World Around Us Level 3

education above all
التعليم فوق الجميع

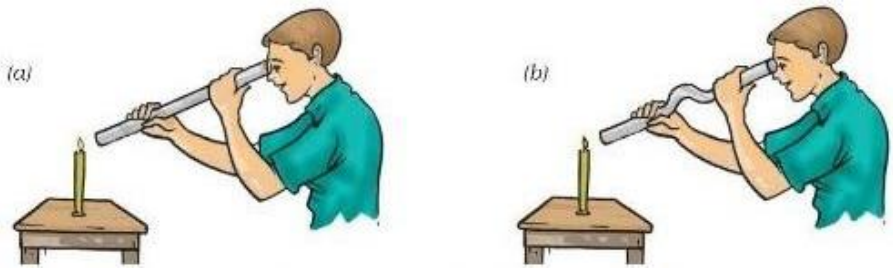
Student Worksheet

Answer the following questions in 20 minutes.

1. Are the following statements true or false?
   a) Plastic is cheaper and more durable than most other materials.
   b) If someone has a broken bone, we should move it slowly.
   c) Vomiting is a symptom of food-poisoning.
   d) Fish is a source of carbohydrates.

2. Which of these items are biodegradable: fruit, paper, aluminum, gold?

3. In which of the following cases will the boy NOT be able to see the candle light? Give reason.



4. If you throw away a plastic bag in a forest, what will you find if you return to the same spot after 1 year, assuming it has not been moved? Explain.

5. List 1 item of each type – transparent, translucent, and opaque.

6. List 2 ways to prevent the spread of COVID-19.

7. Gary has $600 in a bank at 10% interest compounded yearly. How much interest would Gary have earned after 3 years?

Daily Routine

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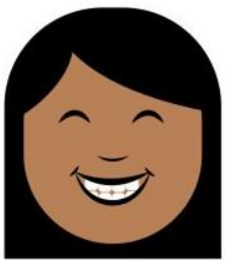
My Emotions

Write how you feel **everyday** in your notebook. Think about why you feel a certain way.

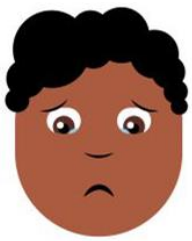
Today, I feel _____ because _____


excited


happy


joyful


calm


hurt


confused


nervous


lonely


frightened

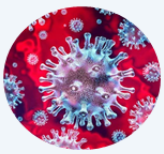

annoyed


enraged

Microorganisms *are living things that are too small to be seen with our eyes. Many of them make soil fertile and even help us digest food. Some are harmful to us and can cause diseases. Eg:*

Bacteria

- Food Poisoning
- Tuberculosis
- Cholera

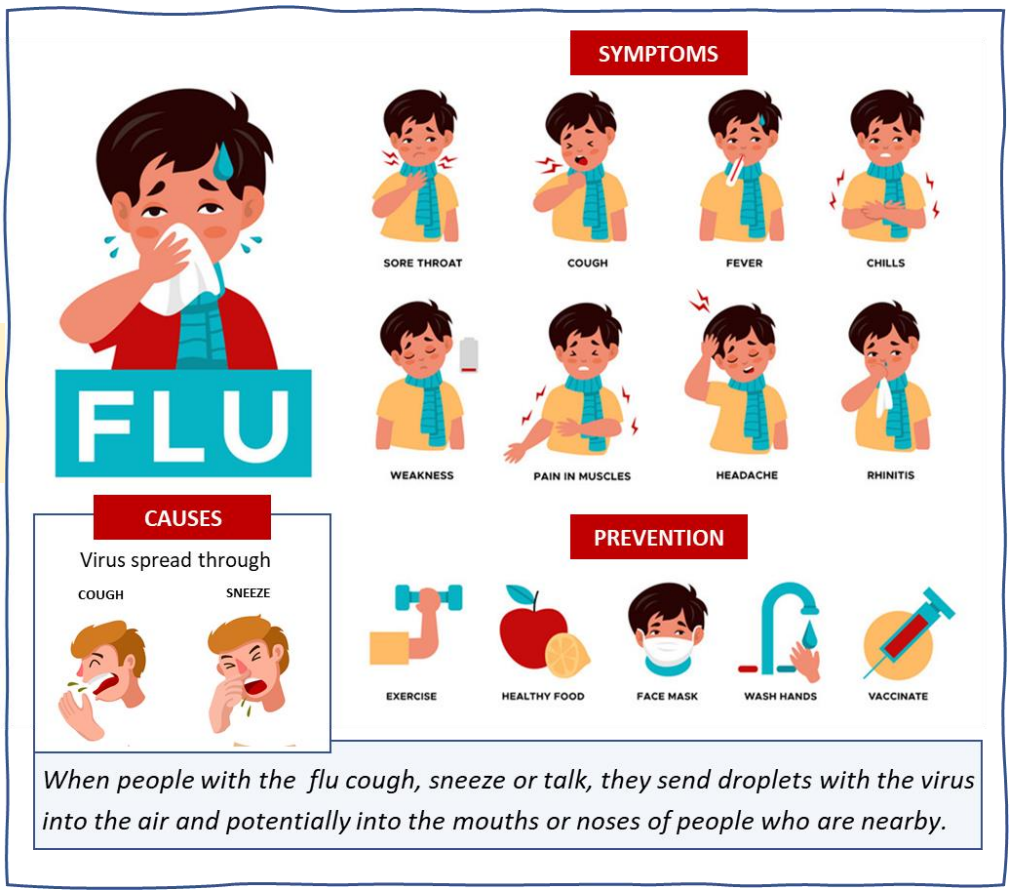


Virus

- Influenza (Flu)
- COVID-19
- Chicken Pox

How do you think these disease-causing microorganisms reach us? Below are some visual clues:

Health Poster Template



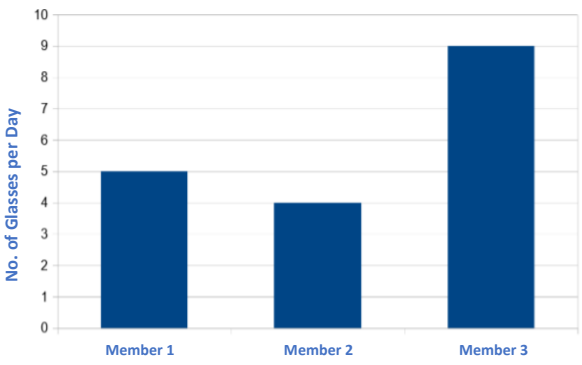
Make house rules that everyone must follow to keep COVID away.

Category	Rule	Observer	Violation Fine
Coming back from outside	Take off shoes at the entrance	*Ayesha*	*Wipe the entire floor where violator stepped with proper detergent + Wash all the dishes for one full day.*

Categories can include: Going out, coming back from outside, and actions taken while in the house.

Day 2

Create a table to track how many glasses of water each person living with you drinks. Present it as a bar graph. *(Example below)*

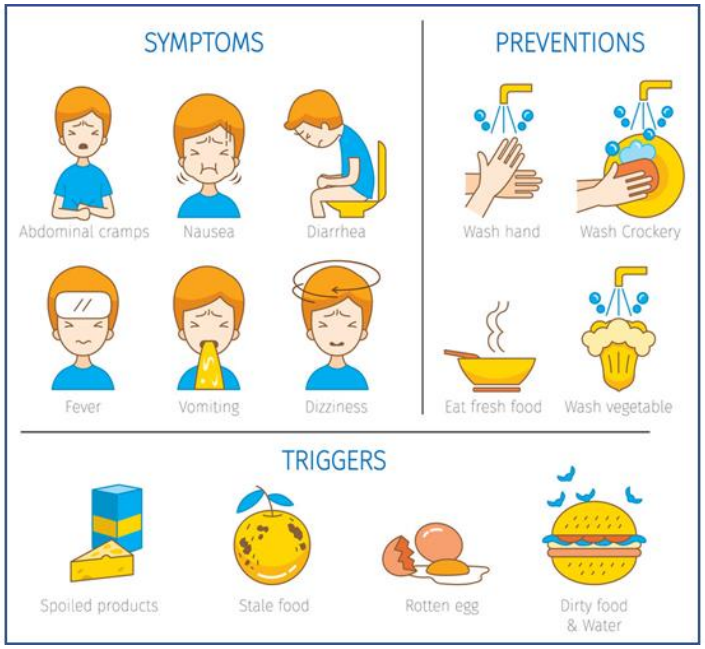


- Who drinks the least amount of water?
- Who drinks the most amount of water?
- What is the average no. of glasses people drink in your house?

Are people in your house drinking the recommended amount of water per day?

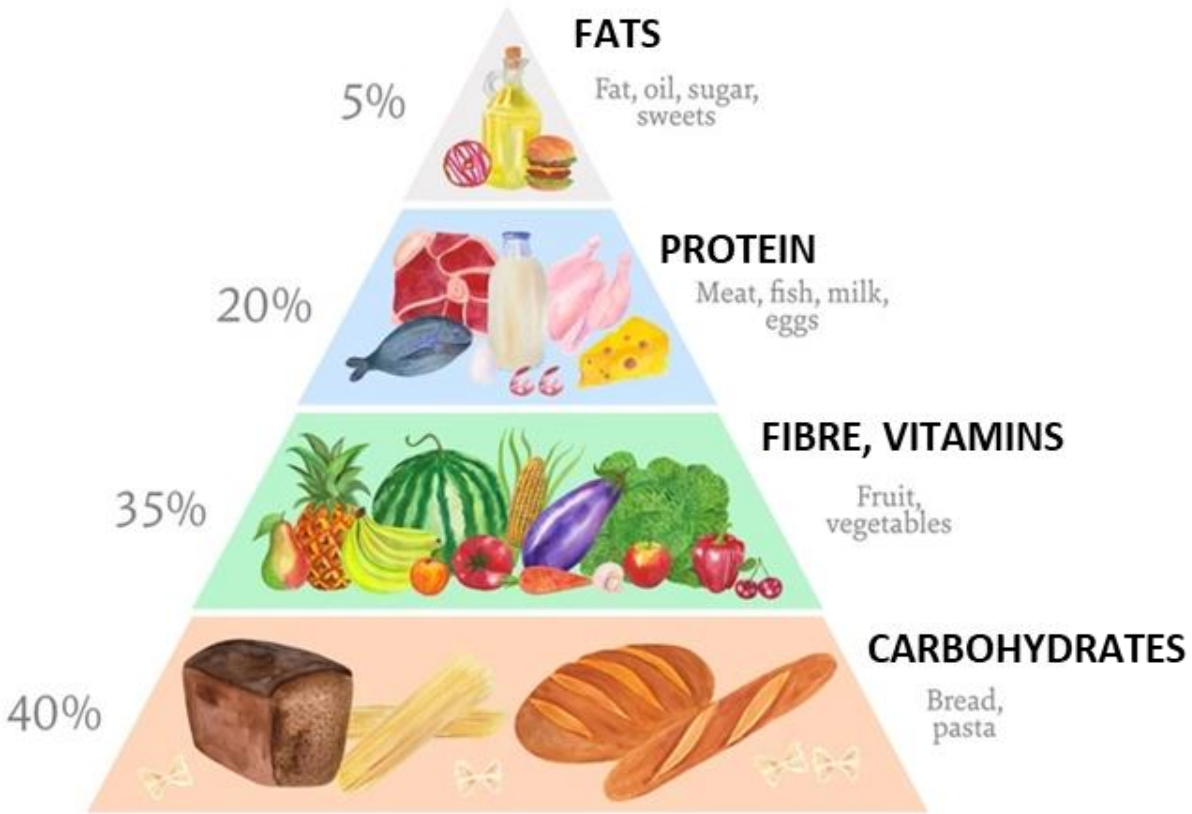
Day 3

Do you know any disease that can be spread through food?



- Observe the poster on '**Food Poisoning**', a common disease caused by bacteria.
- Research or recall when you or someone else suffered from it.
- What are 3 things you can do to make yourself feel better when you have food poisoning? *(Eg: drink more water)*

Make your own 'healthy food' pyramid and draw your favourite food items in each category.



Day 4

Observe the images below. For each, share two habits you can maintain a clean and healthy lifestyle.

- What are some reasons people would not follow your suggestions?

- Convince a partner why it is good for them. Were they convinced?

Example: Brush your teeth daily. Wash your mouth after having food.


Oral Hygiene


Bathing Ritual


Hair Care


Foot Hygiene


Toileting Hygiene


Hand Hygiene


Coughing and Sneezing Hygiene


Home Hygiene

Using the table below, list and track 5 habits you want to build for better hygiene.

Add a ✔ or ✘ to track your progress

Habit	When will I do it?	Week 1	Week 2	Week 3	Week 4
Brush my teeth 2 times a day	Morning and Night	✔	✔	✘ *missed 2 days*	✔

Look at the equation below and discuss:

Day 5

First Aid

If someone has a bad bleed...

Press on the bleed tightly, with cloth.

If someone is choking...

- Hit their back firmly up to 5 times.
- Check their mouth
- If the object doesn't come out, call an adult.

If someone has an allergic reaction...

- Keep away from the cause of the allergy.
- Make them sit and give them their medication.

If someone is unresponsive and breathing...

- Turn them on their side.
- Tip their head back.
- Call an adult.

If someone is having an asthma attack...

Make them sit and make them use their inhaler.

If someone has a broken bone...

- Do not move the broken bone.
- Call for an adult.

If someone has a burn...

Cool the burn under running water for 10 minutes.

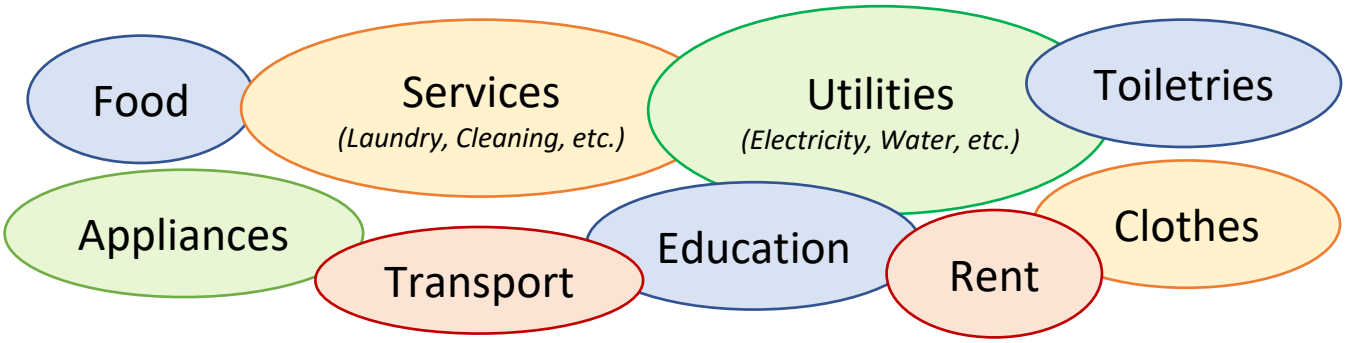
If someone has a nose bleed...

- Sit up straight
- Lean head forward
- Pinch the soft part of the nose for 10 minutes.

Day 1 Week 2

- **Expenses** refer to the money spent to buy the things we need.
- **Fixed expenses** are a set amount spent on something regularly.
  (Eg: rent, education, etc.)
- **Variable expenses** change from time to time.
  (Eg: gifts, new clothes, etc.)

Some expense categories



Expense Table Template

Expense per month	Fixed or Variable?	Cost
Toiletries	Variable	QR 50

Day 2

Income refers to how much money we earn.

- Money left after paying for everything you need:
  Savings = Total Income – Total Expense
- Money owed to others:
  Debt = Total Expense – Total Income

BUDGET ADVICE

1 Mrs. Tanya earns $1000 each week and her husband earns $750. Each week, they need to set aside $200 for food, $75 for gas, $650 for the house rent, and $350 for savings. How much money will they have left each week? At the end of the month?

Total income: _____ Total expense: _____

Remaining amount: _____

After some time, Mrs. Tanya wants to buy a small shop while her husband wants to buy a new car. What should they invest in? Why?

2 Moeen is going to school and working two part-time jobs. He works 20 hours for $9.25 per hour at the grocery and 15 hours for $11.50 per hour at Stellar Pizza Parlor. For all his hard work his mom gives him a monthly allowance of $150. Moeen is responsible for his $35 cell phone bill, $50 gas bill, and $200 car payment. Is he still able to save money? If so, how much?

Total income: _____ Total expense: _____

Can he still save $200 for college? _____

If so, does he have $50 to hang out with friends? _____

Should Moeen try and save more money for college? If so, how? If not, why?

Day 3

Decide how you will spend your beans based on the options on the **NEXT PAGE**.

HOUSING + UTILITIES

Living with family, sharing costs of utilities	
Share an apartment with roommates	
Rent your own place	

FOOD

Cook at home	
Buy from fast food joints.	
All meals away from home.	

TRANSPORT

Walk or cycle	No Cost
Ride a bus or carpool	
Buy a used car + petrol	
Buy a new car + petrol	

RECREATION

Parks, Visiting friends, Videos/ Music on phone	
Movie Theatres, Gym, Classes, Hobby groups	
Concerts, Sporting Events, Short Trips	
Long Vacations / Trips	

HEALTH

No Insurance	No Cost
Health Insurance	

PERSONAL CARE

Basics: soap, shampoo, etc.	
Professional haircuts, branded products	
Regular visits to the salon	

FURNISHINGS / GADGETS

Second-Hand from Friends	No Cost
Buy used furniture	
Rent furniture	
Buy new furniture	

EDUCATION

Free Public Schools	No Cost
Private School	
Additional Tuitions	

COMMUNICATION

No Phone	No Cost
Phone + Limited data	
Phone + Unlimited data	
Wi-Fi at home	
Laptop	

GIFTS

Make your own	
Purchase gifts sometimes	
Purchase gifts frequently	

CLOTHES

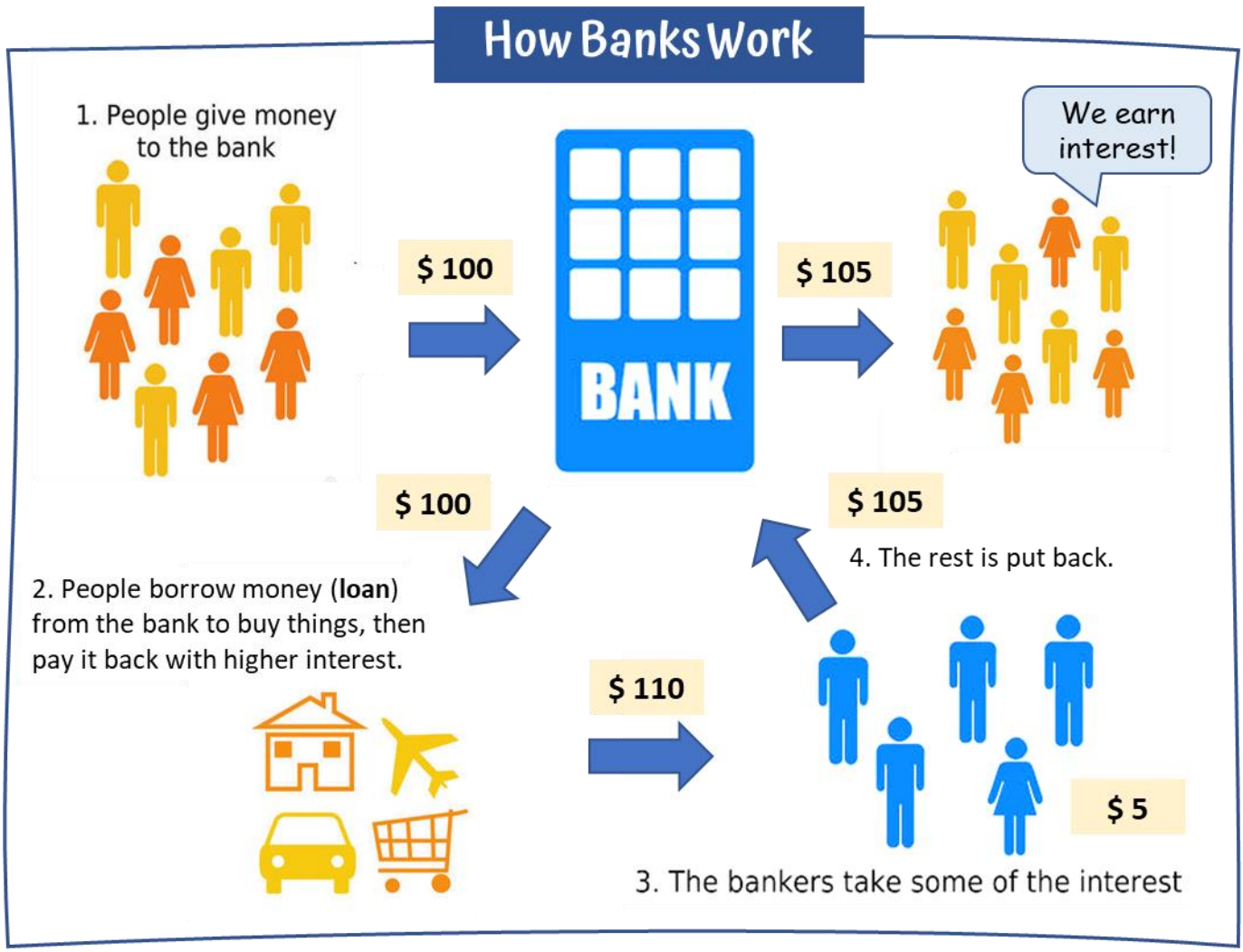
Wear present wardrobe	No Cost
Shop at discount stores	
Shop for new clothes	
Shop for designer clothes	

SAVINGS

Save cash at home	No Cost
5% of income in banks	
10% of income in banks	

Would you keep the money you saved in a bank or at home? Why?

Observe the image below and answer the following questions.



Interest *is the amount that is collected or paid for the use of money.*

- Explain how banks work to your peers in your own words.
- *To borrow money from banks, one deposits some things as* ***collateral*** *(house, land, belongings, etc.). If the loan is not paid back, the collateral is taken by the bank*.
  What is the risk in taking a loan from a bank?

INTEREST

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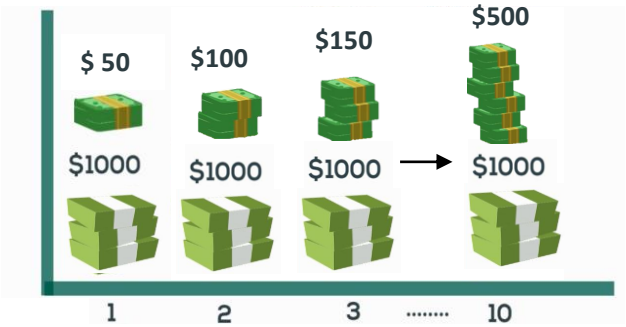
There are 2 types of interests – Simple and Compound.

Simple Interest (SI)

5 % interest rate

Compound Interest (CI)



No. of years

No. of years

- Interest for all years is the same.
- Interest is on the Principal amount only.

$$SI = \frac{P \times r \times t}{100}$$

Principal (P): Amount of money deposited or borrowed
Interest Rate (r): % of the principal amount earned.
Time (t): For how long (in years) you borrow or invest

- Interest for all years is different.
- Interest is on the Principal amount + Previous Interest.

$$CI = P\left(1 + \frac{r}{100n}\right)^{nt} - P$$

n = No. of times the interest is compounded per unit 't'

Eg: If 't'= 1 year,
n = 1 (yearly)
n = ¼ (quarterly)
n = ½ (half-yearly) ,etc.

Total Amount = **Principal** + **Interest**
(to be paid or accumulated)

As a depositor, which type of interest would you prefer? Why?
As a borrower, which type of interest would you prefer? Why?

Use the formula to answer the following questions.

1. You invest $ 40000 for 3 years at 8% per year in a bank compounded half-yearly. How much will you have in the bank at the end of 3 years?

2. Find the difference between compound interest and simple interest on $ 12,000 compounded at 19% annually for 112 years. Which method results in more money?

Day 5 WORD PROBLEMS

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Solve the following:

1. Use simple interest to find the ending balance.

a) $34,100 at 4% for 3 years

b) $7,400 at 10.5% for 14 years

2. Find the total value of the investment after the time given.

a) $7,300 at 7% compounded half-yearly for 3 years

b) $130 at 9.4% compounded quarterly for 2 years

3. Look at the image. Describe and correct the error in finding the balance of the **simple interest** account after two years.

Principal: $700 Rate: 3% per year

t	Principal	Annual Interest	Balance at End of Year
1	$700.00	$21.00	$721.00
2	$721.00	$21.63	$742.63

Hint: *In simple interest, interest is always calculated on the original principal amount)*

4. Hanna borrowed $20000 from her friend Nancy at 12% per annum simple Interest. She lent it to Andy at the same rate but compounded annually. Find her gain after 2 years.

5. In simple interest, a sum of money amounts to $ 6200 in 2 years and $ 7400 in 3 years. Find the principal.

6. The owners of a company want to invest $12,000 for 4 years. Which account should they choose? Explain.
   - Account A earns 5% simple interest per year.
   - Account B earns 5% interest compounded annually.

Day 1

Week 3

Natural Sources of Light

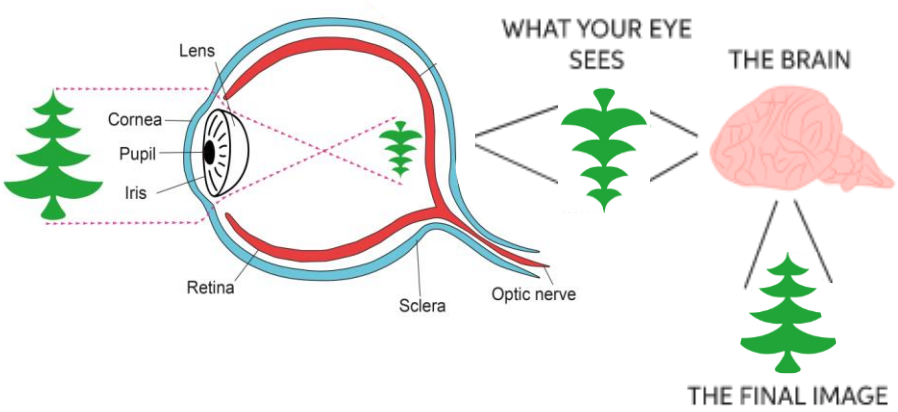
The universe is filled with objects that emit light. Some light from these sources reaches the earth. (Eg: Sun, stars, etc.)

Artificial Sources of light

We can produce light artificially too – by heating objects or through electricity. (Eg: Torch, candle, etc.)

The Human Eye

We need light to see objects. When light from a source falls on an object, it reflects the light into our eyes. Our eyes have light receptors which receive it and form an inverted image on our retina. The brain then shows us the image upright!



- What is the colour of your iris and pupil?
- Can you explain why you cannot see if there is no light?

Day 2

Identify 4 materials of each type:

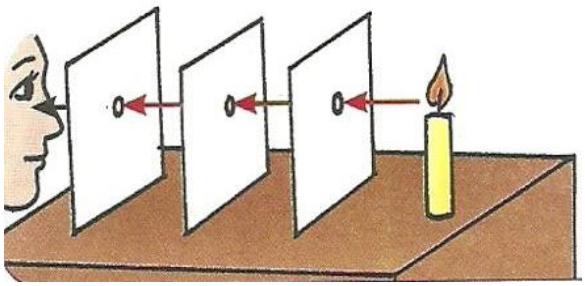
Transparent

Translucent

Opaque

How Light Travels

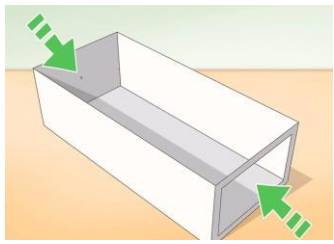
1. Cut out a small hole in 3 pieces of cardboard or thick paper.
2. Place a torch/candle on a flat surface.
3. Arrange the cardboards so that the holes form a straight line, behind the candle, as shown. Can you see the light?



What happens if the holes are not aligned in a straight line?

We can conclude that light only travels in straight lines.

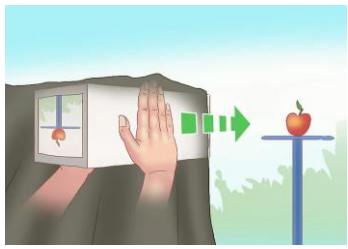
My Pinhole Camera



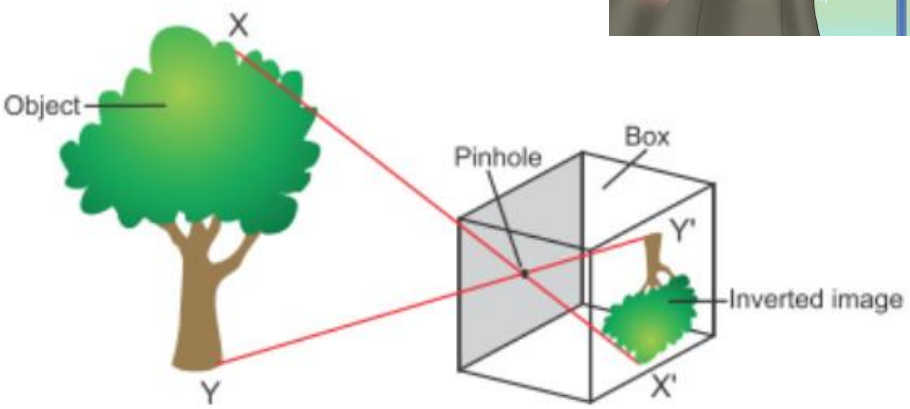
1. On one side of a shoebox, punch a hole using a pin. On the opposite side, cut out a frame, as shown.

2. Use a translucent material such as wax paper/plastic bag to make a screen and stick it on the shoebox.

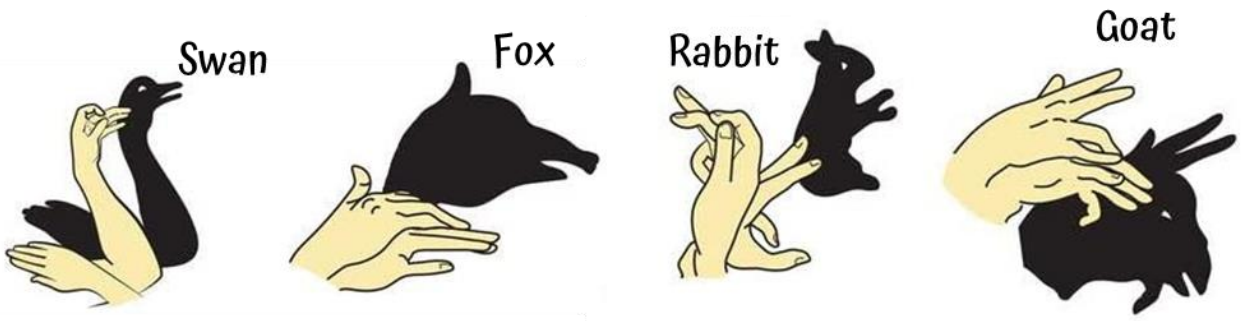
3. **Your pinhole camera is ready!**
   Aim the pinhole end at a well-lit object. Cover the shoebox with a thick, dark cloth. Can you see an inverted image of the object on your screen?



Working of a pinhole camera



Playing with Shadows



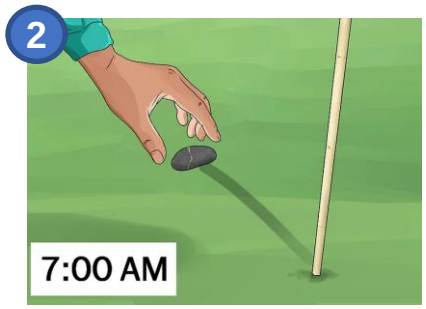
Shadows Tell Time

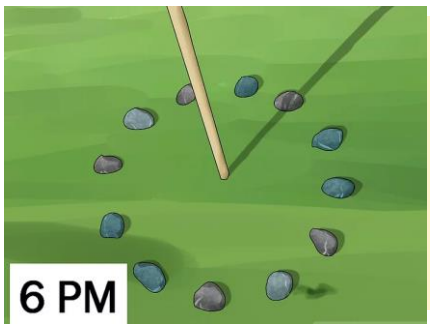
1. Plant a stick on grass outside, where there is enough sunlight.

2. Start when the sun has fully risen (Eg: 7 am). Use a pebble to mark the place where the stick's shadow falls on the ground and note the time on the ground using chalk.

3. Repeat this process every hour and continue till sunset. (Eg: 6 pm)

As long as the sun is shining, you can use this simple device to tell what time of the day it is. Practice doing so the next day!

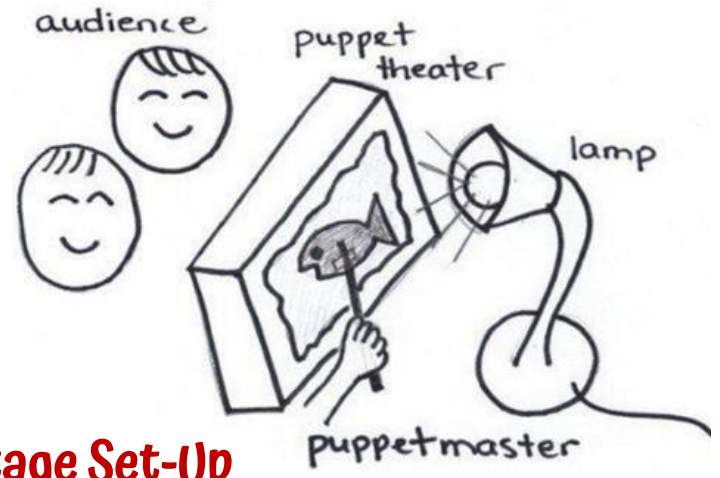




- Does the shadow move in clock-wise or anti-clock-wise direction?
- How does the position of the sun affect the stick's shadow?

Day 4

Making the Characters



Stage Set-Up

Day 5 Lights In Water

Written By Shreya Yadav

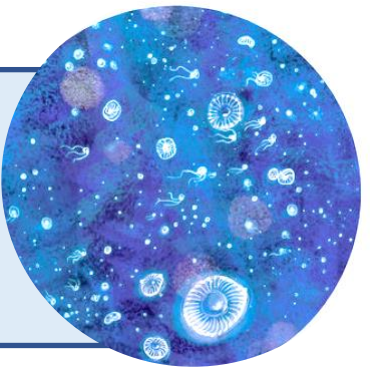
Maisha goes to the beach. She visits Flyman. Flyman is a flying fish. “Do you want to come meet my friends?” asks Flyman.

“Why not!” said Maisha, “But how will we see? It is dark in the night”.

Then, Flyman sees a light in the water. It glows and fades and glows again.

Flyman shouts: "I have an idea! Get on my back.." They swim to the lights. Maisha takes a breath. They go under the water. Maisha gasps. Tiny animals glow in the sea. It is like a sky of stars. Who are these tiny animals?
“These planktons can help us see,” says Flyman.

Plankton are plants that glow when there is movement in the water. This helps to scare away predators that might eat the plankton. Sometimes the movement of boats can cause these sparks too.



Maisha hears a deep voice. It is a Firefly Squid. The squid has blue spots of light. "I can help, too, " says the squid. They all swim down. Down, down, where it is very dark. But the plankton and the squid give light.

The **firefly squid** has special organs called photophores. The photophores make light to scare away the squid's predators or attract food.

They meet an Anglerfish. This fish has sharp teeth! But Maisha feels brave.

"I can help you see too. I have a bulb of my own!" said the Anglerfish.

Anglerfish make their light from the glowing bacteria inside them. When a plant or animal makes light, that is called **bioluminescence**.

"It was wonderful meeting all of you," said Maishsa.
"See! you do not have to worry about light in the sea", exclaimed Flyman.

Flyman and Maisha wave goodbye to the fish and swim back to the beach. Maisha sees the moon and stars in the sky. Now she knows there is also light in the water too!

Day 1 Week 4

***Plastic** is a man-made material, made using certain types of chemicals, that can change its shape easily when soft.*

Make your own Home Plastic Diary:

1. Identify the 5 most commonly used plastic items, by exploring your home, discussing with family members, etc.

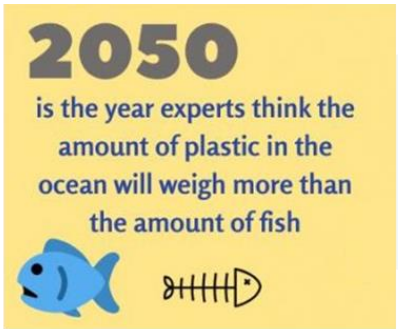
2. Write how many of each plastic item was used each day of the week. Also, calculate the average for the week.

Item	No. of uses /day	Single Use	Total Usage in a Week	Suggested alternative
Plastic Bag 	Monday: **4** Tuesday: Wednesday: Thursday: Friday: Saturday: Sunday: **Average:**	✗	My guess: 15 Family: 10 Actual: 7	

3. Is it discarded after one use? If yes, it is a 'Single Use' item. Tick (✓) or cross (✗) accordingly.

4. Guess how many times the item is used in a week. Interview family members to discuss and make the same guess.

Observe the infographic (continued on the next page)



Imagine what this would look like.

- How will it impact our lives?
- Why do you think plastic gets dumped in the oceans?

- Why do you think people use plastic bottles?
- What can be used instead?

How do you think plastic reaches the food of animals?

- Give 3 examples of single-use plastics.
- How can we avoid using it?

Day 2 Types of Materials

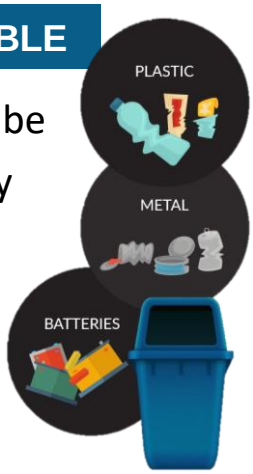
Our environment has micro-organisms such as bacteria that break down substances which go back into the soil. However, not all materials undergo this process.

BIODEGRADABLE

Materials that can be broken down naturally in the environment.

NON BIODEGRADABLE

Materials that cannot be broken down naturally in the environment.

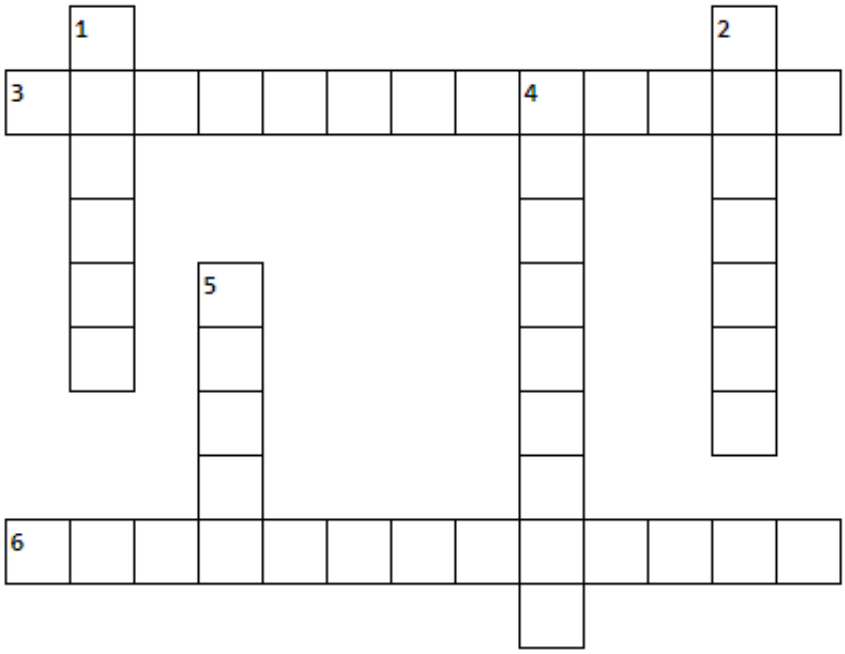


Observe what your family throws into the trash can for a day. Segregate the wastes as biodegradable and non-biodegradable.

Circle the items that are non-biodegradable.

Solve the crossword.

- *Look at the clue below with its number.*
- *Identify the word and write it across or down that number in the crossword.*



ACROSS

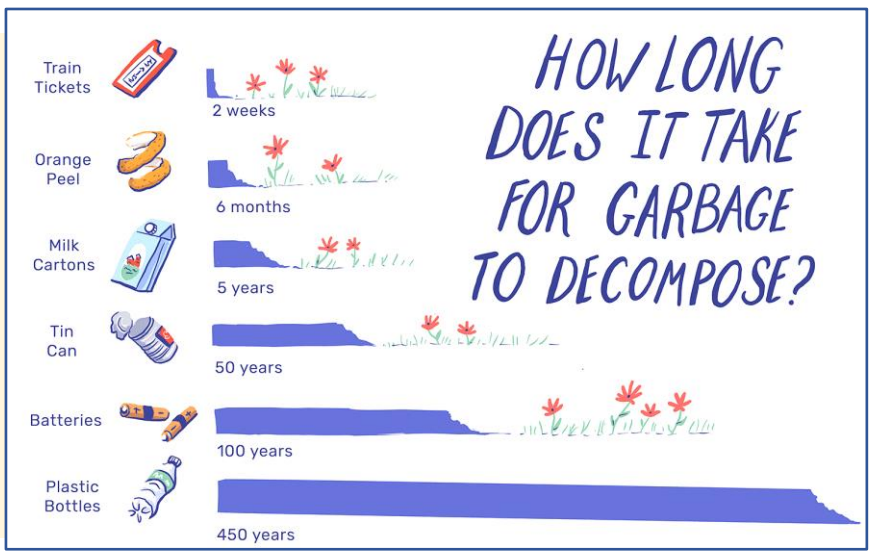
3. Leaves, jute, and fruits are examples of _____ substances.
6. Plastic in the oceans breaks up into small particles called _____

DOWN

1. _____-use plastics are discarded after one use.
2. Synthetically made material
4. A word for the 'breakdown of a substance' (or decay)
5. From paper, gold, and tin, _____ is biodegradable.

Make a similar graph to show how long an item will take to decompose, for any 6 items that you threw today.

Is there any item you could have re-used, donated, or repaired?



Day 3 MARINE VOICE

Imagine you are an animal living in the ocean.

Write a speech, addressed to human beings, expressing how much damage they are causing to the oceans and your lives. Use the template below.

Good morning, dear humans!

I see you thriving in cities and enjoying your technological advances. The human race has achieved a lot over the last decade. However, our kind is dying as a result. The plastic you use kills millions of us every year.

It _____ and _____.

My question for you is this: _____?

I strongly feel _____.

We all share our planet Earth and we all deserve to live. So, I urge you to think about _____.

There is still hope. Let us discuss some actions we can take towards this.

First, _____. This is important because _____.

Next, _____. This helps us _____.

Lastly, _____. Doing this results in _____.

Let us hope for a brighter future for my friends in the ocean and you. Thank you!

Recycling is the process of taking materials ready to be thrown away and converting (changing) them into reusable materials. *(Eg: Waste plastic bottles can be broken down in factories to make new plastic bottles.)*

REDUCE

Which plastic items can you use less?

RECYCLE

Which plastic items can you recycle?
Are there Recycling Bins in your area?

From your Home Plastic Diary…

REUSE

Which plastic items can you use again?

REPLACE

Which plastic items can be replaced with something biodegradable?

Write the suggested alternatives in your Home Plastic Diary.

1. Calculate what percentage of plastic is reused in your home across each of the different plastic items in your diary. Example:

If only 4 of the 12 plastic bags used are re-used in my home,

$$\% \text{ re-used} = \frac{\text{No. of bags re-used}}{\text{Total no. of plastic bags used}} \times 100 = \frac{4}{12} \times 100 = \mathbf{33.3\%}$$

2. Find the average % of all plastic being re-used in your home. Hint:

$$\text{Average \% re-used} = \frac{\text{Total no. of reused plastic items}}{\text{Total no. of plastic items used}} \times 100$$

Day 5 How is Plastic Recycled?

Plastics have only been around for a little over a century, yet they've become part of almost every aspect of our lives. From children's toys to food packaging, plastic materials are an important part of 21st-century life. In fact, in roughly 70 years, there has been 8.3 billion metric tons of plastic produced, with around 6.3 billion metric tons of that becoming waste.

And only 9% of that waste has been recycled.

There are many reasons for this, and while our plastic waste continues to grow, advances in technology and changes to the way we use plastic are helping us make recycling more efficient and effective. Let us understand how plastic is recycled.

1 Waste Collection and Transportation

First, plastic waste is collected from homes and offices. This can be done by either local government or private companies. In many countries, communities have designated recycling bins where people can throw their plastic. These are then transported to the recycling plants.

2 Sorting and Bundling

The next step in the plastic recycling process is sorting. There are several different types of plastic, which need to be separated from each other by recyclers. Further to that, plastics might be sorted by other properties such as color, thickness, and use. This is done by machines at the recycling plant and is an important step to increase the efficiency of plants

3 Washing

Washing is a crucial step in the plastic recycling process since it removes some of the impurities that can impede the operation, or completely ruin a batch of recycled plastic. The impurities targeted in this step commonly include things such as product labels and adhesives as well as dirt and food residue.

4 Shredding

The plastic is then fed into shredders, which break it down into much smaller pieces. These smaller pieces, unlike formed plastic products, can be processed in the next stages for reuse. Breaking down the plastic into smaller pieces also allows for any remaining impurities to be found. This is especially true of contaminants such as metal, which may not have been removed by washing but can be easily collected with a magnet at this stage.

5 Quality Inspection

Here, the plastic pieces are tested for their class and quality. First, they are segregated based on density, which is tested by putting particles of plastic in a container of water.

Will plastic float or sink? Why?

This is followed by a test for what is known as the "air classification", which determines the thickness of the plastic pieces. It is done by placing the shredded plastic into a wind tunnel, with thinner pieces floating while larger/thicker pieces stay at the bottom.

6 Melting and Compounding

This final plastic recycling process step is where the particles of shredded plastic are transformed into a usable product for manufactures. The shredded plastic is melted and crushed together to form pellets. These pellets are used to make new plastic products.

Summarize the plastic recycling process in the form of this flowchart →