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Level 3
Workbook 1

Numeracy

For 11 to 14 year olds

Screen-free learning resources that build multiple skills.

Content Partners

PRATHAM BOOKS storyweaver

DREAM a DREAM

Check if this Workbook is right for you.

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Answer the following questions in 20 minutes.

1. Fill the missing numbers:

   a. $\frac{3}{5} = \frac{\quad}{35}$ b. $\frac{\quad}{8} = \frac{6}{16}$ c. $\frac{1}{6} = \frac{\quad}{36}$

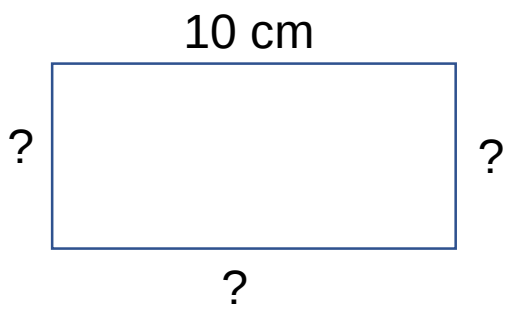
2. Solve:

   10.25 + 12.75 = _____ 34 - 32.75 = _____

   28.5 ÷ 10 = _____ 16.5 X 4 = _____

3. The side of a square brick is 20 cm. Find the number of such bricks needed to be laid for a rectangular path of length 1000 cm and breadth 500 cm.

4. If the perimeter of the rectangle is 30 cm.
   (i) Find the missing side.
   (ii) Find the area of the rectangle.



5. John wants to split $ 30.15 between 3 of his children equally. How much will each child get?

6. What is 5 % of 20?

7. Complete the pattern:

   A A D B B A A D _____ _____ _____

   7 14 21 28 _____ _____ _____

8. What is the probability of getting 3 or 5 while rolling a die?

Check your answers using the key on the next page.

Answer Key

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Give the allotted marks for each correct answer.

1. a. $\frac{3}{5} = \frac{21}{35}$ b. $\frac{3}{8} = \frac{6}{16}$ c. $\frac{1}{6} = \frac{6}{36}$ — *1 mark each*

2. 10.25 + 12.75 = **23.00** 34 - 32.75 = **1.25** — *1 mark each*

   28.5 ÷ 10 = **2.85** 16.5 X 4 = **66**

3. Area of the square brick = 20 x 20 cm = 400 cm^2

   Area of the rectangular path = 1000 x 500 =500,000 cm^2

   No. of Bricks = Area of the path / Area of 1 brick = 1250 — *3 marks*

4. 10 cm; **5 cm**; **5 cm**; **10 cm** — *1 mark each*

   Area = 10 x 5 = 50 cm^2 — *1 mark*

5. 30.15 ÷ 3 = **$ 10.05** — *1 mark*

6. 5 % of 20 is **1**. — *1 mark*

7. A A D B B A A D **B** **B** **A** — *1 mark each*

   7 14 21 28 **35** **42** **49**

8. P (getting 3 or 5) = P (getting 3) + P (getting 5)

   = 1/6 + 1/6 = 2/6 or 1/3 — *2 marks*

If your score is:

10 or less	Use the **Numeracy Workbook for Level 2**
11 or more	This workbook is right for you!

My Learning Journey

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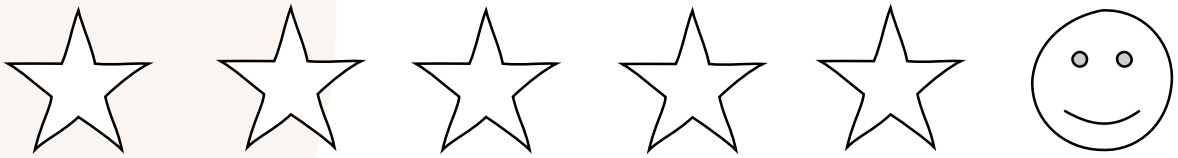
Name: _____

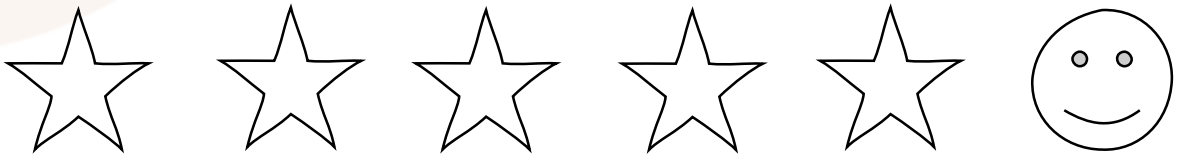
Draw yourself here.

Week 1



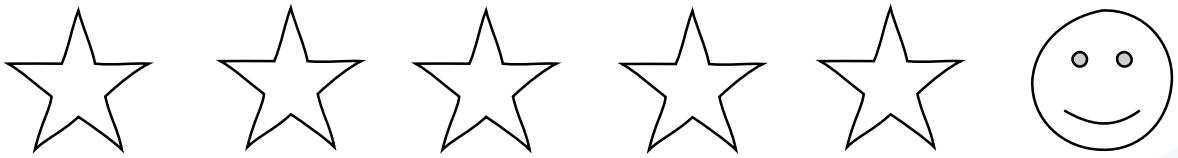
Day 1 Day 2 Day 3 Day 4 Day 5 DONE!

Week 2



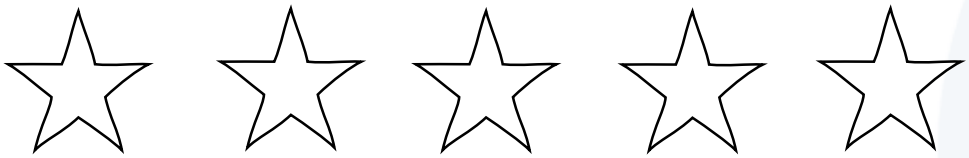
Day 1 Day 2 Day 3 Day 4 Day 5 DONE!

Week 3



Day 1 Day 2 Day 3 Day 4 Day 5 DONE!

Week 4



Day 1 Day 2 Day 3 Day 4 Day 5

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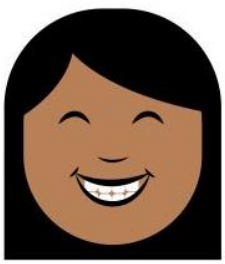
My Emotions

Write how you feel **everyday** in your notebook.

Today, I feel _____

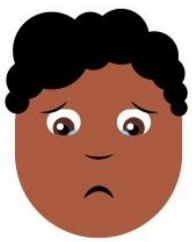
excited

happy



joyful

calm



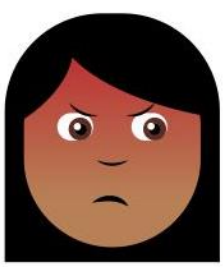
hurt

confused

anxious

lonely

frightened



annoyed

enraged

Week 1 Overview

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Project

Money Matters

Explore the likelihood of an event happening.

Barter System

Go back in time to explore how bartering worked.

1

Circles and Rectangles

2

Reflect on what you like and want to do through a mindful activity.

Demand Curve

3

Learn how to plot the demand table on a graph.

Coffee Shop Math

4

Create and answer your own questions!

Story Time

5

Read a story about doing the right thing.

Materials Needed

- Paper
- Pencil
- Thread
- Glue

Money Matters

Why do we value money?

What is money? What does it help us do?

List some things you can do with money and the people involved.

Example: Money is used to buy food.

If we do not have money, can we use something else to "buy" things?

Interview

Collect information about money from your family members and note down the responses. Sample Questions:

- Did people always have money as we know it today?
- Are there other forms of money?
- What did people use , before we had money, to buy or get the things they needed?

Day 1 Activity

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Long before people started using paper bills, they exchanged things with each other to get what they need. This is called **Bartering** or the **Barter System**.

- Select 4 players for the activity.
- Each player collects 4 items for one of the categories below. You can also add your own categories too!
- Each player will assign a different value (1 to 5) to their items, 5 being most valuable.
- Players will begin the barter. Trade your items for items in other categories. The objective is to have the most number of points.
- After 3 rounds, calculate the total points each player has.

Player	Food	Clothing	Medicine	Others	Total
Player 1					
Player 2					
Player 3					
Player 4					

Let's Reflect!

- Was it easy to convince others?
- What do you think happened to people who owned too much of 1 item?
- **Compare money-based exchanges to bartering.** Ask your family for their inputs too! Which one works better? Why?

Money Matters

Money is mostly made of paper. Why do people want money even though the items are more valuable than a piece of paper?

Make Your Own Money

What is money in your country called?
What are its different denominations?

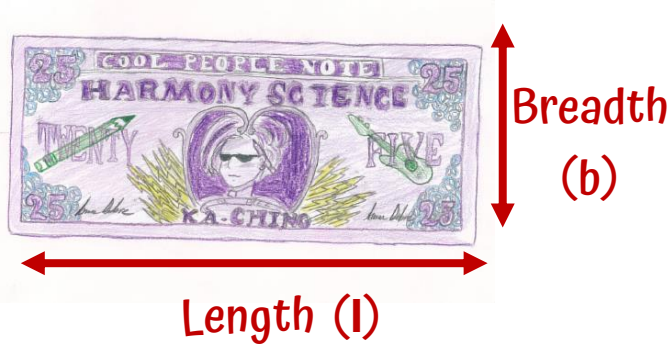
- Cut out 30 rectangles (paper bills) and 30 circles (coins).
- Chose 6 denominations ($5, $20, $100, etc.) and make 5 bills and coins of each.

Observe a money bill. It usually has an important landmark or historical figure on it. Some even have a motivational saying! Add a picture of your hero or favorite landmark and add an inspiring quote to one of your paper bills and coins.

Think of a catchy name for your currency!

Calculate the total amount of money you have.

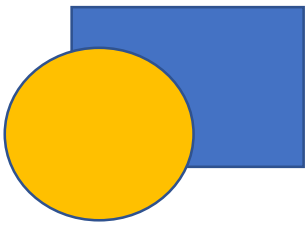
Calculate the perimeter and area of your paper bill.



Perimeter = 2 x (**l** + b)

Area = **l** x b

Circles and Rectangles



- Circle all the things you enjoy doing.
- Draw a rectangle around all the things you want to do in the future.
- Write your own interests in the space below.

Going to school *Singing* *Playing with my friends*

Painting *Helping my family* *Flying a kite*

Spending time with animals *Dancing* *Reading* *Writing*

Going to the park *Playing games* *Playing a musical instrument*

Learning new things *Watching a movie* *Swimming*

Studying *Keeping my things neatly* *Laughing*

Helping others *Travelling with my family* *Telling the truth*

Watching a cartoon *Sleeping on time* *Eating fruits*

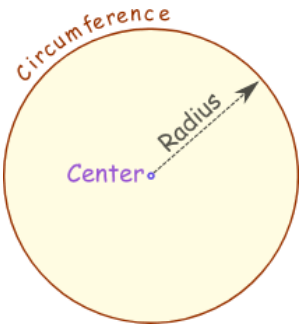
Making new friends *Helping my family* *Growing a plant*

_____ _____

_____ _____

DREAM a DREAM

Money Matters



Find the circumference of a circle using a thread.

Circumference ÷ Radius = _____ or **π**

π = 3.14

- Circumference = $2\pi r$
- Area = = πr^2

Find the circumference and area of your coin using the formulae.

Set Up a Shop

- Collect 10 items from your house and write the price next to each item. Have 4 to 5 objects of each item. (E.g 5 pens)
- Give the money you made to friends and family and invite them to your shop.
- Make a **Demand Table** like this and fill it.

Item	Price	How many people bought it?

How many people want and item and have enough money to buy it? This is called '**demand**'.

Announce a sale in your store and reduce the prices.
Record your customers' purchases at different prices

- What was the demand for items at the original price? What about after the sale?
- Is there any relation between demand and price?

Demand Curve

We will show our demand table as a graph. Graphs show us information visually.

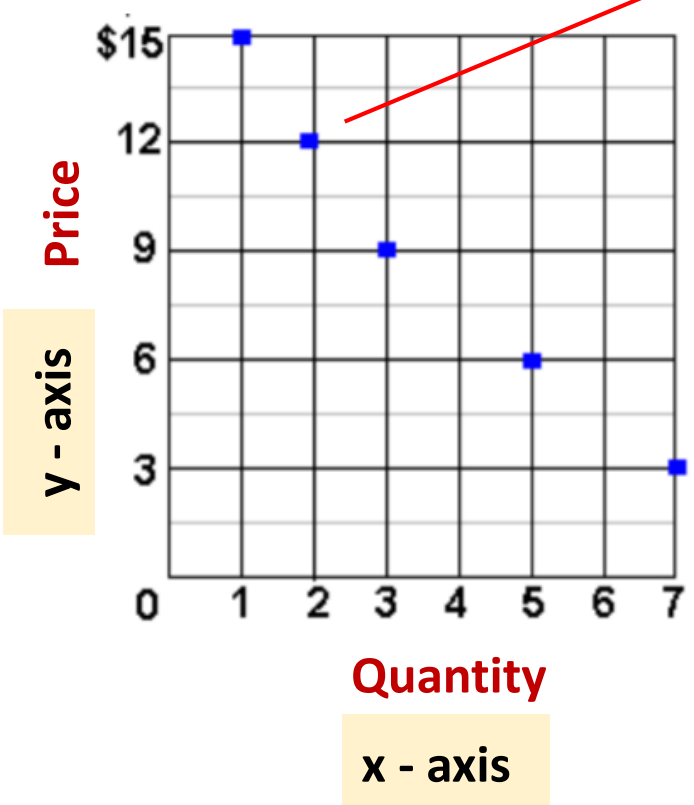
y - axis	x - axis
Price	**Quantity demanded**
15	1
12	2
9	3
6	5
3	7

Make a similar table for the items in your shop.

Example

Ordered Pair (x, y)

(2, 12)



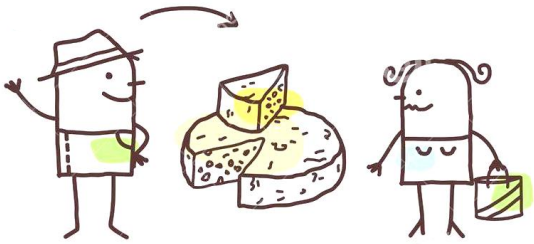
- Construct the graph in your notebook.
- Plot the (x, y) points from the table.
- Draw a line through the points.

This line is called the demand curve.

Money Matters

Producer

People making things to sell.



Consumer

People buying things.

Do consumers want low or high prices? Why?

Which of these items would you produce more of? Why?

Interview a shopkeeper to know what they sell more of and why.

- Imagine you are a shopkeeper (producer).
- Make a **Supply Table** like this for your shop and fill it.

Item	Price	How many of it I want to sell?

How much of an item is produced is called '**supply**'.

Do producers want low or high prices? Why?

Plot the supply on a graph: Price (x-axis), Quantity (y-axis)

Day 4 Coffee Shop Math

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Write the prices for each item below. Ask a friend to fill in the blanks (in decimals) for you to solve!

Coffee Shop Menu


Chocolate sundae _____


Hot chocolate _____


Carrot cake _____


Strawberry cake _____


Milkshake _____

Mia ordered  and  . She paid _____. How much should she get back?

Ana ordered    . She paid _____. How much should she get back?

Ali ordered   . He paid _____. How much should he get back?

Jon ordered   . He paid _____. How much should he get back?

Money Matters

Ask a family member how they decide to spend the money they earn. **Is it important to save money? Why?**

A **budget** is a set amount of limit on money we set aside for something. It helps us spend and save money wisely.

Imagine your budget is $ 50. How many bananas and apples can you buy with it?


$ 2 $ 5

Try different combinations like this:

Item	Price	Quantity	Total
Apple	$ 2	2	2 x 2 = $ 4
Banana	$ 5	10	5 x 10 = $ 50
Total			4 + 50 = $ 54

- Write 10 most important things you use in a week at home.
- Put it in a table (as above) and calculate the total cost.
- Take some money from the currency you made. (Eg: 100)

Money saved is the amount you have left over *after* you pay for everything you need. Are you able to save any money? What if you increase the budget? What will you do with the saved money?

Present your final budget to your family members for their inputs. Discuss with them why we value money.

Pick It Up

"Yippee!" Zonke shouts when the school bell rings. At last, he can go home. This afternoon, he wants to play soccer.

"Hey! Look out," a voice suddenly rings out in front of him. He never noticed Bheka. Bheka growls at him.

"Sorry," Zonke quickly replies. He wants to walk around Bheka. But Bheka suddenly pushes him.

Zonke stumbles. Bheka laughs. "Do you have big feet that you fall so easily?" he mocks.

A girl, Thandi, helps him. "Thank you," Zonke says. "You're welcome," Thandi says. "I saw everything. Bheka really is a bully."

Zonke runs home. It's quite hot. Fortunately, the house isn't far. Suddenly he notices something in the road.

He stops. It's a wallet! Zonke can't believe his luck. He quickly glances inside the wallet. Wow, it contains money!

Pick It Up

Zonke's heart beats faster. Then he puts the wallet in his pocket. He quickly glances around to see if someone noticed. Yes! Somebody is approaching. It's Bheka. He is only a few steps behind Zonke.

Zonke hides the wallet behind his back. "Too late. I saw you picking something up," Bheka says. His eyes grow wide when he sees the wallet. He takes it.

"Keep the money. Buy yourself a new pair of shoes. Or a soccer ball," Bheka says.

"No!" a girl's voice sounds. It is Thandi from school. "Zonke, the money doesn't belong to you. You don't have the right to keep it."

"I'm going to return it," Zonke suddenly says loudly. Thandi smiles.

"That's the right thing to do. You'll see." Bheka shakes his head. He returns the wallet to Zonke. "You're a coward," he says and leaves. "You're not," Thandi tells Zonke softly.

They look at the ID Cards in the wallet. The wallet belonged to someone named 'Gugu'. There was a small picture of Gugu and

Pick It Up

her children. Zonke recognizes her. “She lives nearby. Come along. We’re going to return her wallet.”

They go over to her place and knock on the door. Auntie Gugu opens it crying. Zonke feels bad but then he takes the wallet from his pocket. Auntie Gugu’s sad face immediately turns happy.

“My wallet!” she shouts. “I can’t believe it.” She checks the money in the wallet. “And all the money is here. I am so happy. I had to go and buy some food. But then I lost my wallet. I thought we would go hungry this week.”

She thanked Zonke and Thandi. After a while Zonke and Thandi walk home. Zonke is very glad that he did the honourable thing. Thandi is right. If he kept the wallet, he would be just as ugly as Bheka.

Answer the following:

- Would Zonke have returned the wallet if Thandi wasn’t there?
- Have you ever bullied or have been bullied by anyone? What happened? How did you feel?
- Enact a scene from the story with Bheka, Zonke, and Thandi.

Weekly Reflection

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Did I enjoy learning this week?

What are some new things I learned?

What did I do well?

What can I do better next week?

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Week 2 Overview

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Project

Probability Matters

Explore the likelihood of an event happening.

Favourite Things

Create Venn Diagrams to show probability.

5

Luck of the Toss

Play a game to see whether to choose heads or tails!

4

Flow Like Water

Observe how water flows and draw it.

3

Tree Diagrams

Make a tree diagrams to show probability.

1

2

Exploring Probability

Track the weather and create s probability game.

Materials Needed

- Paper
- Pencil
- Thread
- Glue

Probability Matters

How is probability used in real-life?

Circle the option.

Event	I think it is . . .	
It will be sunny tomorrow.	Likely	Unlikely
I will play with a friend today.	Likely	Unlikely
I will fly in a plane in 2 days.	Likely	Unlikely
I will eat a fruit today.	Likely	Unlikely

There are outcomes to any event – no right or wrong.

Probability (P) shows us how likely an event is to occur.

$$\text{Probabilty} = \frac{\text{Favorable outcomes}}{\text{Total outcomes}}$$

Example:

$$P(red) = \frac{7}{12}$$ ← Number of red marbles / Total number of marbles

$$P(blue) = \frac{5}{12}$$ ← Number of blue marbles / Total number of marbles

Discuss how probability is used in sports.

(Hint: Coin-toss, betting, etc.)

Coin Probability

When you toss a coin once, there are 2 possible outcomes:

Head (H) or **Tail (T)**

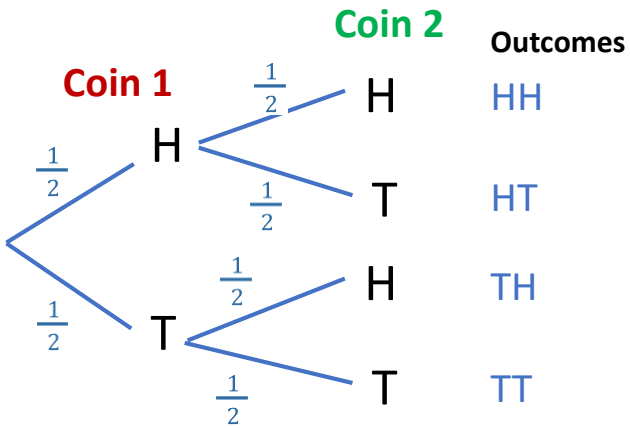
Probability of getting Head → P (H) = $\frac{\text{No. of heads}}{\text{Total no. of outcomes}}$

So, P (H) = $\frac{1}{2}$ and P (T) = $\frac{1}{2}$

Tree Diagram

What are the possible outcomes when we toss 2 coins?

We can show this as a Tree diagram.



Using this, we can find the probability of getting 2 heads:

P (HH) = P (H) X P (H)

= $\frac{1}{2}$ X $\frac{1}{2}$

= $\frac{1}{4}$

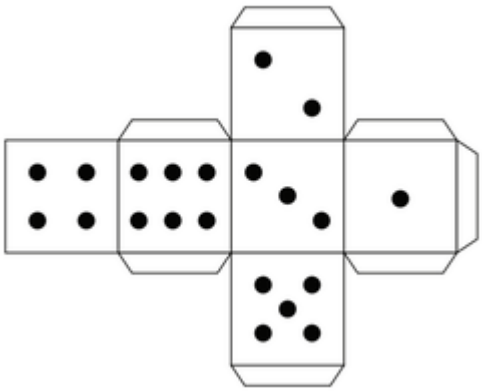
- Calculate P (HT), P (TH) and P (TT).
- What is the sum of the probabilities of all outcomes?

Draw a tree diagram of tossing 3 coins.
Calculate the probability of all the outcomes.

Probability Matters

Make a Die

- Draw and cut the picture.
- Fold along the lines and stick together to form a cube.



The outcomes of rolling a die are 1, 2, 3, 4, 5 and 6.
The probability of an impossible outcome is 0.

Calculate the probability of getting each number on a die.

Roll	Number on die
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

What is the sum of the probability of all the possible outcomes?

Roll a die and record the outcomes in the table.

Based on the table, what is the probability of getting:

- 1 on the die?
- 3 or 5 on the die?
- 2, 4, or 6 on the die?
- 8 on the die?

Day 2 Activity

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Exploring Probability

Two coins are tossed. What is the probability of getting 1 head?

We can add probabilities:

P (1 Head) = P (HT) + P (TH)

$$= \frac{1}{4} + \frac{1}{4}$$

$$= \frac{2}{4} \text{ or } \frac{1}{2}$$

Calculate:

- P (At least 1 Head)
- P (1 Tail)
- P (At least 1 Tail)

Find the same for when 3 coins are tossed too.

Weather Tracking

Observe and record the weather in the table. Is it cloudy, rainy, windy, or sunny?

Roll	Weather
Day 2 (today)	
Day 3	
Day 4	
Day 5	

Probability Game

- Divide a circle into 4 parts. Colour or write the colour's name on each quarter.
- Create an arrow using paper and attach it at the center using a pin, so that it spins.

- Spin it 6 times and record the outcomes in a table.
- Find the probability of getting each colour.

Probability Matters

- Make a second dice.

Discover how many possible outcomes can happen if you roll two dice at the same time. **Draw the tree diagram.**

- Roll the 2 dice 10 times and record your observations:

Roll	Die 1	Die 2
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Then, calculate:

- P (6, 3)
- P (5, 1)
- P (3, 2)
- P (7, 1)
- P (Same number on both dice)

Make your own game using dice or coins.
Play it with your family and friends!

Let's Reflect!

- Did they enjoy the game?
- Were the rules clears?
- Can you make another variation of the game?

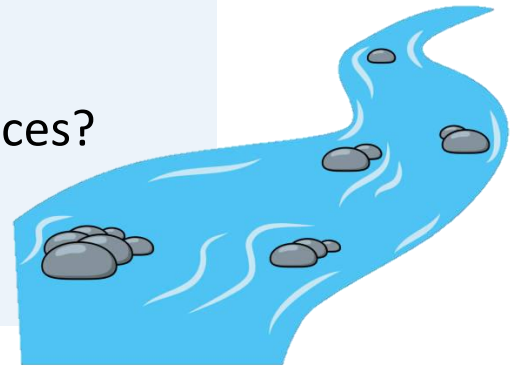
Discuss with your family and list some common applications of probability in real-life. *(**Hint:** Games, Weather, Sports, Health, etc.)*

Flow Like Water

Slowly pour some water on the ground outside.

Observe the water flowing.

- Is the water moving forward?
- Is it moving slowly or fast?
- Does it slow down at some places?
- Does it move faster in some?
- Does it dry up?



Pour some more water and observe how it moves.

Draw the shape it makes below:

What is the probability that water does not spread when poured on the ground – likely or unlikely?

Probability Matters

- Draw a family tree with as many generations possible.
- Find out this information about each family member:

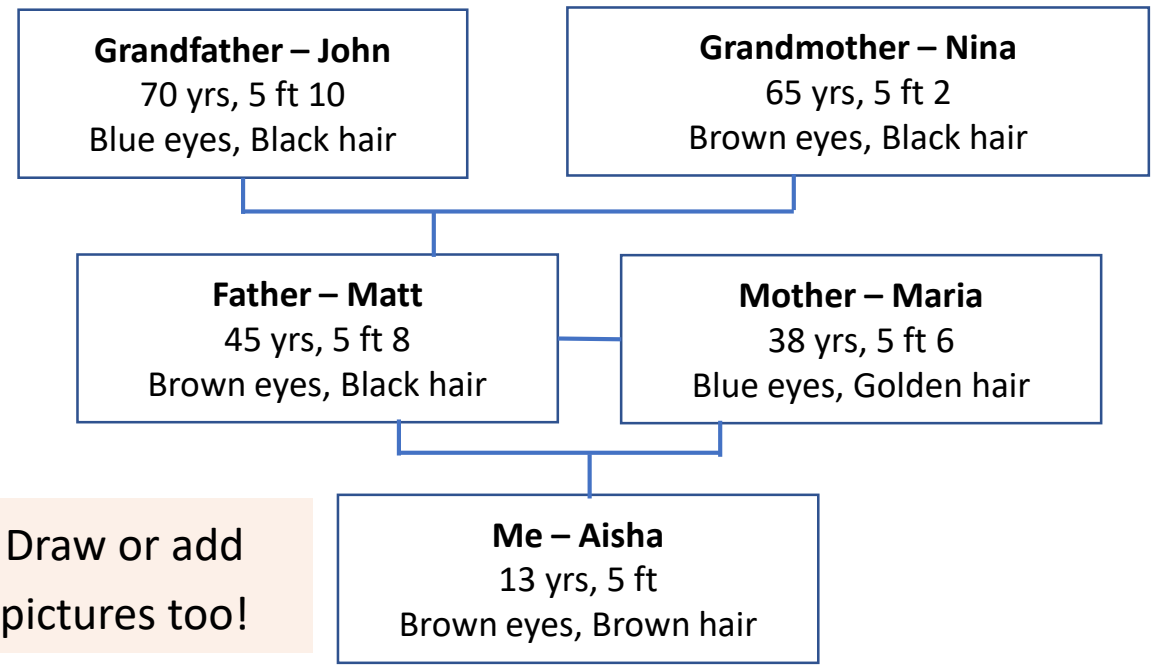
Name | Age | Height

Relation to you

Choose 2 to 4 features:
Ex: Hair/ skin/ eye colour

- Relate your own characteristics to the family tree.

Example



Draw or add pictures too!

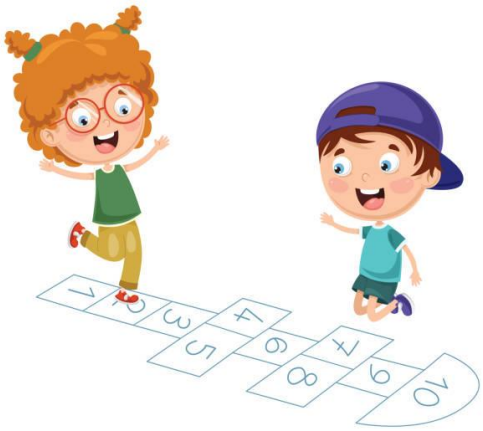
What are the chances your future child will have a certain characteristic? Draw them!

Example: P (Black Hair) = $\frac{3}{5}$ ***Likely***

Luck of The Toss

2 players per round

Game Set-Up



- Mark a starting and an ending point 10 steps away.
- Each player has a coin.

How to Play

- Player 1 tosses the coin and only hops 1 step forward if it is heads. Player 2 tosses and only hops forward if it is tails.
- Players will record their observations below:

Toss	Player 1	Player 2
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

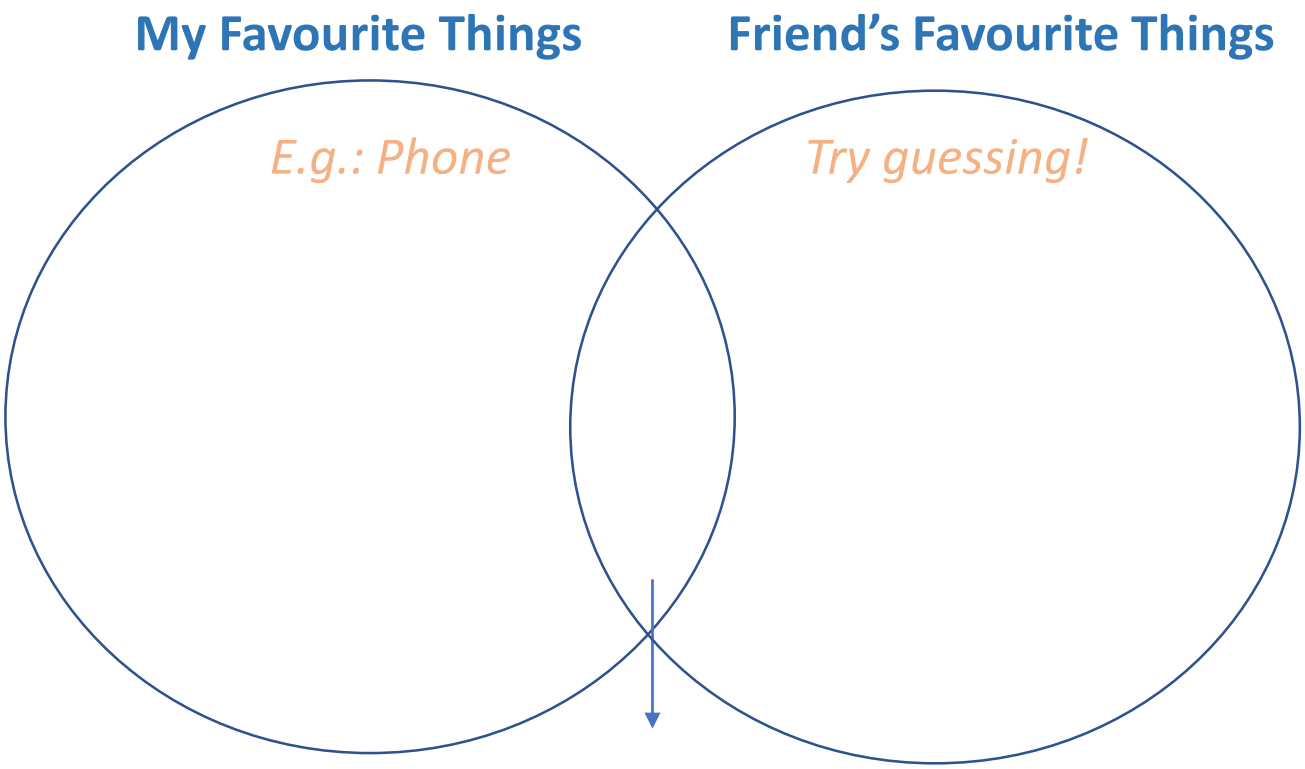
The Player to reach the end of the path first wins!

Play 2 rounds of this game.

Is it better to be Player 1 (heads) or Player 2(tails)?

Favourite Things

Fill the Venn Diagram below



Imagine all the things from the Venn diagram is put in a bag. If you pick out any one thing, what is the probability of getting:

- Your favourite thing $= \frac{\text{Total no. of your favourite things}}{\text{Total no. of things in the Venn diagram}}$
- Friend's favourite thing
- Both of your favourite things

What % of things do you have in common with your friend out of all the things listed?

Probability Matters

- Observe the weather table you made on Day 1.
- Calculate the probability of each outcome – sunny, rainy, windy, and cloudy.

How do we predict the weather?

- If it was sunny for 2 out of 4 days, P (Sunny) = $\frac{2}{4}$
- To find the percentage, multiply it by 100 → $\frac{2}{4}$ x 100 = 50%
- So, next week, the probability that it will be sunny is 50 %

Do you think this information is useful? How?

Community Assignment

- How many people have diabetes (or any other inherited disease) in your family or community?
- What is the probability of a person to get diabetes in your family or community (in %). If it is 50% or higher, it is likely.

Let's Reflect!

- How does probability help the health sector- i.e. doctors, disease researchers, health officials in the government etc.?
- What are some questions you want to explore about probability?

Weekly Reflection

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Did I enjoy learning this week?

What are some new things I learned?

What did I do well?

What can I do better next week?

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Week 3 Overview

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Project

Draw Like an Architect

Explore patterns around you.

1 Scavenger Hunt

Find objects in the house of different lengths.

2 My Home

Think about what makes your home special.

3 Exploring Rectangles

Solve problems related to rectangles.

4 Story Time

Read about the first house being built in a faraway land.

5 Design a House

Your clients need your help to make a floor plan!

Materials Needed

- Paper
- Pencil

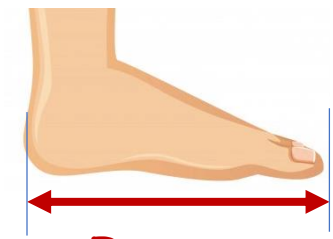
Draw Like an Architect

How can you draw a floor plan and measure using your body?

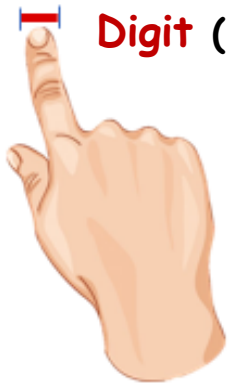
*An **architect** designs a room or a building using accurate measurements.*

In the past, people measured things using their bodies.

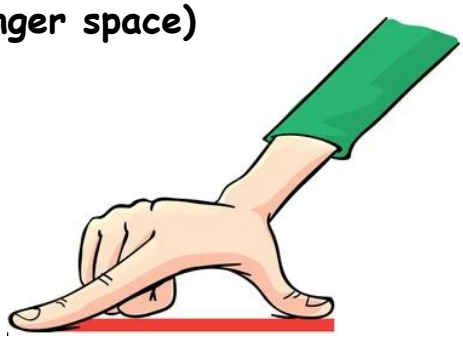
Cubit



Footspan



Digit (1 finger space)



Handspan

- Pick a room with 4 sides in your house.
- Start at one corner and measure each side in footspans.

Side 1: _____ Side 3: _____

Side 2: _____ Side 4: _____

What shape is your room? How many vertices (corners) does it have? Which sides are equal? Does this apply to all shapes?

Scavenger Hunt

Game Set-Up

3 or more players

List different lengths on a sheet. There should be objects at home in these approximate lengths.

Some Examples:

- 2 Cubit
- 3 Footspans
- 4 Handspans
- 10 Digits

- 10 centimeters
- 2 meters
- 5 inches
- 20 centimeters

How to Play

- Players go around the house and bring an object that measures the same as the lengths in the sheet.
- 2 players cannot bring the same object.

The first player to cross out all the lengths wins!

Draw Like an Architect

We will draw a sketch of your room on paper.

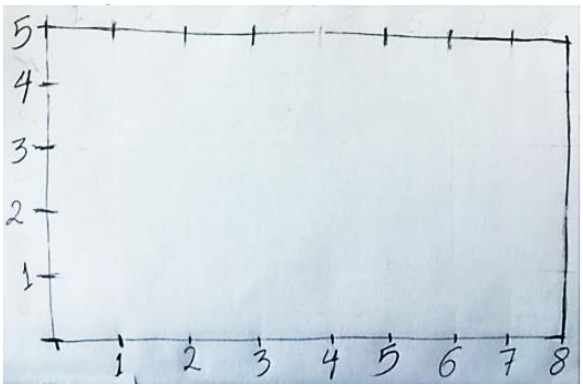
The room is much bigger than the sheet of paper, so architects draw a smaller sketch that looks like the actual room. This is called the **blueprint.**

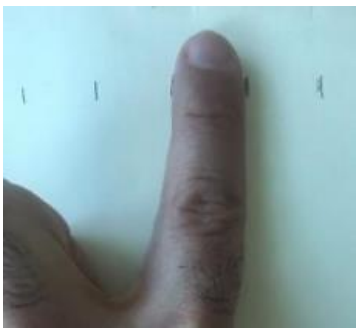
So, we can represent footspans as 'digits' (finger space) on paper.

Example

Length of my room = 8 footspans

Breadth of my room = 5 footspans





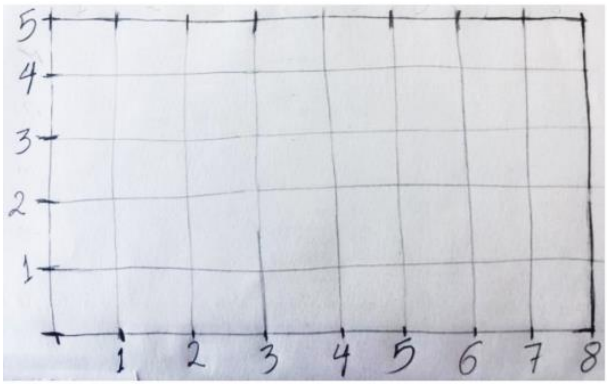
Draw the sides using the same number of digits.

Length = 8 digits

Breadth = 5 digits

Create a grid using the digit marks.

Notice that the side length of the small square is 1 digit, so we call this a **unit square**.



Area is the number of unit squares that something covers.

Area of your drawing = _____ squared digits

My Home

Close your eyes. Breathe in and out slowly, 3 times.

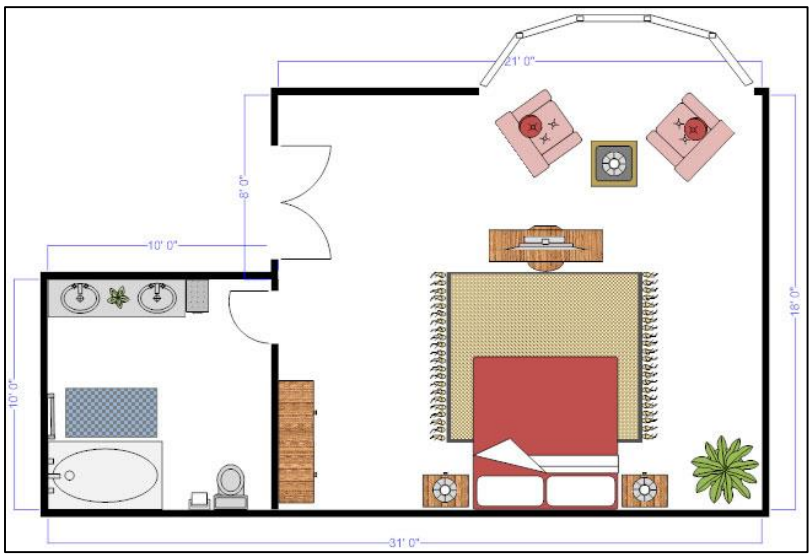
Think of places or things at your home that make you happy. Draw and label them below:

Draw the following:

Special things about my home

Draw Like an Architect

Architects imagine that the roof of the house is transparent and draw a floor map as if we are looking at the house from the top, like a flying bird.



Observe and find:

- The walls
- The doors
- The no. of rooms
- The types of rooms
- The objects you see

Create a Floor Map

- Measure the different rooms in your house using footspan.
- Draw and mark the digits on paper.
- Add doors and draw symbols to show the use of each room.

Present the floor plan to your family and take their inputs.

Calculate the floor map's

Perimeter ☐ digits

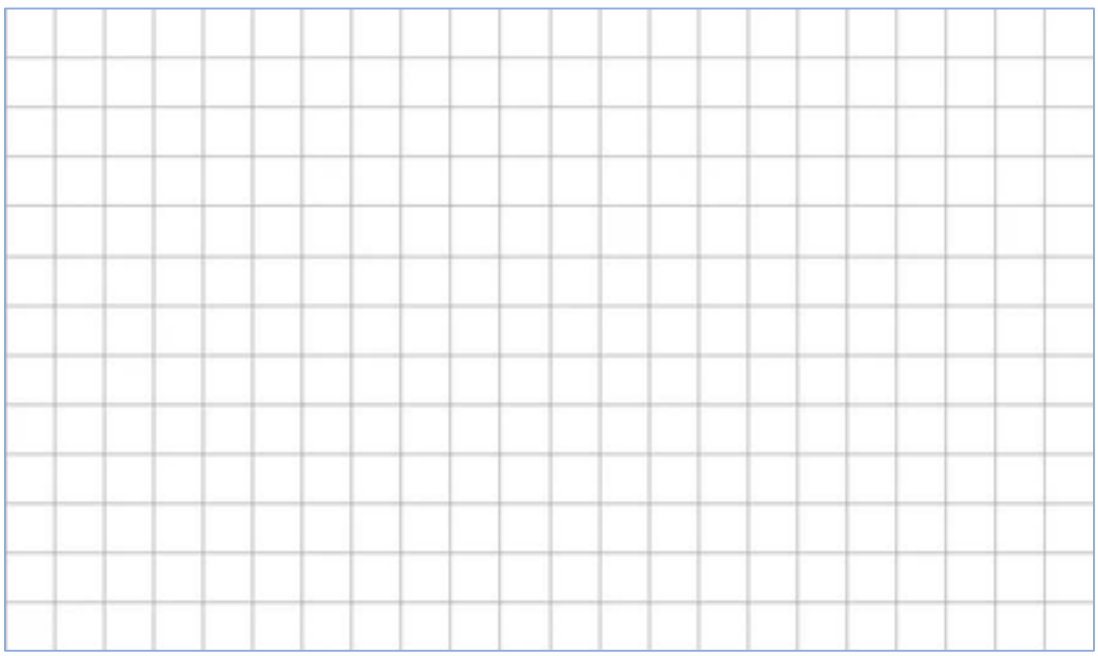
Area ☐ squared digits

Area is usually expressed as square meters or square feet, but since we are using our fingers/digits, we will express the area calculated as square digits.

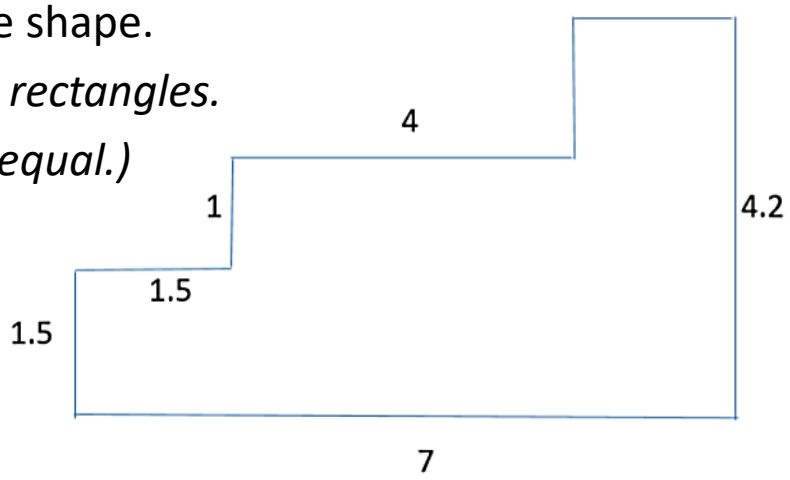
Exploring Rectangles

Draw the information to solve it!

- A rectangle has an area of 35 m^2. One of its sides measures 5 m, measure the other side.
- A rectangle has an area of 20 Squared Feet. Its length is 5 Feet. What is its breadth?
- Draw a floor map of a room whose Length is 14 Feet, and Breadth is 12 Feet. **Scale: 1 digit = 2 feet of the room**



- Find the area of the shape.
  *(**Hint:** Divide it into rectangles. Opposite sides are equal.)*

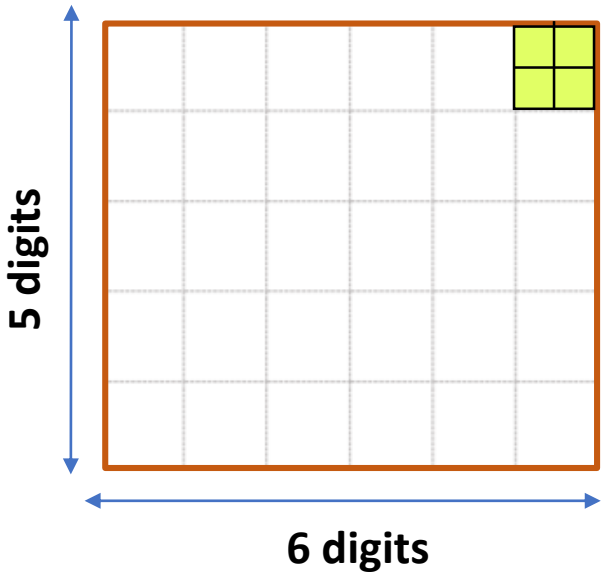


Draw Like an Architect

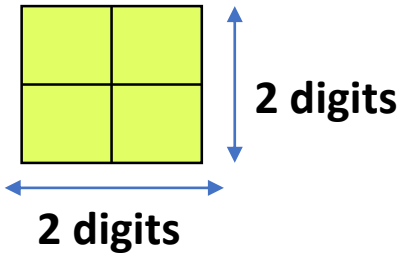
Architects use the different measurements of the house to calculate the material needed to complete the house construction.

How many tiles will we need for this floor?

Floor



Tile



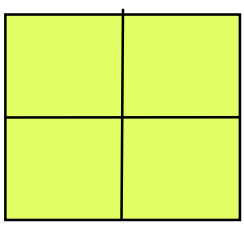
- Find the area of the floor.
- Find the area of 1 tile.
- No. of tiles = $\frac{\text{Floor's Area}}{\text{1 Tile's Area}}$ needed

How many tiles of each type will you need for your house's floor? Calculate the total cost of tiling as per the rates below.

Tile 1

$ 1

Tile 2



$ 2.5

Tile 3

Create your own tile. Add designs or a symbol to it!

$ 5

First House

Koni and Kincha were two close friends. They wanted to build a house. In their land, people still lived in caves and did not know what a house looked like.

One day, Koni said, “Oh Kincha, I’m so tired of living in a dark cave. Why don’t we build a house in the forest?”

“Good idea, Koni!” said, Kincha. “Let’s go and ask our friends- the animals, how to build a house!”

So, they came out of their caves and entered a big forest. The first animal they saw was an elephant

“Can you tell us how to build a house?” they asked.
The elephant said, “Cut trees to make pillars as strong and thick as my legs!”

So, they cut down a tree and made thick pillars out of it.

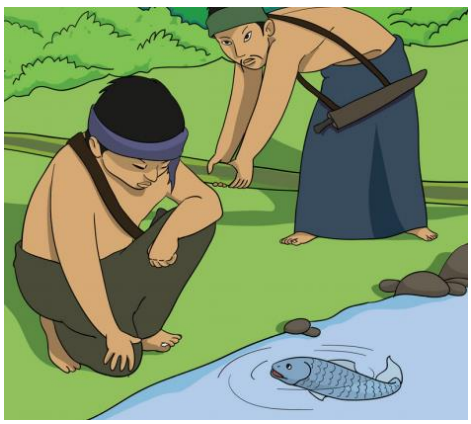
Suddenly, they heard a ‘mooo’. It was Mithun, a large buffalo who lives in the forest.

First House

.“Can you tell us how to build a house please?” asked Kincha

“I’m too sad to talk now,” said Mithun sadly, “but I’ll help you to build your house. You see, a tiger killed my husband, so put sharp poles to protect your home.”

They thanked Mithun and began making the poles, but got tired. They walked to a nearby river to have a drink.



Suddenly, a fish came up to them and said, “Collect a lot of leaves and put them on the roof, one on top of the other, like my scales. That will protect your house from sun and rain, ” said the fish.

Koni and Kincha now had all the ideas they needed to build a house and they worked very hard to complete it. And this is how the first house was built in that faraway land.

- Who are the characters in the story? What is the setting?
- How do you think the first house was built? Draw it.
- What advice would you give Koni and Kincha to make their house better?

Draw Like an Architect

Painting Areas

Assume that 1 footspan = 1 meter (m)

Find the total paintable area of your house (in squared meters).

- Floor Area = _____ m^2
- Ceiling Area = Floor Area *(Why?)*
- Wall 1 Area = _____ m^2

  (Find the areas of all the wall, subtract the area of doors and windows.)

Total Paintable Area = _____ *(Use addition.)*

Assume that 1 liter of paint covers 10 m^2

How much paint is needed for the house? *(Use division.)*

If the cost of paint in $ 3.5 per liter. **What is the total cost?**

Treasure Hunt

- Hide 3 items in the house.
- Mark the hiding spots in the floor map.
- Ask 3 players to search the item using the map.

Let's Reflect!

- Is your floor plan accurate and easy to follow?
- Can you draw a floor plan for any house and measure using your body?

Day 5 Activity Design a House

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Imagine you are an architect. Ask your friends or neighbours for the specifications of their house and draw the floor plan **OR** you can also draw it for these clients:

Bathroom: 9 sq. meters
Kitchen: 15 sq. meters

Living Room: 20 sq. meters
Bedroom: 10 sq. meters

Each square represent 1 square meter.

Find its area, perimeter, and the no. of tiles needed for the floor.

- Close your eyes and visualize your dream house.
- Write down its features. *(no. and type of rooms, wall colours, etc.)*
- How will the environment and weather conditions affect the design of your house? Draw the floor plan of your dream house!

Weekly Reflection

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Week 4 Overview

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Project

Patterns Everywhere

Explore patterns around you.

Story Time

Explore patterns with Paul, the Pattern Detective.

5

Fibonacci Sequence

Explore the Fibonacci sequence

4

Look Up

Observe patterns in the sky!

3

My Habits

Observe patterns in your daily actions and behaviour.

1

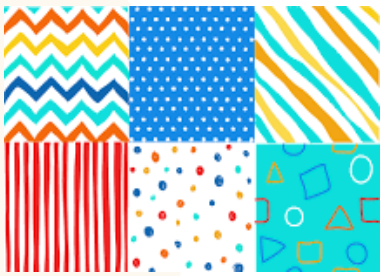
2

Shape Patterns

Explore patterns with different shapes.

Materials Needed

- Paper
- Pencil



Patterns Everywhere

How can patterns help us understand the world?

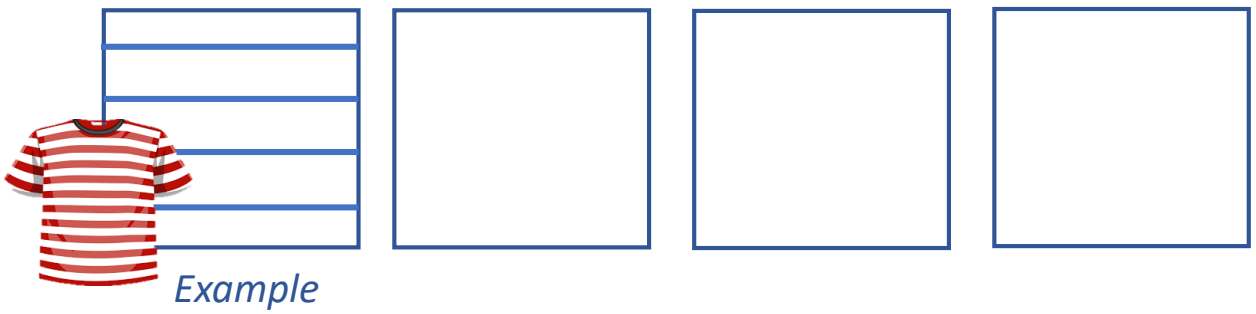
Patterns are things, numbers, or shapes that repeat in a logical way.

Days and nights repeat and happen regularly as a pattern.

Below are some patterns in animal skin. Identify them.

List 3 more patterns you see in nature.

Observe the shapes and designs that repeat in your clothes or things around you. Draw at least three such patterns below.



Example

Day 1 Activity

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My Habits

Let us observe patterns in our daily actions. Fill the table below.

(Add your other behaviours you want to track too.)

✓ I did ✗ I didn't

Question	Day 1	Day 2	Day 3	Day 4	Day 5
Did I lose my temper today? **Think:** When did it happen? What happened before and after that?					
Did I have bad dreams? **Think:** What did I do during the day that day? When did I have my last meal?					

Continue tracking your habits over the next 2 weeks.

Project-Based Learning

Patterns Everywhere

Let's make music based on the code!

A	B	C	D
			
Snap your fingers.	*Clap your hands.*	*Stomp your feet.*	*Tap your thighs.*

Try this! B D A

Symmetric Pattern A A C C A A

Cluster Pattern B B B B C D

- Create your own code and music pattern.
- Which is your favourite song? Identify a pattern in it.

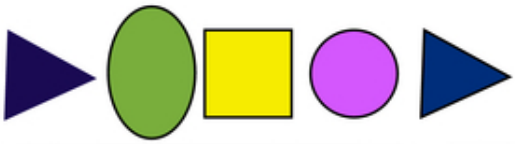
Select a song to dance to. Create a code for different steps and make your own pattern. Teach the dance to your family!

Let's Reflect!

- Did they enjoy the dance?
- Were they able to follow the pattern?
- Do we always "see" patterns?

Shape Patterns

Finish the following patterns.

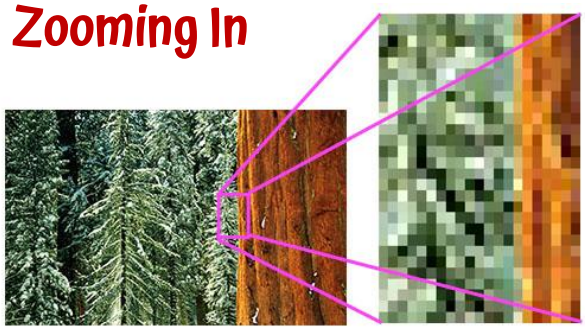


Create 2 patterns using any 3 shapes.

Project-Based Learning

Patterns Everywhere

Zooming In

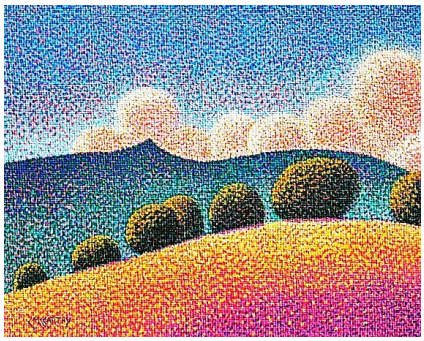


Vision involves identifying patterns, like combining pixels. Pixels are the smallest area of a screen or picture.

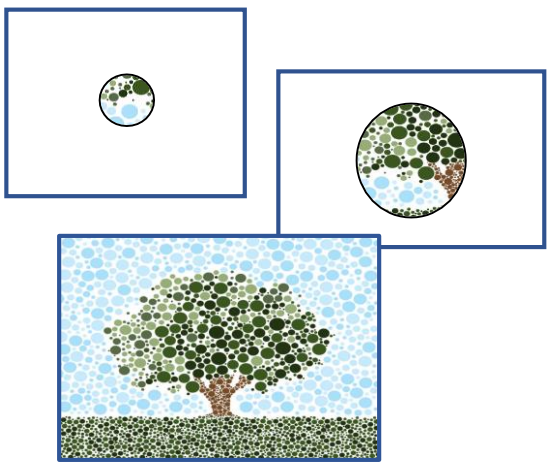
Artists use a technique called pointillism which follows the same principle. Let's try!

- Draw any picture.
- Use your fingers to add colour.
- You can make your own colours using spices. *(E.g.: Turmeric powder → yellow)*

Pointilism



Zooming Out



Make a tiny hole on paper and place it over the painting. Ask a peer:

- What do you see or notice?
- What do you think this might be?

Repeat this by increasing the size of the hole and then showing the full picture.

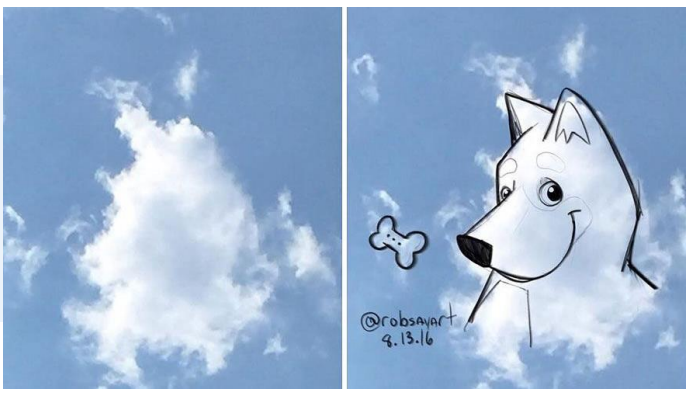
This process of "zooming out" is called **abstraction**. Abstraction helps us make sense of what we see. Patterns help us zoom out and move from small details to see the bigger picture!

Look Up

What are some change you observe in the sky?

- Look up at the sky.
- Draw the different shapes of the clouds you see.

Do they remind you of something - an animal, a person, or a thing?



Patterns Everywhere

What comes next in these patterns?

1 0 1 0 1 0 1 _____ , _____ , _____, _____

K L L A K L L A _____ , _____ , _____

Sit a**S**k ca**S**t bag**S** _____ , _____ , _____

2 3 5 1 1 2 3 5 1 1 _____ , _____ , _____

Ate **B**ot **C**at **D**og _____ , _____ , _____, _____

2 4 6 8 10 ...

- What number comes next?
- How do you know this?

Number patterns follow a **rule**. In this case, the rule is to add '2' to the number. Complete these patterns. What is the rule?

3 6 9 12 _____ , _____ , _____, _____

9 18 27 36 _____ , _____ , _____, _____

30 26 22 18 _____ , _____ , _____, _____

1000 200 40 _____ *(Hint: Divide by a number.)*

Design your own number sequence, using a rule. Challenge your peers to complete it.

Day 4 Activity

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0 1 1 2 3 5 8 …

This is the **Fibonacci Sequence**. Each number is the sum of the two numbers before it. What are the next 3 numbers?

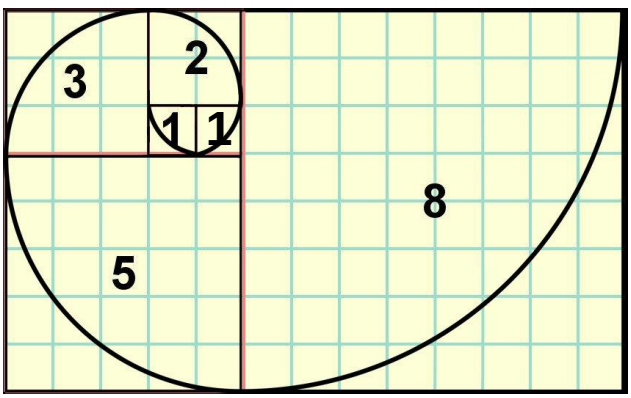
Terms in the Sequence	Previous Term	Ratio
1	1	1
2	1	2
3	2	1.5
5		
8		

Fill this table. What do you notice about the ratios?

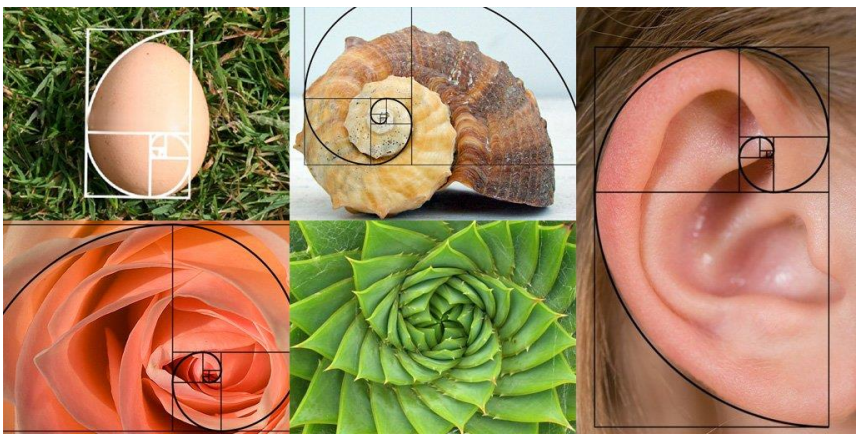
Ratio:
3 ÷ 2 = 1.5

The ratios seem to be 1 close to 1.6. This is called ***phi.***

Draw the number sequence in a grid and connect it to form a spiral. It goes till infinity!



Observe this in nature.



1 Petal

3 Petals

5 Petals

8 Petals

Patterns Everywhere

You see these clouds. What do you think will happen next?

Patterns help us predict.

You have been tracking some behaviours during the week.

Write down 3 patterns you observe like this:

When I _____, then _____ happens.

Ex: When I fight with my friends, then I have nightmares.

- Are there "good" or "bad" patterns?
- Let's zoom out. In a month or a year, how do these patterns affect your life?
- **Patterns can be changed.** How would you break or enhance some patterns?

Make a poster to remind yourself of this!

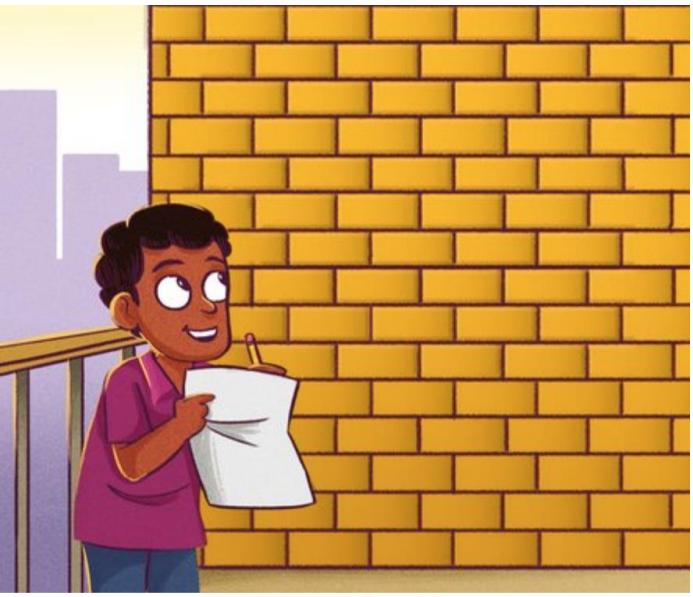
Why is it useful to recognise patterns around us? How do they help us see things differently?

Paul, The Pattern Detective

Paul loves searching for patterns. "I am going to be a pattern detective today! Let's go find patterns!" said Paul.

Paul found a pattern hanging on the tree. It is called a hive and bees live in it. It is made up of the hexagons(a shape with 6 equal sides) stuck to each other.

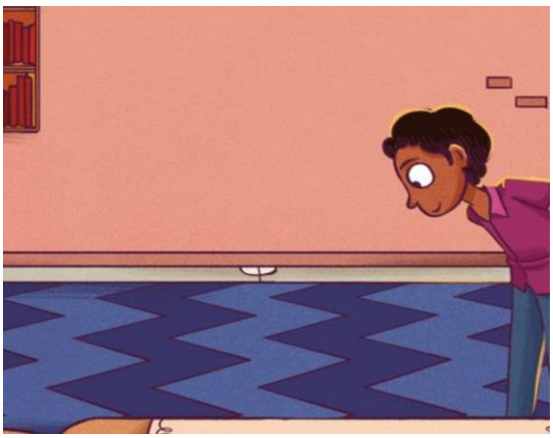
Draw a hexagon.



Before going inside the house, he notices that the bricks of house make a pattern.

What is the shape of the brick? Does it have equal sides?

Paul, The Pattern Detective



Inside the house, Paul saw a pattern on the carpet.

Draw your own carpet pattern.

He went to the kitchen and saw a pattern on the table.
"What is this fruit?" Paul asked his Mom. "It is a _____," she said.

Draw 2 patterns you see in other fruits.

The next day at school, he told his friends all about the patterns he found.

"Join me today! Let's all be pattern detectives!" said Paul.

- Where did Paul see patterns?
- Where do you see patterns around you?
- Draw your favourite pattern. Why is it your favourite?

Weekly Reflection

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Did I enjoy learning this week?

What are some new things I learned?

What did I do well?

What can I do better next week?

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This certificate is awarded to

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for the successful completion of the **Numeracy** workbook.

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Facilitator

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