Unit 4

PLANTS

Look at these lotus plants. How do they reproduce in the pond?

Look at the dandelion seeds too. Why do the dandelion seeds fly when the wind blows?

How do plants maintain their species?

PROTECTION FROM ENEMIES

Plants have various specific characteristics to protect themselves from the enemies to ensure the survival of their species.

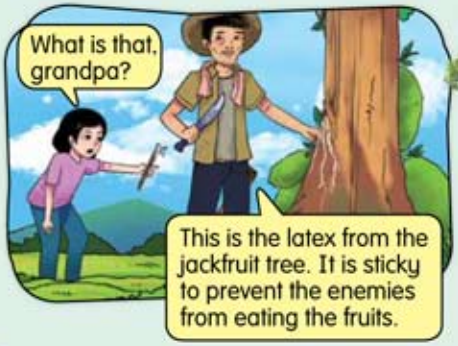
How do these specific characteristics allow plants to protect themselves from the enemies?

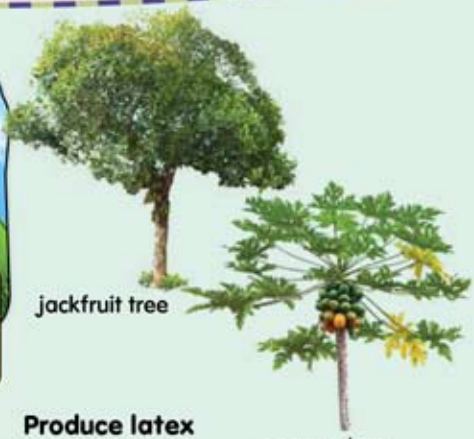
Let us observe the situation of Melia and her sister at their grandfather's orchard.

durian

pineapple

Sharp thorns





jackfruit tree

papaya tree

Produce latex

bamboo plant

pumpkin plant

Fine hairs

allamanda plant

pong pong tree

Poisonous

citronella plant

lantana plant

Bad smell

Sharp thorns, **produce latex, fine hairs**, **poisonous**, and **bad smell** are the specific characteristics of plants that can protect them from the enemies. These ensure the survival of the plant species.

rafflesia

SCIENCE INFO

Citronella plants are also known as mosquito repellent plants. These plants are usually planted around the house. The leaves release a smell that mosquitoes dislike.

citronella plant

FUN ACTIVITY

PLANT SHIELDS

21ST Century Learning

GROUP ACTIVITY

APPARATUS AND MATERIALS

Pencils, containers, 25 picture cards of plants with various specific characteristics, and adhesive notes.

STEPS

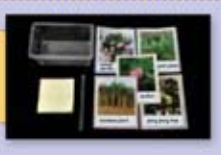
1. Move to each station in groups.

2. At the first station, observe the pictures and identify the specific characteristics of the plants that are used to protect them from the enemies.
3. Write the identified specific characteristics on adhesive notes and place them in the container.
4. Repeat steps 1 and 3 at each station.
5. After completing the task at all stations, the group representative will take a container from one station.
6. Discuss the answers in the container.
7. Construct a mind map based on the result of the discussion.

(a) How do the specific characteristics of the plants in the pictures protect the plants from enemies?
(b) Give some examples of other plants with similar specific characteristics with the ones you have identified.

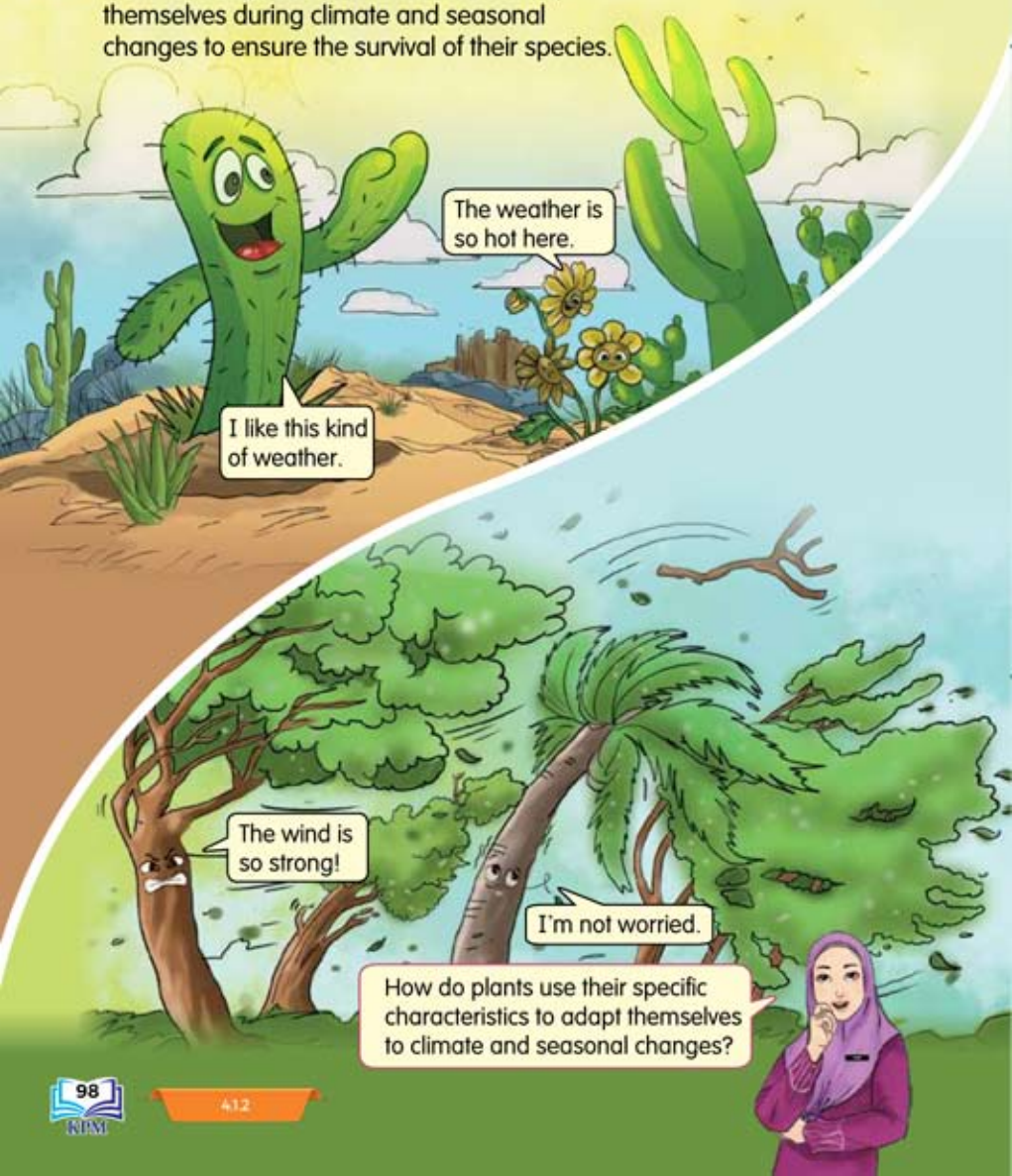
TEACHER'S NOTES

Prepare 25 photos of plants with different specific characteristics. Place the apparatus and materials at each station.



ADAPTING TO CLIMATE AND SEASONAL CHANGES

Plants have specific characteristics to adapt themselves during climate and seasonal changes to ensure the survival of their species.



Let us understand the following specific characteristics of plants to adapt to climate and seasonal changes.

STRONG SEASONAL WIND

I'm a coconut tree. I have a **flexible trunk** and **split leaves** that can reduce the force of strong winds.

coconut tree

I'm a casuarina tree. My tree **trunk and branches are flexible** and I have **needle-shaped leaves** that can reduce the force of strong winds.

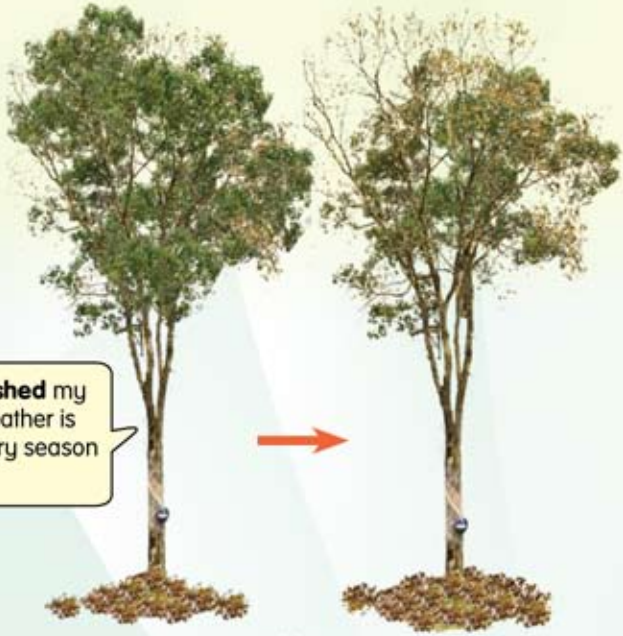
casuarina tree

HOT CLIMATE AND DRY SEASON

I'm a cactus plant. I can survive in a hot climate and during the dry season. My **leaves are modified as spikes** to prevent water loss. My **stem** can **store water** and my **long roots** can absorb water deep in the soil.

cactus plant


I'm a tomato plant. My stem and leaves are covered with **fine hairs** to prevent water loss when the weather is hot.
tomato plant
I'm a turmeric plant. I can **roll my leaves** when the weather is hot to prevent water loss.
turmeric plant
I'm a yam plant. I have **waxy leaves** to avoid excessive water loss when the weather is hot.
yam plant



I'm a rubber tree. I **shed** my **leaves** when the weather is hot and during the dry season to avoid water loss.

rubber tree

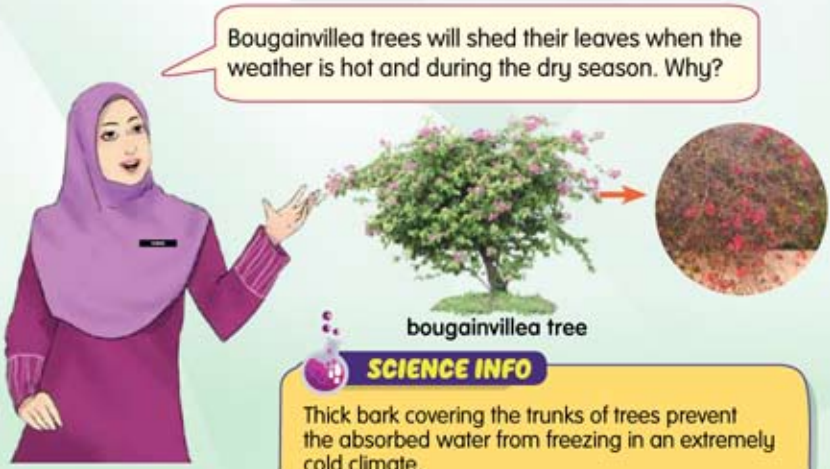
COLD CLIMATE

I'm a maple tree. I have **thick bark** covering my trunk to protect myself from the cold climate.

maple tree

Pine trees have specific characteristics to survive during strong seasonal wind and during hot and cold weather. Based on the specific characteristics mentioned, how do pine trees adapt themselves to climate and seasonal changes?

Flexible trunks, split leaves, needle-shaped leaves, modified leaves as spikes, **water storing stems**, **long roots**, **fine hairs**, **rolling leaves**, **waxy leaves**, **shedding leaves**, and **thick bark** are the specific characteristics of plants to adapt to climate and seasonal changes for the survival of their species.



SCIENCE INFO

Thick bark covering the trunks of trees prevent the absorbed water from freezing in an extremely cold climate.

FUN ACTIVITY

DIGITAL POSTCARD

APPARATUS AND MATERIALS

Computer and internet access.

INDIVIDUAL ACTIVITY

STEPS

1. Use the internet to find information on plants and their specific characteristics to protect themselves from enemies.
2. Download the information and pictures.

3. Make a digital postcard using the downloaded pictures and information.

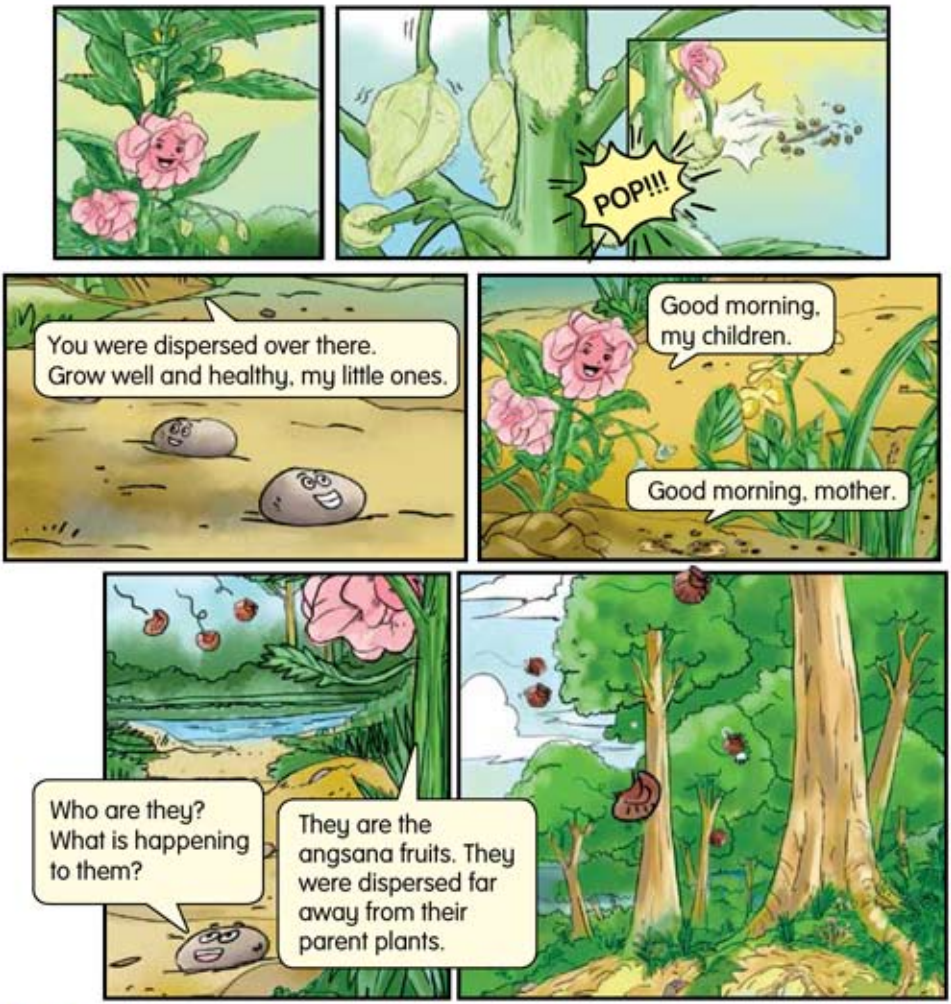
4. Keep the digital postcard made in a folder.

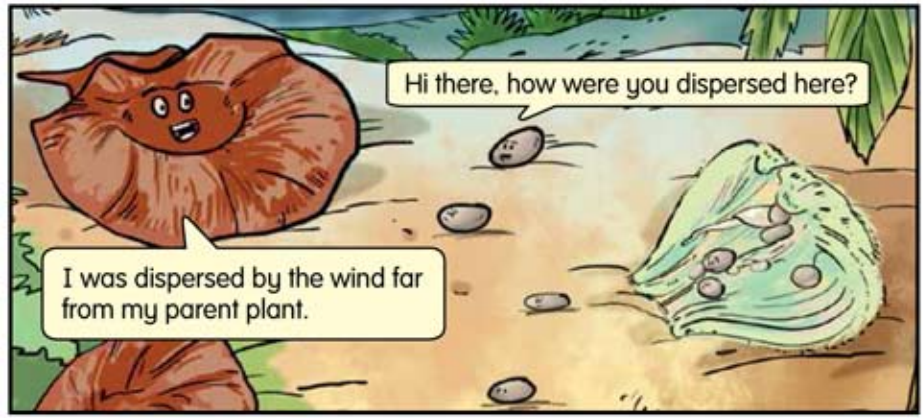
5. Upload the digital postcard on Google Classroom.

Describe the specific characteristics of the plant to adapt to climate and seasonal changes that you have chosen for your postcard.

DISPERSAL OF SEEDS OR FRUITS

Plants have various ways to disperse their seeds or fruits to ensure the survival of their species. Let us follow the story of the balsam parent plant and its seeds to know how plants disperse their seeds or fruits.



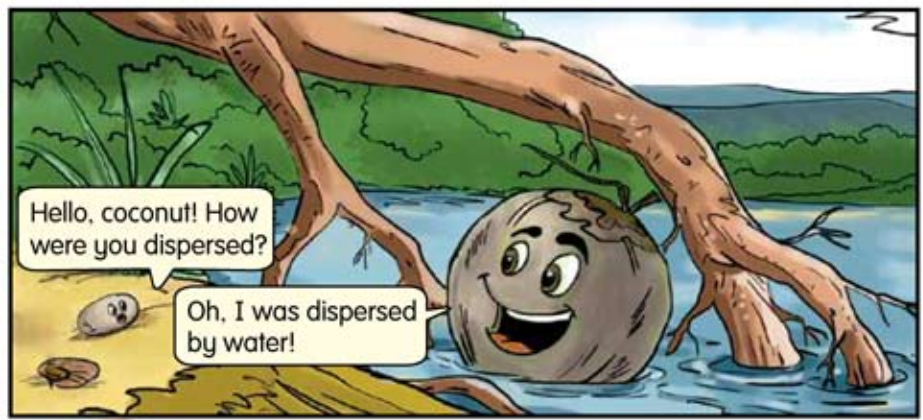


angsana fruit

Dispersal by wind.

Characteristics of seeds or fruits:

- small.
- lightweight.
- fine hairs.
- thin.
- wing-like structure.

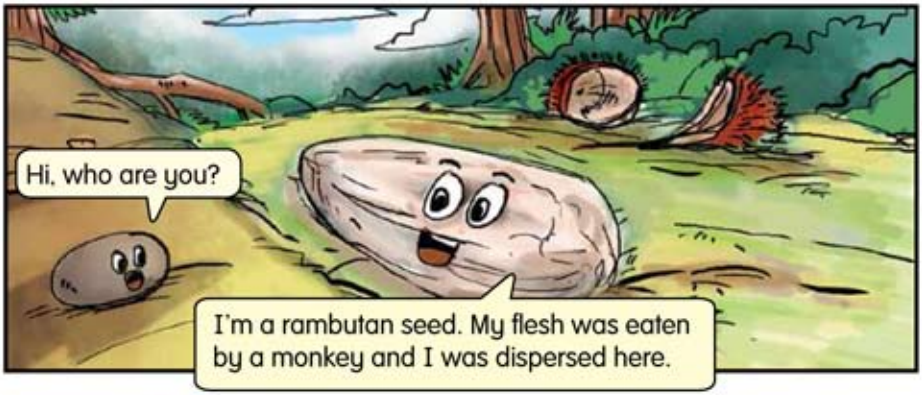


coconut

Dispersal by water.

Characteristics of seeds or fruits:

- waxy skin.
- husk with air cavities.



rambutan

Dispersal by animals and humans.

Characteristics of seeds or fruits:

- edible flesh.
- attractive colour.
- pleasant smell.

burr mallow seeds

Dispersal by animals and humans.

Characteristics of seeds or fruits:

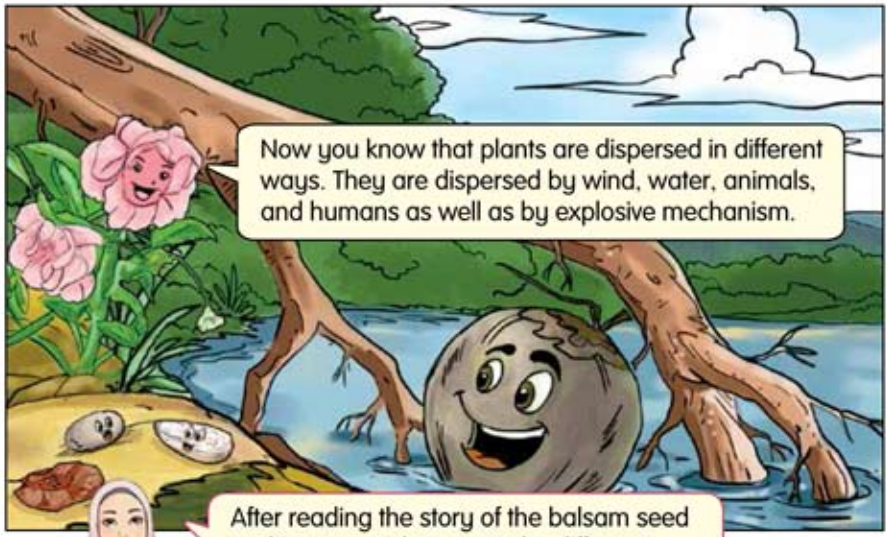
- small.
- lightweight.
- have hooks.

garden balsam seeds

Dispersal by explosive mechanism.

Characteristics of seeds or fruits:

- seed pods dry out.
- seed pods split open.



TEACHER'S NOTES

Seed pods are hard skin of the seeds that break when they mature.

All seeds and fruits are dispersed in various ways to ensure the survival of their species. Plants disperse their seeds or fruits by **wind**, **water**, **animals and humans** as well as by **explosive mechanism**.

Ways of dispersal of seeds or fruits

Based on the characteristics explained earlier, predict the ways these seeds and fruits are dispersed.

dandelion

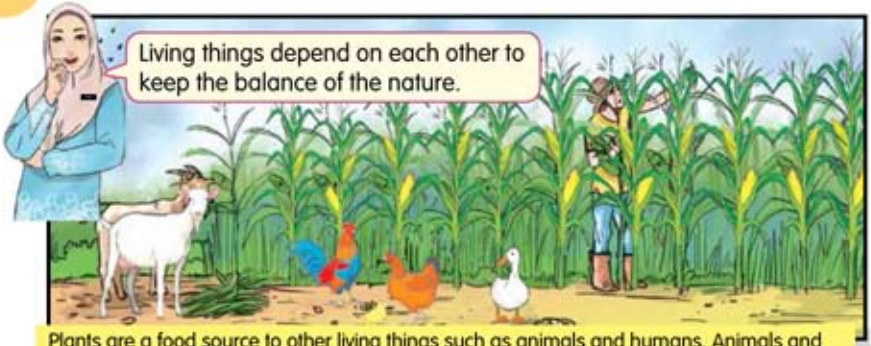
nipa palm fruit

mangosteen

rubber fruit

Plants need to disperse their seeds or fruits far from the parent plants. What type of dispersal method can disperse the seeds or fruits farthest from their parent plants? Why?

THE IMPORTANCE OF SURVIVAL FOR ANIMAL AND PLANT SPECIES



Plants are a food source to other living things such as animals and humans. Animals and humans in turn provide fertilizers and nutrients to plants through decaying process. Only some of the animal and human faeces can be made into fertilizers.

Living things such as animals and humans also ensure the survival of plants species by helping to disperse the seeds and fruits of the plants.

Animals make their nests using plants for protection. Plants also provide oxygen to other living things during photosynthesis.

The interaction between living things ensures the balance of the nature. What will happen if plants are unable to ensure the survival of their species?

4.2.1, 4.2.2, 4.2.3, 4.2.4

FUN ACTIVITY

SEEDS AND WAYS OF DISPERSAL

APPARATUS AND MATERIALS

Marker pens, adhesive tape, and flip chart paper.

21ST Century Learning

GROUP ACTIVITY

STEPS

1. Discuss the relationship between the characteristics of seeds and their ways of dispersal.

2. Construct a suitable mind map.

3. Display your work in front of the class.

4. Present your work in front of the class.

What is the relationship between the characteristics of the seeds or fruits with their ways of dispersal?

Durians have sharp thorns to protect themselves from animals and humans. However, animals and humans are also dispersal agents for durians. Why?

FUN SCIENCE

EXPLODING SEED POD

Create a simulation of seed dispersal by explosive mechanism using a filter funnel, sharp pencil, measuring tape, balloon, and 100 g of beads.

STEPS

1. Insert the end of the filter funnel into the balloon.

2. Pour 100 g of beads into the balloon using the filter funnel.

3. Blow air to inflate the balloon until it is big. Then, tie a knot.

4. Use the sharp pencil to poke the balloon.

5. Measure the distance the beads travelled from the spot where the balloon was popped.

MIND REFLECTION

1. Plants have specific characteristics to protect themselves from the enemies. The specific characteristics are:
   - sharp thorns.
   - produce latex.
   - fine hairs.
   - poisonous.
   - bad smell.

2. Plants have specific characteristics to adapt themselves to climate and seasonal changes such as:

   (a) strong seasonal wind
   - flexible trunks and branches.
   - split leaves.
   - needle-shaped leaves.

   (b) hot climate and dry season
   - modified leaves as spikes.
   - water storing stems.
   - long roots.
   - fine hairs.
   - rolling leaves.
   - waxy leaves.
   - shedding leaves.

   (c) cold climate
   - thick bark.
   - needle-shaped leaves.

3. Ways of dispersal and characteristics of seeds or fruits are:

   (a) wind
   - small.
   - thin.
   - lightweight.
   - wing-like structure.
   - fine hairs.

   (b) water
   - waxy skin.
   - husk with air cavities.

   (c) animals and humans
   - edible flesh.
   - attractive colour.
   - pleasant smell.
   - have hooks.
   - small.
   - lightweight.

   (d) explosive mechanism
   - seed pods dry out.
   - seed pods split open.

MIND TEST

Answer all questions in the Science exercise book.

1. Observe the pictures below. State the specific characteristics of the plants to protect them from the enemies.

(a) 
yam plant

(b) 
citronella plant

(c) 
poison ivy

2. State the specific characteristics of plants based on the given situations to adapt themselves to climate and seasonal changes.

(a) 
Bamboo trees can survive in areas with strong winds.

(b) 
Pine trees can survive in cold weather.

3. The following plants have different ways of seeds or fruits dispersal. State their ways of dispersal.

(a) 
okra seed

(b) 
burr mallow seed

(c) 
dandelion seed

(d) 
lotus seed

4. Observe the picture below.

papaya

(a) What are the specific characteristics of the papaya fruits or seeds with their way of dispersal?

(b) Predict the way of dispersal for the papaya fruits or seeds.

5. Answer the riddles below on the way seeds or fruits are dispersed. Predict the following seeds or fruits.

(a) I am light enough to float on water,
Soft and waxy, my skin won't falter;
My fibrous husk is filled with air,
Take a guess what I am, oh do be fair.

Way of seed or fruit dispersal: _____

Predicted seed or fruit: _____

(b) The colour of my skin is very pretty,
I smell sweet, as you will agree;
My flesh is delicious, you cannot resist,
Please go ahead and guess, I do insist.

Way of seed or fruit dispersal: _____

Predicted seed or fruit: _____

(c) Living in a seed pod, we have to endure,
Once it is dried, we are all so mature;
When it splits open, off we are scattered,
If you know what we are, we would
be so delighted.

Way of seed or fruit dispersal: _____

Predicted seed or fruit: _____

(d) Lightweight and small with hooks all around,
I am not brightly coloured, dull it may sound;
Nor am I fleshy as I would like to be,
But I get the job done, can you guess what
could be me?

Way of seed or fruit dispersal: _____

Predicted seed or fruit: _____

(e) We are small in size and lightweight too,
With these thin wings, we can just fly through;
Just like a loose kite, we can go quite far,
Give it a guess, do you know what we are?

Way of seed or fruit dispersal: _____

Predicted seed or fruit: _____