Skill Manual

Pottery

Grade VI

Central Board of Secondary Education
Shiksha Kendra, 2, Community Centre, Preet Vihar,
Delhi - 110092

ACKNOWLEDGEMENTS

Advisory:

- **Smt. Nidhi Chhibber** (IAS), Chairperson, Central Board of Secondary Education, Delhi
- **Dr. Biswajit Saha**, Director (Skill Education), Central Board of Secondary Education, Delhi
- **Dr. Joseph Emmanuel**, Director (Academics), Central Board of Secondary Education, Delhi

Coordinator & Curator:

- **Shri. R. P. Singh**, Joint Secretary (Skill Education), Central Board of Secondary Education, Delhi
- **Smt. Niti Shanker Sharma**, Deputy Secretary (Skill Education), Central Board of Secondary Education, Delhi
- **Shri. Sandeep Sethi**, Coordinator, Princess Diya Kumari Foundation

Content Development Committee:

- **Ms. Aditi Misra,** Director Principal, DPS Gurgaon
- **Ms. Sapna Dhawan,** Dean, Student Welfare, DPS Gurgaon
- **Ms. Richa Zalpuri,** HOD English
- **Ms. Meera Khurana,** TGT Hindi
- **Ms. Shaifali Bhatt,** TGT Math
- **Ms. Savita Kumari,** TGT Science
- **Ms. Nupur Sahay and Ms. Navpreet Kaur,** TGT Social Science

Layout and Design:

- **Ms. Shilpa Agarwal,** TGT Computer Science
- **Ms. Madhumita Nandi,** HOD Art
- **Ms. Bhavna Srivastava,** Deputy HOD Art
- **Ms. Rupina Anand,** PGT Art








FOREWORD

We all are aware that the National Education Policy 2020 has clearly stated that there should be 'no hard separation' between curricular, co-curricular, and extra-curricular or academic and vocational skill/physical education/art, etc. It is felt that mainstreaming all forms of learning and skills will integrate not just the hands-on skilling component but also the theoretical knowledge, attitudes and mindsets, and soft skills that are required for particular occupations, through a broad-based education that is necessary for students to be able to take on and thrive in a fast-changing world.

To keep pace with the objective of 'no hard separation', CBSE has decided to offer students the flexibility of making a vocational choice of a short-duration module on Pottery(12 hours), at a stage in their early academic career (either at class VI, VII or VIII). In this way, they will be able to spend relevant time pursuing this choice as per the convenience of the school. This would give them the necessary orientation early on, so that they are able to make a choice at a later stage to pursue Skill courses at Secondary and Senior Secondary levels, or choose a higher vocational degree.

This manual ensures that skill-based training is integrated with the pedagogy, resulting in the holistic development of every learner, thereby making them adept at tackling the challenges of the multifarious world. It has been designed in a way that aims to keep the young learners productively engaged, explore their fields of interest and learn regular concepts through an interdisciplinary approach. Pottery helps children to connect to their roots, culture and heritage of Indian handcraftsmanship.

The manual aims at enabling the students to amalgamate their creativity with the acquired vocational skills, thereby ensuring wholesome learning and development. We extend our hearty congratulations to the Director Principal, Delhi Public School, Gurgaon, Ms Aditi Misra and her team for working tirelessly with a holistic vision for the future. The success of this project lies in the implementation of the same, and we are optimistic that no stone will be left unturned in its execution.

INDEX

ESSENTIALS BEFORE THE JOURNEY STARTS

Finding the balance within yourself @Potter's wheel

- Dedicated space/room for pottery
- Tap water with sink and proper drainage system
- Potter's wheel(manual/electric)
- Stools for students to sit while working on the potter's wheel
- Big drums to store and keep the clay airtight and moist
- Two-three buckets of clean water
- Bowls for holding slurry water as you work
- Aprons
- Potter's needle
- Wooden trimming tools
- Wooden boards for drying
- Wooden racks for display
- Fine moist clay
- Thread/wire for cutting of the clay articles from the base of the potter's wheel
- Sponge for cleaning the wheel

Clay is fascinating and is never boring; there is always more to explore, more to try out and more to create.

Be prepared for a fine adventure as you enter the world of pottery, for clay is as deep and as broad as the earth it comes from.

माटी कहे कुम्हार से, माटी है अनमोल
माटी जब आकार ले, लोग लगावें मोल ।

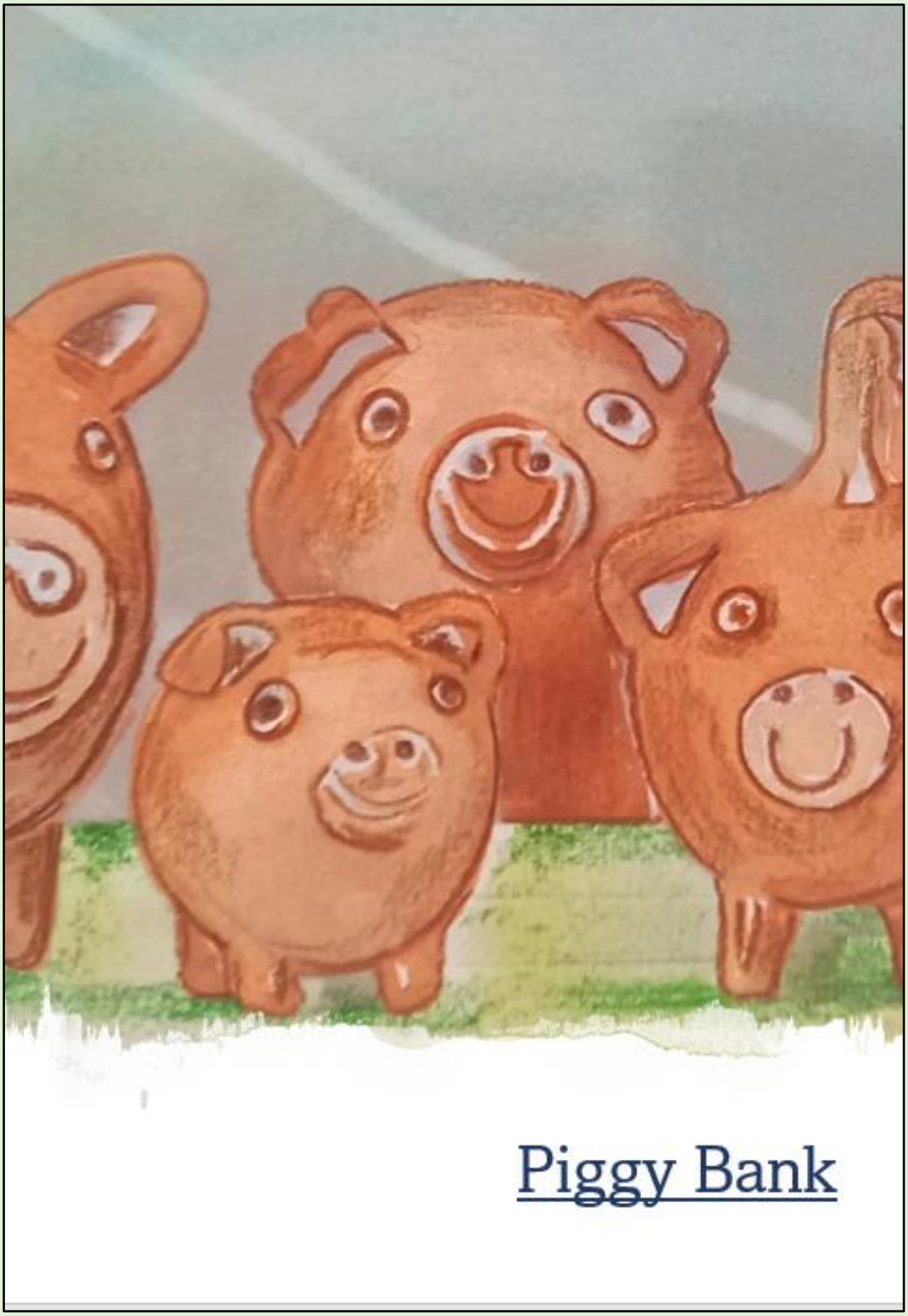
माटी का आकार नहीं, इसका न कोई रूप
जब कुम्हार सिरजन करे, निखरे छवि अनूप ।

माटी और कुम्हार का कितना गहरा नाता
माटी जीव समान है और ये जीवन दाता ।

माटी तो है आत्मा, ये बस धरे शरीर
सब में है परमात्मा, राजा रंक फ़कीर ।

माटी की यह देह भी माटी–सी हो जाए
माटी, माटी में मिले सब माटी हो जाए ।

-दीप्ति सिंह

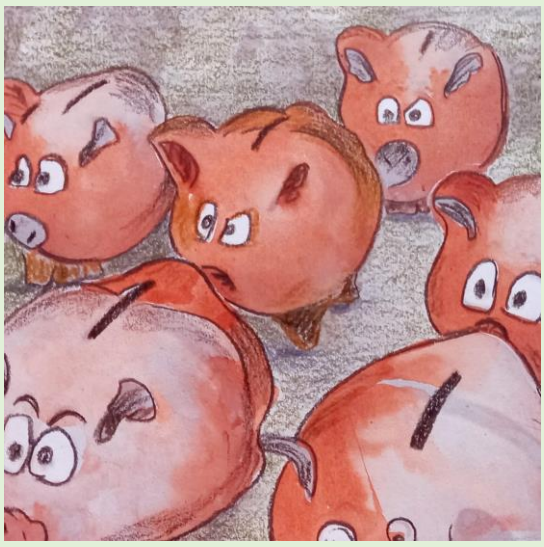


Credits: Collaborative work of students of Grade VI

Pottery is one of the oldest and most widespread of the decorative arts that has been prevalent across the ages. Let's explore more about pottery through a fun activity. Use the clues given below to find the answers in the grid.

W	P	I	N	C	H	I	N	G	K	F
H	A	B	C	G	L	A	Z	E	I	L
E	S	L	I	P	D	E	F	F	L	A
E	G	H	I	J	K	L	O	N	N	T
L	O	C	L	A	Y	P	O	Q	R	W
S	T	U	V	W	X	Y	T	Z	B	A
G	F	I	R	I	N	G	E	D	C	R
E	A	R	T	H	E	N	W	A	R	E

a) Pottery items are made of _____.
b) The process that protects pottery from the effects of water
c) Tool required for pottery
d) A heating chamber for hardening and baking the clay products
e) The base of a pot
f) A vitreous substance used to decorate pottery and render it impermeable to moisture
g) Pots that are porous when unglazed
h) Indenting a pot with the fingers and thumb before it becomes hard
i) Fluid clay in a creamy texture
j) Another name for plates, saucers and trays



ENGLISH

Pottery making has always been an avenue for artistic expression and a reflection of cultural and personal identity. The art of pottery making with clay helps promote self-confidence, develops problem-solving skills and at the same time it's meditative.

ACTIVITY:

Students will make a piggy bank or a jar with a lid on the potter's wheel using clay, and decorate it with Mithila style of art.

AIM:

To develop their skills of convergence of two arts (Pottery & Mithila art), express their creativity using language skills and have a better understanding of the chapter, 'The Women Painters of Mithila', through the activity.

LEARNING OBJECTIVES:

Students will be able to:

- understand the influence and impact of the intermingling of the two ancient arts (Pottery & Mithila art).
- realise the importance of skill training.
- showcase their unique pottery making skills and speak about their experience of creatively depicting Mithila art through pottery making.
- construct their understanding of the world by amalgamating the learnings about culture, history, and concepts.
- understand the basics of money management, budgeting and saving.

LEARNING OUTCOMES:

It will enable the students to:

- bring forth unique creations that will develop their knowledge about the legacy of both pottery and Mithila art form.
- enhance their speaking skills by expressing themselves in a creative way.
- learn about the unique style of Mithila paintings.
- expand their vocabulary by identifying actions, materials, making associations, expressing thoughts and feelings.
- enhance their comprehension and understanding of the entire process.
- understand the cause and effect of various techniques applied in making a piggy bank.
- recognise methods to keep a balanced budget plan and the importance of savings.
- get familiar with financial concepts like saving.

KEY VOCABULARY:

- Self-expression
- Artistic tradition

- Creativity
- Experimentation

MATERIALS REQUIRED

- Clay- 250gms (approx.)
- Water- small bowl
- A small piece of sponge
- Thread/wire- for cutting the clay cylinder from the wheelbase

PRE-REQUISITE KNOWLEDGE

Students should have previous knowledge of Mithila art. **Mithila painting**, also known as **Madhubani art,** is a style of painting practised in the Mithila region of India and Nepal. It is characterised by eye-catching geometrical patterns and makes use of natural dyes and pigments. This painting is a form of wall art which was traditionally created by the women of the various communities living in the Mithila region and is done by using tools like twigs, brushes, nib-pens etc. The paintings depict people and their association with nature as well as scenes and deities from the ancient epics.

DURATION OF THE ACTIVITY: 2 hours

MODE OF ACTIVITY: INDIVIDUAL

SKILLS DEVELOPED:

- Motor Skills
- Kinesthetic Skills
- Aesthetic Skills
- Centring (an important skill used in pottery)
- Creative Skills
- Critical Thinking
- Communication Skills
- Approximation Skills

PREPARATION FOR THE ACTIVITY:

CENTRING THE CLAY

- Arrange the material near the potter's wheel.
- Dampen the wheel head (should not be wet).
- Moisten your hands to keep the clay damp.
- Place a ball of clay firmly on the centre of the wheel head.
- Set the wheel in an anticlockwise direction with low speed.
- Apply equal pressure with the palms (the left hand cupped around the clay and the right hand along the top).
- Keep the arms and hands as steady as possible.

PROCEDURE:

STEPS TO MAKE A PIGGY BANK:

1. Once the centring is done, tap the clay with the thumb and sides with the palm several times.

2. Move your hands upwards from the sides of the clay with both hands to shape it into a cone.

3. Repeat this as many times as needed to mould the clay into the desired width and height.

4. Press down with the thumb to form an incision, while the rest of the fingers stay outside the clay to help maintain the desired shape.

5. The rim of the bowl will be wide at this point.

6. Insert the hand into the bowl and position it near the base of the pot. (Speed – medium)

7. This will help in creating the curve on the inside of the pot.

8. Press the hand together gently and slide it up towards the rim of the pot forming a beautiful round pot.

9. The pot is ready. Take a thread or a wire and push it against the base of the piggy bank with the thumbs or index finger. Run it all the way through, keeping it tight and straight.

10. Place it upside down. Make a slit with a knife on the side wall of the piggy bank for inserting coins in it.

11. Paint and decorate with different folk motifs to make it colourful and attractive.

QUESTIONS:

a) How did William Archer help Mithila art get recognition?
b) What is the difference between Mithila art as it was done earlier and as it is done today?
c) Write a paragraph in about 50 words on Ganga Devi, who inspired an entire generation of women in Mithila.
d) **Thalinomics: Financial Literacy**
Imagine that you have been given Rs 250/- to design a three-square meal for the first day (Breakfast-Lunch-Dinner). You have to plan the meals for 5 days with the amount decreasing by Rs.20/- each day. The meals should be of your liking, nutritious and not repetitive. You also need to save some amount to buy colours to paint your piggy bank at the end of the 5th day. Now, on an A4 size sheet, write the details of the three meals for all five days with the money given to you and their approximate value. Mention the amount of money saved and how many colours you would be able to buy with the money saved.

Fill the details in the chart given below:

THALINOMICS (PLANNER)					
DAY	AMOUNT	BREAKFAST	LUNCH	DINNER	SAVING
ONE	Rs.250/-				
TWO	Rs.230/-				
THREE	Rs.210/-				
FOUR	Rs.190/-				
FIVE	Rs.170/-				
Challenges Faced (if any)**:**				TOTAL SAVINGS:	
				Cost of paint bottles bought with the amount saved:	

e) **POTTERY QUIZ**

1. Potters work with ceramics to create pottery. How many types of pottery are there?
   i. Two
   ii. Three
   iii. Five
2. Early pottery was used for_____.
   i. Storage
   ii. Cooking
   iii. Both storage and cooking
3. Which was the first type of potter's wheel to be used by potters?
   i. Slow wheel
   ii. Fast wheel
   iii. Motorised wheel
4. Terracotta pottery is an example of _____ pottery.
   i. Earthenware
   ii. Stoneware
   iii. Porcelain
5. Firing (baking) of clay pots is done in a_____.
   i. Brick manufacturing unit
   ii. Kiln
   iii. Wall oven

A POTTER'S BLESSING

May inspiration always sit at your shoulder
May your hands always find the centre true
May your clay be soft and supple
And sculpting come easy to you
May glazed flow smoothly along
And your quartz inversion gently fire to perfection...
May slumping, cracking and breaking be strangers
May your shaping never be wrong
Let the kiln be your friend
Let the mud never end
May you always find a clean wheel,
a clean board, and clean canvas
And may all of us here remain friends.

-Sylvia Hardy

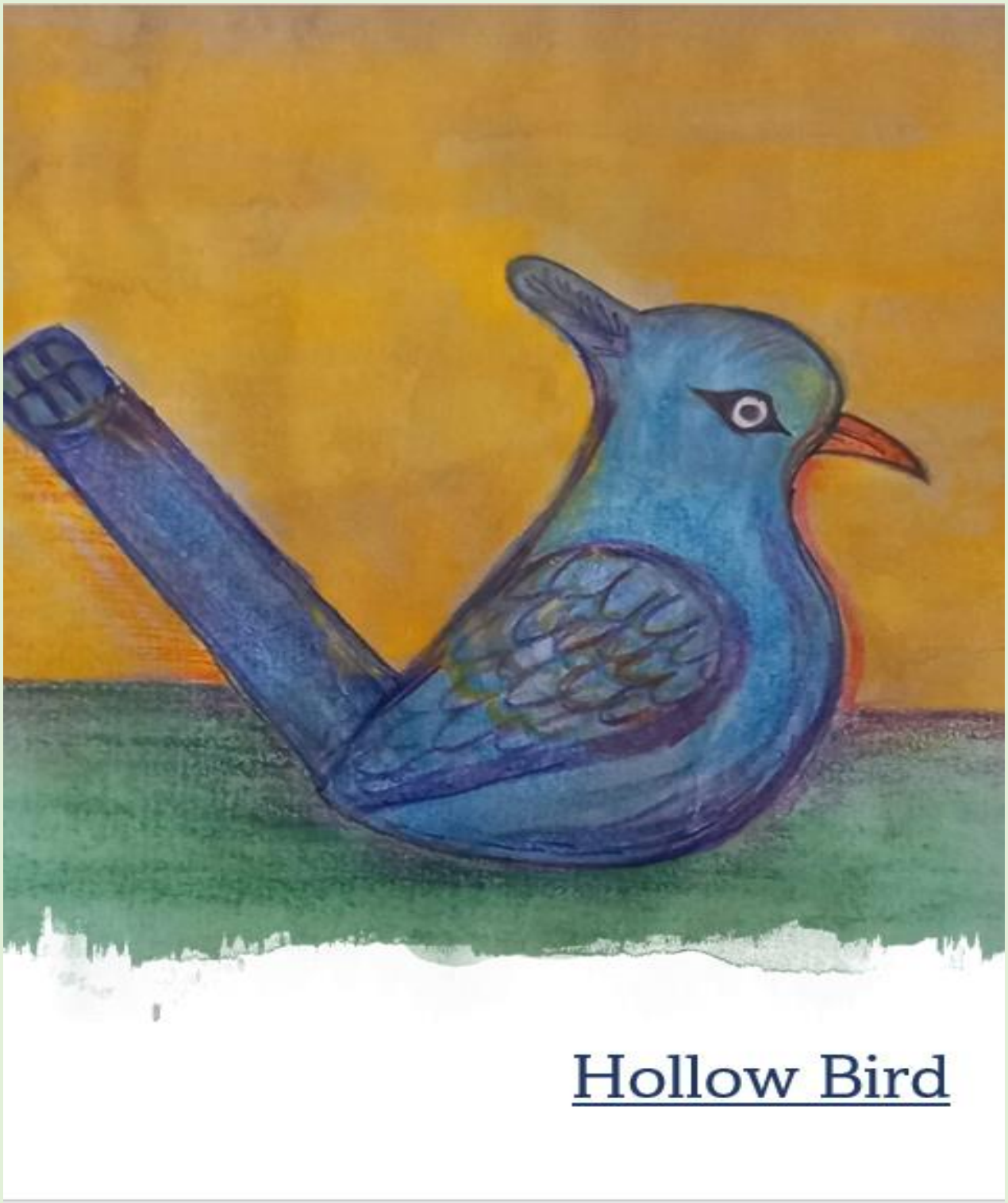
ANSWERS:

I. Answers to the crossword-

a) Clay
b) Firing
c) Wheel
d) Kiln
e) Foot
f) Glaze
g) Earthenware
h) Pinching
i) Slip
j) Flatware

II. Pottery quiz-

1. **Three**- Pottery consists of three different ‘wares’: earthenware, stoneware and porcelain.
2. **Both storage and cooking**- The earliest pots were used for carrying liquids and grains and for storing seeds. The early man began to use pots for cooking not long after.
3. **Slow wheel**- The earliest slow potter's wheel used a simple moving platform. The fast wheel graduated to an axle to turn the platform and with the advent of electricity, the motorized potter's wheel, that we know today, came into use.
4. **Earthenware**- Earthenware pottery, such as terra cotta pots, is fired at the lowest temperatures, and the finished product is usually red, brown or orange.
5. **Kiln**- Clay pottery is fired in a special kiln, usually in several steps. The first round of firing is called bisque firing and produces bisqueware.



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बच्चो, आज मैं तुम्हें अपना परिचय देती हूँ । मैं मिट्टी हूँ। हर जीव–जंतु का मुझ से गहरा नाता है। जब से इंसान का जन्म हुआ है। वह मुझे अपनी माता के समान समझता है। बचपन में वह मेरे साथ ही खेलता है। किसान के लिए मिट्टी सोने की तरह मूल्यवान होती है। मानव मुझसे घर, बर्तन, खिलौने, गहनें आदि का निर्माण करता है । वास्तव में मुझे गर्व है कि मैं सभी जीव– जंतु, मनुष्य, पेड़– पौधों के लिए अत्यंत उपयोगी हूँ ।

आओ, आज एक रोचक गतिविधि के माध्यम से कुछ नया सीखते हैं ।

HINDI

खोखला पक्षी व अन्य जानवर

(HOLLOW BIRD OR OTHER ANIMALS)

''जीवन कुम्हार की मिट्टी की तरह है, जिसे हम अपने हाथों से आकार देते हैं।''

गतिविधि (ACTIVITY)

छात्रगण मिट्टी से खोखला पक्षी व अपनी कल्पना अनुसार किसी जीव–जंतु की आकृति बनाएँगे। वे उस पर चित्र संकेतों व कलाकृतियों के माध्यम से अपने भावों व विचारों को व्यक्त करेंगे।

उद्देश्य (AIM)

पाठ अक्षरों का महत्त्व के आधार पर कुंभकारी कला के माध्यम से अपने विचारों व भावों को व्यक्त कर प्रकृति के साथ जुड़ाव महसूस करना।

- **अधिगम उद्देश्य (LEARNING OBJECTIVES)**
- छात्रों को मिट्टी से वस्तुएँ बनाने की कला से परिचित करवाना।
- कला के प्रति आत्मीयता का भाव उत्पन्न करना।
- कल्पना शक्ति का विकास करना।

अधिगम प्रतिफल (LEARNING OUTCOMES)

- छात्रगण ध्यानकेंद्रित करने में समर्थ होंगे।
- उनके आत्मविश्वास में वृद्धि होगी।
- प्रयोगात्मक ज्ञान में वृद्धि होगी।
- बच्चे अपने भावों और विचारों को प्रकट करने में सक्षम होंगे।
- उनकी रचनात्मक कला का विकास होगा।

शब्दकोश (KEY VOCABULARY)

कुम्हार, तला, वृत्ताकार, गोलाकार, कुम्हार का पहिया, कुंभकारी कला (मिट्टी के बर्तन व अन्य वस्तुएँ बनाना कुंभकारी कहलाता है)

आवश्यक सामग्री (MATERIAL REQUIRED)

- मिट्टी – 200 ग्राम (लगभग)
- पानी का एक छोटा कटोरा
- धागा
- सुई
- अलग– अलग रंग व ब्रश

पूर्वापेक्षित ज्ञान (PRE-REQUISITE KNOWLEDGE)

- प्राचीन भारत की चित्रकला, भावों व विचारों को प्रकट करने वाले संकेतों की जानकारी।

समय अवधि (DURATION) – 2 घंटे

गतिविधि का तरीका (MODE OF ACTIVITY) – एकल

कौशल विकास (SKILL DEVELOPED)

- रचनात्मक कला का विकास
- प्रयोगात्मक व क्रियात्मक कौशल
- हस्तकला का विकास
- ध्यानकेंद्रित कौशल
- संप्रेषण कौशल

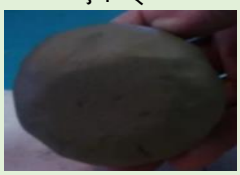
कार्य पद्धति/कार्यप्रणाली (PROCEDURE)

- आवश्यक सामग्री को कुम्हार के पहिए के पास रखें।
- पहिए के ऊपरी सिरे (व्हील हैड) को गीला करें।
- मिट्टी को नम रखने के लिए अपने हाथों को गीला करें।
- मिट्टी का गोला बनाकर पहिए के केंद्र पर अच्छे से रखें।
- पहिए को विपरीत दिशा में सेट करें।
- हथेली से बराबर दबाव डालें। (बायाँ हाथ मिट्टी के चारों ओर और दाहिना हाथ ऊपर की ओर)
- हाथ और बाजू को यथासंभव स्थिर रखने का प्रयास करें।

खोखला पक्षी बनाने की विधि (STEPS TO MAKE HOLLOW BIRD)

1. कुम्हार के पहिए पर 2 छोटी कटोरियाँ बनाएँ।

2. दोनों कटोरियों को सुखाने के लिए अलग रख दें। एक कटोरी के तले पर हल्का–सा थपथपाएँ। इससे तला स्थिर होगा।



3. दोनों कटोरियों को चित्र में दिखाए अनुसार जोड़ लें। जोड़ों पर मिट्टी डालें और थोड़ा पानी डालकर चिकना कर लें।

4. मिट्टी का एक छोटा–सा हिस्सा लें और इसे गोले के सामने लगाएँ। इसे तब तक चिकना करते रहें जब तक कि यह पक्षी के शरीर में न मिल जाए।


5. इसी तरह चिड़िया की पूँछ बनाने के लिए थोड़ी–सी मिट्टी डाल दें। उँगलियों को नम करें और पक्षी की सतह को चिकना करें। इसे सूखने दें।

6. थोड़ा सूख जाने पर सुई का औज़ार लेकर पक्षी के शरीर पर कुछ बनावट बना लें।

7. इसे अपने पसंद के रंगों व अन्य कलाकृतियाँ बनाकर सुंदर बनाएँ।

अन्य कुंभकारी कला बनाने का प्रयास करने के लिए लिंक दिया जा रहा है –

https://www.youtube.com/watch?v=fid81Rl4XNo

निष्कर्ष (CONCLUSION)

छात्रगण मिट्टी से वस्तुएँ बनाने की कला में निपुण हुए। भाषा की प्राचीन पद्धति व कुंभकारी कला की बारीकियों से अवगत हुए।

वस्तुनिश्ठ प्रश्न (OBJECTIVE QUESTIONS)

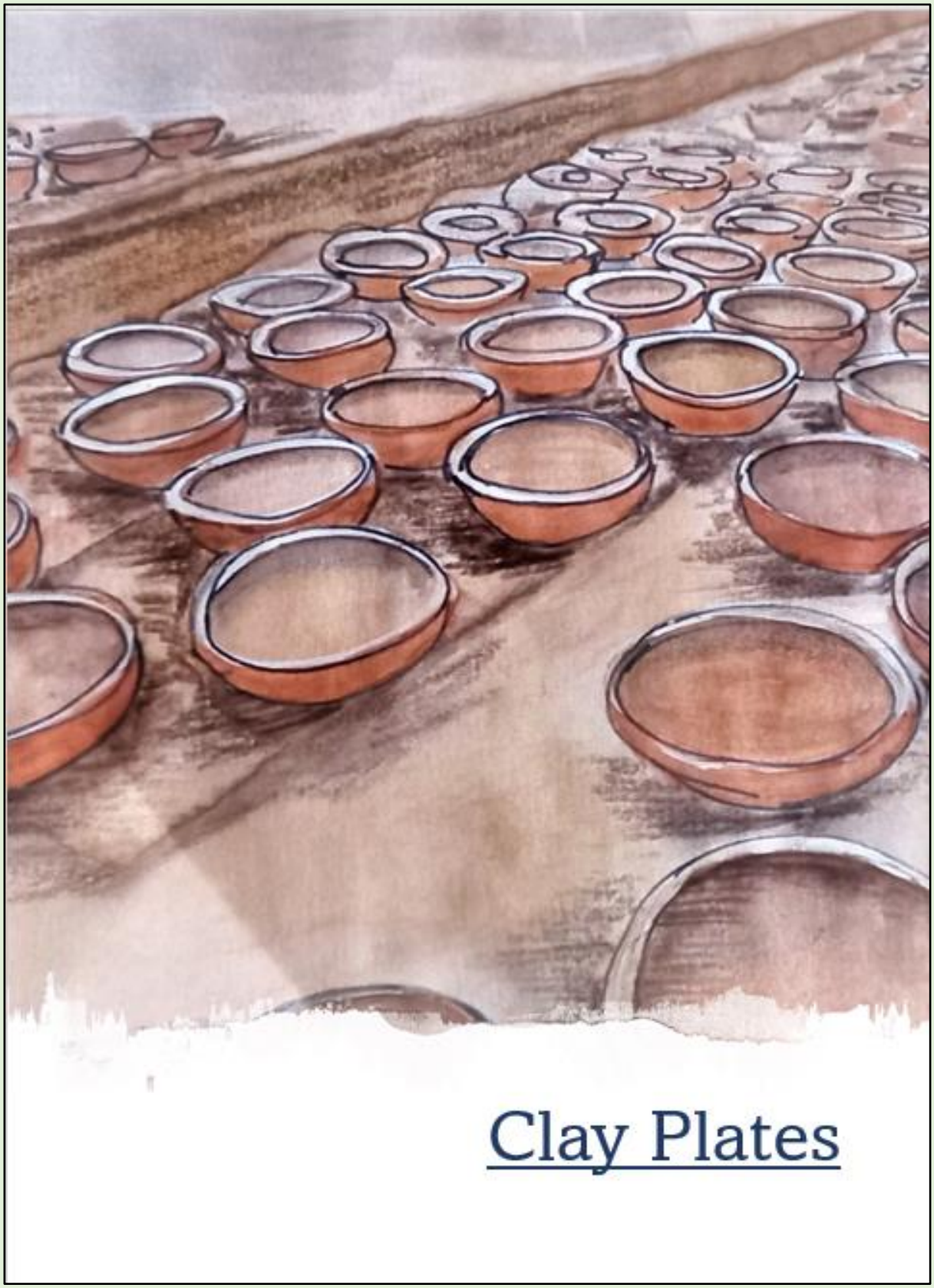
1. अक्षरों की खोज किसने की थी ?

2. प्राचीनकाल में मनुष्य किस भाषा से अपने विचार प्रकट करते थे ?

3. ब्लू पॉटरी कला कहाँ की जाती है ?

योग्यता विस्तार

'पर्यावरण के संरक्षण में पक्षियों का महत्त्व' विषय पर अनुच्छेद लिखिए।



Credits: Collaborative work of students of Grade VII

Rohan and Reema went on a picnic to a farmhouse which offered a lot of indoor and outdoor activities like camel ride, horse ride, pottery, portrait painting etc. Among all these interesting activities, they were quite intrigued by pottery making. They were amazed to see the way pottery items were being made and thus they decided to try their hands on it. Rohan wondered if all the items were made up of fixed proportion of clay and water. Reema said it is proportionate, but Rohan was not convinced so while making the pottery items they thought of noting down the quantity of clay and water used in making them.

What do you think? Does the ratio of clay and water remain constant or does it vary in making different pottery items?

Let's perform an activity to find the answer to the above question.

MATHEMATICS

ACTIVITY #1

The art of pottery is described as therapeutic and relaxing. While spinning clay, the mind and body are in natural synergy, wrapped around creative ambitions and goals.

ACTIVITY: Making different pottery items using clay and water.

AIM: To calculate the ratio of clay and water used in making different pottery items.

LEARNING OBJECTIVES:

Students will be able to:

- understand and apply the concept of ratio and proportion in their day-to-day lives.
- realise the importance of using a fixed proportion of clay and water to make a pottery item.
- develop problem solving skills.
- communicate mathematical ideas with others.

LEARNING OUTCOMES:

It will enable students to:

- help in enhancing problem solving skills.
- solidify the concept of Ratio and Proportion.

KEY VOCABULARY:

- Ratio
- Middle Terms and Extreme Terms
- Proportion

MATERIALS REQUIRED:

- Clay
- Water

- A small piece of sponge
- Potter's wheel
- Measuring scale
- Measuring cylinder
- Acrylic colours
- Paint brush
- Needle tool

PRE-REQUISITE KNOWLEDGE: Students should have previous knowledge about:

- fractions
- decimals
- the concept of equivalent ratios
- algebra
- the conversion of units

DURATION OF THE ACTIVITY: 1.5 hours

MODE OF ACTIVITY: GROUP

SKILLS DEVELOPED:

- Motor Skills
- Kinesthetic Skills
- Aesthetic Skills
- Centring (an important skill used in pottery)
- Creative Skills
- Communication Skills

PREPARATION FOR THE ACTIVITY:

❖ **Steps for centring the clay**

1. Arrange the material near the potter's wheel.
2. Dampen the wheel head. (should not be wet)
3. Moisten your hands to keep the clay damp.
4. Place a ball of clay firmly on the centre of the wheel head.
5. Set the wheel in an anticlockwise direction.
6. Apply equal pressure with palms (the left hand cupped around the clay and the right hand along the top).
7. Keep the arms and hands as steady as possible.

PROCEDURE:

❖ **General Procedure**

1. Students will be divided into three groups. Each group will make one pottery item.
2. They will be given a fixed amount of clay and water.
3. Using a weighing scale and measuring cylinder, each group will record the amount of clay and the quantity of water given to them.
4. Once the pottery item is made, they will measure and record the amount of clay and quantity of water left with them.

❖ **Steps to make a clay plate**

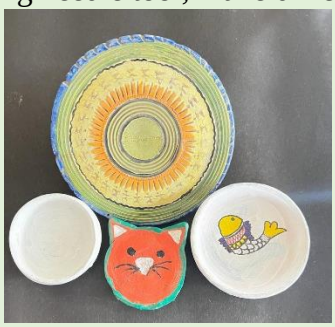
1. Throw a piece of clay on the table to thin it out. Lift and throw the clay several times. This will help in getting out bubbles from the clay. Dampen your hands while throwing the clay.

2. Push the clay with force downwards until it reaches the required size.

3. Start opening the clay with the help of a sponge (medium speed). Flatten the surface, pushing it down the edge forming a rim.

4. The plate is ready. Take a thread or a wire and push it against the base of the plate with the thumbs or index finger. Run it all the way through keeping it tight and straight.

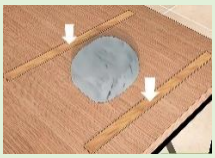
5. Using needle tool, make different textures and enhance it with colours.



❖ **Steps to make a circular shaped disc**

1. Throw a piece of clay on the table to thin it out. Lift and throw the clay several times. This will help in getting out bubbles from the clay. Dampen your hands while throwing the clay.

2. Place wooden scales on the table to help create an even layer of clay. Place the scales in front as shown in the figure.



3. Roll the clay with a rolling pin. Press down into the clay as you roll the pin away. Keep going back and forth across the clay until you get the desired thickness.

4. Place a plate on top of the clay. Trace around it with a needle tool.

5. Remove the extra clay with your hands. Cut through the border with the needle tool.

6. The disc is ready.

❖ **<u>Steps to make a cylindrical vessel</u>**

1. Once the clay is centred, clasp both hands around the clay and push forward the wrists. This will force the clay upward.

2. Make a depression in the centre of the clay with the first finger. (Wheel speed should be fast)

3. Use the thumb of the left hand to keep the finger steady and press down into the clay until the fingertip is almost down to the wheel head.

4. Place the fingers against the inside wall of the vessel and thumbs outside to form a wall of the vessel.

5. Squeeze the sides of the vessel upwards with your hands such that the radius of the cylinder remains constant throughout. This movement will start giving the vessel a right cylindrical shape. (Wheel speed should be medium)

6. Move hands upwards slowly and steadily with clay, applying even pressure all the time.

7. Take a thread or a wire and push it against the base of the vessel with the thumbs or index finger. Run it all the way through keeping it tight and straight.

8. The pottery items are ready.
9. Once the pottery items dry, paint them with acrylic colours of your choice.

OBSERVATIONS AND CALCULATIONS:

1 litre = 1000 grams.

1 gram = 0.001 litres.

	Quantity of clay given (in grams)	Quantity of clay used (in grams) (A)	Quantity of clay left (in grams)	Quantity of water given (in litres)	Quantity of water used (in litres)	Quantity of water left (in litres)	Quantity of water used (in grams) (B)	Ratio of clay to water (A: B)
CLAY PLATE								
CIRCULAR DISC								
CYLINDRICAL VESSEL								

CONCLUSION:

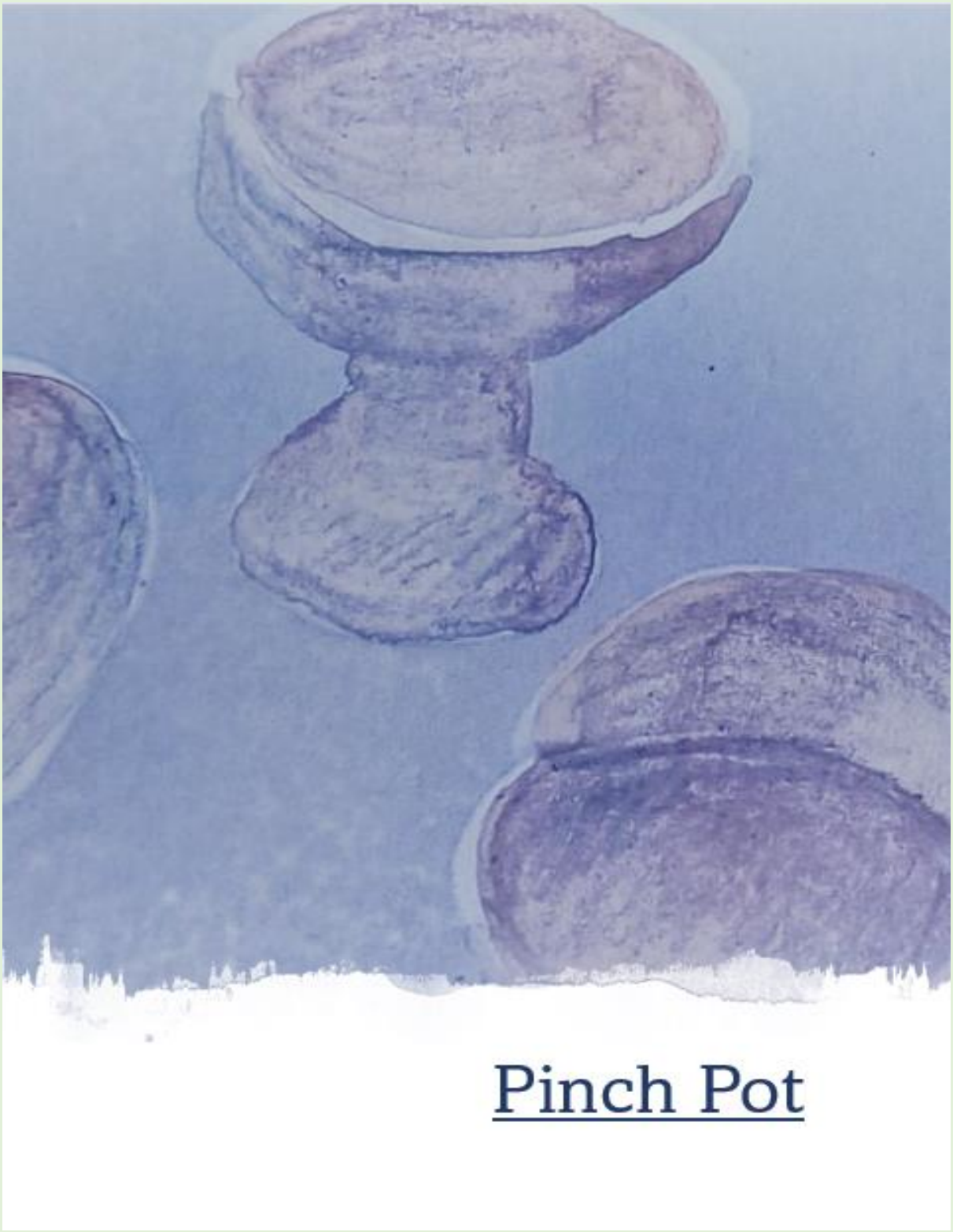
The ratio of clay and water used in making each pottery item remains constant.

OBJECTIVE QUESTIONS:

1. Which ratio is greater?

   5 : 6 or 7 : 9

2. Reema prepared 18 kg of sweets by mixing khoya with sugar in the ratio of 7 : 2. How much khoya did she use?
3. What is the ratio of the number of sides of a square to the number of edges of a cube?
4. On a shelf, books with green cover and that with brown cover are in the ratio 2 : 3. If there are 18 books with green cover, then find the number of books with brown cover.
5. The length and breadth of a school ground are 150 m and 90 m respectively, while the length and breadth of a park are 210 m and 126 m respectively. Are these measurements in proportion?



Credits: Collaborative work of students of Grade VI

Rohan and Reema decided to make pasta on their mother's birthday. They saw an online video to know about its recipe. While watching the video, they observed that the chef had kept the ingredients and chopped vegetables in various colourful and attractive pinch pots. Being flabbergasted by them, they thought of making the pinch pots for their kitchen. They started researching about the process of making pinch pots and during their research they came to know about the composition of clayey soil which in turn is used to make clay and thus the pinch pots.

What do you think? What is the composition of clayey soil? How is clay obtained from clayey soil?

Let's perform an activity to find the answer to the above questions.

ACTIVITY #2

ACTIVITY: Making a classic pinch pot with soft natural clay.

AIM: To draw a bar graph depicting the composition of clayey soil.

LEARNING OBJECTIVES:

Students will be able to:

- learn about the major components of the clayey soil which in turn is used to make the pinch pot.
- draw a bar graph depicting the main components of clayey soil.
- develop problem solving skills.
- communicate mathematical ideas with others.

LEARNING OUTCOMES:

It will enable students in:

- improving the concentration span.
- developing cognitive skills.
- understanding and drawing a bar graph.
- interpreting the data presented on a bar graph.

KEY VOCABULARY:

- Data
- Bar graph

MATERIALS REQUIRED:

- Clay- 250gms (approx.)
- Water- small bowl
- A small piece of sponge
- Sand paper
- Ruler
- Graph paper
- Acrylic colours
- Paint brush

PRE-REQUISITE KNOWLEDGE: Students should have previous knowledge about:

- the concept of data
- the organisation of data
- the components of a bar graph – Origin, Scale, Axes, Labelling, Vertical/Horizontal Bars
- the reading of a bar graph

DURATION OF THE ACTIVITY: 1.5 hours

MODE OF ACTIVITY: INDIVIDUAL

SKILLS DEVELOPED:

- Motor Skills
- Kinesthetic Skills
- Aesthetic Skills
- Centring (an important skill used in pottery)
- Creative Skills
- Critical Thinking
- Communication Skills

CONCEPTUAL BACKGROUND:

❖ **Steps for making clay**

1. Collect some soil from beneath the topsoil.
2. Mix water into the soil, thoroughly stir the mixture. You should eliminate all clumps and have an even mixture of water and soil.
3. Let the mixture sit till the sediments settle down. Add water, stir the mixture, let it set, and pour the clay water into another container. Each time you do this, the clay will be purer. Ideally, you will continue the process until you see no sediments at the bottom.
4. Pour the clay into a cloth. Lay the cloth over a bowl to help guide the runny clay into the cloth. The cloth must be large enough to encompass all of the clay in your container. The cloth will act as a bag for the clay. Tie the cloth with a piece of string as though you are creating a ball of clay inside the cloth.
5. Thus, clay is obtained from clayey soil which consists mainly of minerals. The three main minerals in clayey soil are alumina, iron oxide and silica.

The composition of clayey soil is represented in the table given below.

Components of clayey soil	Composition (approximate %)
Organic Matter	5
Iron oxide	7
Others	12
Alumina	20
Silica	56

Table (i)

PROCEDURE:

- **Steps to make a pinch pot**

1. Take a small piece of clay. Gently pat and roll the clay in your hands to make a nice, neat ball.

2. Then supporting the clay ball in one hand, press the thumb of your other hand into the clay. The thumb needs to be pressed into the centre of the clay.

3. Once the thumb is far enough into the clay, stop pushing and start pinching! Keep the fingers straight and pinch the whole ball of clay. This helps compress the clay into a bowl shape.

4. Continue to pinch and rotate the clay, the clay ball will begin to open out into a bowl shape.

5. Damp the hands and blend the dry cracked areas with the tip of the finger.

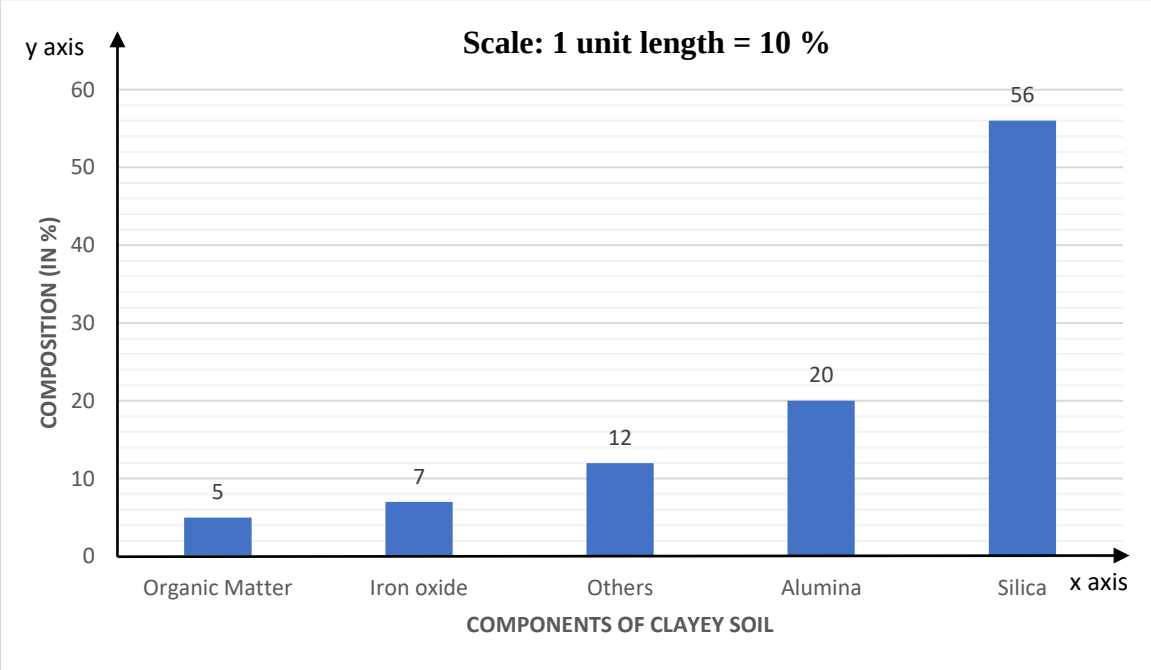
6. Once the bowl is ready, smoothen the outer surface with a sandpaper.

7. A smooth, shiny pinch pot is ready.

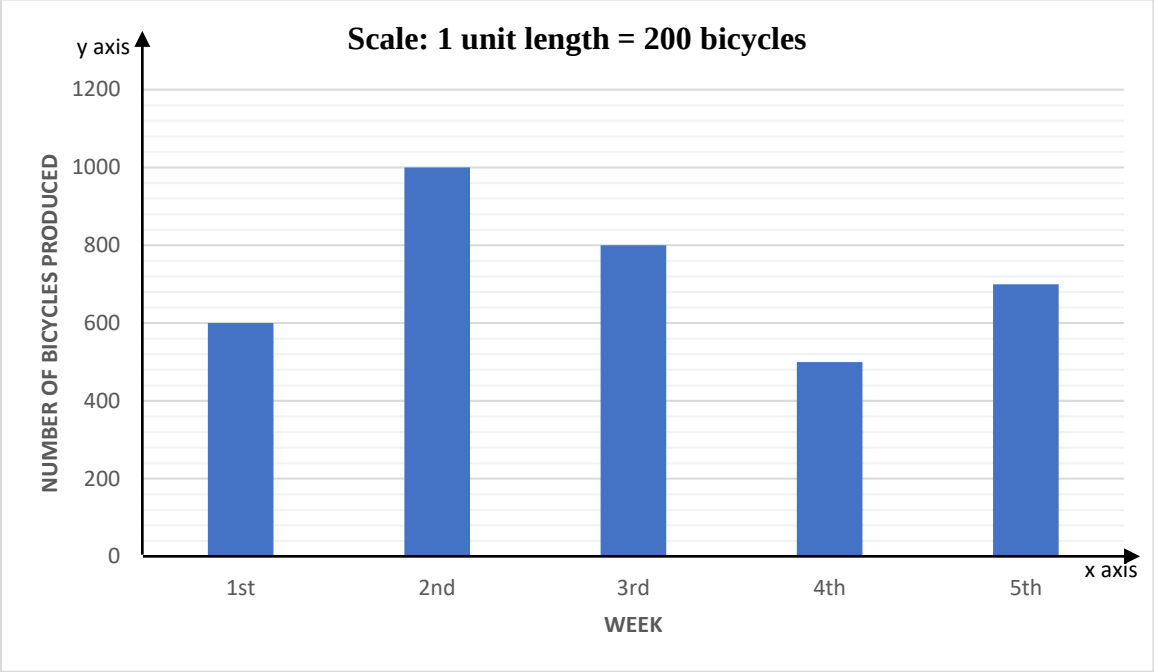
Students will draw a bar graph depicting the composition of clayey soil using the data provided in Table (i).

OBSERVATIONS AND CONCLUSION:

Students will be able to represent the given data as a bar graph which will look similar to the graph as given below.

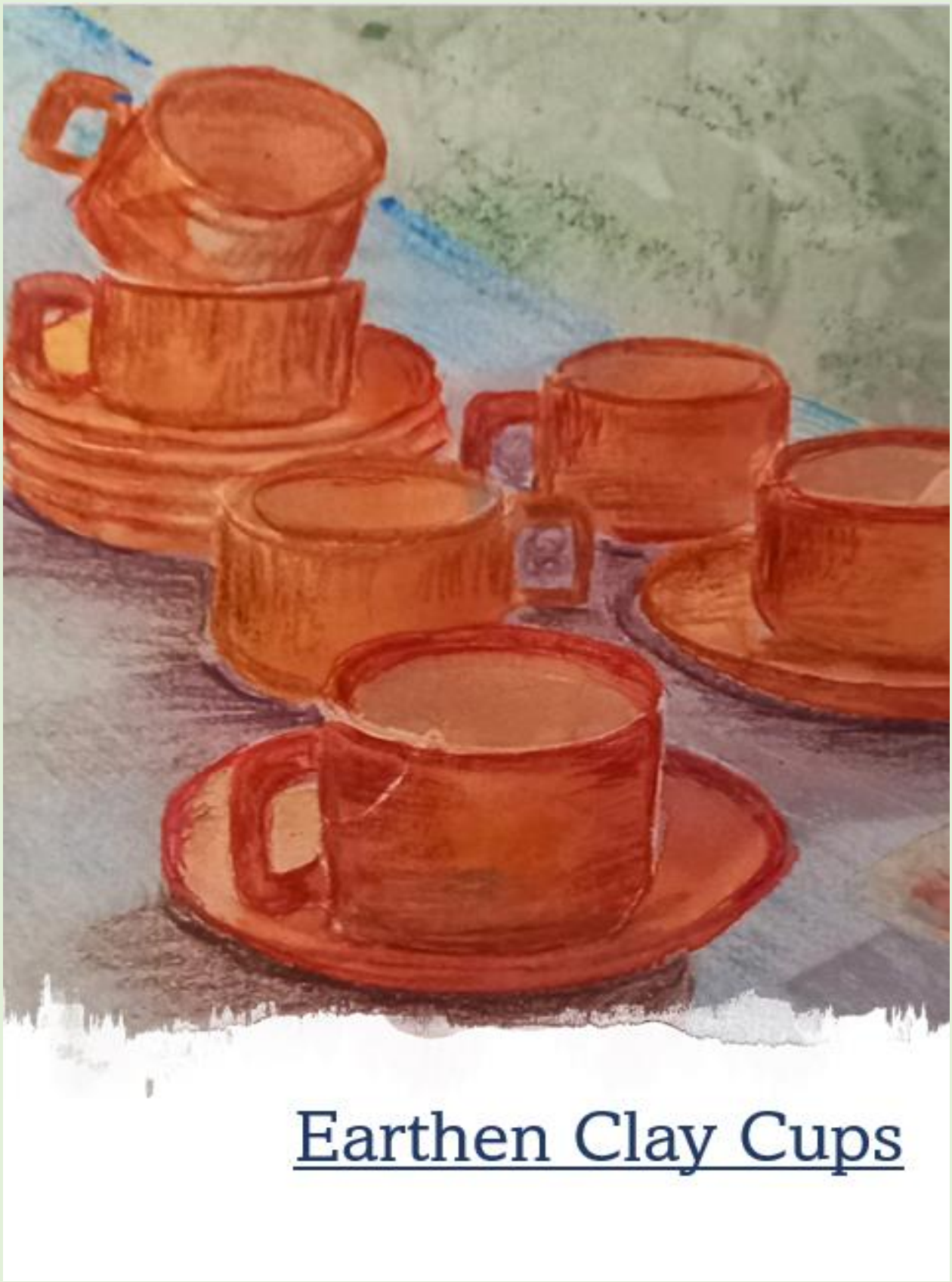


OBJECTIVE QUESTIONS:



Study the bar graph carefully and answer the questions given below:

1. In which week was the production of bicycles maximum?
2. In which week was the production of bicycles minimum?
3. What is the total production of bicycles during these five weeks?
4. Find the difference between the maximum and the minimum production of bicycles.
5. What is the difference between the number of bicycles produced in week 4 and week 5?



Credits: Art Department

Boojho and Paheli decided to clean their rooms.
Boojho – I have kept my books and clothes in place and have even swiped the floor.
Paheli – I have also done the same, but the floor has not dried yet. Boojho, how has your floor dried when we both swiped them at the same time?
Boojho – The change of water into water vapour on heating is called evaporation. My mother told me that evaporation is faster if we switch on the fan after swiping the floor. I switched on the fan, so the floor has dried.
Paheli – How does a moving fan affect evaporation?
Boojho-Moving air increases the rate of evaporation.
Paheli- Ok, what are the other factors that affect the rate of evaporation?
Boojho –Surface area, temperature and humidity in air are the other factors that affect rate of evaporation.
Paheli – I have got three vessels here of different shapes. Let's find out how surface area affects rate of evaporation.

SCIENCE

ACTIVITY: Comparing the rate of evaporation of water in earthen vessels of different shapes.

AIM: To observe that the rate of evaporation of water depends upon the exposed surface area of the water.

LEARNING OBJECTIVES:

Students will be able to:

- understand that the rate of evaporation depends on the exposed surface area.
- develop creativity and artistic abilities.
- understand how cooling of water happens in earthen pots.
- sensitize themselves to the health and environmental benefits of using earthen pots as compared to a refrigerator for cooling water.

LEARNING OUTCOMES:

It will enable students to:

- develop an understanding of the process of evaporation and the factors it depends upon.
- create earthen pots and become aware of pottery as a traditional handicraft.
- gain knowledge about the process of cooling of water in earthen pots.
- be aware of the use of earthen pots for cooling and compare it to cooling in refrigerator.

KEY VOCABULARY:

- Expansion
- Surface area
- Evaporation
- Volume

MATERIALS REQUIRED:

- Clay- 250gms (approx.)
- Water- small bowl
- A small piece of sponge
- Thread/wire- for cutting the clay bowls from the wheelbase.
- Measuring cylinder

PRE-REQUISITE KNOWLEDGE: Students should have previous knowledge about:

- the three states of matter
- the change of state of matter with temperature
- the process of evaporation
- the effect of heat on molecular arrangement in liquids and gases
- the expansion on heating

DURATION OF THE ACTIVITY: 1.5 hours

MODE OF ACTIVITY: INDIVIDUAL

SKILLS DEVELOPED:

- Motor Skills
- Kinesthetic Skills
- Aesthetic Skills
- Centring (an important skill used in pottery)
- Creative Skills
- Critical Thinking
- Analytical Skills

PREPARATION FOR THE ACTIVITY:

❖ **Centring the clay**

1. Arrange the material near the potter's wheel
2. Dampen the wheel head (should not be wet)
3. Moisten your hands to keep the clay damp
4. Place a ball of clay firmly on the centre of the wheel head
5. Set the wheel in an anticlockwise direction with low speed
6. Apply equal pressure with the palms (the left hand cupped around the clay and the right hand along the top)
7. Keep the arms and hand as steady as possible

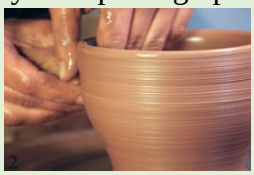
PROCEDURE:

❖ **Steps to make vessels of different shapes**

I

1. Once the clay is centred, clasp both hands around the clay and push forward the wrists. This will force the clay upward.

2. Slowly start pulling up the height of the cup.



3. Compress the rim using an index finger to give a smooth finish.

4. The cup is ready.

II

1. Throw a piece of clay on the table to thin it out. Lift and throw the clay several times. This will help get out bubbles in the clay. Dampen your hands when throwing the clay.


2. Push the clay with force downwards until it reaches the required size.

3. Start opening the clay with the help of a sponge. (Speed medium) Flatten the surface, pushing it down the edge forming a rim.

4. The plate is ready. Take a thread or a wire and push it against the base of the plate with the thumbs or index finger. Run it all the way through keeping it tight and straight.

5. The cup and plate are ready.

III

1. Once the clay is centred, clasp both hands around the clay and push forward the wrists. This will force the clay upward.

2. Make a depression in the centre of the clay with the first finger. (Wheel speed - fast)

3. Use the thumb of the left hand to keep the finger steady and press down into the clay until the fingertip is almost down to the wheel head.

4. Place the fingers against the inside wall of the vessel and thumbs outside to form a wall of the vessel.

5. Squeeze the sides of the vessel upwards with your hands such that the radius of the cylinder remains constant throughout. This movement will start giving the vessel a right cylindrical shape. (Wheel speed - medium)

6. Move hands upwards slowly and steadily with clay, applying even pressure all the time.

7. Take a thread or a wire and push it against the base of the vessel with thumbs or index finger. Run it all the way through keeping it tight and straight.

8. The cylindrical vessel is ready.

- Enhance it with colours of your choice.
- Pour equal amount of water in 3 earthen vessels of different shapes.
- Measure the amount of water left in the vessels after 4 hours

OBSERVATIONS AND CALCULATIONS:

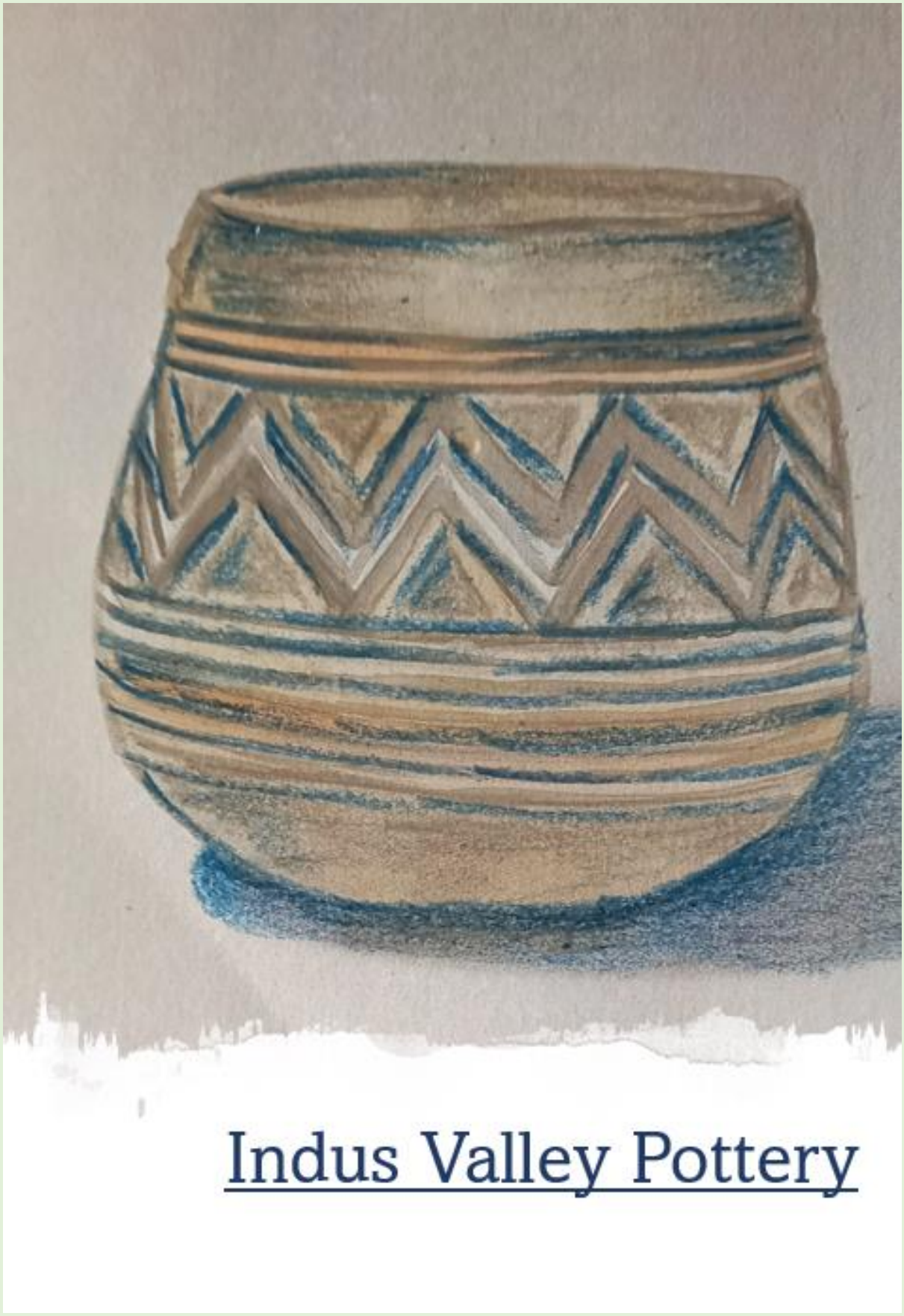
- Amount of water evaporated = Initial volume of water – volume of water left after 4 hours
- Evaporation is more in vessel with more exposed surface area.

CONCLUSION:

The rate of evaporation increases with increase in surface area of water exposed.

OBJECTIVE QUESTIONS:

1. We spread the clothes on a clothesline for drying. Give reason.
2. Give two factors, other than surface area, that affect the rate of evaporation of water.
3. How does water cool down in earthen pots during the hot summer days?
4. Define evaporation.
5. Give one health benefit of using earthen pot for cooling water.



Credits: Collaborative work of students of Grade VI

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Source- https://hi-static.z-dn.net/files/d77/c5e71f5d426497070d00ce4928e044ea.jpeg

Deepak: Surahi, can you identify these objects?

Surahi: Yes, they are vessels made of clay.

Deepak: These are not ordinary clay pottery. These are miniature pottery discovered from the Harappan sites.

Surahi: What are Harappan sites?

Deepak: They are archaeological sites that belong to the Indus Valley Civilization.
Indus Valley Civilization, also known as Harappan Civilization, is one of the oldest civilizations of the world. It flourished in and around the Indus River Valley. It includes the whole of modern-day Pakistan and parts of modern-day India and Afghanistan. For the extent of the Indus Valley Civilization refer to the map in the link: https://www.mapsofindia.com/history/indus-valley-civilization.html
Do you want to create such vessels? Let us ask our teacher to help us in creating these.

SOCIAL SCIENCE

ACTIVITY #1

Indus valley pottery consists of very fine wheel made wares, very few being handmade. Plain pottery is more common than painted pottery. Geometric and animal designs are mostly drawn on these potteries.

ACTIVITY: Making small bowls and embellishing them with geometrical/animal designs.

AIM: To develop an understanding of the different styles of pottery of the Indus Valley Civilization.

LEARNING OBJECTIVES:

Students will be able to:

- learn about the new crafts that developed during Indus Valley Civilization.

- learn about the lives of people and the trade relations that existed with distant places during this period.
- increase optimistic outlook, improve focus and help in exploring and experimentation**.**

LEARNING OUTCOMES:

It will enable students to:

- gain knowledge and appreciate the pottery and sculpture of the Indus Valley Civilization.
- learn pottery making as a skill and create different objects.
- appreciate the dignity of labour.

KEY WORDS:

- Earthenware
- Steatite
- Terracotta

MATERIAL REQUIRED:

- Clay- 250gms (approx.)
- Water- small bowl
- A small piece of sponge
- Thread/wire- for cutting the clay cylinder from the wheelbase

DURATION OF THE ACTIVITY: 2 hours

MODE OF ACTIVITY: INDIVIDUAL

SKILLS DEVELOPED:

- Motor Skills
- Kinesthetic Skills
- Aesthetic Skills
- Centring (an important skill used in pottery)
- Creative Skills
- Critical Thinking
- Communication Skills

PREPARATION FOR THE ACTIVITY

❖ **Centring the clay**

- Arrange the material near the potter's wheel.
- Dampen the wheel head. (should not be wet)
- Moisten your hands to keep the clay damp.
- Place a ball of clay firmly on the centre of the wheel head.
- Set the wheel in an anticlockwise direction with low speed.
- Apply equal pressure with the palms (the left hand cupped around the clay and the right hand along the top).
- Keep the arms and hands as steady as possible.

PROCEDURE:

- **Steps to make a Bowl**

1. Once the clay is centred, clasp both hands around the clay and push forward the wrists. This will force the clay upward.

2. Make a depression in the centre of the clay with the first finger. (Wheel's speed should be fast)

3. Use the thumb of the left hand to keep the finger steady and press down into the clay until the fingertip is almost down to the wheel head. Remove the extra clay.

4. Note that the thumb is helping in squeezing the clay. The bowl is ready.

5. Take a thread or a wire, push it against the base of the pot with thumbs or index finger. Run it all the way through keeping it tight and straight.

6. Once dried, colour it with organic colours to give an old rustic look to the bowl. Design it with geometrical motifs in black colour.

OBSERVATION AND CONCLUSION:

1. The type of pottery, including the styles of vessels and various decorative elements, associated with the Indus Valley Civilization tells about the life of the people and growth of the civilization.
2. Pottery developed as a response to the needs of mankind.
3. This art is a gift from our ancestors and needs to be preserved.

OBJECTIVE QUESTIONS:

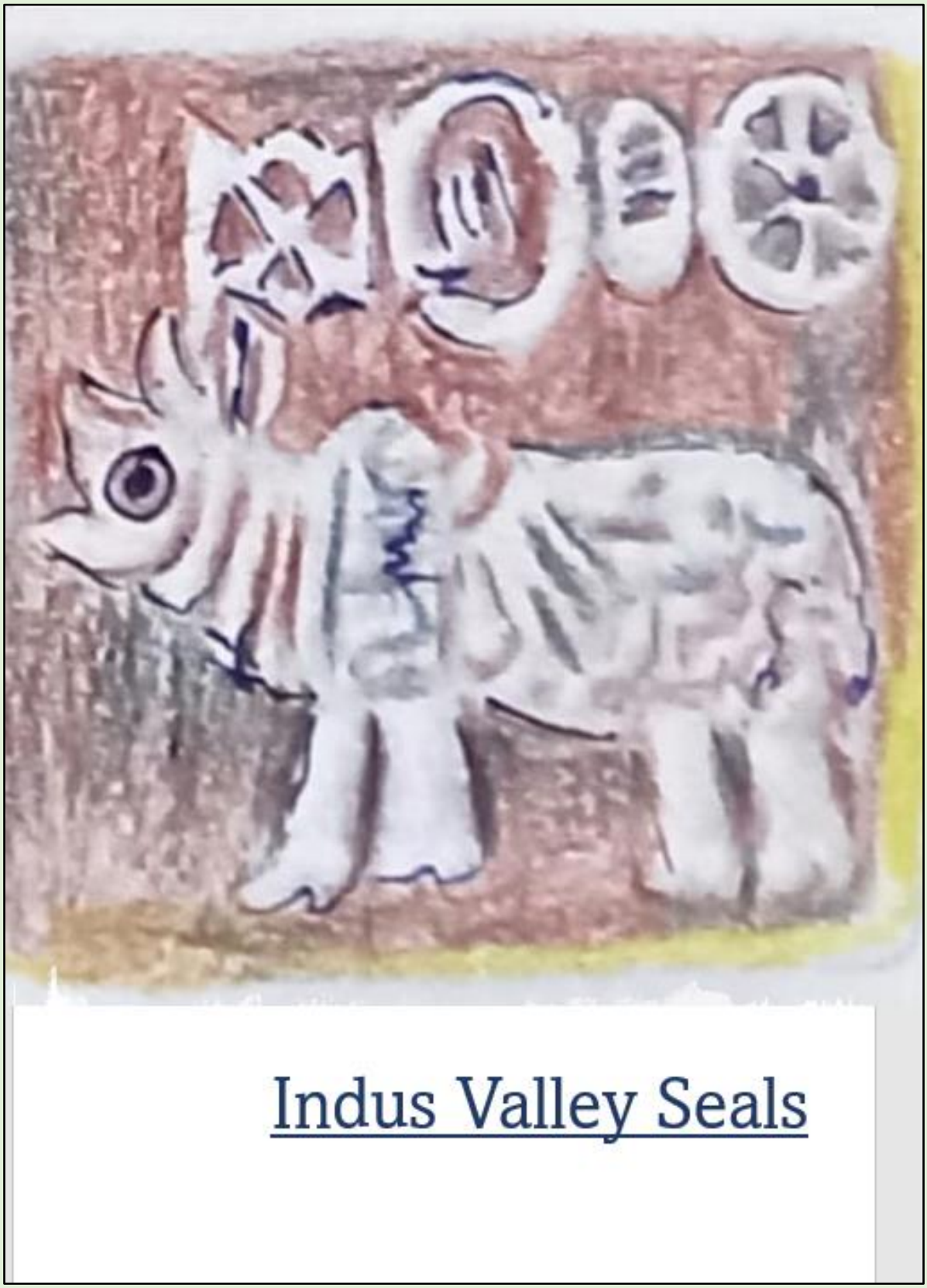
1. Name the Harappan civilization sites which are located in the present-day Pakistan.
2. Name the special building found in Mohenjodaro.
3. What type of pottery was chiefly found in the Indus Valley sites?
4. Name the pottery traditions that existed during the Harappan civilization.

LINKS AND REFERENCES:

- **Condition of Potters in India: There used to be times when potters were an integral part of our society. With the modern equipment catching up among the people, potters are vanishing fast from the social scene. Their number is declining every year as the modern utensils and items made of rubber, steel, plastic and other material is replacing traditional apparatus made of clay.**

  Link: https://www.thestatesman.com/lifestyle/the-dying-culture-of-pottery-in-india-1502765323.html

- **Government initiatives and policies**:**The Indian government is taking steps to promote the traditional pottery community by providing marketing support through haats, fairs, promoting clay cups in railways etc.**
  Link 1- https://www.youtube.com/watch?v=XJKET_N4QBk
  Link 2- https://indianexpress.com/article/india/hunar-haat-playing-key-role-in-making-vocal-for-local-campaign-a-mass-movement-naqvi-7207282/



Credits: Collaborative work of students of Grade VI

It was Deepak and Surahi's IT slot. Surahi wanted to explore the link (**https://www.britannica.com/topic/Indus-Civilization/Craft-technology-and-artifacts**) shared by the Social Science teacher. She came across these pictures (fig a and fig b)

Fig a.

Fig b.

Surahi: Deepak, do you know what are these pictures showing?

Deepak: Yes Surahi, these are seals, one of the best-known artefacts of the Indus Valley Civilization.

Surahi: Oh! What are they made of?

Deepak: Most of the seals were made of steatite, which is a kind of soft stone. A few of them were also made of terracotta, gold, chert, ivory and faience.

Surahi: Oh! They resemble stamps. Deepak, what were they used for?

Deepak: You are right, they are actually stamps only but we call them seals as they were probably used to close documents and mark the packages to check the authenticity.

Let us perform this activity and learn how this most curious object discovered during this period was prepared.

ACTIVITY #2

Thousands of seals have been discovered by archaeologists from the Harappan sites. The Harappans made seals mostly out of stones and usually had an animal carved on them. Seals tell the story about the people, their beliefs, rituals, trade and the script of the Harappan Civilization. The impression of a seal is called sealing.

ACTIVITY: Seal Making

AIM: To develop an understanding of the seals of the Indus Valley Civilization.

LEARNING OBJECTIVES:

Students will be able to:

- identify how artefacts and ruins provide an insight into a civilization's economy, culture and technology.
- understand the importance and use of seals in the Indus Valley Civilization.
- increase optimistic outlook, improve focus and help in exploring and experimentation.

LEARNING OUTCOMES:

It will enable the students to:

- gain knowledge and appreciate the seals of the Indus Valley Civilization.
- learn about the importance of seals in the Indus Valley Civilization.
- appreciate the dignity of labour.

KEY WORDS:

- Seals
- Sealing
- Chert
- Carnelian
- faience

MATERIAL REQUIRED:

- Clay- 250gms (approx.)
- Water- small bowl
- Wooden scales 2
- Rolling Pin

DURATION OF THE ACTIVITY: 1.5 hours

MODE OF ACTIVITY: INDIVIDUAL

SKILLS DEVELOPED:

- Motor Skills
- Kinesthetic Skills
- Aesthetic Skills
- Centring (an important skill used in pottery)
- Creative Skills

- Critical Thinking
- Communication Skills

PREPARATION TIME: 20 minutes

❖ **Centring the clay**

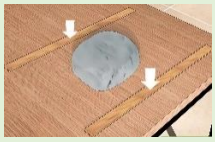
1. Arrange the material near the potter's wheel.
2. Dampen the wheel head. (should not be wet)
3. Moisten your hands to keep the clay damp.
4. Place a ball of clay firmly on the centre of the wheel head.
5. Set the wheel in an anticlockwise direction with low speed.
6. Apply equal pressure with the palms (the left hand cupped around the clay and the right hand along the top).
7. Keep the arms and hands as steady as possible.

PROCEDURE

❖ **Steps to make Seals**

1. Throw a piece of clay on the table to thin it out. Lift and throw the clay several times. This will help get out bubbles in the clay. Dampen your hands when throwing the clay.

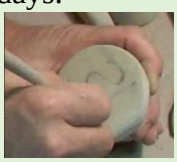
2. Place wooden scales on the table to help create an even layer of clay. Place the scales in front as shown in the figure.



3. Roll the clay out with the rolling pin. Press down into the clay as you roll the pin away. Keep going back and forth across the clay until you get the desired thickness.

4. Measure the desired side of the square and cut it out with a needle tool as shown below.

5. Engrave the seal design on the clay tile with the needle tool. Leave it for drying for 2 or 3 days.



6. The seal is ready.

OBSERVATION AND CONCLUSION:

1. The seals indicate the well-developed artistic ability of the people of the Indus Valley Civilization.
2. The seals reveal the trade and economy of the Indus Valley Civilization.
3. This art is a gift from our ancestors and needs to be preserved.

OBJECTIVE QUESTIONS:

1. Out of the remains excavated in Indus Valley, which one indicates the commercial and economic development?
2. What is the most common animal figure found at most of the Harappan sites?
3. Name the dockyard city of the Harappan Civilization.
4. What was unique about the Harappan city of Dholavira?
5. People of the Harappan Civilization brought many items such as copper, tin, gold, silver and precious stones from distant places. Name some of the places from where they got these raw materials.

LINKS AND REFERENCES:

- **Condition of Potters in India:** There used to be times when potters were an integral part of our society. With the modern equipment catching up among the people, potters are vanishing fast from the social scene. Their number is declining every year as the modern utensils and items made of rubber, steel, plastic and other material is replacing traditional apparatus made of clay.

  Link: https://www.thestatesman.com/lifestyle/the-dying-culture-of-pottery-in-india-1502765323.html

- **Government initiatives and policies**: **The Indian government is taking steps to promote the traditional pottery community by providing marketing support through haats, fairs, promoting clay cups in railways etc.**
  Link 1: https://www.youtube.com/watch?v=XJKET_N4QBk

  Link 2: https://indianexpress.com/article/india/hunar-haat-playing-key-role-in-making-vocal-for-local-campaign-a-mass-movement-naqvi-7207282/

Glossary

Amalgamating: combine or unite to form one organization or structure.

Archaeology: It refers to the scientific study of the material remains (such as tools, pottery, jewellery, monuments, etc.) of past human life and activities.

Artefacts: Artefact is a combination of two Latin words 'arte' meaning 'by skill' and factum which means 'to make' It refers to an object, such as a tool, that was made or crafted in past, that has some kind of cultural significance.

Bar graph: The representation of data through rectangular bars is called bar graph or bar diagram.

Budgeting: The overall process of preparing and using a budget.

Carnelian: A beautiful red coloured stone, that was used to make beads during the Indus Valley Civilization.

Chert: It is a kind of stone, that is hard, dark and opaque. It was used to make weights during the Indus Valley Civilization.

Civilization: It refers to human society with its well-developed social organizations, the culture and the way of life.

Convergence: the process of two or more things come together to form a new whole.

Data: It is a collection of numbers gathered to give some information.

Equivalent Ratios: Two or more ratios are equivalent if they have the same value when reduced to the lowest form.

Evaporation: The process of converting liquid into vapour.

Expansion: The action of becoming larger.

Faience: It is a material that is artificially produced with gum and sand or powdered quartz.

Financial Literacy: the ability to understand and effectively use various financial skills, including personal financial management, budgeting, and investing.

Impermeable: not allowing fluid to pass through

Indenting: to notch the edge of

Intermingling: mix or mingle together

Madhubani art: It's a style of Indian painting, practised in the Mithila region of India and Nepal. It was named after Madhubani District of Bihar, India which is where it is originated.

Middle Terms and Extreme Terms: In a statement of proportion; a : b :: c : d; a, b, c and d are called the terms of the proportion. First and fourth terms (a and d) are known as extreme terms (extremes) and second and third terms (b and c) are known as middle terms (means).

Moisten: Wet slightly

Molecular arrangement: The three-dimensional structure or arrangement of atoms in a molecule.

Proportion: Proportion states the equality of two ratios. The symbol '::' or '=' are used to equate the two ratios.

Ratio: The comparison of two quantities using division having the same units is called ratio. It is denoted using the symbol ':'.

Seal: Seal is a device for making an impression in wax, clay, paper, or some other medium, including an embossment on paper.

Sealing: The impression of the seal is known as the sealing.

Steatite: It is a soft stone also known as Soapstone.

Surface area: The amount of area covered by the surface (uppermost layer) of something.

Terracotta: A type of fired clay, typically of a brownish-red colour and unglazed, used as an ornamental building material and in modelling. It is derived from a Latin word 'terra cocta' meaning 'baked earth'. It is also used for making things such as flower pots, small statues and tiles.

Thalinomics: The 'Thali Economics' or the 'Thalinomics', is a measure on how much a meal costs in India.

Vitreous: like glass, in appearance or physical properties

Volume: The amount of space that a substance or object occupies or that is enclosed within a container.

कुंभकारी कला : मिट्टी के बर्तन व अन्य वस्तुएँ बनाना कुंभकारी कहलाता है।

संप्रेषण कौशल : विचारों का आदान–प्रदान करने एवं अपने विचार अन्य व्यक्ति तक उत्तम तरीके से पहुँचाने की कला हैं।

वृत्ताकार : चक्र के आकार का।

कलाकृति : मनुष्य द्वारा निर्मित वस्तु, मानवीय शिल्प।

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