you have studied.

5. In what ways are the contradictory or the paradoxical significant aspects of the **two** works you have studied?

2. Passages with interesting content: The language and literature papers used an interesting format comprising even comic strips to induce interest in the students without making the question text heavy, and exposing students to alternate text features and genres.

[76] https://www.ibo.org/globalassets/new-structure/about-the-ib/pdfs/final-dp-statistical-bulletin-november-2022.pdf


THE 21st CENTURY
BEFORE LAST WEEK, I HAD NEVER USED A "SMARTPHONE."
A HUMAN BEING EXPERIENCING PURE UNFRAGMENTED REALITY
SPECIAL
UNEMPLOYED
BUT THEN MY DUMBPHONE BROKE
HAND-ME-DOWN FROM TEENAGE SISTER
OMINOUSLY, AN INTERNET FRIEND IMMEDIATELY DONATED HIS OLD ANDROID SMARTPHONE.
TENTATIVE CURIOSITY...
TRUST US!!!
HAND-ME-DOWN FROM ADULT WITH A JOB
AND I THOUGHT,
HEY, WHY NOT?
JOIN THE HIVE
EVERYONE ELSE ALREADY HAS ONE, RIGHT?
DON'T I WANNA BE NORMAL?
DOWNLOAD SOME "APPS"?



Adapted from a comic strip by Gabby Schulz. Used with permission.

- Analyse the words and images that characterize the protagonist and his world.
- Comment on the significance of the final frame in relation to the cartoon as a whole.

Science:

1. Variety of question types: Questions in each of the three subjects (Physics, Chemistry, and Biology) are focussed on knowledge of subject matter and are a mix of application-based and knowledge-based questions. [77]

The tennis ball was stationary at the instant when it was hit. The mass of the tennis ball is 5.8×10^{-2} kg. The area under the curve is 0.84 N s.

(a) Calculate the speed of the ball as it leaves the racket. [2]

(b) Show that the average force exerted on the ball by the racket is about 50 N. [2]

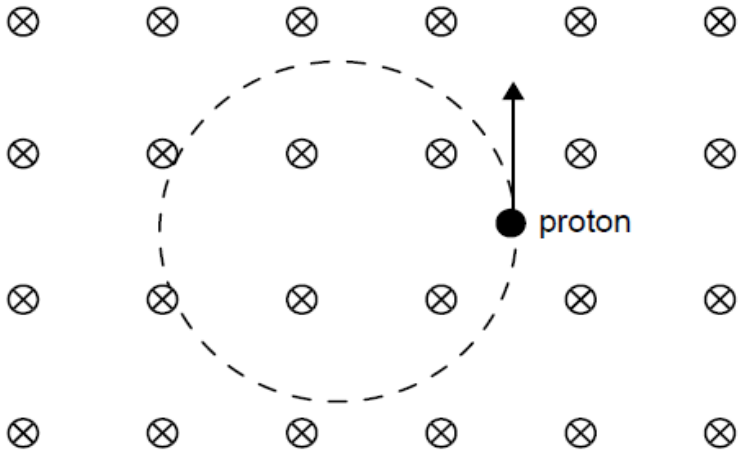
(c) Determine, with reference to the work done by the average force, the horizontal distance travelled by the ball while it was in contact with the racket. [3]

(d) Draw a graph to show the variation with *t* of the horizontal speed *v* of the ball while it was in contact with the racket. Numbers are **not** required on the axes. [2]

2. Rooted in reasoning and application: Students are also assessed on their ability to explain cause, effect and reason behind a physical, biological and chemical process, phenomena or occurrence.

[77] https://workdrive.zohopublic.in/external/4cf5b2eaaa34e982354acb1ccde8950dc589fb4eccff053b15a13e889546951d

A proton is moving in a region of uniform magnetic field. The magnetic field is directed into the plane of the paper. The arrow shows the velocity of the proton at one instant and the dotted circle gives the path followed by the proton.



(a) Explain why the path of the proton is a circle.

The biochemical oxygen demand of a water sample can be determined by the following series of reactions. The final step is titration of the sample with sodium thiosulfate solution, $Na_2S_2O_3(aq)$.

$$2Mn^{2+}(aq) + O_2(aq) + 4OH^-(aq) \rightarrow 2MnO_2(s) + 2H_2O(l)$$

$$MnO_2(s) + 2I^-(aq) + 4H^+(aq) \rightarrow Mn^{2+}(aq) + I_2(aq) + 2H_2O(l)$$

$$2S_2O_3^{2-}(aq) + I_2(aq) \rightarrow 2I^-(aq) + S_4O_6^{2-}(aq)$$

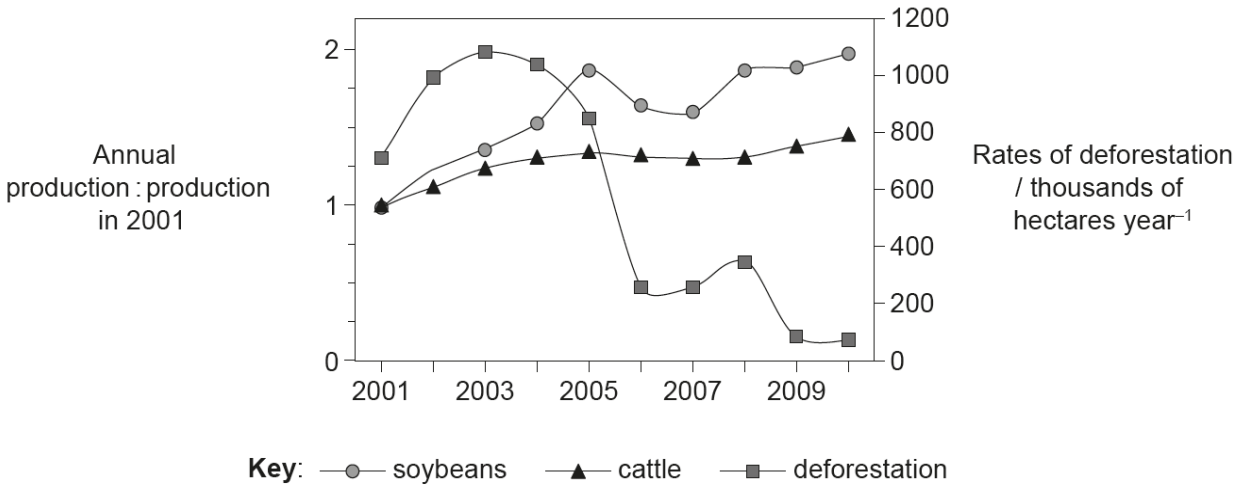
A student analysed two 300.0 cm^3 samples of water taken from the school pond: one immediately (day 0), and the other after leaving it sealed in a dark cupboard for five days (day 5). The following results were obtained for the titration of the samples with 0.0100 mol dm^{-3} $Na_2S_2O_3(aq)$.

Sample	Titre / cm^3 ± 0.1 cm^3
Day 0	25.8
Day 5	20.1

Suggest a modification to the procedure that would make the results more reliable.

3. Authentic contexts and real-life application: Some of the questions from IB Science question papers make good use of authentic contexts that pivot on testing real-life application of the concepts. The source from where the authentic context is taken is mentioned. Some of the sources even include popular research journals.

16. Deforestation and agricultural activities including the production of crops and livestock are thought to play a major role in the greenhouse effect. The graph shows annual trends in rates of deforestation and the production of soybeans and cattle in the state of Mato Grosso in Brazil in the period from 2001 to 2010.



[Source: 'Decoupling of deforestation and soy production in the southern Amazon during the late 2000s.' Marcia N. Macedo, Ruth S. DeFries, Douglas C. Morton, Claudia M. Stickler, Gillian L. Galford, and Yosio E. Shimabukuro *PNAS* January 24, 2012, 109 (**4**) 1341–1346; https://doi.org/10.1073/pnas.1111374109, used with permission]

What conclusion can be drawn from the information in this graph?

A. The decline in rates of deforestation led to an increase in production of CO_2.

B. Soybean production accounted for a greater proportion of deforestation than cattle production.

C. Forest habitats declined during the first few years of the study.

D. The decline in rates of deforestation is due to an increase in soybean production.

Mathematics:

1. Testing core concepts: The IB board also puts a lot of focus on testing core concepts and ensuring that learning objectives are taught in a way that they are understood and retained by the student and not merely memorised. The mathematics paper is short and only consists of 10 questions since assessing essential skills and concepts is considered paramount over volume of testing materials.

2. Overuse of procedural questions: Though many questions in the IB paper are of higher difficulty level, in comparison with questions posed in other board's papers in the same subjects, they are procedural; if a student has practiced similar problems they can answer such problems easily.

Consider $\binom{11}{a} = \frac{11!}{a!\,9!}$.

(a) Find the value of a.

(b) Hence or otherwise find the coefficient of the term in x^9 in the expansion of $(x+3)^{11}$.

In an arithmetic sequence, $u_2 = 5$ and $u_3 = 11$.

(a) Find the common difference.

(b) Find the first term.

(c) Find the sum of the first 20 terms.

Let X and Y be normally distributed with $X \sim \mathrm{N}(14, a^2)$ and $Y \sim \mathrm{N}(22, a^2)$, $a > 0$.

(a) Find b so that $\mathrm{P}(X > b) = \mathrm{P}(Y < b)$.

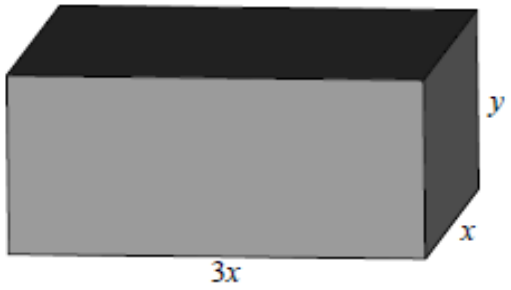
It is given that $\mathrm{P}(X > 20) = 0.112$.

(b) Find $\mathrm{P}(16 < Y < 28)$.

3. Simple calculations, even in higher order questions: A few questions test higher order thinking skills of students are application-based but do not require intensive calculations.

A small cuboid box has a rectangular base of length $3x$ cm and width x cm, where $x > 0$. The height is y cm, where $y > 0$.

diagram not to scale



The sum of the length, width and height is 12 cm.

(a) Write down an expression for y in terms of x.

The volume of the box is $V\,\text{cm}^3$.

(b) Find an expression for V in terms of x.

(c) Find $\frac{dV}{dx}$.

(d) (i) Find the value of x for which V is a maximum.

(ii) Justify your answer.

(e) Find the maximum volume.

SUMMARY

Test Conducting Authority

The International Baccalaureate Board

Test Frequency

Exams are held twice
For Northern and Southern hemispheres

Grades

Each group is graded on a scale of 1-7
ToK and EE are graded on a scale of 0-3
Maximum possible score = 45

Test Format

Exam duration ranging between 1-3 hours
Board approved calculators and formulae books allowed

Quality of Question Papers

- Integration of HOTS questions
- Interesting format of comprehension questions
- Questions rooted in reasoning and application
- Authentic contexts in questions testing core concepts and enduring learning objectives

Subjects offered

Group 1: First Language (English)
Group 2: Second Language (French, Hindi, etc.)
Group 3: Individuals and Societies
Group 4: Individuals and societies
Group 5: Mathematics and Computer Science
Group 6: Electives
Mandatory 2 year courses: Theory of Knowledge, Extended Essay & Creativity, Action and Services

International Baccalaureate®
Baccalauréat International
Bachillerato Internacional

3.9.2. What do these examination boards do well and what best practices can be explored in our context?

3.9.2.1 Integration of interdisciplinary learning in assessments: Evidence of this can be found in the structure of IB programs, where Theory of Knowledge (TOK), Extended Essay (EE), and Creativity, Activity, Service (CAS) are integrated into the curriculum. These components are essential parts of the IB Diploma Programme, designed to promote interdisciplinary learning, holistic development and higher order thinking skills.

3.9.2.2 Authentic Assessment Contexts: IB assessment materials often include authentic contexts and real-life applications. For instance, questions in IB Science papers are sourced from reputable research journals, providing students with opportunities to apply their knowledge to authentic scientific scenarios.

3.9.2.3 Quality Assurance and Standardization in assessment design and evaluation: The IB maintains rigorous quality assurance processes to ensure the reliability and validity of assessments. Evidence of this can be seen in the training and certification of examiners, as well as the regular monitoring of marking consistency.

3.9.2.4 Inclusive Assessment Practices: IB assessments accommodate diverse learners through inclusive practices. For example, accommodations for students with special educational needs, such as extended time or alternative assessment formats, are provided to ensure equitable access to assessment opportunities.

3.9.2.5 Research and Innovation: The IB invests in research and innovation to enhance assessment methodologies and practices continually. Evidence of this can be found in the IB's ongoing efforts to explore new assessment formats, conducting pilots and research, and releasing studies and blogs on their website.

3. Summary Table:

	Canada	Vietnam	Estonia	Singapore	Cambridge	Finland	Hong Kong	IB	South Korea
Purpose of Assessments	Selection / Certification	Selection / Certification	Selection / Certification	Selection / Certification	Selection / Certification	Selection / Certification	Selection / Certification	Selection / Certification	CSAT: Selection Kodung-Hakkyo: Certification
Subjects Offered	Provincial variations, common subjects, and electives.	Compulsory and optional subjects with specialization.	Core subjects and optional subjects based on interest.	Core and elective subjects with a global perspective.	Broad range of subjects with a focus on practical approaches.	Languages, mathematics, and "Reaali" covering various topics.	24 senior secondary subjects (4 core and 20 elective); applied learning and other language subjects; emphasis on practicality.	First Language, Second Language, Individuals and Societies, Sciences, Mathematics and Computer Science, Electives.	The national curriculum outlines subjects covering Korean language, English, mathematics, science, vocational training, and autonomous courses. Local adjustments to credits are allowed based on regional needs.
Internal and External Components	Mix of internal assessments, projects, and external exams.	Internal assessments and national exam components.	Emphasis on external assessments with practical components.	Combination of internal coursework and external exams.	Blend of internal coursework and external assessments.	Focus on external assessments with practical components.	Internal assessment conducted by schools; external assessment by HKEAA; significant weight on external examination.	Diverse assessments: portfolios, essays, studio work, exams; criterion-referenced grading.	Internal assessments, designed by teachers, coexist with external examinations. The weightage between internal and external assessments varies, offering flexibility to schools and subjects.

Frequency & Duration of Tests	Provincial variations, usually held at the end of courses.	National high school exams are held at the end of the academic year.	Centralized exams held at the end of upper-secondary studies.	National exams are held at the end of the academic year.	Biannual exams (May/June and Oct/Nov) with retake options.	Biannual online exams held in spring and autumn.	Annual Matriculation Examination; subject-specific durations; core subjects may have longer durations.	Global exams in May and November; varying durations (3-5 hours per subject).	Unlike a specific "General Senior High School Certificate" exam, assessments are ongoing throughout the academic year, focusing on credit completion and curriculum requirements. The frequency and structure of exams vary across school types and regions.
Grading and Passing Criteria	Provincial grading systems, percentages, and GPA.	Grading based on achievement levels and national standards.	Grading system with a focus on performance levels.	Grading system with letter grades and standardized scores.	Grading based on a letter scale and percentage uniform mark.	Grading includes honors, excellent praise, and acceptance.	Level 1 to 5 for Category A subjects; 'Attained' and 'Attained with Distinction' for Category B; Grades A to E for Category C.	Grading from 1 to 7, with 7 as the highest; max 42 points (6 subjects), plus 3 from EE and TOK. "Mastery model" ensures competence.	Grading involves numerical scores on a scale of 0 to 100, corresponding to letter grades. The passing criteria rely on credit completion and fulfillment of curriculum requirements
Remarking and Rechecking Policy	Policies vary by province, allowing for remarking.	Opportunities for re-evaluation and appeals.	Re-evaluation allowed under specific policies.	Rechecking and re-marking available with a fee.	Re-evaluation or re-marking allowed under "Enquiry About Results" (EAR).	Both remarking and rechecking policies available for students.	Re-checking and re-marking system for up to four subjects; appeal review available with valid reasons.	Allows remarking for a fee; no specific feedback provided.	Information on remarking and rechecking policies is not available.

Assessment Development Process	Involves curriculum design, assessment creation, and moderation.	Development involves drafting questions, review, and adjustments.	Comprehensive process with question setting and translation.	Rigorous process spanning 24 months with expert involvement.	Detailed process with question creation, review, and translation.	Involves exporting questions to a USB, digital exam setup, and evaluation.	Rigorous mechanism for question paper setting; Moderation Committees for each subject; reviews ensure integrity and fairness.	Annual fresh papers by authors; 18-month process; senior examining team involvement.	No specific information is provided on the process followed to develop and administer assessments in South Korea.
Administration and Invigilation	Provincial administration with guidelines for invigilation.	National exam administration with strict invigilation.	Centralized administration with a focus on security.	National administration with trained invigilators.	Stringent administration with trained invigilators.	Digital exam administration, local network, and strict protocols.	Traditional pen & paper exams starting at 8:30 am; strict protocols; technology used for communication and recording.	Specific materials allowed; invigilation ratios maintained; bilingual translation dictionary permitted.	Details on the administration and invigilation processes for assessments in South Korea are not available.
Evaluation Process	Mix of teacher assessment, external markers, and moderation.	Centralized marking by qualified examiners.	Centralized evaluation with secure processes.	Centralized marking by examiners and senior examiners.	Online evaluation by teachers and Board's censors.	Digital evaluation with teachers' assessments and Board's censors.	Meticulous marking process; thorough training for markers; Chief Examiners and Assistant Examiners oversee marking.	Moderation on Internal Assessment; scanned answer scripts, onscreen marking for efficiency.	No specific information is provided on the evaluation process for assessments in South Korea.

Reporting	Provincial reporting with transcripts and diplomas.	National reporting with detailed score breakdowns.	Centralized reporting with standardized certificates.	National reporting with detailed result slips.	International grading system with percentage uniform mark.	Certificates with grades and points based on performance.	Multi-stage grading process; core subjects graded first; certificates issued with the option for rechecking and remarking.	Grading system from 0 to 45; release of Statistical Bulletin for exam statistics.	The grading system involves numerical scores and letter grades, contributing to the award of the "General Senior High School Certificate."

LIST OF FIGURES

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BIBLIOGRAPHY

1. An Analysis of Some Unintended and Negative Consequences of High-Stakes Testing, Audrey, Berliner, Arizona State University, (2002)
2. A critique of the modern education system, by Sandeep Pandey.
3. An Overview of K-12 Education in Singapore Local Schools.
4. Assessment of Student Learning, Arlan M. Villanueva
5. Concerns with International Assessments in Education, HaiTiet and Sarah Tumen, UNESCO (2011)
6. Examination Reforms and Continuous and Comprehensive evaluation, CBSE, (2010)
7. Essentials of High-school Reform: New Forms of Assessment and Contextual Teaching and Learning, Betsy Brand, A Y P, (2003)
8. High-school Exit Examinations: When Do Learning Effects Generalize? John H. Bishop, Cornell University (2006)
9. High-Stakes Testing & Curricular Control: A Qualitative Met synthesis, Wyne Wu, Education Researcher (2007)
10. High-Stakes Testing, Uncertainty, and Student Learning, Audrey L. Amrein, David C. Berliner, Arizona State University, (2002)
11. International Review of Curriculum and Assessment-INCA table of education system comparison (2010)
12. Learning for Understanding, Howard Gardner, (2002)
13. Overview of IGCSE – Background, Syllabus, Format of Exams, Question Types, Marking Schemes, (www.cambridgeinternational.org/)
14. Overview of IB – Background, Syllabus, Format of Exam, Question Types, Marking Schemes (www.ibo.org)
15. Overview of ICSE – Background, Syllabus, Format of Exam, Question Types, Marking Schemes (www.cisce.org)
16. Overview of CBSE - Syllabus, Format of Exam, Question Types, Marking Schemes (www.cbse.nic.in)
17. Overview of Finnish Matriculation Exam - Background, Syllabus, Format of Exam, Question Types, Marking Schemes (www.ylioppilastutkinto.fi/)

18. Overview of HKDSE - Background, Syllabus, Format of Exam, Question Types, (www.hkeaa.edu.hk/en/hkdse/)
19. Overview of Singapore Matriculation Exam - Background, Syllabus, Format of Exam, Question Types, Marking Schemes (www.moe.gov.sg/)
20. Commentary and Discussions on High-school Exit Exam of China (www.factsanddetails.com/china.php)
21. Commentary and Discussions on High-school Exit Exam of South Korea (CSAT) (www.kice.re.kr)
22. Position paper: National Focus Group on Examination Reform, NCERT 2006
23. Quality in School Education, Quality Council of India, Institute for Studies in Industrial Development
24. Reflections on Educational Testing: Problems and Opportunities, Edward H. Haertel, Stanford (2002)
25. State High-school Tests: Exit Exams and Other Assessments, (2010), CEP
26. The Influence of Teaching Methods on Student Achievement, Group of Authors, Virginia Tech, (2002)
27. 21st Century Skills, 21st Century Educator, 21st Century Educator (www.21stCenturyskills.org)
28. Economic Indicators data, World Bank (2018), (https://data.worldbank.org/)
29. Secondary education across the globe, OECD (https://www.oecd.org/)
30. Toksöz, Sibel, and Ayşe Ertunç. "Item analysis of a multiple-choice Exam." Advances in Language and Literary Studies 8.6 (2017): 141-146.
31. Talebi, Ghadam Ali, et al. "Item analysis an effective tool for assessing exam quality, designing appropriate exam and determining weakness in teaching." Research and Development in Medical Education 2.2 (2013): 69-72.
32. Education in Estonia, https://eacea.ec.europa.eu/national-policies/eurydice/content/estonia_en
33. Estonia – National Centre on Education and Economy (NCEE), https://ncee.org/country/estonia/
34. Education in Vietnam, https://wenr.wes.org/2017/11/education-in-vietnam
35. Education in Vietnam, World Bank
36. Schleicher, A. (2018), World Class: How to Build a 21st-Century School System, Strong Performers and Successful Reformers in Education, OECD Publishing, Paris, https://doi.org/10.1787/9789264300002-en

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