GENERAL PREFACE

The Homi Bhabha Centre for Science Education (HBCSE) has been active in research and field work since 1974. Interdisciplinary scholarship at the Centre has been developed around a doctoral programme in Science Education. Textbooks, workbooks and teacher's books in primary science brought out by HBCSE are one outcome of this research and field work.

These books have received warm and appreciative response from all quarters - teachers, students, parents, professionals and also government agencies. When these books were first published, several ideas in them appeared radical and unconventional. Today these ideas have become part of the discourse on education in our country. We are therefore very happy that Oxford University Press is publishing these books for wider dissemination to schools across India.

The National Curriculum Framework 2005 has laid down five guiding principles for curriculum development: connecting knowledge to life outside the school; ensuring that learning shifts away from rote methods; enriching the curriculum so that it goes beyond textbooks; making examinations more flexible and integrating them with classroom life; and nurturing an overriding identity informed by caring concerns within the democratic polity of the country. Often, however, there remains a gap between the generally agreed objectives of the curriculum, and their translation into textbooks and teaching practices. The books authored by HBCSE reflect an attempt to close this gap as much as possible.

We hope the attempt has been successful, and is a step towards imparting quality elementary education in Indian schools.

Arvind Kumar
Centre Director
Homi Bhabha Centre for Science Education
Tata Institute of Fundamental Research

PREFACE TO SMALL SCIENCE CLASS 5

The class 5 book, like others in this series, attempts to encourage the natural curiosity and powers of observation which children have. It uses these qualities to help children learn about the world around them.

The emphasis in the books is on the process of science - observing, asking questions, trying to find the answers through further observations and experiments - rather than on information that children are expected to memorize without any real understanding. Needless to add, it would be difficult to use this book meaningfully without doing the activities.

The activities have been designed such that easily available materials can be used; sometimes low cost materials may have to be purchased, but this small investment is unavoidable, and certainly worthwhile if it makes learning fun and easy.

The material in this book has been tested and incorporated in the book when it was found to be successful in our classroom. We would like to know how you found it in yours. Please send us your feedback and suggestions by e-mail, or use the form provided in the WorkBook and also in the Teacher's book.

I hope the teachers and children have as much fun with this book as I did in developing it.

Jyotsna Vijapurkar

Teacher Support: smallscisupport@hbcse.tifr.res.in

ACKNOWLEDGEMENTS

My sincere thanks to Arvind Kumar for his active interest in this work, for constant encouragement and for making time for discussions despite his busy schedule.

Jayashree Ramadas pointed the way in the beginning, and the pitfalls along the way.

Madhugandha Damle contributed much more than the illustrations; she gave many inputs all through the text. I am very fortunate indeed to have had the pleasure of collaborating with her.

I would have been grateful to the biology folks - Shilpa Pathak, Rekha Vartak, Anupama Ronad, Ritesh Khunyakari, Abhijeet Bardapurkar- had they just tolerated my many questions; they welcomed them! Sandhya Thulasidas shared her naturalist's knowledge with me.

G. Nagarjuna and Chitra Natarajan gave valuable feedback. I often went straight to them after the classroom trials, with much to share. Thanks for always keeping the door open.

Many thanks to V. G. Gambhir, to whom I turned for answers unlikely to be found in any book.

Manoj Nair and R. S. Patwardhan made innumerable troubleshooting trips to the Cognitive Lab where the layout work was done. We could not have proceeded without their help.

Swati Mehrotra was a great sounding board, and gave helpful comments.

Suchitra Varde in the initial stages, then Gouri Patil and Fouzia Dohadwalla carried out trials of the activities, maintained logs, and aided in the research. Archana Shinde and Aisha Kawalkar gave valuable help during the final stages of production.

I thank Mariona Gomes and her colleagues of the NGO 'PATH', Madhavan Nair and his colleagues at the National Institute of Nutrition, Hyderabad for their help. Madhav Gadgil gave very helpful and detailed comments and suggestions on the first two chapters.

The principals and teachers of Atomic Energy Central Schools and Childrens Aid Society school accomodated us in their schedules, making the classroom trials of the material possible. The children of these schools were enthusiastic participants, and taught me much.

Photographs from Space are by NASA and ISRO. A. Ghaisas provided photographs of the globe.

I thank all my other colleagues at HBCSE whom I consulted from time to time. I am grateful for the computer and administrative support at HBCSE.

Thanks to many friends, and friends of friends - who contributed in many ways.

My mother, Sharada, is one of the best teachers I have ever had. She inculcated in me a love of learning. I dedicate this effort to her.

Jyotsna Vijapurkar

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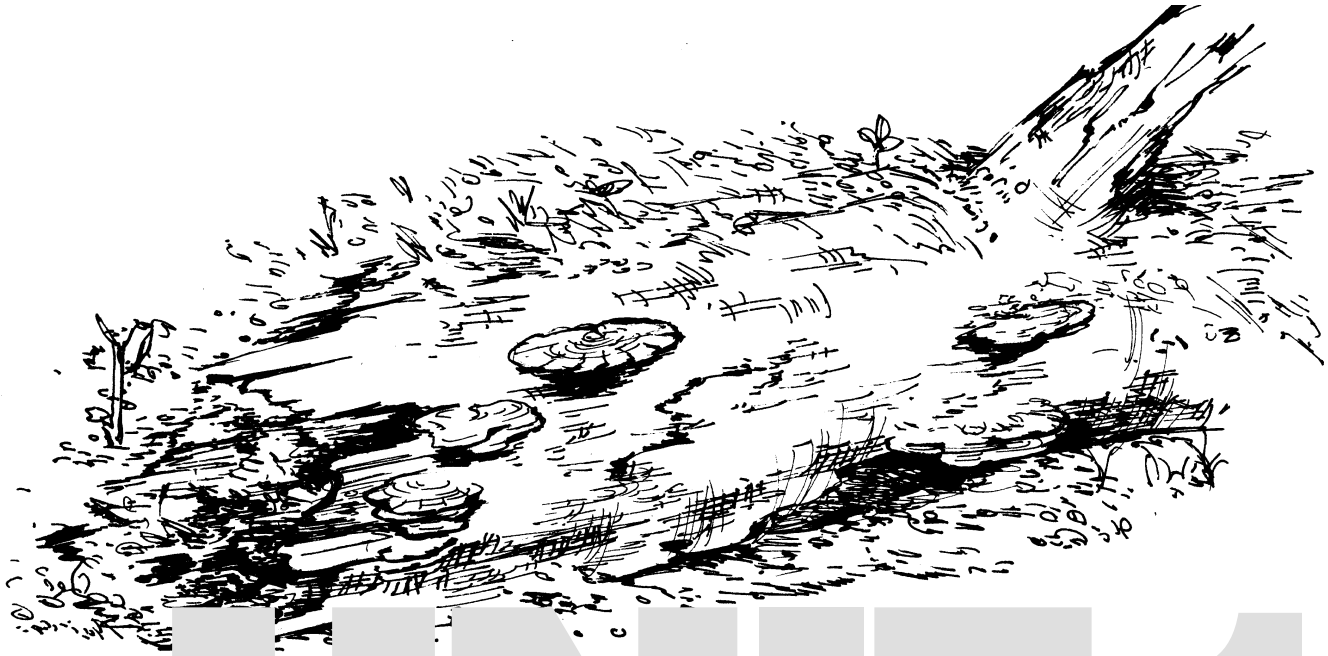
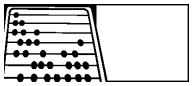


UNIT 1

THE WEB OF LIFE

Assessment Sheet: Unit 1

Category	Score	Comments
Observation		....
Understanding		....
Oral Language (Talking)		....
Written Language (Writing)		....
Design and Engineering Skills		....
Mathematical Skills		....

Enthusiasm in doing activities

.....

.....

Patience and concentration

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Independent thinking and creativity (☆)

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.....

Co-operation with other students

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Completion of home assignments

.....

.....

Animals and their food

1. What animals eat

a. Make a list of all living things, parts of living things and homes of animals you find in your plot. Look for birds, birds' nests, different kinds of worms, ants, ants' nests, spiders, spider webs and anything that is caught in them, etc. Be sure to look inside flowers, under leaves, and in cracks in the bark.

If you find living things whose names you don't know, write a short description of them. How big (or small) were they? Draw them.

Observe carefully where you saw the animals - both large animals and small ones like tiny insects and worms. Make a guess - what do they eat? In the list circle the animals, like this: (small red ant)

What I found	Where I found it	My guess of what it eats (only if it is an animal)	What it eats
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
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Use this place for your drawings and description.

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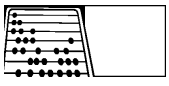


b. Describe the shape of your plot. How big is it? Measure the length of the boundary and write it in your description.

.....

.....

Draw a map of your plot. Mark the lengths of the boundaries on it.

Draw the map to scale - decide how many cms on the map show one metre on the ground. In the map, show where the trees and bushes were.

Some symbols are shown below.

Make up some symbols of your own if you need them. Next to each symbol on your map, write the name of the bush/tree. Write the names of the animals where you found them.

My plot:

anthill 

grass 

bird 

nest 

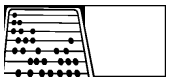
bush 

tree 

water 

c. Here is a list of some living things. Where is each one found most often - under the ground, on the ground, or in some other place? Mark the correct column with a ✓ for each one.

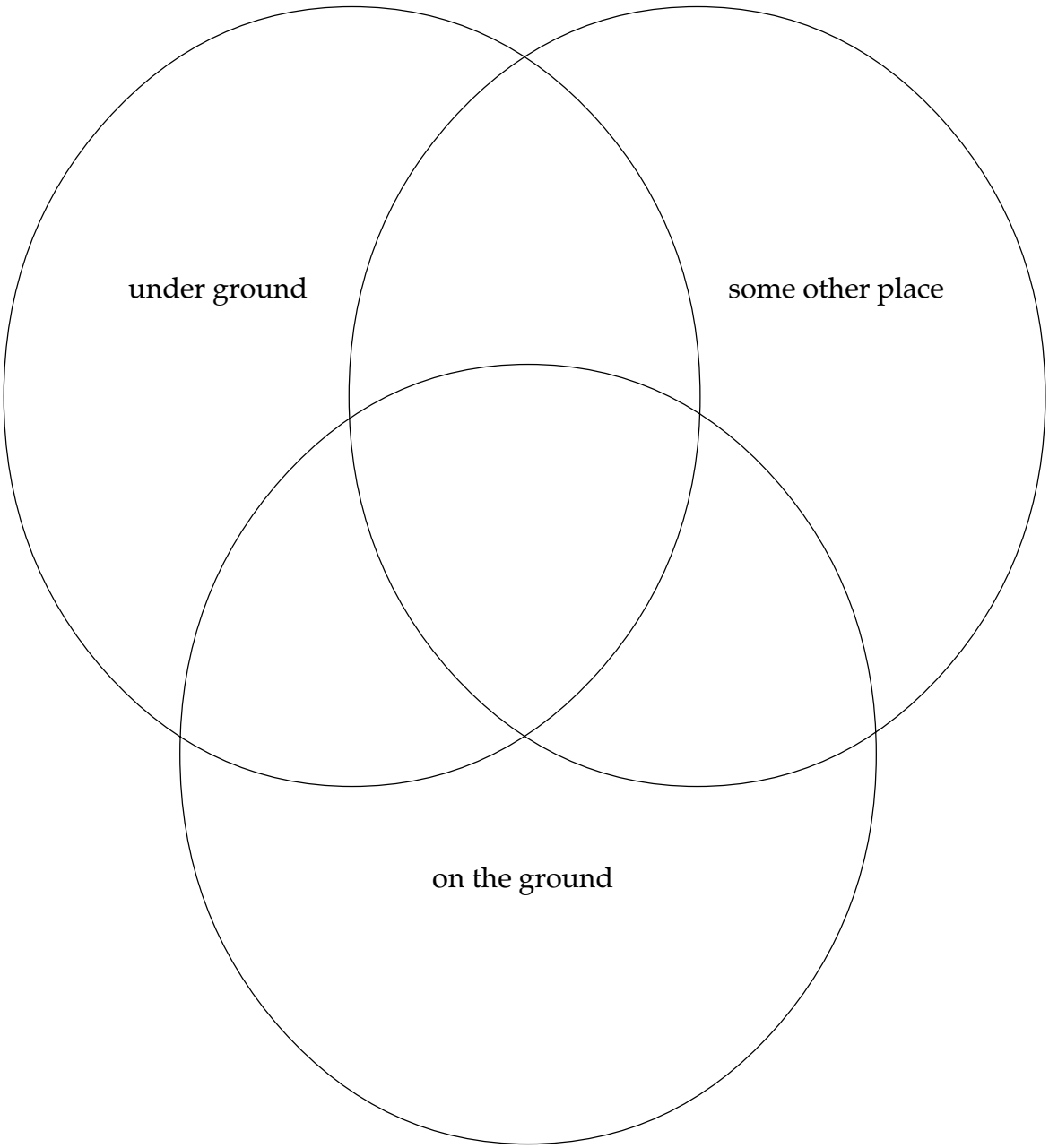
If you mark the column 'in some other place', write in **which** place you find that living thing.



living thing	under the ground	on the ground	in some other place
ant-lion			
human being			
elephant			
wall spider			
frog			
oyster			
fish			
rabbit			
bee			
flea			
sparrow			
dung beetle			
earthworm			
root bacteria			
rat			
crab			
red ant			
bat			
monkey			
water hyacinth			

How many living things have a mark in more than one column?.....

Now write the names of these in the correct places in this diagram.



Think! Think!

Where would you put a mango tree in this diagram?

.....

Living things depend on each other.

2. Every animal depends on other living things for its food.

a. Select an animal from your list and write here some things it eats

Animal: .....

Eats:..... , ... , ... , ... , ... , ...

Now all the animals which eat the animal you selected.

It is eaten by:..... , ... , ... , ... , ...

b. Food chain:

Draw arrows between the following living things, showing which eats the other.

The arrow should always point from the plant or animal that is eaten (food) to the animal that eats it. Here are two examples.

A cow eats grass

grass ———> cow

An owl eats a mouse, a mouse eats rice

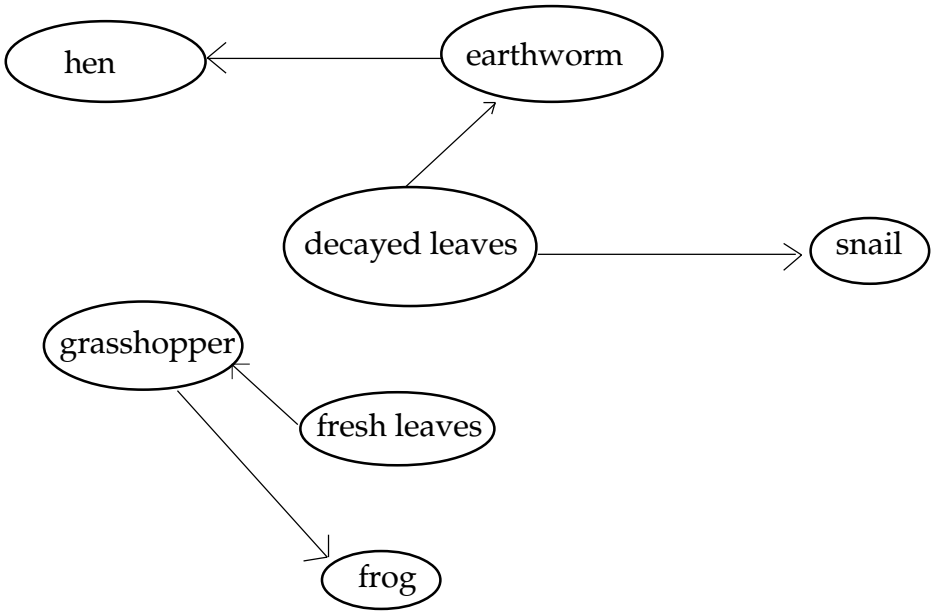
owl <— mouse <— rice

mynah	earthworm	decaying leaves
koel	caterpillar	fresh leaves
wheat	mouse	snake
snake	frog	fly
mosquito	frog	stork
seagull	*bombil* fish	prawns

c. Make a web:

On the next page, there's a part of a web showing some living things, showing who eats whom.

Add more living things to this to make a larger web by asking questions like these: Who else eats a grasshopper? What else does a frog eat?


hen
earthworm
decayed leaves
snail
grasshopper
fresh leaves
frog

d. Now weave (!) a story about 5 of the living things in your web. Imagine that they can talk to each other.

.....

.....

.....

.....

.....

.....

3. Animals depend on other animals and plants for many things, not just food.

a. Pick one animal from your list, and write down some other living things it needs.

What does it need them for? Think of where it lives, whether it builds its home, and with what.

For example,

A spider needs branches (to support its web)

needs insects (as food)

..... (living thing you chose)

needs.....(.....)

needs.....(.....)

needs.....(.....)

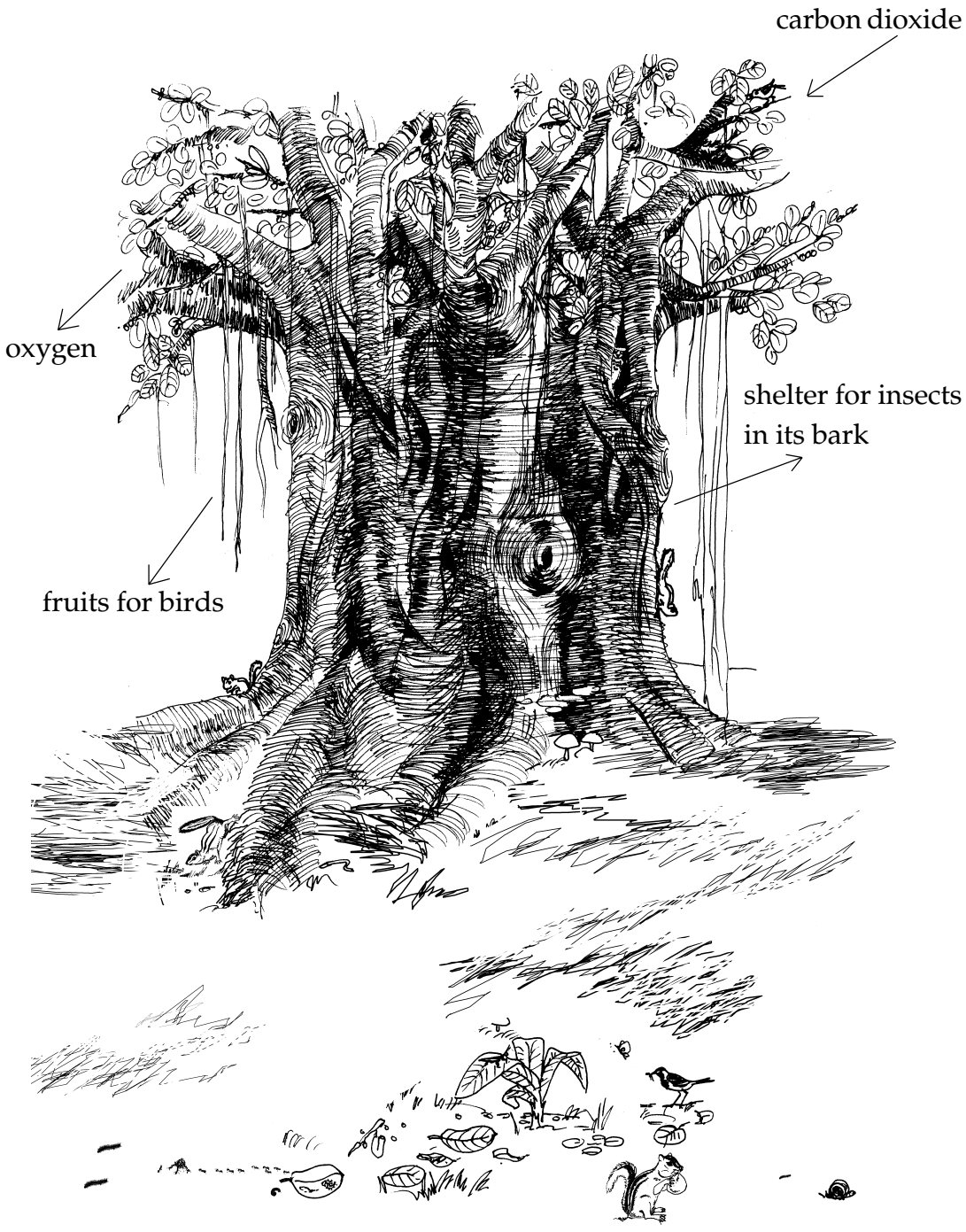
needs.....(.....)

b. Look at the picture of a banyan tree on the next page. It shows

i) some things the tree uses from its surroundings and the living things in the surroundings.

ii) some things that the tree gives to its surroundings and the living things in the surroundings.

Add as many things as you can to this picture. Remember - the arrows have to point in the correct direction!



Think! Think!

How did the banyan seed which grew into this tree get planted here?

.....

c. Now draw similar arrows for an ant.

Animals need plants. Do plants need animals?

4. Pollination.

b. i) In the flowers of oxalis and pea, can the pollen reach the stigma on their own, without the help of any animal ?

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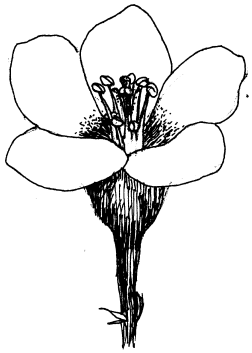
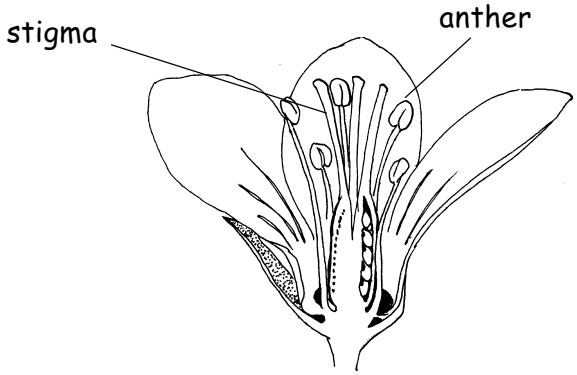
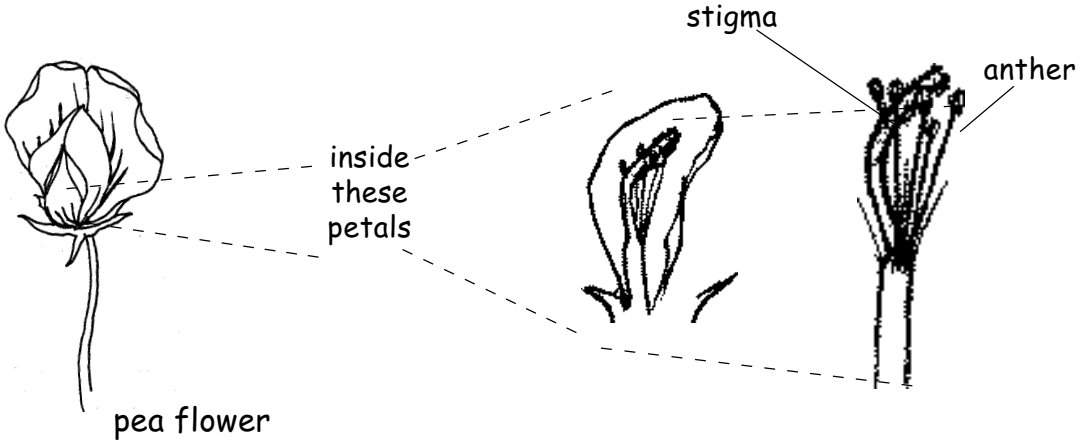


(magnified)

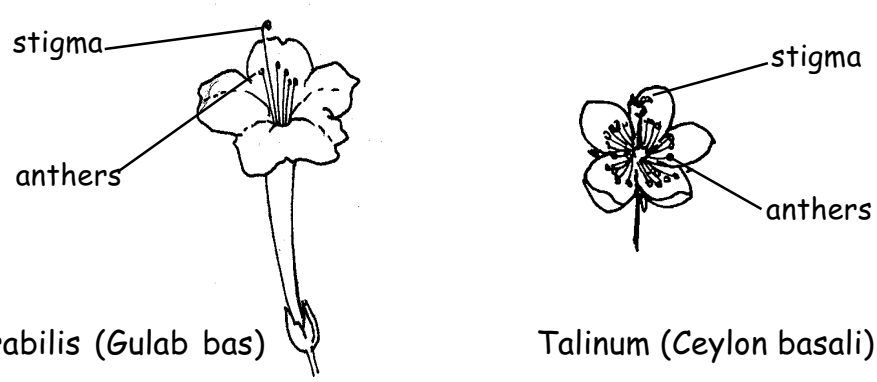


oxalis flower



pea flower

ii) In the Mirabilis and Talinum flower can the pollen fall on the stigma of the flower? How?



Mirabilis (Gulab bas) Talinum (Ceylon basali)

If not, how can the pollen reach the stigma?

.....

c. Find any flower that has only a few petals and draw it; show where the anthers, ovary and stigma are.

Does your flower have both the male and the female parts?.....

d. Which animals, other than bees, pollinate flowers?

Some animals I saw feeding from flowers -.....

5. Dispersal of seeds

How can they travel from the plant to other places where they can grow?

Draw the seeds which clung to you. In your drawing show which part of the seed got stuck to you or your clothes.

Think! Think!

Plants and animals die, parts of plants like leaves and branches fall off.

What happens to all these dead plant and animal parts?

.....

EXERCISES

Interesting questions

1. In the following, fill in the blanks. One is filled out for you.

More snakes -> fewer rats -> more grain.

More ..... -> fewer rats -> less plague.

More ..... -> fewer mosquito larvae -> less malaria.

More snakes -> fewer frogs -> more.....

More bulbuls -> fewer..... -> more grain.

Less bees -> less pollination -> fewer .....

More people -> more..... -> less trees.

Less trees -> fewer bulbuls -> more..... -> less.....

Add similar lines of your own:

.....

.....

.....

.....

2. Suppose two flowers are very far apart. How can pollen from one flower reach the stigma of the other? Can this happen without the help of insects? How?

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3. What would happen to leaves if snails and earthworms did not eat them?

.....

4. Name some animals which

a) drink blood of other animals

.....

b) eat grain

.....

c) eat dead animals

.....

d) eat wood

.....

e) eat insects

.....

f) eat decaying leaves

.....

5. Now what would happen if you used insecticides to kill off all insects? If you burned all dead leaves?

.....

.....

.....

6. What did people eat before they started farming?

.....

.....

.....

7. Do all fruits grow from flowers?

.....

8. Do all flowers grow into fruit?

.....

9. What would happen if the pollen from the *karela* falls on the stigma of a papaya flower?

.....

.....

10. Which of these vegetables are fruits, and which ones are not? How do you know?

Bhindi, tomato, potato, brinjal, ginger, beet-root, chilli, *palak*, green peas, radish

.....

.....

Observe and draw

Flowers of as many fruits as you can, like those of *ber*, papaya, mango, *neem*, tamarind, drumstick, tomato, *bhindi*. Next to your drawing write the colour and size of the flower.

Act it out

Pretend to be any animal of your choice. Describe it, then act like it.

a) How does this animal move?

b) Does it make any sound you can hear?

c) Does it build its home? Where, and with what?

d) How does it eat?

e) Does it hunt other animals? How?

f) Is it hunted by any animal? How does it try to escape?

Ask and find out

Are there places near your school or house that had less animals and plants than they do now? How did this happen? Tell your teacher.

Are there places that had **more** animals and plants than they do now? How did this happen? Tell your teacher.

My poem on my favourite living thing.

.....

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Show and tell

Bring to class and show any baby fruit with part of the flower still attached. You may find such tender vegetables in the market (or garden or field).

What I brought

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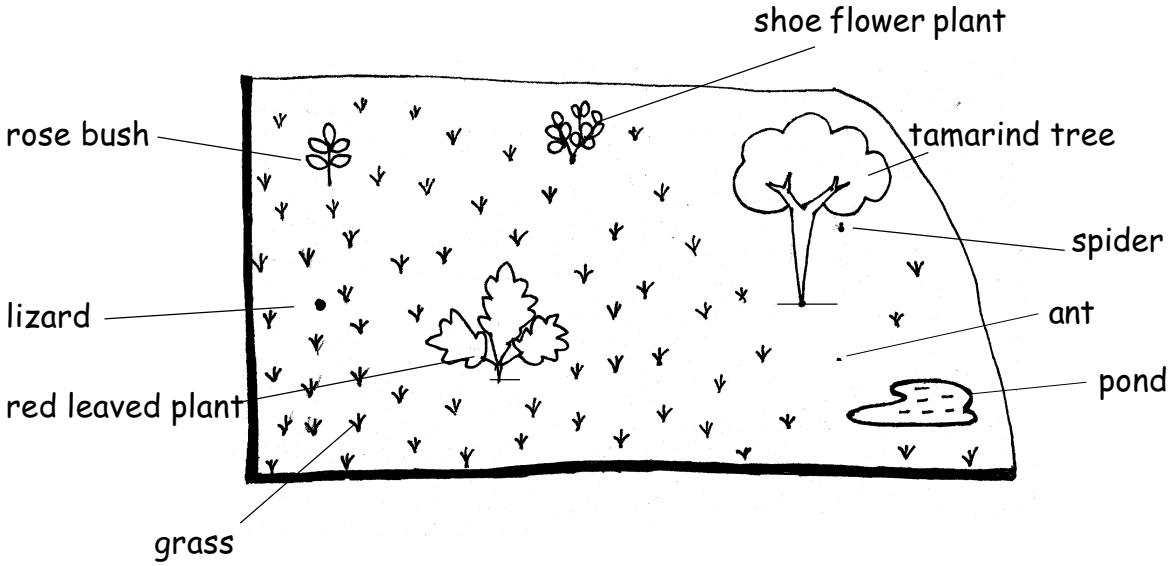
Figure it out

1. This is a map of Apu's plot.



1 cm on this map shows 1 m on the ground.

a) Give your answers in metres for the questions below:

How far is the plant with big leaves from the tamarind tree? You can measure from the base of the tree to the base of the plant. .....

How far is the lizard from the ant? .....

b) There is a banyan tree 30 m from the shoe flower plant.

Can you show this on the map? If not, what can you change about the map so that you can show the tree on it?

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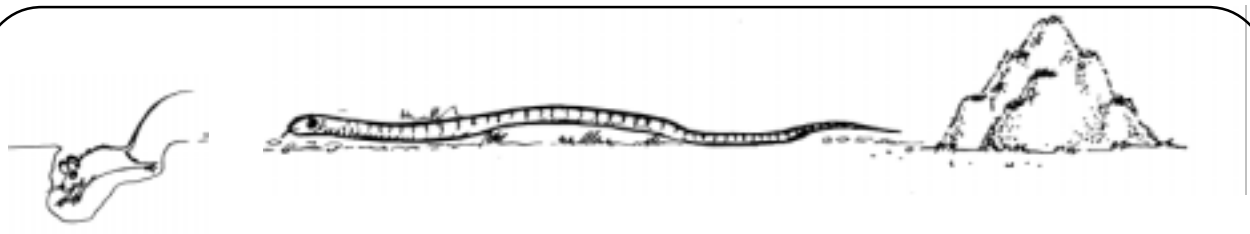
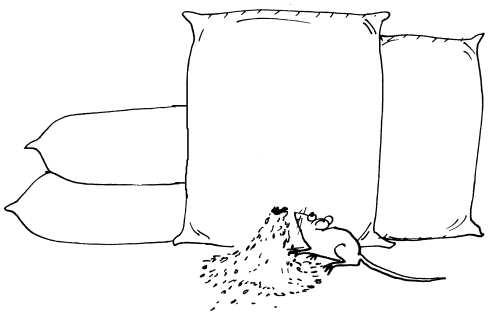
2. A rat's tale

Read the story first, then answer the questions.



A ratsnake lived in an ant hill on the edge of a rice field. It ate the rats which came to the field and the godown nearby. One day the snake was very hungry and chased a rat that came near the godown. But the rat was very clever - she ran fast and escaped into the godown. There she could eat all the rice she wanted.

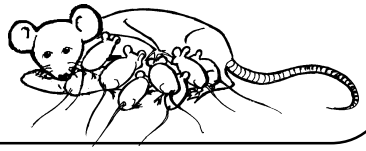
If, like other rats, she eats about 50 g of rice a day, how much rice does she eat in 30 days?
She eats_____ g in 30 days.



Now write your answer in kg.
(Remember 1000 g = 1 kg)
She eats_____kg in 30 days.

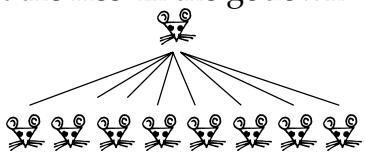
One day she gave birth to eight babies. The rat and her babies grew up without fear as the snake was dead. Some people, who didn't know that ratsnakes are not poisonous, had killed the snake. Very soon the rat's babies will grow up and start eating rice.

What is their food until they grow up? _____



The eight babies are all grown up now. All of them eat the rice in the godown.

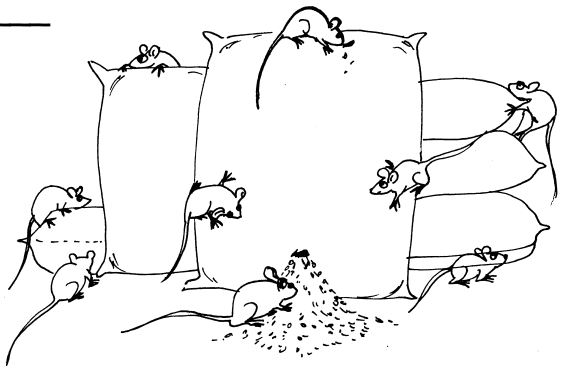
How many rats are there in this family now?____



Can you see them all among the sacks?_____

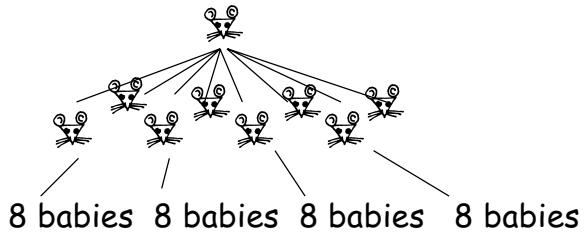
Remember, in 30 days each rat eats 1.5 kgs of rice

In this time how much rice does our rat family eat? _____



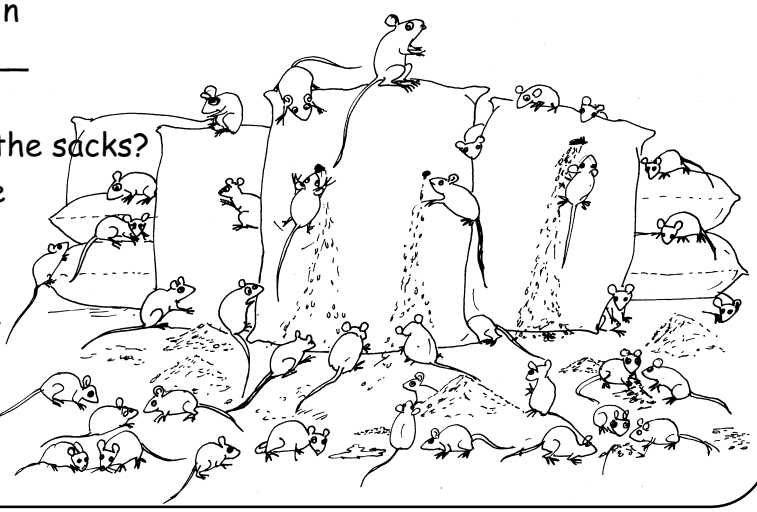
If the snake had eaten the first rat, we would have saved all this grain!!

Our first rat has now become a grandmother! Four of her babies have babies of their own - eight each!



How many grandchildren does our first rat have now? _____

Figure out how many rats are in the whole family now. _____



Do you see all of them among the sacks? Are any rats hiding behind the sacks? How many? _____

Remember, in 30 days each rat eats 1.5 kg

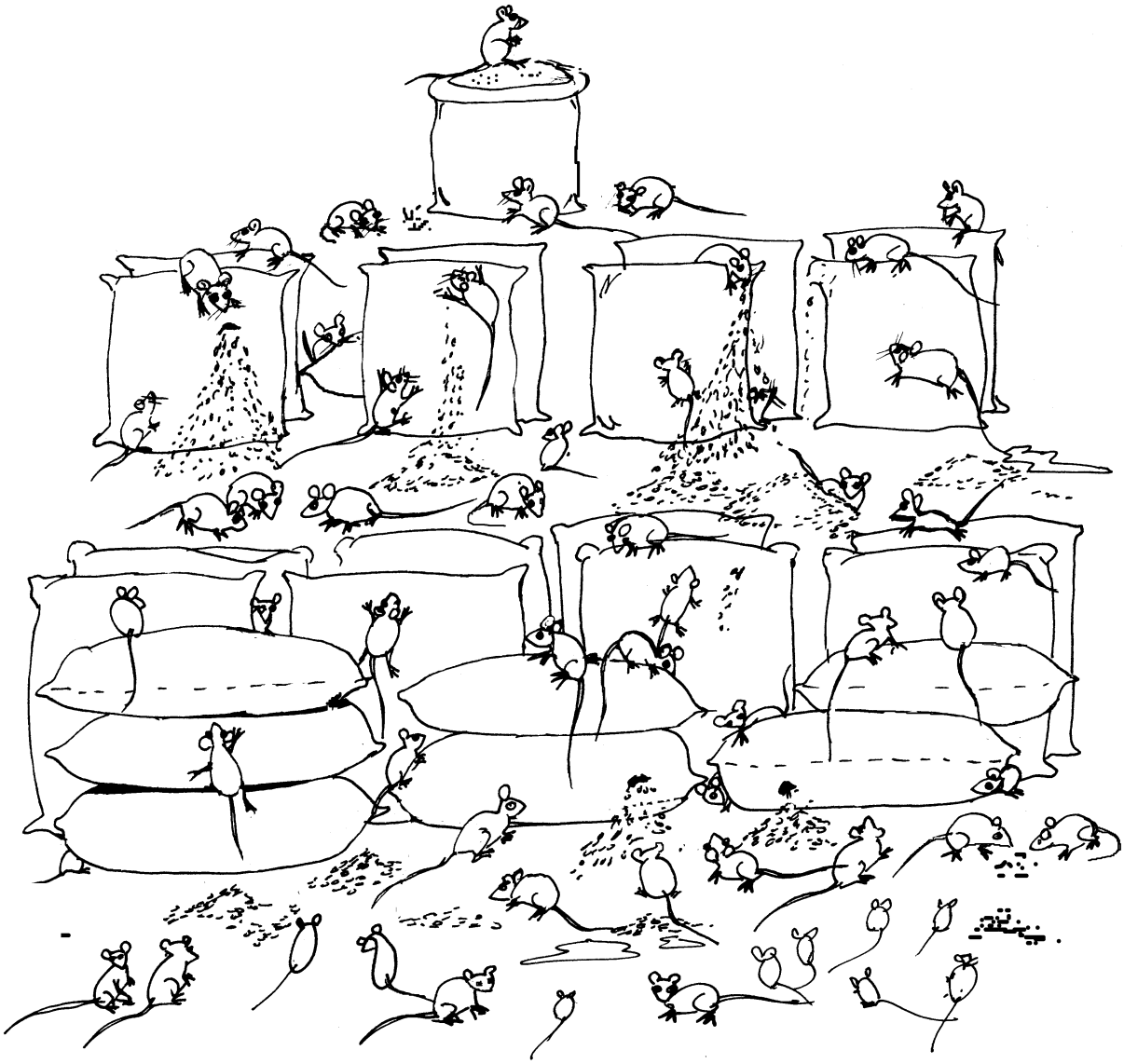
How much rice does this whole family eat?_____kg

Rats eat not only rice, but any grain they can find.

How much grain does your family eat in a month?

Rice	_____kg.
Wheat	_____kg
(Any other food grain)	
_____	_____kg
_____	_____kg
_____	_____kg
All together	_____kg

Is this more or less than what our rat family ate up?_____ Of course, the godown has many other rats too.



Rats have babies many times a year (and many babies each time!).

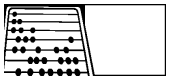
A snake eats many rats in a year.

Think of all the grain we save because of snakes and other animals which eat rats.

Rats spread dangerous diseases like plague - the fewer the rats the better!

Did you know - many people kill snakes because they are afraid of them, even snakes which are not poisonous?

Some people kill snakes to sell their skins (even though this is against the law); snake skins are used to make purses and belts. Every year 50,000 snakes are killed for this in India.



Play this game

Ask your friend to choose one of the animals from this list:

Owl, eagle, crow, sparrow, cat, squirrel, mosquito, fly, spider, cobra, lizard, butterfly, frog, fish, cow, horse, sunbird, earthworm, moth.

Your friend will not tell you his or her choice right now.

Ask questions which have 'yes' or 'no' answers to find out what your friend chose.

Q1. .....

Ans .....(yes or no)

So the animal can be one of these - .....

Q2. .....

Ans .....(yes or no)

So the animal can be one of these - .....

Keep asking questions till you guess what your friend chose. Each time, write down the question, the answer and the list of animals.

Q3. .....

Ans .....

So the animal can be one of these -
.....

Q4. .....

Ans .....

So the animal can be one of these - .....

Q5. .....

Ans .....

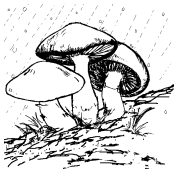
So the animal can be one of these - .....

Ask a question

My question about a living thing:

.....

.....



CHAPTER **2**

SOIL

1. Living things in the soil

a. Soil creatures I found

....

....

....

....

....

....

....

....

b. I collected leaves of .....

How are the first and last leaf different?.....

.....

.....

.....

How would it look when it decays even more?

.....

.....

.....

.....

Date I put the leaves in soil .....

Where I put the leaves

Dry place .....

Moist place .....

Check the leaves after a few days

Date.....

How had the leaves changed?

.....

.....

Think! Think!

What happens to the leaves which fall in dry weather and dry up?

.....

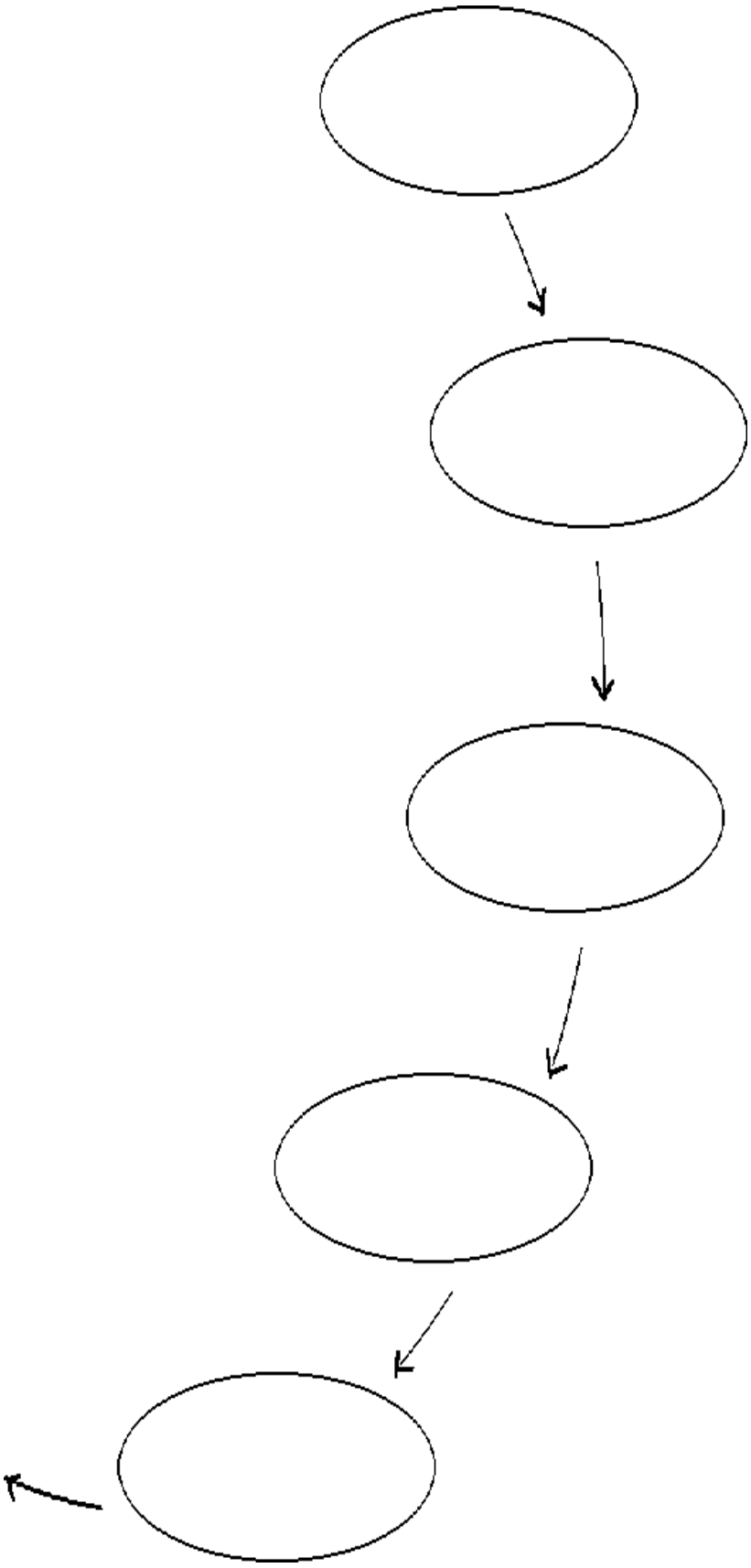
.....

Think! Think!

From where do we get the minerals our bodies need?

.....

Now think - from where did **this** get minerals? Keep asking this question and answering it as many times as you can. Write your answers in the ovals on the next page. Add more ovals if you need to.



Think! Think!

Leaves fall on the ground. After some time, you don't see these leaves, even decayed ones, on the ground. Where do they go? How do they get mixed with the soil?

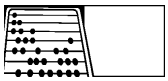
c. Make a guess - which other animals might mix the dead parts of plants and animals from the surface into the soil?

.....

.....

How deep have the roots of this tree grown into the soil?

At what depth you find -



the deepest earthworm burrow .....

ants and snails .....

2. Other things that make up soil

a. Collect a handful of soil from 3 different places. Pack them separately and bring them to school.

Write about the soil you collected.

Soil sample

	1	2	3
From where it was collected			
	.....	.....	.....
	.....	.....	.....
Colour			
	.....	.....	.....
How it feels			
	.....	.....	.....
What is in the soil			
	.....	.....	.....

Soil sample

1 2 3

Sieve 3 capfuls of the soil through a tea strainer or a wire mesh.

What is left on sieving (in the strainer)

....

Which has the most amount passing through the strainer? Which has the least?

....

Feel what fell through the strainer. How did it feel (fine, coarse, gritty...)?

....

Look closely at what fell through the strainer - which soil had the largest, and which the smallest particles?

....

Take a capful of soil and add water to it drop by drop. Keep adding drops of water until the water starts to flow out.

How many drops of water could it absorb (i.e. how many drops added before the water starts to separate from the soil)

.....drops .....drops .....drops

Try to make a small ball or rod with the wet soil. With which soil is it easiest to do?

....

Smell the wet soil. Describe how it smells.

....

Make a smudge of wet soil here

1	2	3

Give a name to this soil

....

b. Look at the picture of soil on page 22 of your TextBook. What is there in the gaps between the soil particles? .....

i) Which glass had more bubbles? .....

ii) Where did the air in the bubbles come from? .....

Which soil has more air - packed or loose? .....

Why? .....

.....

c. Make a drawing of your bottle. Show where the soil is. In your drawing show which part was wet after 5 minutes, then 10 minutes.

Did water get to the other side of the plastic divider as well?.....

When you added more water, what happened to the level of water?

.....

Did the soil just above the water in the well get wet? .....

Did the surface of the soil get wet on that side?.....

How did water get into the well?.....

.....

When you tilted the bottle, did any water flow off from the surface? .....

Was it clear water or did soil flow off too?.....

When it rained more, did the water level in the well rise?

.....

What I did to stop the water from flowing off. .....

.....

What happened to the water level in the well?

Suppose you use up the water in the well, and it doesn't rain for a long time.

What would happen to the level of water in the well? .....

.....

Can the water level in the well go down even if it rains? .....

How?.....

.....

Are there ways you can keep the rainwater from flowing off, and make it enter the ground? Give some ideas.

.....

.....

Think! Think!

Sheela thinks groundwater is like a lake or river of clear water underground.

What do you think? How will you convince her that it is not a clear lake or river?

.....

d. Which tray had more water?.....

In which tray was the water muddier? Why?.....

.....

From which place can soil flow off more easily - bare ground, or where many plants grow? .....

Which path was more slippery - grassy or bare?.....

Why is it more slip-
pery?.....

.....

e. Can fertilizers and pesticides get into the groundwater? .....

How?.....

EXERCISES

What's the same? What's different?

In what way or ways can soils be alike?.....

.....

.....

In what way or ways can they be different? .....

.....

.....

Interesting questions

1. Name some things which make up soil. Which of these are living things, which are not?

.....

.....

.....

2. In which of these places do you think soil has more air? On a path where people walk, and the soil is packed tight, or in a ploughed field?

.....

3. Where would most plants grow better - in packed clay or loose soil? Why?

.....

.....

4. Name 3 things which are porous.

.....

5. Does it have to rain into a well for the water in the well to rise?.....

.....

6. Does water in different villages and towns taste different? Why do you think this is so?

.....

.....

.....

7. No one waters large trees in the forests or by the roadside, yet they don't dry up even in the dry season. How do they get water?

.....

.....

.....

8. In which of these climates will leaves decay the fastest?

Cold and dry Hot and dry

Hot and humid Cold and humid

.....

9. Where else have you seen the word 'minerals'? Are some of them the same as the minerals which plants, our bodies and other animals need?

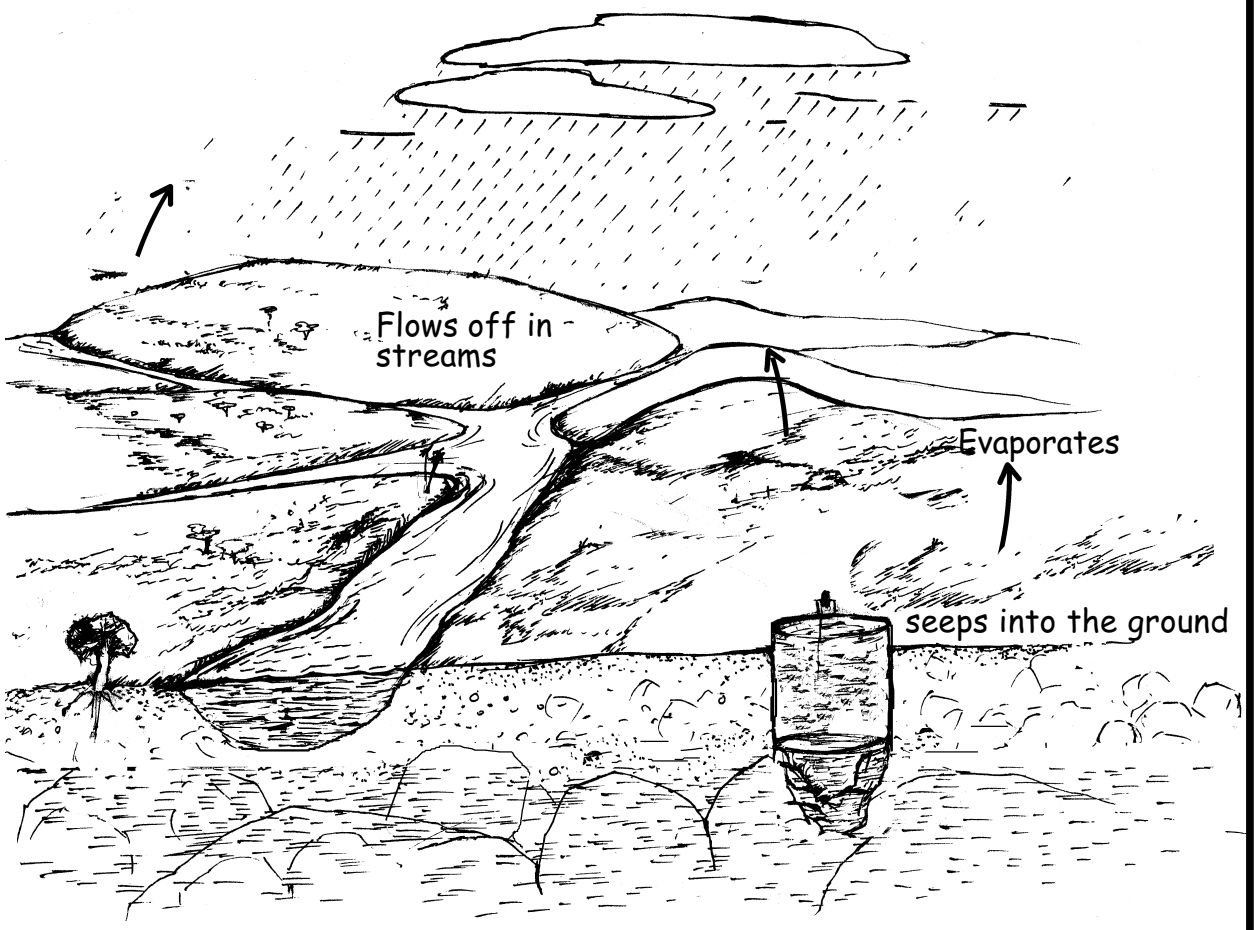
.....

.....

Complete the cycle

Look at the picture. 3 things which can happen to the rainwater that falls on land are shown. Choose any of these as a starting point. Think of what happens to the water after that, then after that...and so on till it falls back as rain.

Can this water rain somewhere else, or will it rain right back here?



Here is an example -

Evaporates-
condenses as dew → goat licks it up while grazing → breathes out as water vapour

.....

.....

.....

Classroom discussion

In what ways is it useful to make compost pits?

Which of these things would you put in it - glass bottles, vegetable peels, leaves, newspaper, spoilt food, plastic bags, fruit seeds?

.....

If you don't put them in the compost pit, where do you throw them?

.....

What happens to them after you throw them away?.....

Are there any difficulties in making compost pits where you live?

Are there ways to solve them?

Start a compost pit in your school or near your house. Tell your class about this pit.

Where I started a compost pit .....

Ask and find out

Is there a well or a borewell near your school or house? .....

They dug .....metres deep. Did they hit rock?.....

If so, how deep is the rock? .....metres.

The water level is .....metres deep.

Was this level higher or lower some years ago?.....

Why did the level change?.....

If the water level has been going down, ask and find out what kind of crops were grown in the area before?.....

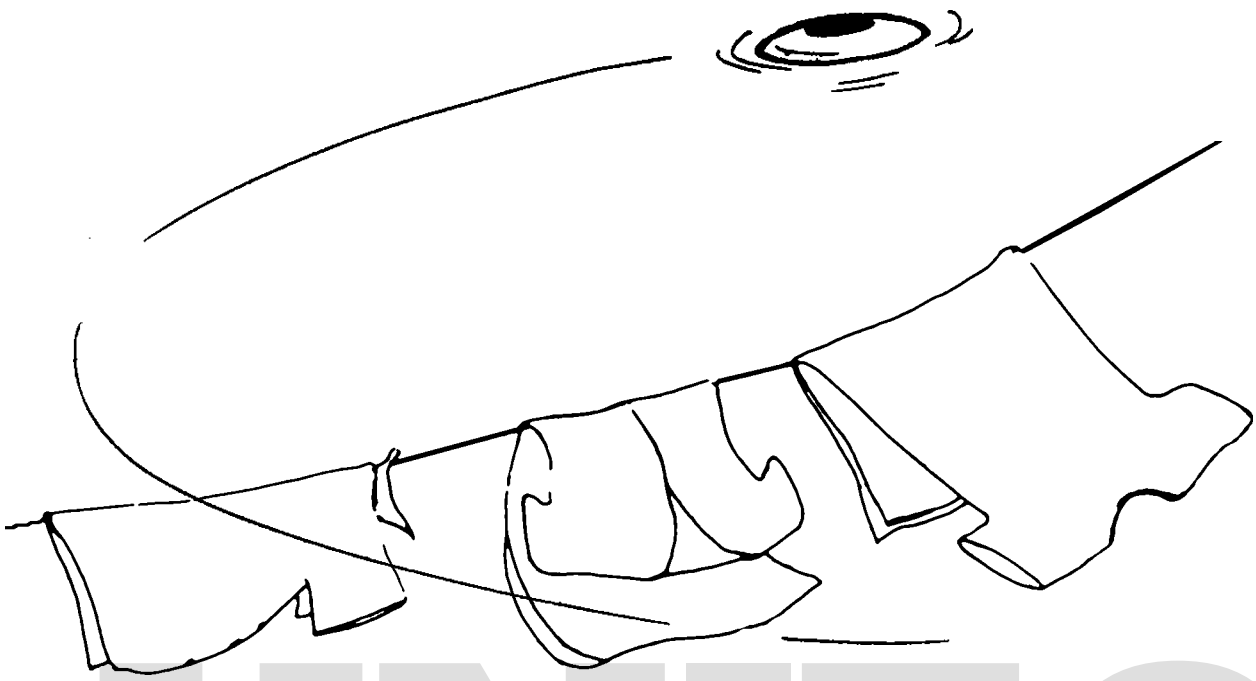
What kind of crops are grown now?.....

Which crops need more water? .....

Are there any programmes in your village or town which help in getting more water into the ground? .....

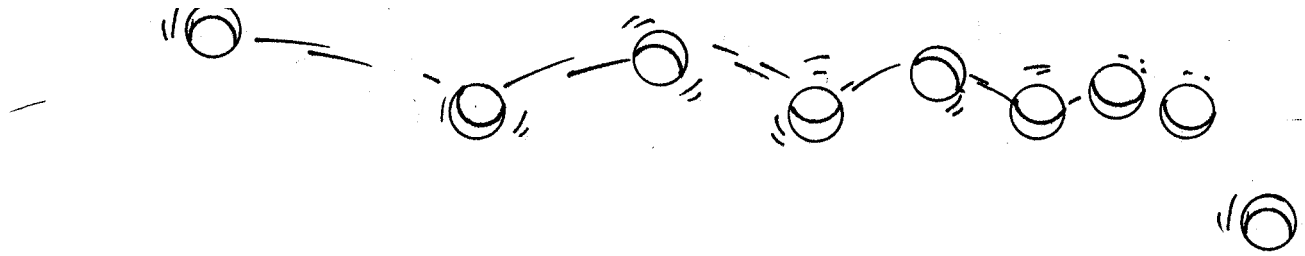
Ask a question

My question about soil: .....

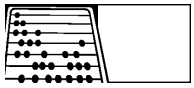


UNIT 2

MOVING THINGS



Assessment Sheet: Unit 2

Category	Score	Comments
Observation		....
Understanding		....
Oral Language (Talking)		....
Written Language (Writing)		....
Design and engineering Skills		....
Mathematical Skills		....

Enthusiasm in doing activities

.....

.....

Patience and concentration

.....

.....

Independent thinking and creativity (☆)

.....

.....

Co-operation with other students

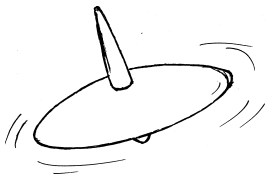
.....

.....

Completion of home assignments

.....

.....



Describing movement

1. Different kinds of movement

a. List of words to choose from:

wobble, bounce, sway, spin, rotate, glide, slide, roll, vibrate, flutter, swing, back and forth, up and down

Moving things	Words describing the way they move
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

....

....

b. What I brought.....

.....

Sort them into different groups by asking questions like these:

Does it slide, roll, spin, or move in some other way?

Does it move in a straight line or in a curve?

Does it also move up and down?

Does it vibrate?

Give a name to each group. Write the names of the group. For each group, write the names of things which you put in this group. One example is given here.

1. Spinning things .....

.....

.....

2. _____ .....

.....

.....

3. _____ .....

.....

.....

4._____ .....

.....

.....

5._____ .....

.....

.....

6._____ .....

.....

.....

Think! Think!

Some things which move and *at the same time*, remain in the same place

.....

.....

2. Movements of your body

b. Try to move your leg from the hip in the same way you moved your arm. Can you move your leg (from the hip) in the same way?.....

Ways in which I can move my arm but not my leg:

.....

.....

.....

.....

Ways in which I can move my leg but not my arm:

.....

.....

.....

.....

c. When you make the cup of your palm shallow, does the ball turn more or less? .....

If you hold the ball more loosely, does it move more or less?.....

Which socket is deeper - the shoulder or the hip? Why do you think so?

.....

.....

.....

d. Ways in which I can move

i) my head.....

.....

ii) my arm at the elbow.....

.....

iii) my leg at the knee.....

.....

Do you think the elbow and knee joints are ball and socket joints too?.....

Give some reason for your answer.....

.....

3. Slow or fast?

Our track was .....metres long

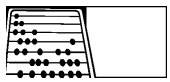
a. The running race. Run the whole length of the track, and have your friends measure the time.

1..... ran on the track in .....seconds.

..... ran on the track in .....seconds.

Who needed more time to run from one end of the track to the other?.....

Who ran faster?.....



2..... ran on the track in .....seconds.

..... ran on the track in .....seconds.

Who needed more time to run from one end of the track to the other?.....

Who ran faster?.....

b. Now hold the race again. As you start the race, have your friends count tik-tik 1, tik-tik 2 ...till tik-tik 10. This time, each of you run for only 10 seconds.

1..... ran ..... metres in 10 seconds.

..... ran ..... metres in 10 seconds.

In 10 seconds, who ran more distance?.....

Who ran faster? .....

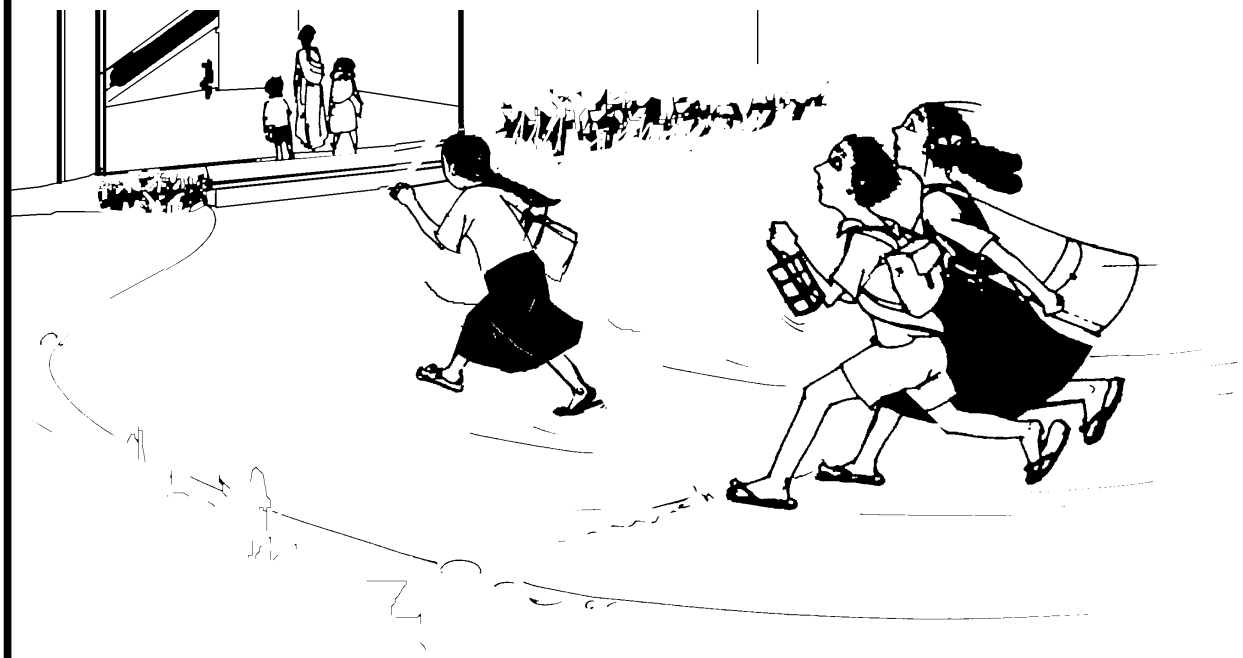
2..... ran ..... metres in 10 seconds.

..... ran ..... metres in 10 seconds.

In 10 seconds, who ran more distance?.....

Who ran faster? .....

c. Look at the picture. Read the story and answer these questions:



i) Mini and Apu are walking to school together. Asma is ahead of them, much closer to the gate. They all hear the first bell; and they all have to be at the gate just before the second bell rings. Mini, Apu and Asma start running.

Who is closer to the gate?.....

Who is farther from the gate?.....

Who has to run more distance?.....

They all reach the gate at the same time. Who ran slower?.....

ii) The next day, the first bell rings just as Asma reaches the gate. She doesn't have to run at all. But Mini and Apu, walking together, are far from the gate. They both start running. Mini reaches the gate 30 seconds before Apu.

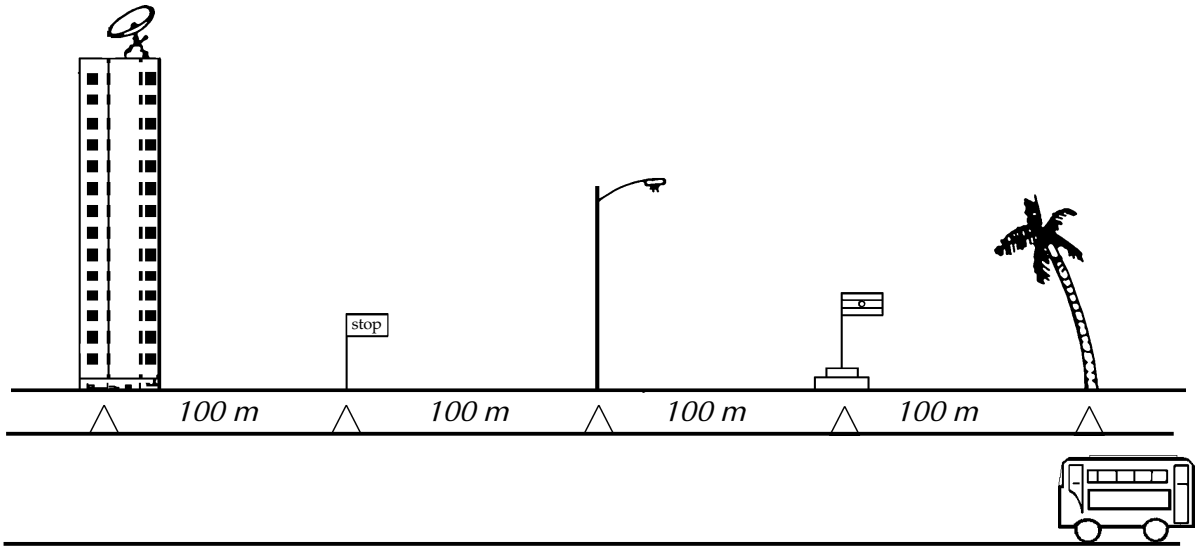
Did Mini and Apu have to run the same distance?.....

Who reached first?.....

Who took more time?.....

Who ran faster?.....

d. Look at these pictures and answer the questions.



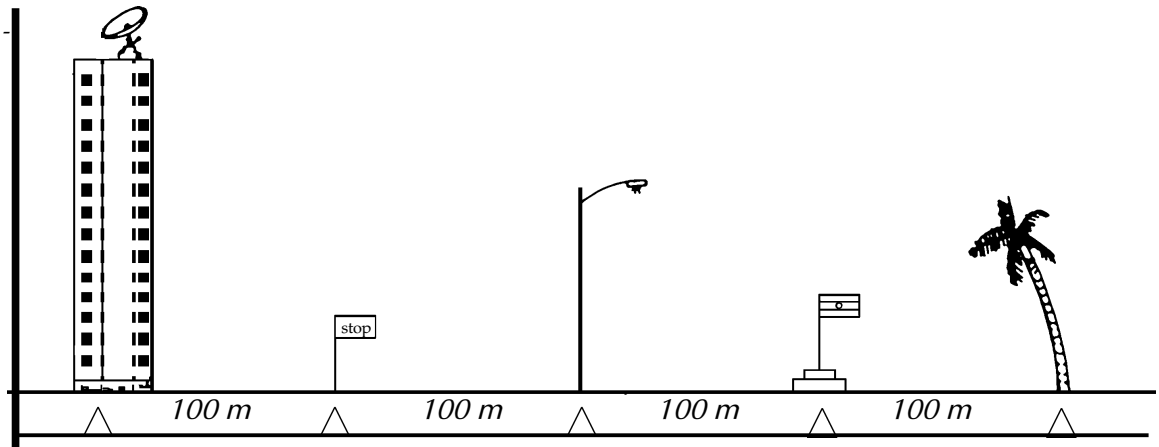
In this picture,

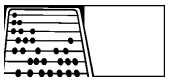
What is the distance between the palm tree and the flagpole?.....

Between the flagpole and the lamp post?.....

Between the bus stop and the tower?.....

(i) A bus comes down the road. It takes 10 seconds to go from the palm tree to the flagpole. It keeps moving at the same speed (it does not speed up or slow down) along the road.





Where will the bus be exactly 10 seconds after it crosses the flagpole? Draw the bus where it will be exactly 10 seconds after it crosses the flagpole. Write '1a' next to your drawing.

Draw the bus where it will be exactly 20 seconds after it crosses the flagpole. Write '1b' next to your drawing.

Draw the bus where it will be exactly 30 seconds after it crosses the flagpole. Write '1c' next to your drawing.

(ii) Another bus (bus no. 2) comes along. This bus also takes 10 seconds to go from the palm tree to the flagpole.

If this bus has to be at the lamp post in less than 10 seconds after it crosses the flagpole, what should it do? (Speed up? Slow down? Do nothing?)

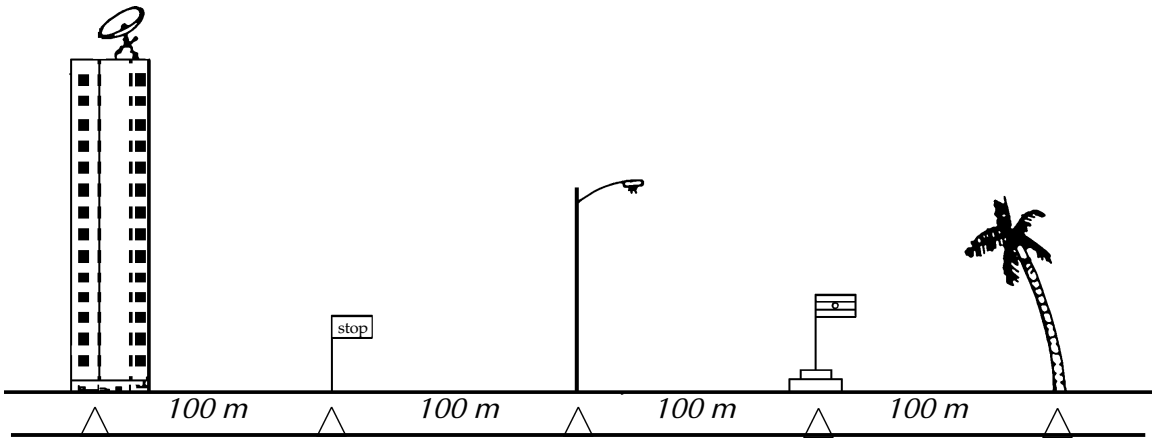
.....

Why?

.....

(iii) One more bus comes along (a lot of buses today!). This bus (bus no. 3) too takes 10 seconds to go from the palm tree to the flagpole. But, when it reaches the flagpole, it starts going faster.

Draw where this bus can be 10 seconds after it crosses the flagpole. Write '3a' next to your drawing of this bus.



iv) If, instead of speeding up, the bus slows down at the flagpole, where can it be exactly 10 seconds after it crosses the flagpole?

.....

v) Remember, the first bus travelled 100 metres in 10 seconds. How many metres did it travel in 1 sec?

Write you answer as.....metres per second. This is the speed of the bus.

vi) The speed of the bus (or train or any other vehicle) by which I travel

.....

Making things move, making them stop

4. How to slow things down and make them stop

a. How far the duster moved before it stopped .....

Think! Think!

What made it stop? .....

b. Friction slows things down

ii) The ruler is made of .....

Feel the flat side of the ruler with your finger.

How did the surface of the ruler feel? .....

How high you had to raise the end of the ruler .....

Object placed on the ruler	How it moved
.....	.....
.....	.....
.....	.....
.....	.....

Between which object and the ruler was friction the least?.....

iii) After dusting powder:

How did the surface of the ruler feel now? .....

Place the objects again on the ruler.

Object placed on the ruler	How it moved
.....	.....
.....	.....
.....	.....
.....	.....

Which objects did not slide before, but did after dusting powder?

.....

iv) The ruler is made of .....

Feel the flat side of the ruler with your finger.

How did the surface of the ruler feel? .....

Object placed on the ruler	How it moved
.....	.....
.....	.....
.....	.....
.....	.....

Between which object and the ruler was friction the least?.....

After dusting powder:

How did the surface of the ruler feel now? .....

Place the objects again on the ruler.

Objects placed on the ruler	How it moved
.....	.....
.....	.....
.....	.....
.....	.....

Which objects did not slide before, but did after dusting powder?

.....

Did anything slide down one kind of ruler but not down the other?

.....

.....

.....

Think! Think!

Why did putting talcum powder make the coin slide easily?

.....

.....

.....

Is sliding easy on a soapy surface?.....

Why?.....

Where have you experienced this?.....

c. Things made of rubber

What happened to the eraser when I pressed it .....

.....

Some things made of rubber | Why we need more friction here

..... | .....

..... | .....

..... | .....

..... | .....

d. Friction and rolling:

i) object I rolled	how it moved on the dry *thali*	how it moved after adding soap
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

Was the friction between the plate and the things you rolled more or less after spreading soap water on the plate? .....

Why do you think so?

.....

.....

ii) Look at new tyres of bicycles or other vehicles. Are they smooth or treaded?

Why do you think they have to be made that way?.....

.....

e. The papers I wrote on.....

With which ones could you write easily? .....

With which ones was it difficult?.....

Why?.....

In what ways does friction help us in writing?.....

.....

Think! Think!

Why do pencil leads and chalk pieces get shorter as you write with them?

.....

.....

.....

f. How I tried to slow the ball down

.....

.....

.....

.....

Did it work?.....

.....

.....

Does the ball slow down on its own too? Why?

.....

.....

.....

5. How to make things move:

a. A map of my classroom showing how the ball moved.

How I tried to make the ball go in a straight line

.....

.....

.....

.....

How I tried to make the ball move without bouncing

.....

.....

.....

.....

b. What I did to make the ball move faster:

.....

.....

Did it work?.....

.....

c. Start something moving so it keeps moving along a circle. It should keep moving along the circle even after you take your hand off it.

Ways in which I tried to move something along a circle

What worked

.....

.....

.....

What did not work

.....

.....

.....

EXERCISES

Name and draw

a) A ball that is not moving, and one that is moving. Your drawing should show it moving

b) A ball that is slowing down

c) A ball that is speeding up

d) A person who is not moving and (e) a person who is moving

What's the same? What's different?

Give two similarities and two differences between:

a) The wheel of a moving bicycle, and a ceiling fan that has been switched on.

Similarities

i).....

ii).....

Differences

i).....

ii).....

b) A rubber ball and an eraser both dropped from a table.

Similarities

i).....

ii).....

Differences.

i).....

ii).....

c) The way you can move your hand at the wrist, and the way you can move your arm at the elbow.

Similarities

i).....

ii).....

Differences

i).....

ii).....

Interesting questions

1. Name at least three things or places

a) Which need to be rough

.....

Does the roughness in each case slow down movement or prevent movement?

.....

b) Which should be smooth.

.....

Why?

.....

2. Name some things or places where oil is used to make movement easier.

.....

.....

3. Which is easier to hold without slipping - a bar of wet soap or a comb?

.....

Why?.....

4. Would you want your bathroom floor of smooth polished stone or a rough

surface?.....

Why?.....

.....

5. Look at how the brakes of a bicycle work and answer these questions:

a) What are they made of? .....

b) Which part of the wheel do they touch? .....

c) How do you operate them? .....

.....

d. Does it matter if they touch the wheel lightly or press hard against it?

.....

6. Suppose you push a wooden duster or some other object on the floor, and there is no friction at all. How far will the duster move? Will it slow down?

.....

.....

7. Name some parts of your body which move, or which you can move, without moving any bone.

.....

.....

8. a) Arrange these surfaces from the roughest to the smoothest:

Tar road, sheet of glass, wooden table, the floor of your classroom

.....

b) Suppose each of the following is moving at its top speed. Arrange from the slowest to the fastest:

bullock cart, car, plane, bicycle, bullet

.....

Classroom discussion

Think of places which are slippery to walk on -

.....

Why is it difficult to walk?

.....

Do you need more friction or less than there is between these surfaces and your foot?.....

How will the things you do everyday be different if there were no friction?

i).....

ii).....

Play with words

1. Write down some things that

vibrate.....

spin.....

roll.....

slide.....

wobble.....

walk.....

flutter.....

glide.....

bounce.....

swing.....

crawl.....

2. The words on the left describe the way some animals move.

Match the words with the animals.

scurrying	snakes
hopping	mice
slithering	kangaroos
crawling	elephants
soaring	monkeys
swinging	eagles
swaying	worms

Name at least 3 other animals and give words describing how they move.

.....

.....

.....

Recall and write

a) The story of the hare and the tortoise

.....

.....

.....

.....

.....

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.....

.....

.....

.....

.....

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.....

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.....

.....

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.....

.....

.....

b) Suppose the hare does not stop to rest or sleep. Think of a way in which the tortoise can still win the race. Write a new story using your idea.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Figure it out

The hare and the tortoise decide to hold another race. The tortoise says he wants to start closer to the finish line because, being a tortoise, he can only run slowly. If he starts closer to the finish line the race would be fair. The hare agrees. We do not know who will win the race.

Look at these pictures and make a guess: who will win?

My guess : .....

1.

5 seconds later

2.

5 seconds later

3.

Now draw the hare and the tortoise where they will be after every 5 seconds:

4.

5.

6.

Was your guess correct? .....

Did the hare run faster than the tortoise?.....

Write in your own words who won the race and how. Use these words in your description: speed, distance, time, slow, fast.

.....

.....

.....

.....

.....

The tortoise says he wants to race again. The hare readily agrees. This time the tortoise starts even closer to the finish line. Again we do not know who will win. Look at the pictures and make a guess - who will reach the finish line first?

My guess : .....

1.

5 seconds later

2.

Now draw the hare and the tortoise where they will be after every 5 seconds:

3.

4.

5.

Was your guess correct? .....

Did the hare run faster than the tortoise?.....

Write in your own words who won the race and how. Use these words in your description: speed, distance, time, slow, fast.

.....

.....

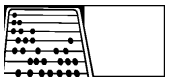
.....

.....

.....

.....

Play this game



Write here the questions you asked.

Q. .....

Q. .....

Q. .....

Q. .....

Q. .....

Q. .....

Q .....

Q. .....

Q. .....

Q. .....

Q. .....

Q. .....

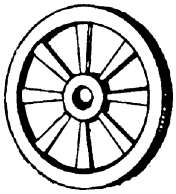
What was your guess?

.....

Was it correct? .....

CHAPTER **4**

MAKING A CART



1. Plan how you will make your cart.

a. How many wheels will your cart have?.....

b. Some things I can use to make the wheels .....

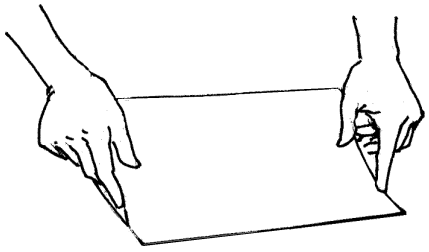
.....

i) Things I can use to draw a circle.....

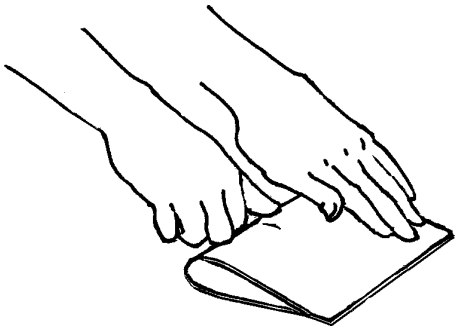
.....

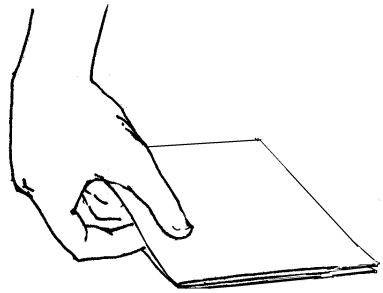
ii) Here's one way you can find the centre of a circle:

Take a sheet of paper in the shape of a rectangle, and fold it into half as shown.

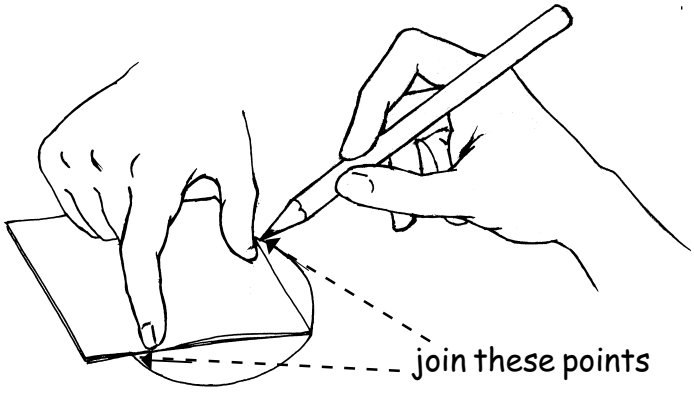


Fold again as shown.

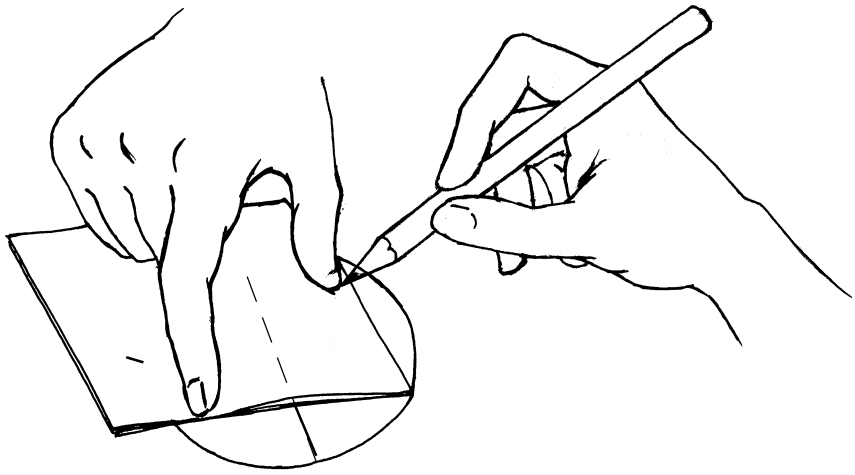




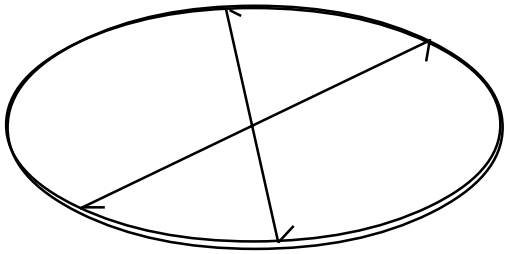
Now place the paper with the corner on the circle. Mark the points where the edge of the paper crosses the circle. Join them.



Do this again, keeping the corner at some other point on the circle.



The centre is where the 2 lines meet.



c. i) Things I can use to make my axle (or axles)

.....

.....

ii) Things I can use to fix the wheels or axle to the cart body

.....

.....

d. Things I can use to make the cart body .....

.....

e. Some other things I may need to make my cart.....

.....

.....

2. Now make your cart.

a. I made the wheels with.....

Was this in your list in 1b?.....

If you used something which was not in your list, explain why.

.....

.....

b. What I used as an axle.....

.....

Was this in your list in 1c?.....

If you used something which was not in your list, explain why.

.....

.....

c. Set your cart in motion. Watch closely how it moves and answer these questions:

i) Do the wheels rotate smoothly?

Do both wheels rotate when the cart moves?

If a wheel does not rotate smoothly, what can you do to make it rotate smoothly? .....

.....

Did you try your idea? .....

Do the wheels wobble? If they do, what can you do to make them stop wobbling? .....

.....

Did you try your idea? .....

ii) When the wheels rotate, does the axle rotate too? .....

iii) Does it move in a straight line?.....

iv) What I put on my cart.....

Its weight.....g.

I think my cart can carry .....g without any of its

parts breaking or bending.

d. How my cart and my friend's cart are similar.....

.....

How my cart and my friend's cart are different.....

.....

3. i) Why the cart did not move.....

.....

.....

.....

Use this space for your drawing.

ii) What I did to repair it.....

.....

.....

.....

iii) Could the cart move after you repaired it?.....

4. Instructions for making a cart.

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EXERCISES

What's the same? What's different?

Give two similarities and two differences between a bicycle and a bullock cart.

Similarities

i).....

ii).....

Differences

i).....

ii).....

Name and draw

A cart I see often.

Interesting questions

1. Write about the carts you have seen

a) which had only 1 wheel.

What is it called? .....

Where did you see it? .....

What was it used for?.....

How was it pushed or pulled? .....

Could it balance on its wheels when it was not moving, or was anything else used to support it? .....

Could it balance on its wheels when it was moving?.....

b) which moves on 2 wheels

What is it called? .....

Where did you see it?

.....

What was it used for?

.....

How was it pushed or pulled?

.....

Could it balance on its wheels when it was not moving, or was anything else used to support it?

.....

Could it balance on its wheels when it was moving?.....

c) which moves on 3 wheels

What is it called? .....

Where did you see it? .....

What was it used for?.....

How was it pushed or pulled? .....

Could it balance on its wheels when it was not moving, or was anything else used to support it? .....

Could it balance on its wheels when it was moving?.....

d) which moves on 4 wheels

What is it called? .....

Where did you see it?.....

What was it used for?.....

How was it pushed or pulled? .....

Could it balance on its wheels when it was not moving, or was anything else used to support it?

.....

Could it balance on its wheels when it was moving?.....

e) which moves on 5 wheels

What is it called? .....

Where did you see it?

.....

What was it used for?.....

How was it pushed or pulled? .....

Could it balance on its wheels when it was not moving, or was anything else used to support it? .....

Could it balance on its wheels when it was moving?

.....

2. Look closely at how the wheels of a 4-wheeled push cart (*thela*) and a bullock cart are fixed, and how the carts move. Then answer these questions:

Bullock cart:

Is the axle under the cart body, or above it?.....

Why do you think it is this way?.....

.....

Does the axle also rotate with the wheels? .....

Why do you think it is this way?.....

.....

4-wheeled push-cart (*'thela'*):

How many axles does it have?.....

Are the axles under the cart body, or above it?.....

Why do you think it is this way?.....

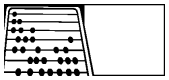
.....

.....

Do the axles also rotate with the wheels?.....

.....

Ask and find out



How much weight can a bullock cart carry?.....

How much weight can a truck carry?.....

Classroom discussion

Look at how a bus or jeep is made to turn. Suppose a bus is turning to the left.

Do only the front wheels turn to the left first?.....

Or all the wheels at the same time?.....

When you want to turn the 4-wheeled cart, do you have to turn the whole cart or can you turn only the front wheels?.....

.....

What is different between the way the cart and the bus turn?.....

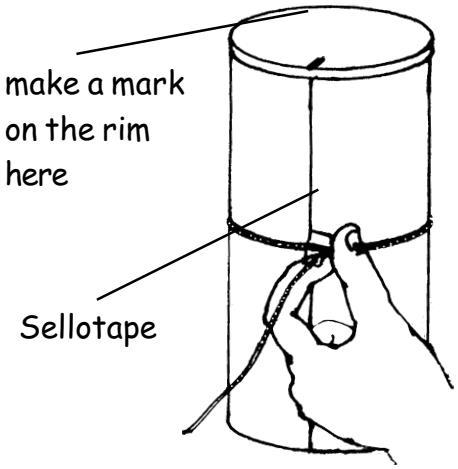
.....

Why can't you turn a bus or jeep the way you turn a cart?.....

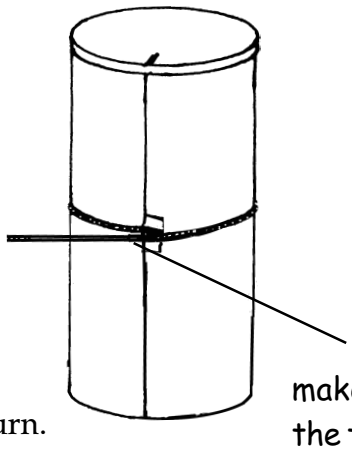
.....

Figure it out

1. a) Take any cylindrical object like a tin can. Keeping it upright, draw a vertical line on it from the top to the bottom (your can may already have a line on it). Mark the rim where the line touches it.



Using Sellotape, stick one end of a thread to the can on the line you have drawn.



Taking the free end of the thread, wind the thread on the can so it makes exactly one turn. Mark the thread where it just touches the fixed end of the thread on the line.

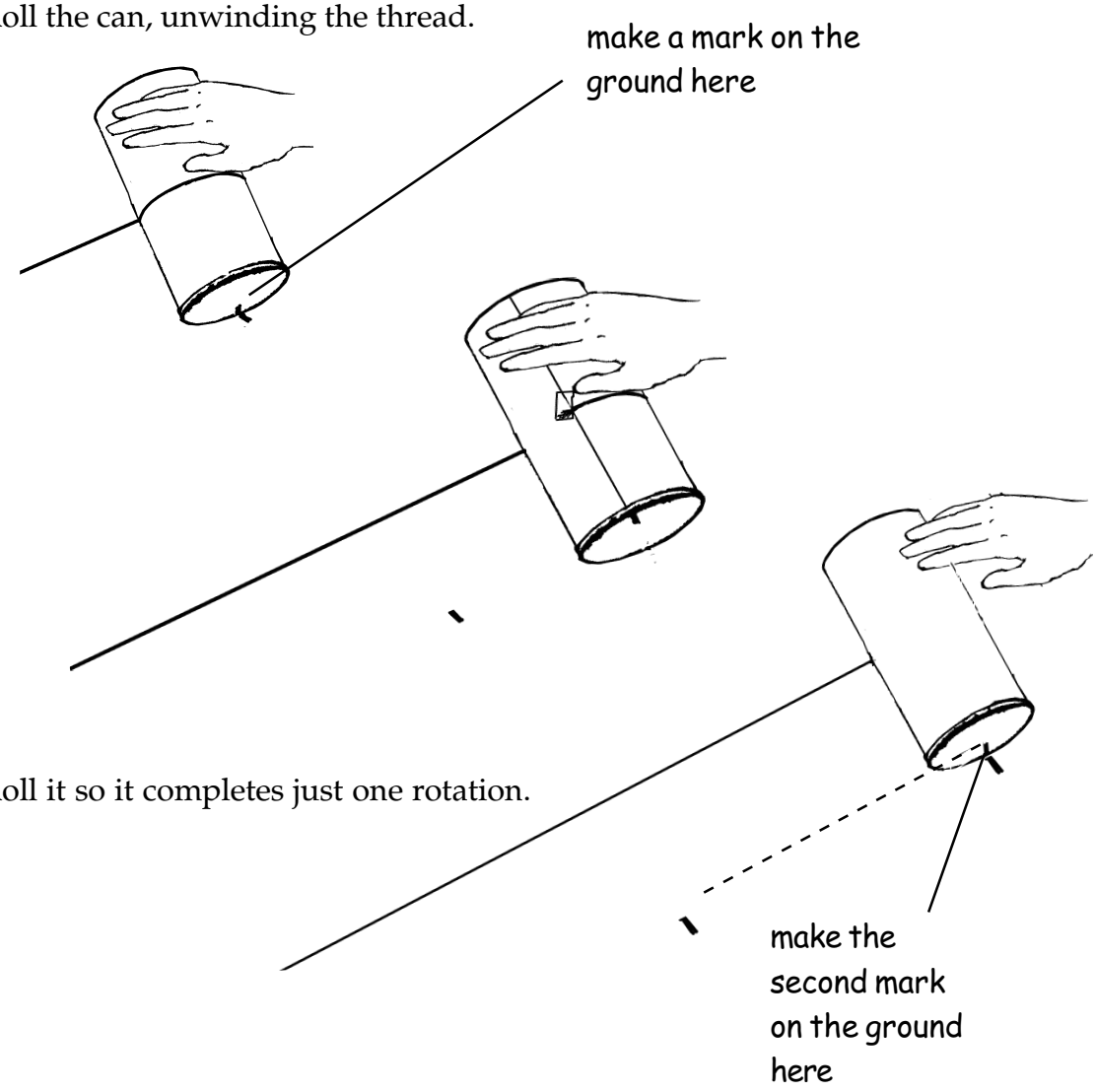
Measure the thread from the fixed end to the mark. This is the circumference of the cylinder.

The circumference of my cylinder is ..... cm.

b) Again wind the thread on the can so it completes one turn. Place the can so that the line (and the mark on the rim) touches the ground, as shown.

With a chalk, make a mark on the ground at this point.

Roll the can, unwinding the thread.



Roll it so it completes just one rotation.

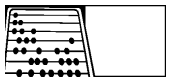
How much distance did the can move?.....cm

2. The circumference of a cart wheel is 6 metres. How many times does the wheel of the cart have to rotate if the cart has to travel 60 metres?

The wheel has to rotate.....times.

3. Another cart has smaller wheels. The circumference of the wheel is only 3 metres. Compared to the wheel in (2), will this smaller wheel turn more times, or fewer times to cover the same distance (60 metres)?.....

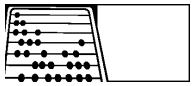
How many times should it turn?.....



UNIT 3

EARTH AND ITS NEIGHBOURS

Assessment Sheet: Unit 3

Category	Score	Comments
Observation		....
Understanding		....
Oral Language (Talking)		....
Written Language (Writing)		....
Design and engineering Skills		....
Mathematical Skills		....

Enthusiasm in doing activities

.....

.....

Patience and concentration

.....

.....

Independent thinking and creativity (☆)

.....

.....

Co-operation with other students

.....

.....

Completion of home assignments

.....

.....

CHAPTER **5**

OUR EARTH

1. This big round earth

a. What I see in this photograph.

.....

.....

.....

.....

.....

I think the white things in the picture are.....

b. The countries, continents and oceans I see in the pictures.

First picture

.....

.....

.....

Second picture .....

.....

.....

Third picture

.....

.....

.....

Think! Think!

Why we don't see people, houses, trees, and hills in these pictures.

.....

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.....

.....

c. A drawing of the tree

Does your drawing have as many leaves as the tree has?.....

Is the ant of the right size compared to the leaf?.....

To the tree?.....

2. A model of the earth

Name of the continent	countries in the continent
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

Think! Think!

My answer to Vasundhara

.....

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3. Make your own globe

a. Follow the instructions on the next page to make your own globe.

Show these parts of your globe:

The North Pole, The South Pole, The Northern Hemisphere, The Pacific Ocean, The Atlantic Ocean

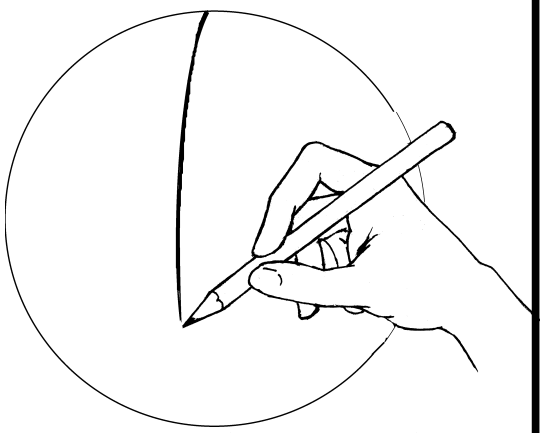
On the globe, show where your city is. From here, how would you reach the equator?

.....

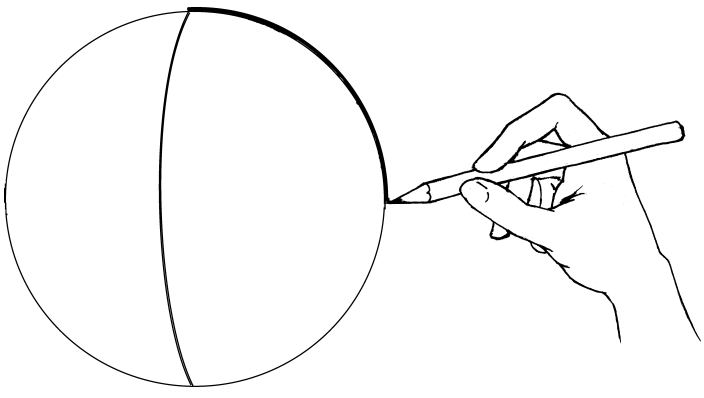
.....

.....

Find a ball or fruit or any round object. Find a pen or colour pencil with which you can draw on this ball. Try different kinds of pens and pencils to find one that can write easily, but whose writing does not rub off too easily. Draw a circle on this ball to divide it in two equal parts. This circle is the equator. Make the equator dark (or thick).

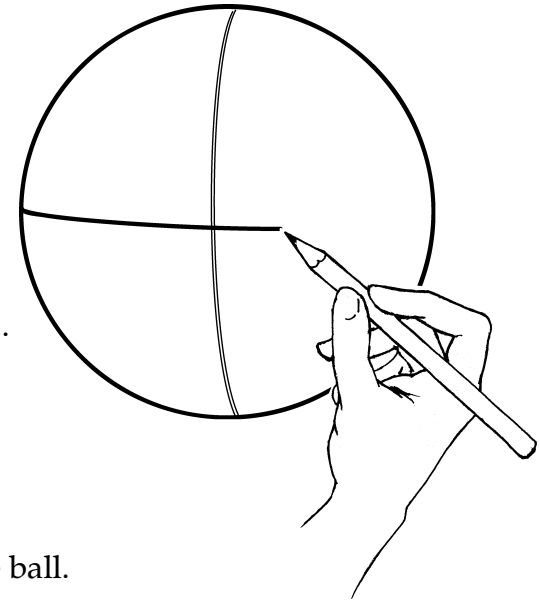


Mark a point on the equator and place the ball with the point touching the table. Then mark the topmost point on the equator.



Now draw a second circle that passes through these two points. You will now have each hemisphere divided into two equal parts.

Now draw another (third) circle which divides each of these parts equally.

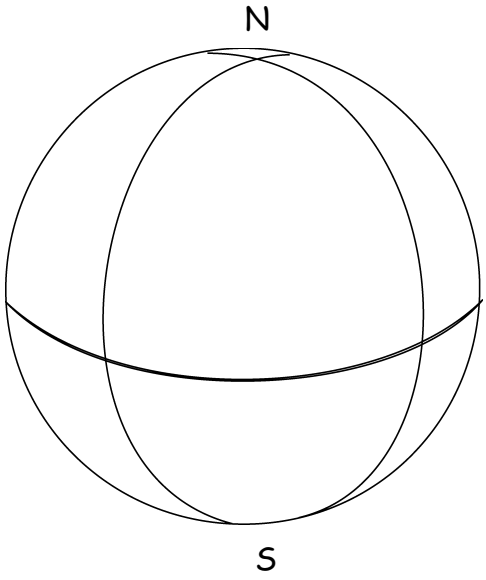


Do the second and third circles cross?.....

In how many points? .....

These are the Poles.

You should now have 8 equal sections on the ball.



One of the poles is the north pole; mark it as N. The other pole is the south, pole. Mark it as S.

Look at the drawings on the next page.

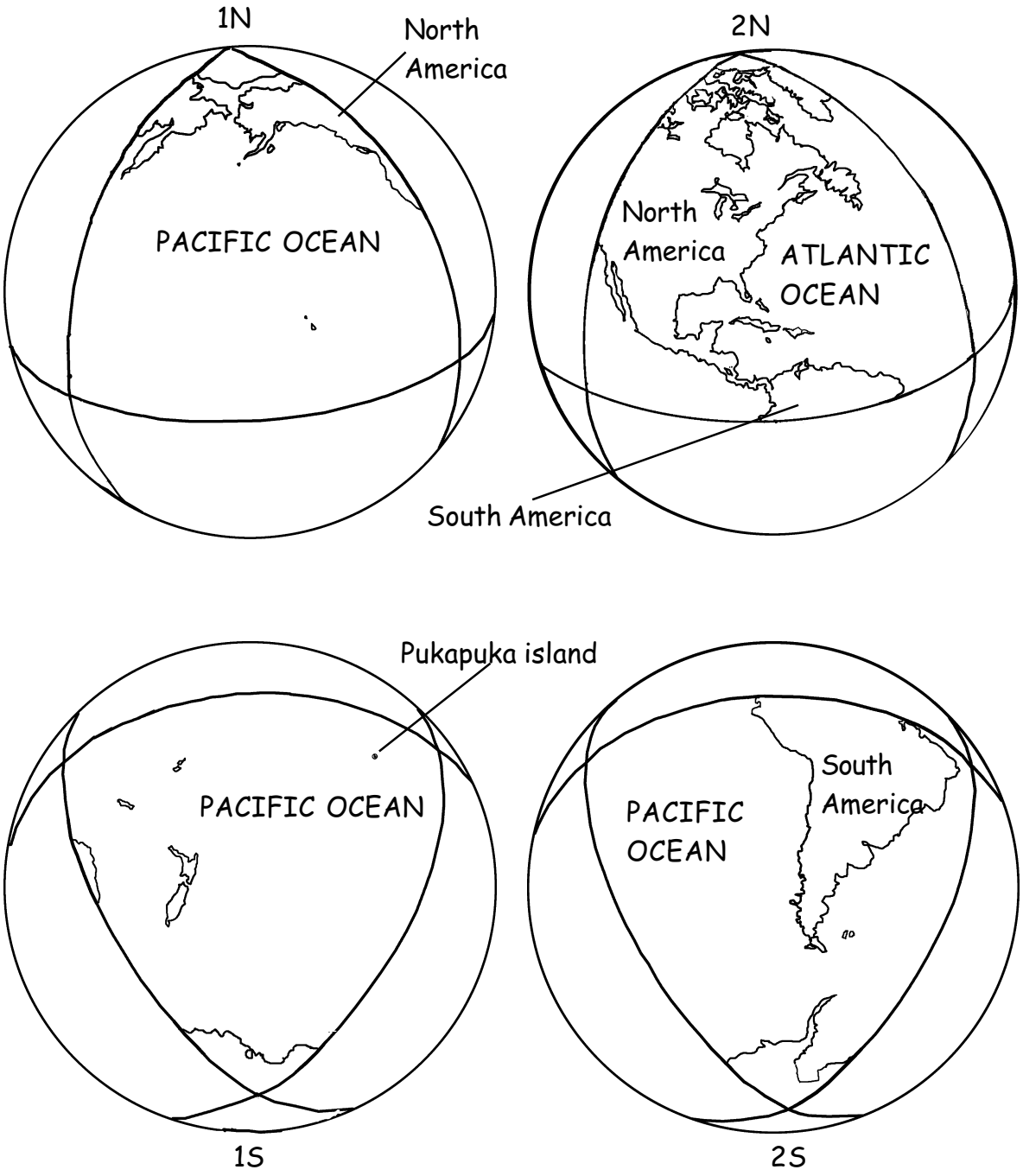
Each drawing shows the outline of the continents on a section of the globe.

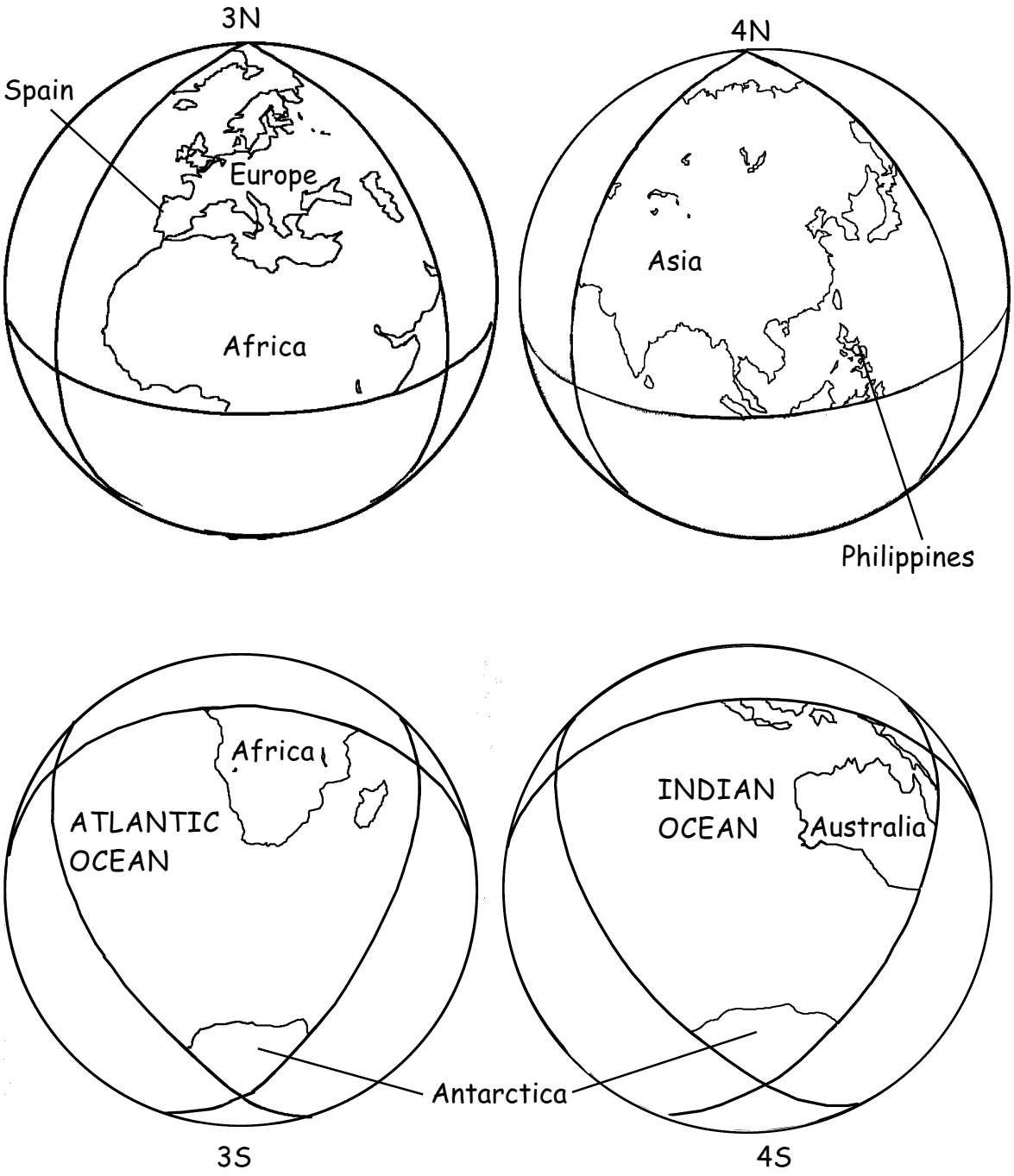
They are numbered as 1N, 1S, 2N, 2S etc.

Section 2 is to the right of section 1, 3 is to the right of 2 etc. What is to the right of section 4 ?.....

Draw these outlines on your ball - one section at a time.

Write the names of the continents and oceans, and some of the countries shown in the pictures.

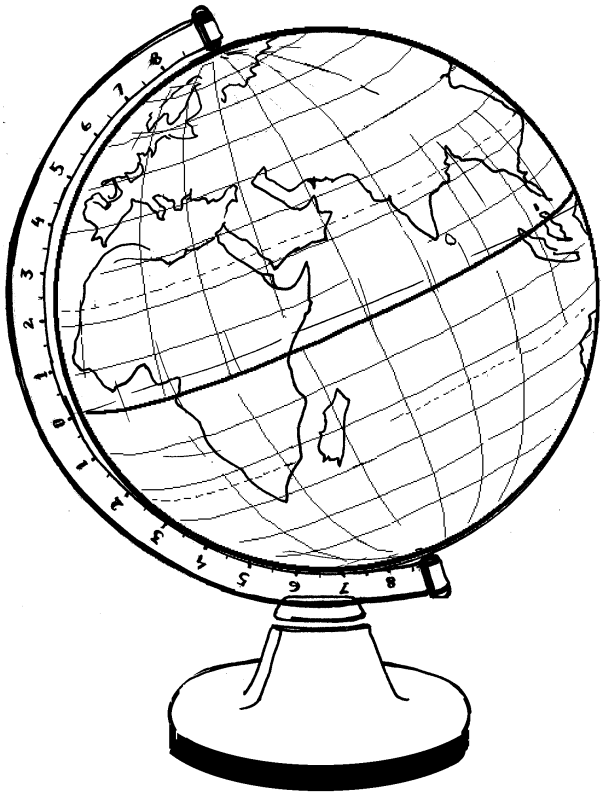



3N
Spain
Europe
Africa
4N
Asia
Philippines
Africa
ATLANTIC
OCEAN
INDIAN
OCEAN
Australia
Antarctica
3S
4S

Think! Think!

Are the equator, the North and South poles, and names of continents, countries, oceans etc. marked on the earth too, as they are on the globe? .....

b. Show how you placed the doll at the equator and near the south pole.



c. How big a sphere would you need to make the string look straight? Write its diameter here.....

Think! Think!

Do you think that your doll is of the right size compared to the globe? If not, should it be larger or smaller? Why?

.....

.....

.....

EXERCISES

Name and draw

Draw a map of the area surrounding your house. Draw what is to the east, west, north and south. Mark these directions clearly on the map. On your map, show in which direction you see sunrise.

What's the same? What's different?

Give two similarities and two differences between the earth and the globe.

Similarities

i).....

ii).....

Differences

i).....

ii).....

Interesting questions

1. a. Name the ocean which is

i) to the east of South America.....

ii) to the west of South America.....

iii) to the west of North America.....

iv) to east of Asia .....

v) to the west of Australia.....

b. Name a continent

i) which lies only in the Southern hemisphere.....

ii) which lies only in the Northern hemisphere.....

iii) a part of which lies in the northern hemisphere and part of which lies in the southern hemisphere.....

c. Name two continents connected by land

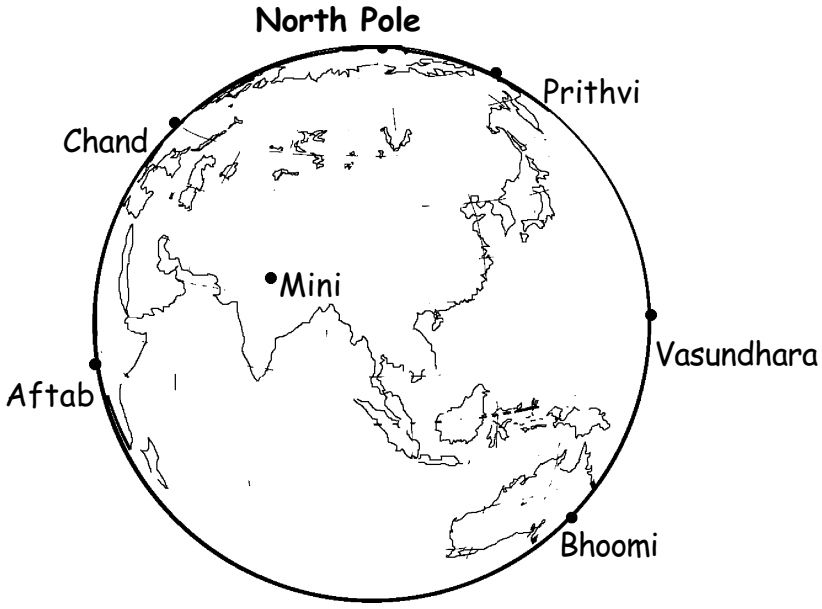
i).....ii).....

d. Name a sea which is completely surrounded by land.....

2. Which of these things is nearest in shape to the earth?

a chapati, a puri, an orange or a banana .....

3.



a) Mini, Chand, Aftab, Vasundhara, Bhoomi and Prithvi are standing at the places shown. Shade the sky for Aftab, Prithvi, Vasundhara, Bhoomi and Chand. Where is Mini's sky?

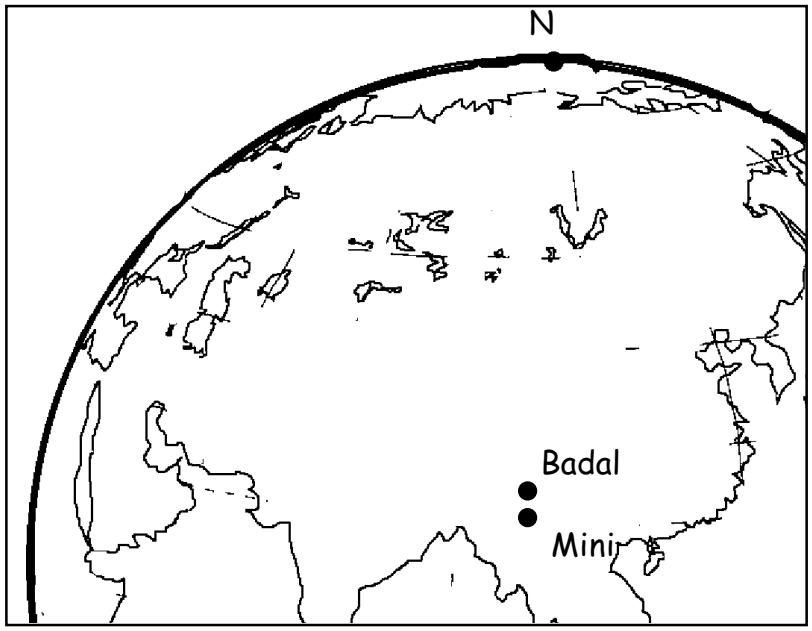
b) Chand thinks Bhoomi is upside down; Bhoomi thinks Chand is upside down. Which one of them is right? .....

Are they both right? Are both wrong?.....

c) Which of these children is in a ship?.....

d) Prithvi throws a ball towards the north. Show the direction in which the ball goes.

4.



Mini and Badal are facing each other. Badal is facing south.

a) Which direction is Mini facing?.....

b) Mini throws a ball to her right. In which direction does it go - E, W, N or S?

.....

c) Badal throws a ball to his right. In which direction does it go - E, W, N or S?

.....

5. Did Magellan's ships ever travel eastward in their journey from Spain to the spice islands?.....

Classroom discussion

Akash has an interesting idea - he thinks that people live inside the earth, not on it. How will you convince Akash that we live **on** the earth?

.....

.....

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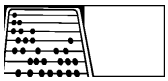
Ask and find out

On the globe, find your town or a large city near your town. Find another city in India on the globe.

Name of the city (my city or a big city near my town) which I found on the globe.....



Another city far away, in India, which I found on the globe.....

a) The distance between these two cities. .....

b) The train takes .....(days, hours) to go from one city to the other.

c) The distance between my house and my school (or bus-stop) ..... km.

d) I take ..... (hours, minutes) to walk this distance.

e) Suppose you can walk 20 km a day. Guess - how long will it take you to walk between the two cities you found on the globe? .....

Write a play

An ant and a mouse are on a large ball, of diameter 2 m. They argue about whether they are on a sphere or on a flat surface. Write a play giving their arguments. Which one of them do you think knows that they are on a sphere? Why?

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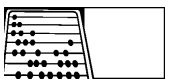
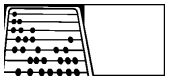
Figure it out



1) Magellan's ship *Victoria* left Spain on Sept 20, 1519, and returned on Sep 6, 1522, after going completely around the earth.

How long (how many years, months, days) did this journey take?

.....



2) There are about 1,000,000,000 people in India. If about 5 people can live in 1 house, how many houses would you need?.....

If you make tiny toy houses, each measuring a square 1 cm by 1 cm, would you

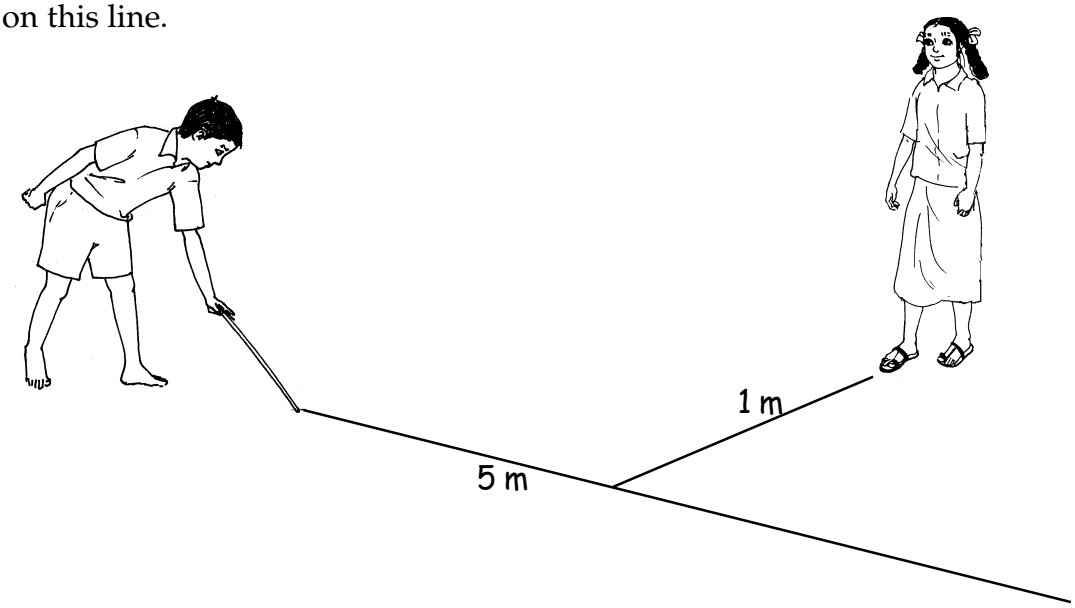
be able to show all these houses in India shown on your globe?.....

3) The radius of the earth is about 7000 km. Mount Everest is about 9 km tall. How many times the height of Everest is the earth's radius?.....

Act it out

1) Do this activity outdoors. Draw a line 5 metres long. Ask your friend to stand one metre from the centre of this line as shown.

Walk on this line.



Keep looking at your friend as you walk.

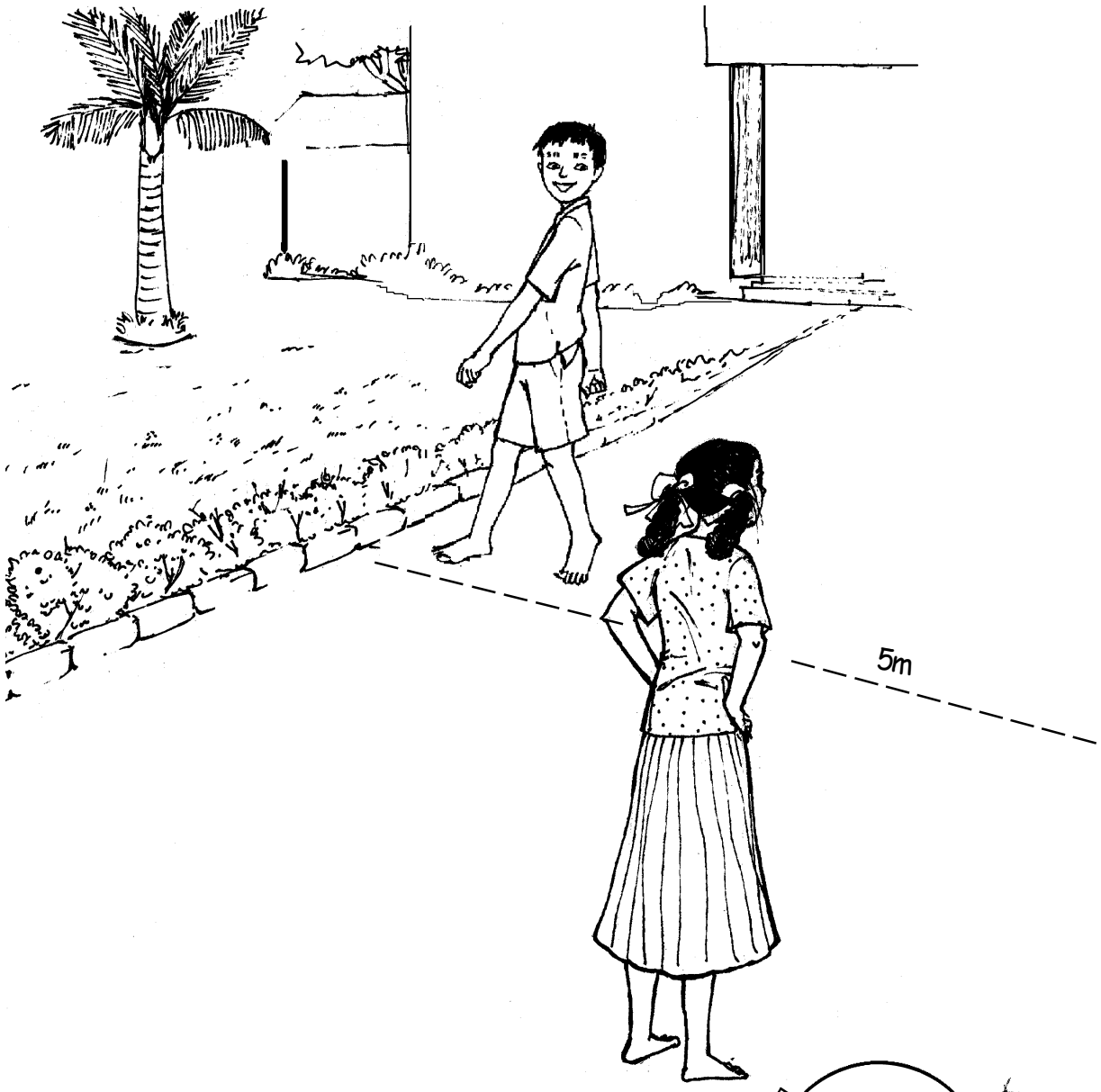
Now ask your friend to stand 4 metres from this line. Again walk along the same line as before; again keep looking at your friend as you walk.

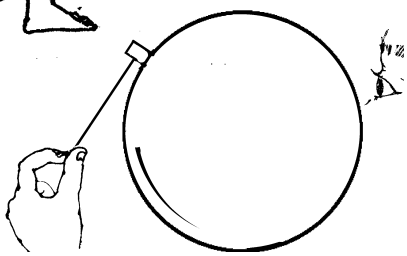
When did you have to turn your head more - when your friend was closer or farther away?.....

What if your friend is even farther away?.....

What is the farthest thing you can see (a tree, a hill, a building) in the direction in which your friend is standing. When you walk along the same line, looking at it, do you have to turn your head more or less?.....

How much do you have to turn your head when you look at the moon or stars as you walk? .....





2) Hold a ball close to your eye; take a small object, like your eraser and hold it on the other side of the ball. Now, very slowly, move it on the ball so you can see it.

Describe what you see - did the eraser come into view all at once?.....

Why or why not? .....

.....

My question about the earth.....

CHAPTER **6**

DAY AND NIGHT

The spinning earth

1 a. On which continent is it daytime in the second picture? .....

Do you see this continent in the first picture?.....

If not, where would this continent be in that picture?.....

In each picture, do you see all parts of the earth which have daytime?.....

.....

c. I pretended to be the earth and ..... pretended to be the sun.

What did you call out when you were facing your friend? .....

2. From sunrise to sunset

a. My map

b. Stand facing north, looking straight ahead.

Which direction (to your right or to your left) is east?

.....

Which direction is west? .....

Look carefully at the shadow of this child on page 80 of your TextBook and make a guess - where is the sun?.....

(Eastern or western half of the sky? High or low?)

Guess what time it is. .....

Stand facing south, looking straight ahead.

Which direction (to your right or to your left) is east?.....

Which direction is west?.....

c. Complete this paragraph:

As the earth rotates, the sun comes into view on the horizon in the east (it rises); then we see it higher and higher above the horizon in the eastern half of the sky. Then, after .....(what time?) it is in the western half of the sky. Then it is seen .....(higher or lower?) in the western sky until it goes out of our view in the west (it sets).

Think! Think!

In which direction does the earth rotate? East to west, or west to east?

As seen from the top, did you have to spin the globe clockwise or anti-clockwise? .....

Show this direction by drawing an arrow on this globe.

After a few days...

3. Watching the moon and stars

a. The moon

Date:

Where I was standing .....

How I marked the spot where I was standing.....

The phase of the moon .....

The direction I was facing .....

East is to my .....(left or right)

Mark east and west in the drawing.

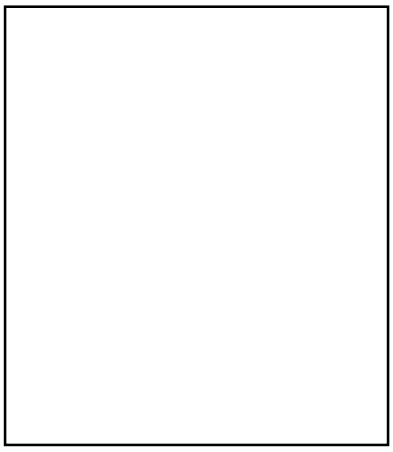
The time at which I saw the moon

.....

How high was the moon? Show it in the drawing.

Was the moon in the eastern or

western half of the sky? .....



1 or 2 hours later:

Time .....

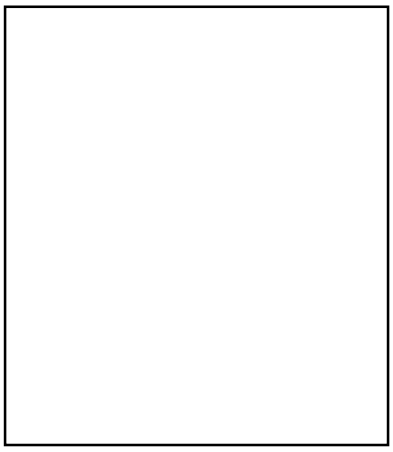
Was the moon in the eastern or

western half of the sky? .....

How high was the moon? Show it in the drawing.

Was it higher in the sky or lower?

.....



How did the moon's direction change - towards the east or west?.....

After a few days...

Date:

Where I was standing .....

How I marked the spot where I was standing.....

The phase of the moon .....

The direction I was facing .....

East is to my .....(left or right)

Mark east and west in the drawing.

The time at which I saw the moon

.....

How high was the moon? Show it in the drawing.

Was the moon in the eastern or

western half of the sky? .....

1 or 2 hours later:

Time .....

Was the moon in the eastern or

western half of the sky? .....

How high was the moon? Show it in the drawing.

Was it higher in the sky or lower?

.....

How did the moon's direction change - towards the east or west?.....

After a few days...

Date:

Where I was standing .....

How I marked the spot where I was standing.....

The phase of the moon .....

The direction I was facing .....

East is to my .....(left or right)

Mark east and west in the drawing.

The time at which I saw the moon

.....

How high was the moon? Show it in the drawing.

Was the moon in the eastern or

western half of the sky? .....

1 or 2 hours later:

Time .....

Was the moon in the eastern or

western half of the sky? .....

How high was the moon? Show it in the drawing.

Was it higher in the sky or lower?

.....

How did the moon's direction change - towards the east or west?.....

b. The stars

Date:

Soon after dark.

Time .....

Where I was standing .....

The direction I was facing .....

The constellation I saw .....

In which part of the sky you see it - in the east, west, north or south? Or between any two of these directions - SE, SW, etc? .....

Was the constellation in the eastern or western half of the sky? .....

1 or 2 hours later:

Time .....

Was the constellation in the eastern or western half of the sky? .....

In which part of the sky you see it - in the east, west, north or south? Or between any two of these directions - SE, SW, etc? .....

How did its direction change - towards the east or west?.....

Was it higher in the sky or lower?.....

Did you notice anything else which was different about the constellation?

.....

.....

Next day show your teacher how you were standing - facing which direction - and where the constellation was the first and the second time you saw it.

Some constellations I can recognise in the sky.

Name of the constellations	Dates on which I saw it
.....	.....
.....	.....
.....	.....
.....	.....

c. Does the star you pick appear and disappear from view as you turn?.....

Look at some other stars too as you turn.

Are some of them in the same part of your 'sky' as the sun?.....

Are you able to see the sun and the stars at the same time?.....

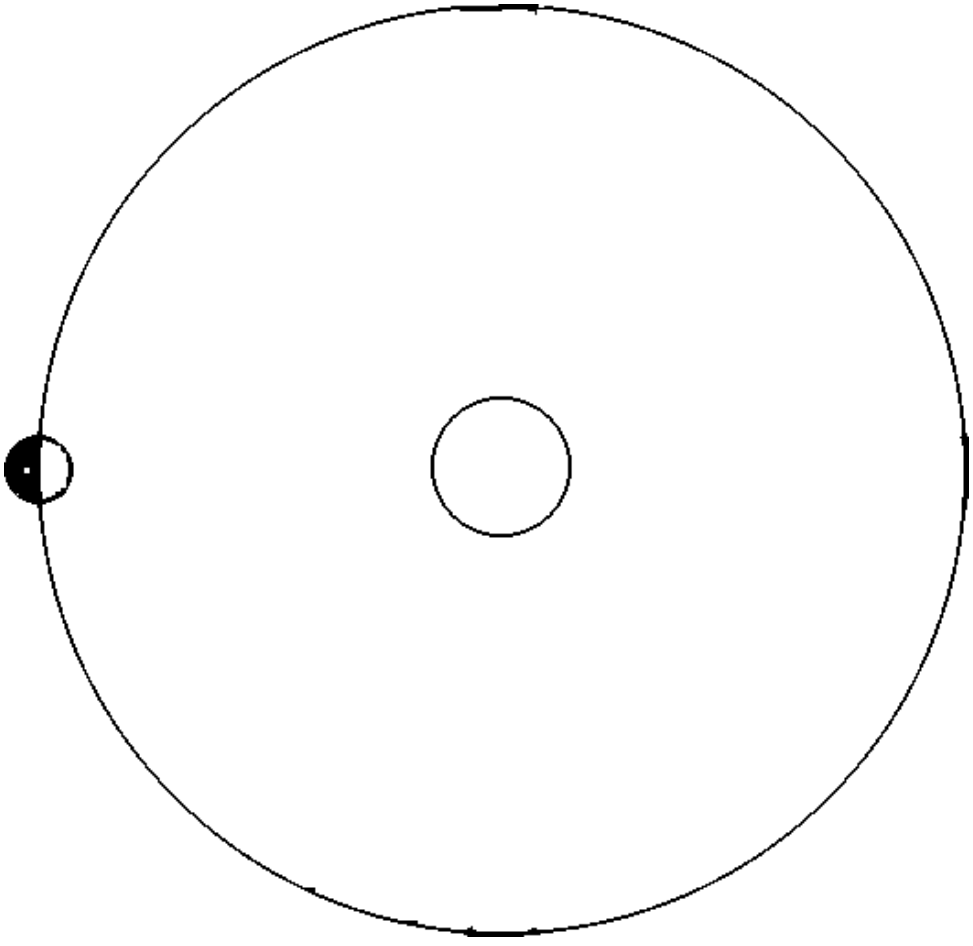
Think! Think!

Why don't you see stars in the daytime? .....

The revolving earth

4. The earth goes around the sun

The earth completes ..... rotations while it revolves around the sun once.



Show in this drawing where the earth would be 3 months, 6 months, and a year later.

EXERCISES

Interesting questions

1. Name some things you see in the sky, other than the moon, sun and stars, which appear to rise and set.....

.....

2. Why is it hotter during the day than it is at night?

.....

.....

.....

.....

3. Where do you have to hold the torch to make the shadow the shortest?

.....

4. Suppose the sun is at the zenith. If you fix a stick upright, in which direction will its shadow be?.....

How long will the shadow be?

.....

5. Does the moon ever rise in the west? Explain your answer.

.....

.....

6. Answer the following questions with the help of a globe:

a. Akash sees the sun rising in Kolkata. He telephones Vasundhara who lives in Mumbai. "Hello Vasundhara, guess what ! I am watching the sun rise - look out of your window - can you see it too?"

Which of the following do you think Vasundhara says to Akash?

i) "It is still dark here, the sun will rise after some time"

ii) "Akash, the sun is already quite high"

iii) "Oh yes, I see it too - thanks for calling me."

Why do you think so?.....

.....

.....

b. A cricket match in South Africa starts at 9:30 in the morning. When you watch it live on TV from India, what time would it be here - earlier or later than 9:30?.....

c. Suppose it is 7 am in India, and Apu and Mini are just waking up. For the following children, guess what time it would be in their countries - much earlier or later than 7 am? Or a little earlier or later then 7 am? What time of day or night would that be?

Then guess what these children would be doing at that moment - match them with the activities on the right as shown:

i. Hakim and Arida in Senegal (NW Africa)	waking up
ii. Akihiro and Keiko in Japan	sleeping
iii. Gonzalo and Maria in Chile	in the classroom
iv. Emil and Eva in Sweden	having dinner
v. Mini and Apu in India	

Classroom discussion

Do stars rise and set? Do they appear to move from east to west?

Do they disappear below the horizon in the west like the sun does?

.....

.....

.....

.....

Figure it out

Is the sun overhead at noon everyday? How will you find out, without looking directly at the sun?

,.....

,.....

,.....

,.....

,.....

Try your ideas. You may want to make something to try to answer this question. What materials do you need for this?

What I tried.....

,.....

,.....

,.....

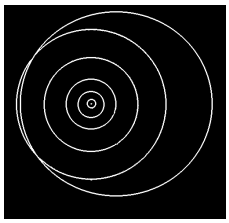
,.....

,.....

,.....

,.....

Was the sun overhead at noon ?.....



CHAPTER **7**

EARTH'S NEIGHBOURS

Earth's nearest neighbour

1. The Moon

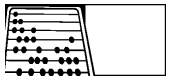
a. .....acted as the earth.

.....acted as the moon.

.....acted as the sun.

Make a drawing of the earth and moon. Draw the orbit of the moon. You need not show the continents on the earth. In your drawing the size of the moon should be correct compared to the earth.

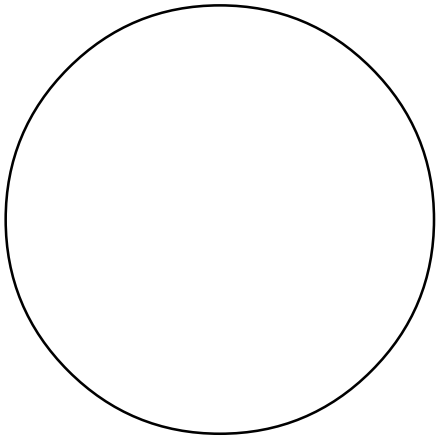
In your drawing, if you show the correct distance, will it fit on this page?.....



If not, how big a sheet would you need to fit the drawing on it?.....

b. I saw the moon on..... . Was it a full moon? .....

Show here the dark areas of the moon as you saw them.



What do you see in the close-up photograph of the moon? Describe the moon's surface.

.....

.....

c. I made craters in the sand using.....

Do your craters look like the craters on the moon?.....

.....

Our other neighbours

2. The planets

a. Name some planets you have seen.

planet.....

Description (faint or bright? How bright compared to some stars you know like the stars of the Great Bear or Sirius? What was its color? Twinkling or not?)

.....

.....

When did you see it? (time and date) .....

Where in the sky was it when you saw it? (near which constellation? Or in which direction, and how high in the sky?)

You may make a drawing of it as on page 82 of your TextBook.

.....

.....

.....

Think! Think!

Apu asked Mini mischievously - there is one planet you never see up in the sky, even with a telescope. Which one is it?

What do you think Mini's answer should be?.....

b. Can Pluto ever be closer to the sun than Neptune?

.....

c. Draw the orbits of the planets and Pluto to scale. You can draw all the orbits as circles.

	Distance from Sun Unit of Mercury-Sun distance	Distance in your model (cm)
Mercury	1	
Venus	1.9	
Earth	2.6	
Mars	3.9	
Jupiter	13.4	
Saturn	24.6	
Uranus	49.5	
Neptune	78	
Pluto	102	

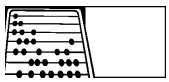
How many centimetres in your drawing will show the distance between Mercury and Sun?.....

Then how many centimetres will the distance between the sun and the other planets be? Write this in the table on the previous page.

Now draw the orbits.

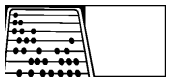
Think! Think!

What is the Earth - Sun distance in kilometres? Show your calculations below.



.....

Make a guess.
How far is the nearest star (other than the sun) in this model? .....



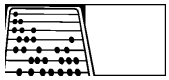
d. Did you see Venus in the morning or evening? In which direction?

.....

e. Make a model of the planets and Pluto.

Which of the scales on page 110 of your TextBook has markings like yours-

(I) or (II)?



Did you need to make any correction to measure the correct diameter?

If so, how did you make that correction - did you add or subtract the length of the blank strip to the reading on the scale?

.....

What did you use as a model for

Jupiter..... Saturn.....

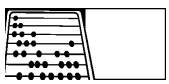
Mars ..... Earth .....

Venus..... Mercury .....

Uranus ..... Neptune .....

Pluto .....

If you measure distances in metres by counting steps, will your measurement be exact?.....



Why or why not?.....

.....

3. Other objects

Describe any meteors ('shooting stars') you have seen.

.....

.....

.....

EXERCISES

What is the same, what is different?

Give two similarities and two differences between

The earth and the moon

Similarities

i).....

ii).....

Differences

i).....

ii).....

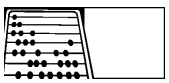
Interesting Questions:

1. Are there days and nights on other planets? .....

On the moon?.....

Why do you think so?.....

.....



2. Arrange from the nearest to the farthest (from the earth):

Moon, sun, clouds, Pole Star

.....

3. When you look at the moon (without a telescope), why don't you see the craters on it?

.....

.....

4. Why can we not see Uranus, Neptune, and Pluto without a telescope while we can see stars which are even farther away?

.....

.....

5. From the eight planets, choose some which have something in common. Guru's answer is given here as an example ,

The planets in your group	What they have in common
Venus and Mercury -	these planets do not have satellites.

.....

.....

.....

.....

6. Neptune is colder than Uranus, which is colder than Saturn, which is colder than Jupiter, which is colder than Mars. Why do you think it is so?

.....

.....

Talk and write

There is one planet about which nothing is written in section 2d. Which one is it? Write a few sentences about this planet.

.....

.....

.....

.....

.....

.....

Ask and find out

Watch for news reports of comets or meteor showers. Look for meteor showers at the predicted time. If there are any bright comets you learned about from news reports, look for them.

.....

.....

Play with words

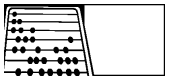
Make a sentence by writing words, each word starting with the letter as shown below.

M..... V..... E.....

M..... J..... S.....

U..... N.....

Figure it out



The orbits of Earth and Jupiter are shown on the next page .

The position of the earth in its orbit is marked. The distance between the sun and Earth is called 1 Astronomical Unit, or AU.

a. How many AU is Jupiter from the sun? .....

b. Where would Jupiter be in its orbit when it is closest to the earth? Mark this position in Jupiter's orbit.

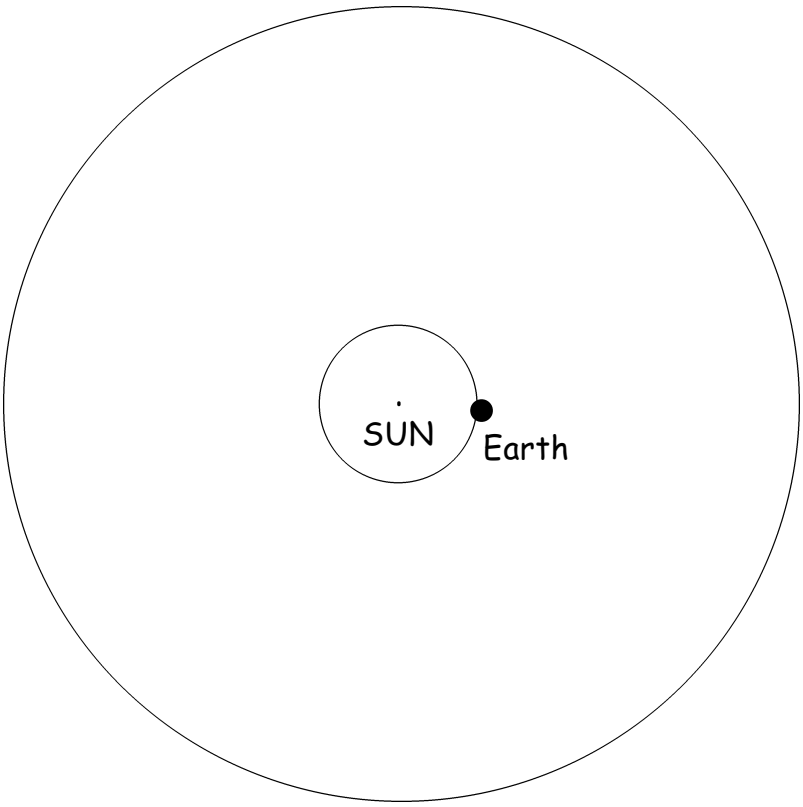
How far would it be from Earth then? (Give your answer in AU)

.....

c. For the earth in the same position, where would Jupiter have to be for it to be farthest from the earth? Mark this position in Jupiter's orbit.

How far would it be from Earth then? Show your calculations here.

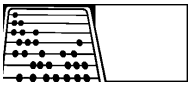
(Give your answer in AU) .....



UNIT 4

OUR BODIES

Assessment Sheet: Unit 4

Category	Score	Comments
Observation		.....
Understanding		.....
Oral Language (Talking)		.....
Written Language (Writing)		.....
Design and engineering Skills		.....
Mathematical Skills		.....

Enthusiasm in doing activities

.....

.....

Patience and concentration

.....

.....

Independent thinking creativity (☆)

.....

.....

Co-operation with other students

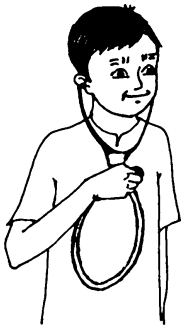
.....

.....

Completion of home assignments

.....

.....



CHAPTER **8**

WHAT IS IN OUR BODIES?

1. a. Your heart

Listen to your friend's heart.

How would you describe the sound?.....

My heart beat .....times in 15 seconds.

My heart beat .....times per minute. This is my heart rate.

After I ran, my heart beat .....times in 15 seconds.

My heart beat .....times per minute.

Think! Think!

On page 120 of your TextBook, whose left is shown - your left or the left side of the person who is facing you?

b. Draw the outline of the hand here. Then draw the veins you could see.

Whose hand is it?.....

Where else in the body could you see veins?

.....

How many heartbeats (lub dub) did you hear each time you felt a pulse?

.....

Think! Think!

Why are heart rates and pulse rates the same?

.....

.....

.....

2. Make a guess - how many cells are in your body?.....

b. When I breathed in, my chest measured .....(cm).

When I breathed out, my chest measured .....(cm).

Think! Think!

Do you think lungs are hollow like bags and balloons, or like sponges?

.....

Have you ever felt the lungs of any animal? What did they felt like?

.....

.....

Look at your drawing of the veins in the hand. On it draw arrows to show which way the blood flows in all the veins you have drawn.

Think! Think!

Look at the picture of the veins in the body on page 121 of your TextBook. Do you think blood from different parts of your body mixes as it enters the heart?

.....

Where does the blood go from the lungs?

.....

Think! Think!

Does a blood cell which was in some part of your body, for example, your eye, come always right back to the eye after it goes through the heart and lung?

.....

c. Draw the bag and tube.

In your drawing show the level of the liquid before you squeezed the bag.

Show the level of the liquid after you squeezed the bag.

Tell your class how this model is similar to the real heart, and how it is different from the real heart. Think of as many answers as you can.

Similarity.....

.....

Differences.....

.....

.....

.....

.....

Think! Think!

Would the blood from the lungs reach the cells in your head, ears, neck or shoulders if your heart did not pump it?.....

Would it reach your legs, stomach, intestines?.....

These parts do not have pumps - then how does the blood from these parts come back up to your heart?.....

.....

.....

.....

EXERCISES

Interesting questions:

1. Name some things blood carries (other than those given on pages 125-127 of your TextBook).....

.....

2. Which of these has blood richer in oxygen -

a. blood flowing from the heart to the toe or blood flowing from the toe to the heart?.....

b. blood flowing from the heart to the lungs or blood flowing from the lungs to the heart?.....

3. Why don't your nails bleed when you clip them?.....

.....

Why is there no blood when you cut your hair?.....

.....

4. Have you ever got scratches on your skin which did not bleed?.....

Does it mean there are no capillaries there?.....

What can you say about the cells you must have scraped off - are they alive or dead? .....

5. How do the cells which make up the heart, the arteries and veins get oxygen and nutrients ? .....

.....

6. Why do we breathe faster and deeper when we run? .....

.....

Why does our heart rate increase then?.....

.....

7. Jigar thinks that your heartbeat stops when you hold your breath. What do you think? How can you find out? Try your idea.....

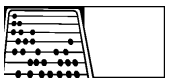
.....

.....

Classroom discussion

Wounds and deep cuts anywhere on your body bleed. Does this mean that blood does not flow in tubes, but fills all the cells and the space between the cells? Or does blood flow in tubes, but the capillaries very thin and there are many of them? Would some of them always get cut when you get hurt? Would blood then flow out of the wound? What do you think?

Figure it out



Recall you heart rate. Does the blood that fills the lower chambers of your heart stay there for more than 1 second or less than 1 second? .....

Act it out

Do this activity when you are having a bath. Fill your mouth with water, look up, then open your mouth and let the water flow out. Again fill your mouth with water, look up, and squeeze your cheeks with your hand. Was there anything different in the way the water came out?

.....

.....

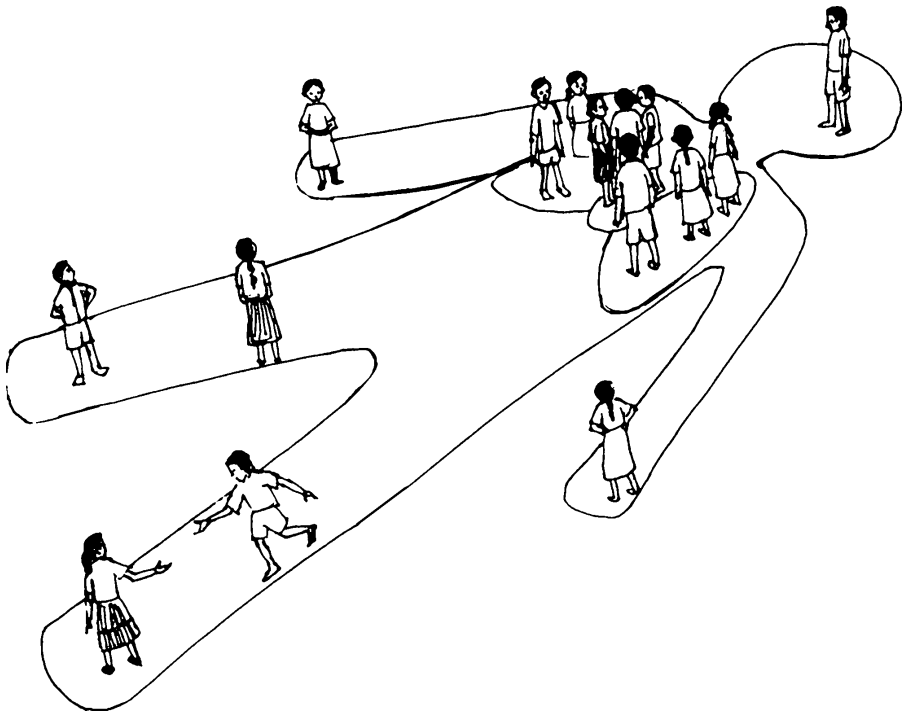
Play with words

Write a poem on heart

Play this game

What we used as oxygen .....

What we used as carbon dioxide.....



Ask a question

My question about the body:

.....

.....

CHAPTER **9**

STAYING HEALTHY

Eating well

1. a. Other cereals eaten in your area. What dishes are made from them?

1..... : ..... 2..... : .....

3..... : ..... 4..... : .....

Mark the ones you brought to class with a ✓.

Think! Think!

Why do you think the number of rice grains in 1 gram of rice is not exact?

.....

.....

	Water (grams)	Protein (grams)	Carbohydrates (grams)	Fat (grams)	Calcium (mg)	Iron (mg)
Bajra	12.4	11.6	67.5	5.0	42	8.0
Jowar	11.9	10.4	72.6	1.9	25	4.1
Ragi	13.1	7.3	72	1.3	344	3.0
Raw, milled rice	13.7	6.8	78.2	0.5	10	0.7
Parboiled milled rice	13.3	6.4	79	0.4	9	1.0
Wheat	12.8	11.8	71.2	1.5	41	5.3

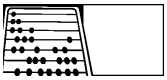
What makes up most of the weight of cereals?.....

Which of these cereals has the most iron?.....

Which has the least?.....

Which of these cereals has the most calcium?.....

Which has the least?.....



Which cereals have the most protein?.....

Which has the least?.....

Which cereal is the least nutritious?.....

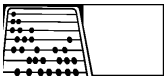
What cereals do you eat?.....

What is made from them?.....

Make a guess - how many grams of cereals do you eat at one meal?.....

Does cooked cereal weigh more or less than uncooked cereal? Why?

.....



.....

b. Name some dals.....

Pulses also have starch in them. How can you check if they do?

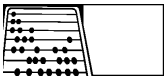
.....

Name some things made from milk.

.....

They are carried to the different cells of the body (how?).....

100 grams of mutton, with most of the fat removed, contains 74 grams of water, about 21 grams of protein and 4 grams of fat.



Other things make up the rest (how many grams)?.....

Other than water, what makes up most of the weight of meat?.....

Think! Think!

Do you think the muscles of our bodies are similar to the muscles of other animals? Do you think our muscles too are made up of a lot of protein?

.....

.....

How I know I have grown heavier and taller.....

Where did this extra weight come from? .....

Think! Think!

Are there parts of an adult's body which keep growing? Name them.

.....

What kinds of food do you and your family eat which contain proteins?

.....

What dishes do you eat made from leafy vegetables?

.....

Fermented food we eat .....

Sprouted cereals and pulses we eat.....

What cooking oil do you use at home? .....

Which of these has oil you can press out:

polished rice, groundnut, *til*, potato, *moong dal*, clove.

.....

Does milk contain fat? How did you find out?

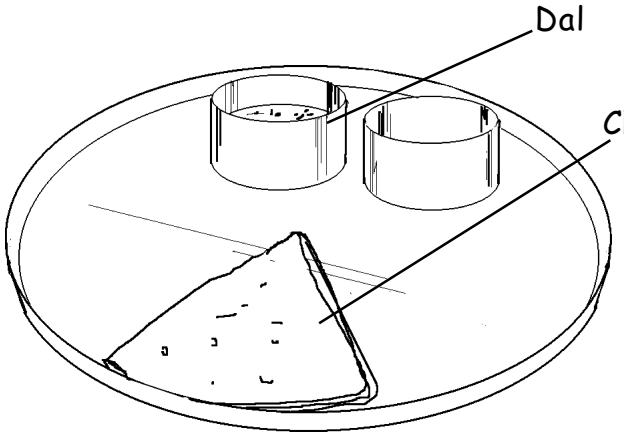
.....

.....

In each plate here, some dishes have been served.

Add one or two dishes to the plate to make the meal complete.

What dishes would you add to this plate?



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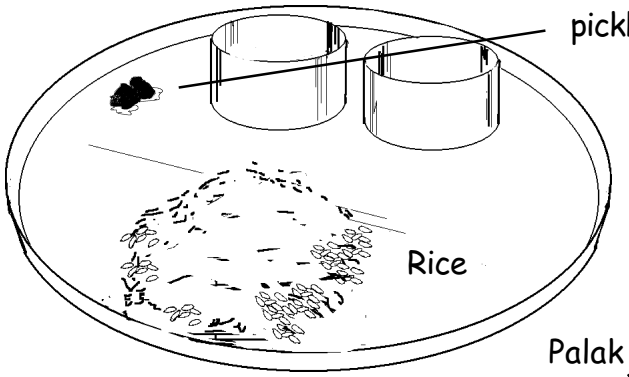
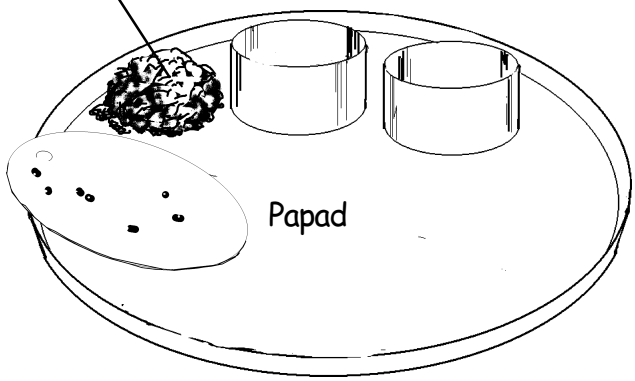
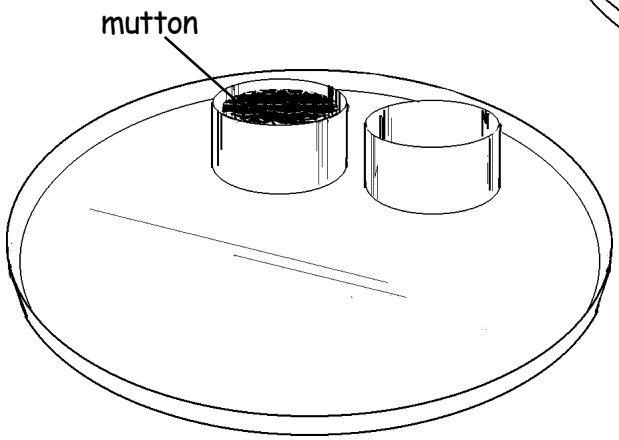
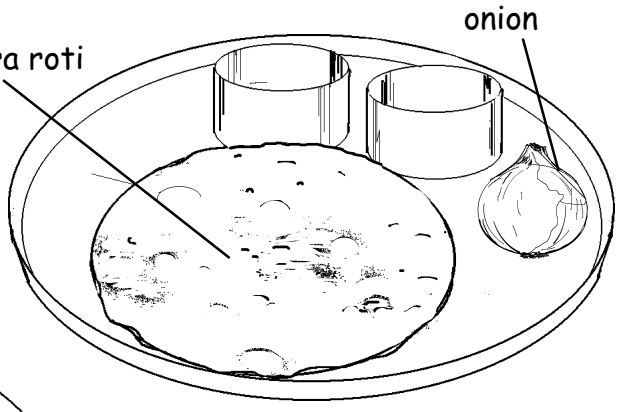
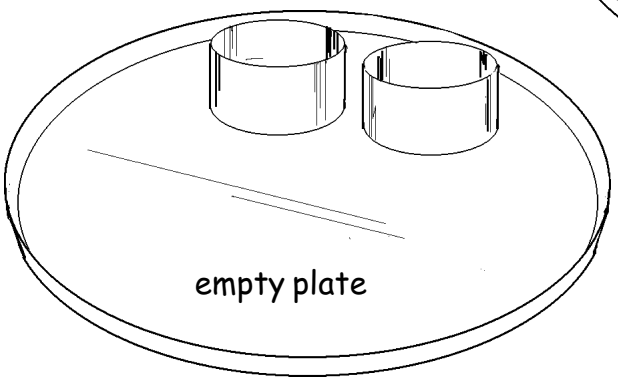

pickle
Rice


Palak sabji
Papad


mutton


Bajra roti
onion


empty plate

2. Getting Sick

When did you fall ill? .....

How did you know you were ill? .....

Describe some things which you experienced because of the illness - fever, vomiting, pain or anything else? .....

Did you go to a doctor?.....

Did you find out what had made you ill?.....

Is there anything else you want to say about the experience?.....

.....

Did others in your family fall sick around the same time?.....

Did they have the same illness? .....

Who got sick first? .....

b. Did you ever catch a cold or flu when everyone in class had it too? Why do you think many people got sick one after another?

.....

.....

c. Date on which the report was in the newspaper. .....

Name of the disease. .....

Where was the outbreak? .....

Does this happen every year? .....

Does this happen in the same season every year? .....

If so, in which season? .....

Think! Think!

From where do these microbes get into the air, water and food? How do they get into the air? How do they get into your food and water?

.....

.....

Think of two things people who have TB, cold and flu can do to prevent the microbes from getting into the air. .....

.....

b. i) How did the water look after one person dipped his hand in it?

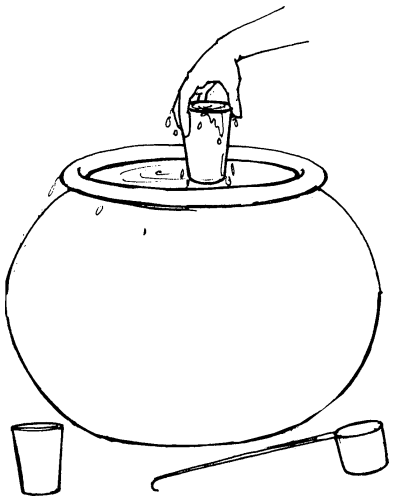
.....

After how many people dipped their hands did it look dirty? .....

Would you drink this water?.....

Would you have drunk this water after the first time a hand was dipped in it?.....

Do you think everyone's hands really were clean? .....



What would you choose to take water from the pot - the glass or the dipper? Why?

.....

.....

.....

.....

.....

.....

ii) Can the microbes enter into the groundwater also?.....

Think of some ways how can the microbes causing red eye spread by touch.

.....

How can the eggs get from the stools into someone's food?

.....

.....

Have you or anyone in your family ever had worms? How did you (or they) know you (or they) had worms? Did you get help from a doctor?

.....

.....

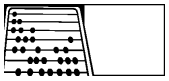
EXERCISES

Interesting questions

1. Name 5 leafy vegetables available in your area. You can write their names in any language. Circle the ones you like the most. How often do you eat it?

.....

.....



2. If you eat 50 g of leafy vegetables a day, you'll get enough vitamin **A.**
How many grams does a bunch of palak or any other leafy vegetable weigh?
How many people can share this bunch so each person can have at least 50 g?

.....

3. This table shows the amount of vitamins in 100 g of apple, 100 g of banana and 100 g of guava.

Vitamin	A	B1	B2	B3	C
Apple	0	_	_	0	1
Banana	78	0.05	0.08	0.5	7
Guava	0	0.03	0.03	0.4	212

Which of these grows near your city or town? Which one is cheaper? Which one would you buy? Why?

.....

.....

4. .....had to take vitamin.....tablets (or tonic). How much of these was in each dose?.....

5. Does everyone in your family eat together? .....
If not, who eats last? .....
Do you think this person (or persons) gets enough food?.....
What can be done so everyone gets a fair share?

.....

.....

6. Name a plant or plants you can grow for fruits or vegetables. These plants should need only a small place, be easy to grow and give enough fruits or vegetables for your family for at least one meal at a time.

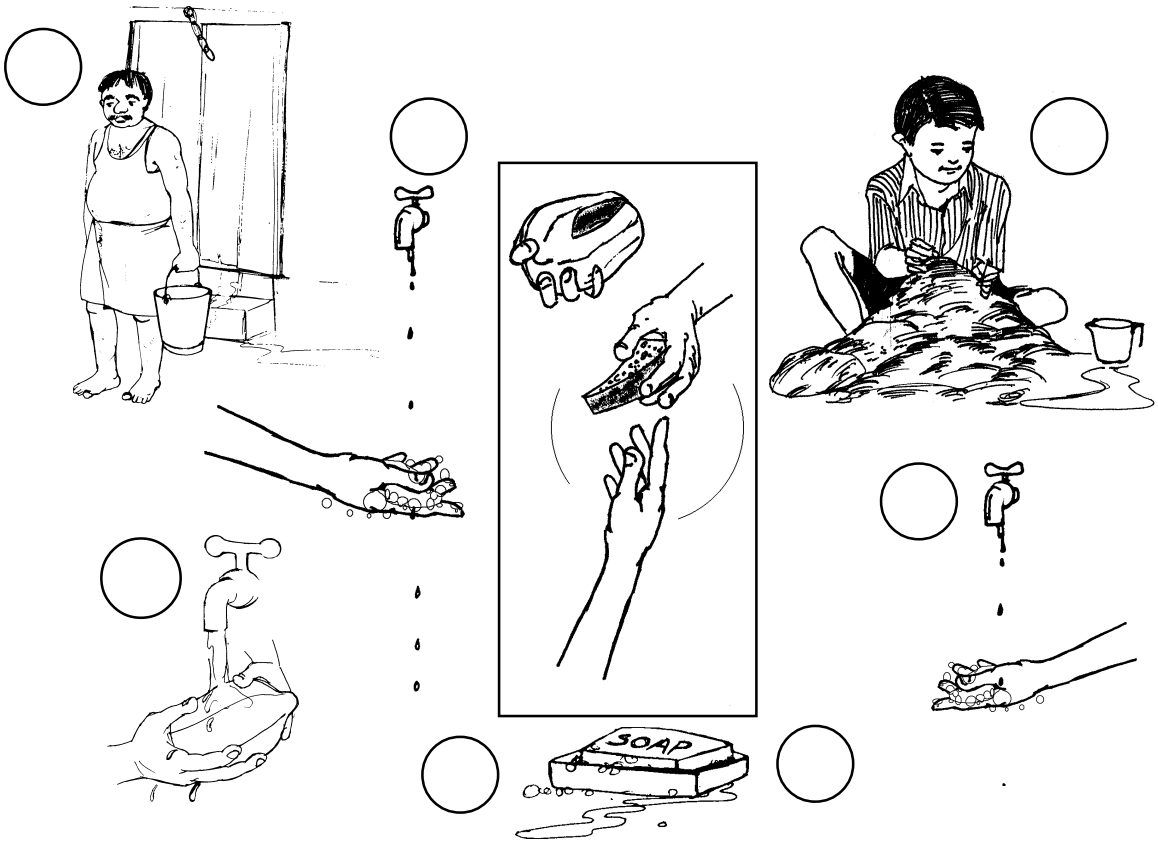
.....

.....

7. a) Point out in which of these cases we should wash our hands before eating or handling food. Why?

After a trip to the toilet; after travel in crowded buses; after sneezing or coughing into your hands; after playing; after returning from school.

b) The drawings below show a man who has just returned from the toilet, and who later shares a papaya with the boy. But there are things he should do before he cuts the papaya. Number them in the correct order. Write your number in the circle next to each drawing. There are things the boy should do before he takes the papaya. In the same way, number them in order too.



8. Name some things sold outside your school which you or your friends buy and eat. Circle the ones you think are good for you.

.....

.....

Do you think they are clean? Why or why not?

.....

.....

If you buy fruits, do you wash them before you eat them? .....

9. Think of a guava growing on a tree in a field. Think of all the steps in its journey to the market and finally to your hand when you buy it. How can this guava get germs on it? Explain to your friend why he or she should wash the guava well before eating it.

.....

.....

.....

.....

10. Name some places or things which attract flies. What can you do to keep flies away from your area?.....

.....

11. Did you or anyone you know had to get blood or stool tested? Why was this test needed?.....

.....

12. Circle the diseases which spread from one person to another:
diabetes, heart disease, anaemia, cataract, polio, hepatitis, flu, cold, cancer.

13. Suppose someone in your house has a cold. How can you catch it? What can they do to prevent it from spreading to others in the family?

.....

.....

14. Is it true that if even one child has polio, others can get it? Why?

.....

.....

15. Did your parents or grandparents get smallpox vaccinations? Why do you think no one needs to get smallpox vaccinations now?

.....

.....

Ask and find out

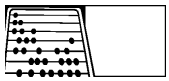
1. Something other than vitamins and minerals which we take and which is measured in mg.... but which has a very strong effect on our bodies!.....

2. Was the cereal eaten in your family or your area different when your parents were little? Which cereal was eaten then? .....

What was made from it? .....

Why did they start eating a different cereal? Which of these cereals is better for you?.....

Figure it out



Find out the price of things given in the list below. Be sure to write it as Rs __ per kg or per bunch etc.

Now suppose you have only Rs. 40 with you. You have to buy a day's food for a small family. You need to buy at aleast

1 kg of cereals

300 grams of dal or other sources of protein

120 grams of fat

1 kg or 2-4 bunches of vegetables

As many fruits as you can buy.

Try to buy things which are rich in minerals and vitamins.

	Price		Price		Price
wheat	.....	*bombil*	.....	cabbage	.....
bajra	.....	pomfret	.....	brinjal	.....
rice	.....	prawn	.....	tomatoes	.....
ragi	.....	egg	.....	carrot	.....
parboiled rice	.....	potatoes	.....	lemon	.....
sprouts	.....	*methi*	.....	grapes	.....
groundnuts	.....	*palak*	.....	guavas	.....
tur dal	.....	radish	.....	orange	.....
rajma	.....	*chaulai*	.....	papaya	.....
beef	.....	green peas	.....	banana	.....
mutton	.....	*dudhi*	.....	apples	.....
chicken	.....	pumpkin	.....	.....	.....
bangra	.....	green beans	.....	.....	.....
cold drinks	.....	potato chips	.....	.....	.....
ice cream	.....	ghee	.....	.....	.....
milk	.....	oil	.....	.....	.....

Classroom discussion

Your teacher will write on the board the things that some of you planned to buy. Is there anything missing in their list? Could they have chosen something even better? What?

.....

.....

Show and tell

1. What I brought.....

.....

2. What I brought.....

.....

What dish is made from it. .....

Play with words

a) Use some of these words to describe each of the food items below: crisp, crunchy, tangy, chewy, light, fluffy, soft, tasty, slurpy, creamy. You may use other words if you like.

1. sprouts.....

2. *rotis*.....

3. *idli* .....

4. mango.....

5. dried and roasted *chana*.....

6. groundnuts.....

7. orange .....

8. cucumber.....

9. curd (*dahi*).....

And three of your favourite foods:

10. .....

11. .....

12. .....

b) Read the story and tell your teacher which one you would rather buy - orange or ice candy.

Suppose there is a fair at the school and you and your friend have to manage stalls selling different foods.

i) Your friend has soft drinks to sell, you have tender coconut water. How will you convince people to buy the tender coconut instead of soft drinks?

ii) Suppose he has chocolates to sell, and you have oranges.

How will you convince people to buy oranges instead of chocolates?

You do not have to write a story.

Recall and write

Did you or anyone you know ever have a scratch, wound or a fracture? How long did it take for the wound to heal? Where did this new skin and muscle come from?

.....

.....

.....

.....

.....

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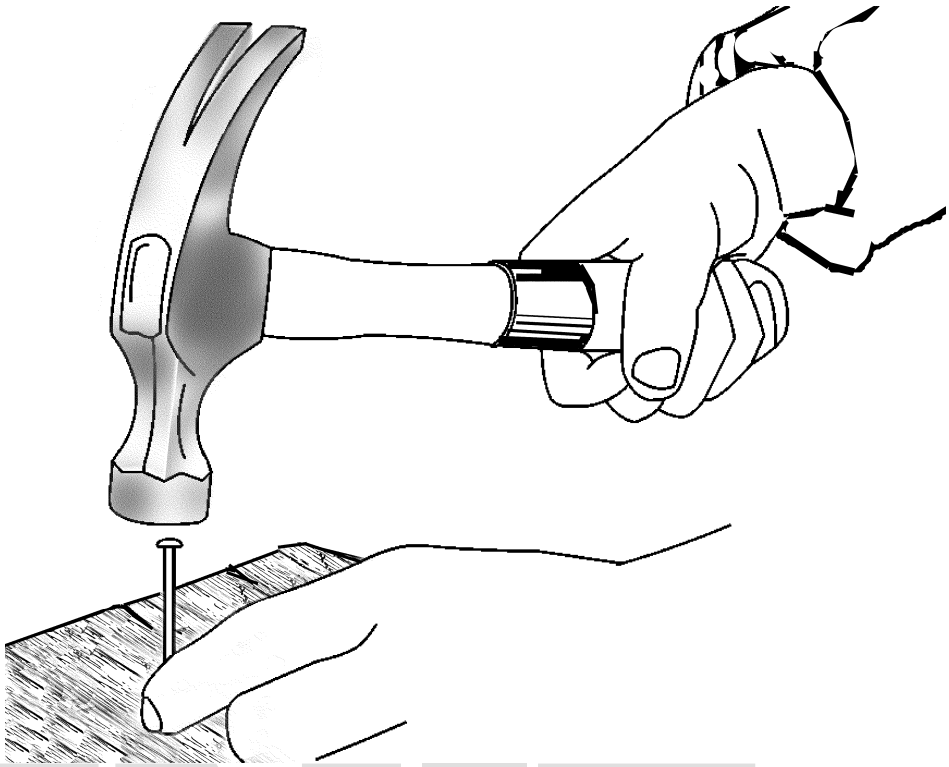
.....

.....

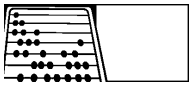
.....



UNIT 5

MATERIALS

Assessment Sheet: Unit 5

Category	Score	Comments
Observation		.....
Understanding		.....
Oral Language (Talking)		.....
Written Language (Writing)		.....
Design and engineering Skills		.....
Mathematical Skills		.....

Enthusiasm in doing activities

.....

.....

Patience and concentration

.....

.....

Independent thinking and creativity (☆)

.....

.....

Co-operation with other students

.....

.....

Completion of home assignments

.....

.....

CHAPTER **10**

THE THINGS WE USE

1. a. I chose .....

Its parts are .....

For each part, complete the following:

..... is made of ..... It can also be made of.....

..... is made of ..... It can also be made of.....

..... is made of ..... It can also be made of.....

..... is made of ..... It can also be made of.....

..... is made of ..... It can also be made of.....

b. Choose 3 things from this list:

broom, pencil, umbrella, spectacle lenses, towel, road surface, bat, chair, bell, shoes/slippers, plate

For each thing, write down which of the following materials it **cannot** be made of? Why?

list of materials: paper, clay, wool, gold, wood, plastic, wax, leather, glass, cotton, rubber

1..... cannot be made of.....because

.....

2..... cannot be made of.....because

.....

3..... cannot be made of.....because

.....

c. Think of everything you do and use from the time you wake up to the time you return from the picnic. Write what these things are made of.

What different things did (or would) you use all day? .....

.....

.....

What did (or would) you use to pack food and drinks? .....

.....

What did (or would) you use to eat and drink from?.....

.....

What did (or would) you do with the leftovers and with the used containers, plates and glasses, and things like wrappers and packets?

.....

.....

If you throw them away, what happens to them after you throw them in the garbage?

.....

Which ones will decompose without adding harmful things to our soil and water?

.....

Which ones will not decompose?

.....

Does anyone collect them from the garbage?.....

Guess what they do with them.....

Suppose you didn't throw all kinds of waste in the same bin. Will it be easier for the people who collect some of them? .....

How? .....

.....

d. I made my leaf cup from the leaf of.....

Was the leaf soft or stiff, thin or thick?.....

Write down how to make a leaf cup.

.....

.....

.....

.....

.....

.....

What kind of leaves are easy to work with?.....

.....

What kind are difficult to make into cups?.....

.....

Can you use leaves of banana or canna? Try it. Write down whether it worked, and why if it didn't.

.....

.....

.....

2. **From materials to a final product**

b. A picture story of how to make a spoon from a coconut shell.

3. Solids, liquids, gases

Of the stones, fine sand, water and water vapour which ones take up the shape of the glass?.....

Which of them can you make into a heap?.....

Which ones can you never make into a heap?.....

Which can flow?.....

Which one expands to fill all the space it can get?.....

Which of these can you hold between two fingers? .....

Which of these can you turn as shown in the picture shown on page 159 of your TextBook?.....

EXERCISES

Interesting questions

1. a) Name some things which you have seen sometimes as a solid and sometimes as a liquid.....

.....

b) Are they liquids when they are warmer or colder? How do you know?

.....

2. Which of them have you seen disappear into vapour?.....

.....

Did any of them turn from a solid directly to vapour? .....

.....

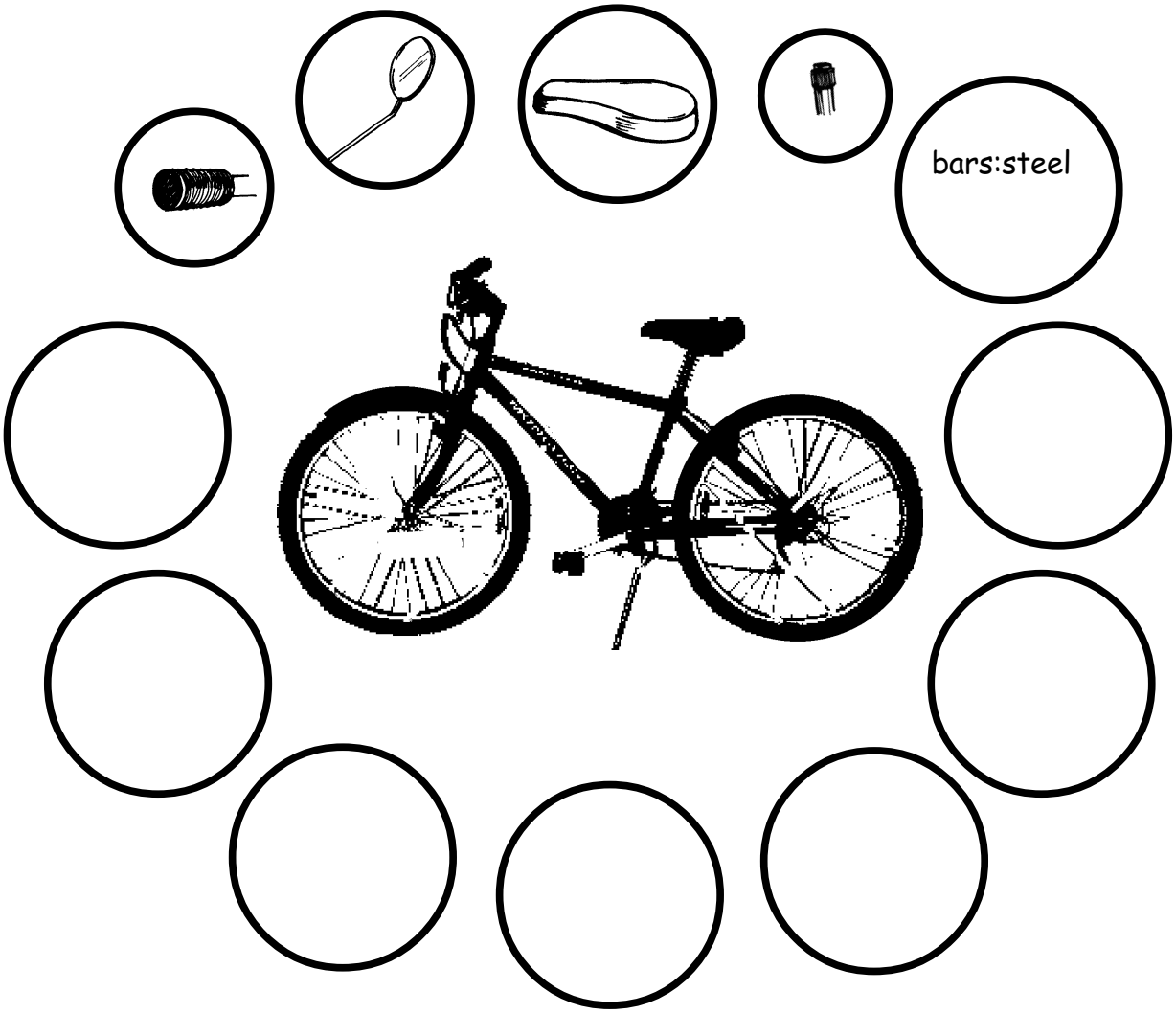
3. Name some old or used things you give to someone who collects them for recycling .....

.....

4. When your parents or grandparents were little, in what did they pack their food when they went on picnics or travelled? .....

.....

5. Look at the different parts of a bicycle and write down what they are made of. Tell your teacher why you think that material is used for that part. Look at some bicycle parts which are made of metal. Is the same metal used for all these parts?



Here is more space if you need it.

.....

.....

6. Circle the places where you should throw trash.

a. In *nallahs,* through the window from buses and trains, on the streets, in garbage bins, on lawns, on playgrounds, over compound walls.

b. If you do not find garbage bins when you have trash to throw, what will

you do?.....

.....

7. Thin polythene bags are used for shopping even though they are not bio-degradable, are used only once and thrown. In the garbage cows swallow them by mistake and get sick or die. Sometimes people throw them in water, where they harm fish and other creatures. They also clog drains in cities and towns. They make a mess everywhere!

a) Does anyone in your house use polythene bags? .....

b) What do they use them for? How often do they use them?

.....

.....

c) These polythene bags came into use about 15 years ago. What did people use before that? .....

.....

d) If we had to stop using them, what can we use instead?

.....

.....

Ask and find out

Some things now made of plastic	They used to be made of
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

What happens to the old newspaper that get collected by the '*raddiwala*'?

.....

.....

.....

Play with words

1. 3 things which are soft .....

3 things which are hard .....

3 things which are smooth .....

3 things which are rough .....

3 things which absorb water .....

3 things which dissolve in water.....

2. .....are made into a pulp.

..... are gritty.

.....can be crumpled.

.....can crumble.

3. .....can be twisted,.....cannot.

.....can bend,.....cannot.

.....can be folded,.....cannot.

Classroom discussion

1. Is sand soft or hard?

2. Did you ever see anyone collecting garbage from garbage bins? .....

Some things in the bin which makes it smelly.....

Do you think it would help to have separate bins for dry waste and bio-degradable waste? How?

.....

.....

How does the garbage from your house go to the garbage bin on the streets, and where does it go from there? .....

.....

What can be done with bio-degradable waste?

.....

.....

.....

OUTLINE OF SMALL SCIENCE

CLASS 3

Unit 1: The Living World

- Chapter 1. So many living things!
- Chapter 2. Looking at plants
- Chapter 3. Grow your own plant
- Chapter 4. Looking at animals

Unit 2: Our Bodies, Our Food

- Chapter 5. Our Bodies
- Chapter 6. Our Food
- Chapter 7. Our Teeth
- Chapter 8. Taking care of our body

Unit 3: Measurement

- Chapter 9. How many, how much?
- Chapter 10. How long, how high, how far?

Unit 4: Making Houses

- Chapter 11. Houses of all kinds
- Chapter 12. Make your own house

CLASS 4

Unit 1: Sky and Weather

- Chapter 1. Sun, wind, clouds and rain
- Chapter 2. Day sky, night sky

Unit 2: Air

- Chapter 3. Fun with air!
- Chapter 4. What's in the air?

Unit 3: Water

- Chapter 5. Fun with water!
- Chapter 6. Water and life
- Chapter 7. Water and us

Unit 4: Food

Chapter 8. Where our food comes from

Chapter 9. Food in our bodies

Chapter 10. What is thrown out

CLASS 5

Unit 1: The Web of Life

Chapter 1. Living together

Chapter 2. Soil

Unit 2: Moving Things

Chapter 3. How things move

Chapter 4. Making a cart

Unit 3: Earth and its Neighbours

Chapter 5. Our earth

Chapter 6. Day and night

Chapter 7. Earth's neighbours

Unit 4: Our Bodies

Chapter 8. What is in our bodies

Chapter 9. Staying healthy

Unit 5: Materials

Chapter 10. The things we use

Note: The topics begin with everyday experiences and immediate surroundings in Class 3, moving gradually outwards. Classes 4 and 5 make increasing use of measurement concepts.

FEEDBACK TO AUTHORS
(Small Science)

Name:.....Profession.....Relationship to pupil.....

School/Institution: .....

I have read the books partially ☐ completely ☐ tried the books with childred. ☐

1. Activities which are easy:.....

.....

2. Activities which are difficult:.....

.....

Why? (time limitation, material not available, any other):.....

.....

3. Class strength:.....

4. Number of children in this curriculum with overall grade of:

Excellent: Good: Fair: Other:

Which of the units/chapters/activities were able to hold the children's interest/attention/enthusiasm all through?

.....

.....

Which didn't?

.....

.....

How can they be changed to make them interesting?

.....

.....

5. How much did you depend on the teacher's book throughout the year?

☐ totally ☐ partially ☐ not at all

6. Give some examples of childres's questions:.....

.....

.....

7. Some examples of children's observations (apart from the specific ones they were asked to make in the book) :.....

.....

.....

Were the children able to use the work book on their own? If not how much help/guidance was required from the teacher?.....

.....

.....

8. Any other comments on

a. The TextBook:.....

b. The WorkBook:.....

c. The Teacher's Book:.....

9. Which other textbooks for Class 5 have you used?.....

.....

10. How do these books compare with them?.....

.....

.....

.....

(Signature and Date)

Please mail to:
Homi Bhabha Centre for Science Education,
V.N. Purav Marg,
Mankhurd,
Mumbai 400088.

Mark the envelope 'Small Science Class 5'.