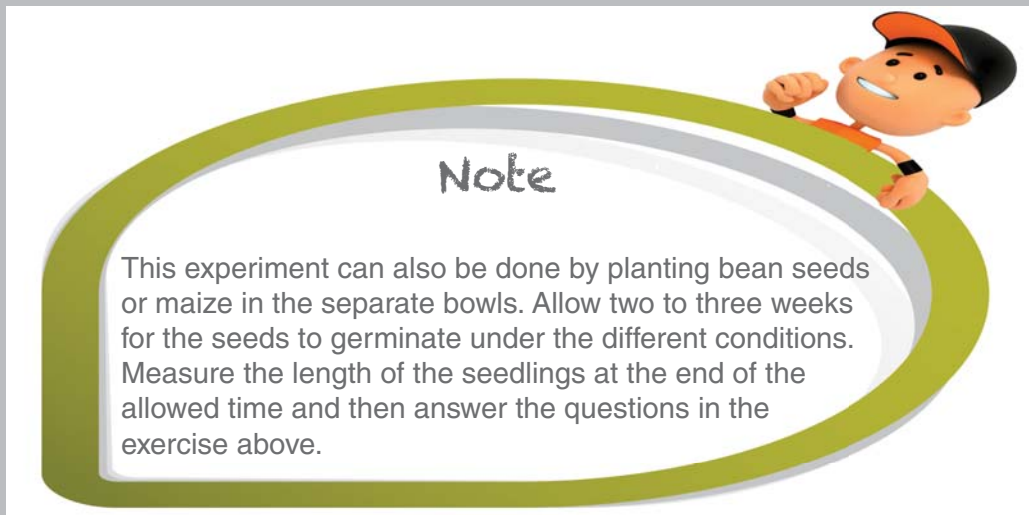




Rubric:

Levels of performance	1	2	3	4
Laboratory technique	Learner struggles to do practical and is not capable of taking successful readings.	Learner is diligent, but cannot work alone.	Needs help to handle apparatus and obtain correct results.	Class time was well used. Little help needed to set up apparatus. Correct readings were taken.
Report of results (Question 3)	Does not understand; unsuccessful in drawing comparisons.	Meaningful comments or comparisons.	Insightful comments and good comparisons.	Comparisons and comments are relevant. They are well worded and shows good understanding.



Note

This experiment can also be done by planting bean seeds or maize in the separate bowls. Allow two to three weeks for the seeds to germinate under the different conditions. Measure the length of the seedlings at the end of the allowed time and then answer the questions in the exercise above.

Exercise 3: Page 36

1.

Hydrosphere	Atmosphere	Lithosphere
Fish and algae Cattfish Fish and coral Seal Polar bear Crab Geese	Eagle Geese	Lion Eagle Squirrel Cattfish (in drought) Seal Polar bear Crab Geese Dandelion Pine tree



- 2.1 Growth
- 2.2 Reproduction
- 2.3 Respiration
- 2.4 Excretion
- 2.5 Sensitivity
- 2.6 Movement

- 3.1 Growth, reproduction, sensitivity (grows towards the light).
- 3.2 Growth, reproduction, motion
- 3.3 Breathing, excretion
- 3.4 Feeding (photosynthesis)
- 3.5 Feeding, growth, reproduction
- 3.6 Reproduction, growth
- 3.7 Sensitivity (smell)
- 3.8 Movement
- 3.9 Feeding
- 3.10 Growth, feeding (photosynthesis), sensitivity (grows towards the sun).
- 3.11 Excretion (sweat)
- 3.12 Feeding
- 3.13 Feeding
- 3.14 Sensitivity (hearing)
- 3.15 Movement, excretion (sweat)
- 3.16 Feeding

4 (Any reasonable adaptation will be correct. The answers are some examples of adaptations of these plants or animals.)

- 4.1 Squirrels:
 - Collect food during summer for winter.
 - Have thick fur which insulates them.
 - They can hibernate in winter.
- 4.2 Polar bears:
 - They have a thick layer of fat under their skin which insulates them.
 - Air is trapped between their hair and serves as a layer of insulation.
 - They can make holes in the snow that serve as shelter and insulation against the cold.
 - Their bodies are oval-shaped. Therefore the surface area of their bodies that is exposed to their surroundings is as small as possible in comparison to the size of their bodies.
- 4.3 Tulips (bulbous plants):
 - Survive the cold months with the food collected in their bulbs under the ground.
- 4.4 Swallows:
 - Move to warmer regions in cold months.
 - Can fly great distances.
- 4.5 Dormice:
 - Can hibernate in winter.



- 4.6 Geese (migratory birds):
- Migrate to warmer regions during cold months.
- 4.7 Cactus:
- Leaves are thorn-shaped. Therefore there are no stomata through which the plant can lose water.
 - Stems are thick and fleshy so they can store water.
- 4.8 Pine trees:
- Leaves are needle-shaped so that there is a smaller surface area for water loss.
 - The conical shape of the tree allows the branches to collect a large amount of snow without breaking.
 - They have a deep root system to absorb water.
- 4.9 Oryx:
- Get water from the plants that they eat.
- 4.10 Bears:
- Can hibernate in winter.
 - Have thick fur to insulate them.
 - Have a thick layer of fat under their skin that serves as a source of food when they hibernate.
- 4.11 Camels:
- Can survive for fifteen – twenty days without water.
 - Water loss through urine is limited since their urine is concentrated.
 - Can endure temperature fluctuations of 34 to 42°C.
 - They are able to store heat in their bodies and release heat through methods other than sweating.
- 4.12 Deciduous trees:
- Plants lose their leaves in winter so that they do not lose moisture through their leaves when there is less water available.
 - Plants lose their leaves because it is difficult to protect their leaves against temperatures below freezing point.

