Lesson 1

Topic: Examining relationships of living things

The impact of environmental factors

Learning alerts

Be aware of:

- students thinking that when the weather gets cold, plants don't get as much sun and rain and die
- students thinking that living things can change to meet their survival needs.

Suggested next steps for learning

- Inform students that cold temperatures cause plants to die because the cold freezes the plant and causes irreparable damage.
- Inform students that plants and animals can only survive in an environment if the conditions are suited to their particular needs.

Lesson answers

1. No answer required.
2. For example:

Habitat	Environment
A place in an environment where a living thing lives and can survive because all of its needs are met.	All of the living and non-living things in the surroundings of a living thing that can influence its survival.

3. For example: food supply, predators, environmental factors.

4. For example:

Rainforest habitat

Environmental factors of this habitat: filtered sunlight, plenty of water, warm temperature and moist.

Plants and animals that might live here: frogs, snails, butterflies, insects, birds, tree snakes, lizards, spiders, trees, ferns and strangler figs.

Desert habitat

Environmental factors of this habitat: plenty of sunlight, dry, high to very high temperature during the day and low temperatures at night.

Plants and animals that might live here: thorny devil lizards, water-holding frogs, insects, dingoes, snakes, wallabies, spiders, camels, cacti, shrubs, short grasses and spinifex.

Grassland habitat

Environmental factors of this habitat: plenty of sunlight, moderate temperatures, less rainfall than rainforests and more than deserts and windy.

Plants and animals that might live here: insects, snakes, blue-tongued lizards, wombats, kangaroos, echidnas, magpies, wedge-tail eagles, variety of grasses and low shrubs.

Farmland habitat

Environmental factors of this habitat: plenty of sunlight, moderate temperatures and water supply.

Plants and animals that might live here: insects, birds, rabbits, cows, sheep, horses, snakes, grasses, trees, flowers and crops.

Mangrove habitat

Environmental factors of this habitat: filtered sunlight, warm temperatures, high rainfall and area floods with salty water or fresh water.

Plants and animals that might live here: fish, crabs, shellfish, prawns, worms, birds, trees, shrubs, mangrove trees, climbers and grasses.

Pond habitat

Environmental factors of this habitat: filtered sunlight, cool temperatures and plenty of water.

Plants and animals that might live here: insects, birds, fish, turtles, ducks, snails, earthworms, dragonflies, leeches and aquatic plants.

5. Please refer to attached **Sheet 2 — Non-living factors that affect living things** answers.
6. No answer required.
7. Fire can burn away dead growth and help to germinate seeds. More sunlight and rain can come into the area because the dead plants have gone and so more plants can grow. Fire can kill animals and destroy the shelter of animals.

Lesson 2

Topic: Examining relationships of living things

Studying relationships between plants and animals

Learning alerts

Be aware of:

- students thinking that living things can change to meet their survival needs.
- students thinking that the needs and roles of a species are the same as those of similar species.

Suggested next steps for learning

- Inform students that plants and animals can only survive in an environment if the conditions are suitable for their particular needs.
- Inform students that different plants and animals within habitats have different needs. Similar species of plants and animals can have different roles to play within habitats.

Lesson answers

1. No answer required.
2. No answer required.
3. The caterpillar eats the leaf for food for its growth and survival needs. The leaf also provides shelter for the caterpillar to hide from predators.
4. The spider eats the bee. The spider is the predator and the bee is its prey.
5. No answer required.
6. No answer required.
7. Answers **Sheet 4 — Habitat retrieval chart** attached.
8. Answers **Sheet 4 — Habitat retrieval chart** attached.
9. For example:

10. Seven relationships can be identified from the concept map.

Lesson 3

Topic: Examining relationships of living things

Investigating relationships in habitats

Learning alerts

Be aware of:

- students thinking that living things can change to meet their survival needs
- students thinking that the needs and roles of a species are the same as those of similar species.

Suggested next steps for learning

- Inform students that plants and animals can only survive in an environment if the conditions are suitable for their particular needs.
- Inform students that different plants and animals within habitats have different needs. Similar species of animals can have different roles to play within habitats.

Lesson answers

1. No answer required.
2. No answer required.
3. a) For example:

Habitat:	rainforest	
Producer	**Consumer**	**Decomposer**
fruiting tree ferns	flying fox quoll native bee green tree snake moth sunbird	fungi earthworm
Habitat:	mangrove	
Producer	**Consumer**	**Decomposer**
mangrove tree algae	ibis crab mangrove jack mussels mangrove robin prawn	fungi

b) If one of the producer, consumer or decomposer relationships was interrupted, things would become unbalanced in the habitat. There could be an abundance of some plants or animals as a result, or certain plants or animals may diminish. Life cycles could be interrupted.

Lesson 4

Topic: Examining relationships of living things

Exploring relationships between plants, animals and humans

Learning alerts

Be aware of students thinking that the actions of humans can have only positive or only negative impacts on the environment.

Suggested next steps for learning

- Explain that the actions of humans can have both positive and negative impacts.

Lesson notes

Aboriginal and Torres Strait Islander histories and cultures in this lesson

Students will access Aboriginal peoples' knowledge about interrelationships with living and non-living things, life cycles and the environment.

Aboriginal and Torres Strait Islander peoples are warned that this resource contains the name of a person who is deceased.

Lesson answers

1. No answer required.
2. For example: Positive things can include protecting habitats, planting trees, controlling pests, rescuing injured animals; negative things can include destroying habitats, introducing pest species, taking native species, killing animals.
3. Please refer to attached **Sheet 5 — Aboriginal peoples of Australia and their environment** answers.
4. Please refer to attached **Sheet 5 — Aboriginal peoples of Australia and their environment** answers.

Sheet 1 Answers

Investigation planner: How does temperature affect plant growth?

What are you going to investigate?

- What happens to the growth of seeds when the temperature they are exposed to is changed?

Aim of the investigation

- To test the effect of different temperatures on seed growth.

1. To keep the investigation fair you need to keep the following things the same:
   - the amount and type of potting mix
   - the size and type of cup
   - the type of seeds
   - the number of seeds
   - the amount of water applied.
2. Identify what you are changing or testing:
   - the temperature of the environment.
3. Identify what you are measuring:
   - the growth of the seeds — how much they grow.
4. Predict what will happen to the growth of the seeds.

   I think ...

   For example:
   The seeds in the cold will not grow at all and the plants in the warmth will grow a lot.
   because ...

   For example:
   plants need warm temperatures to grow. The environment in the fridge will be cold, and this will not be providing the plant with what it needs so it will not be able to grow. The plant in the warm temperature will have all its needs met.
5. Draw a picture of what you think might happen.

   Answers may vary.

6. Use this table to record the height of each plant at the end of two weeks.

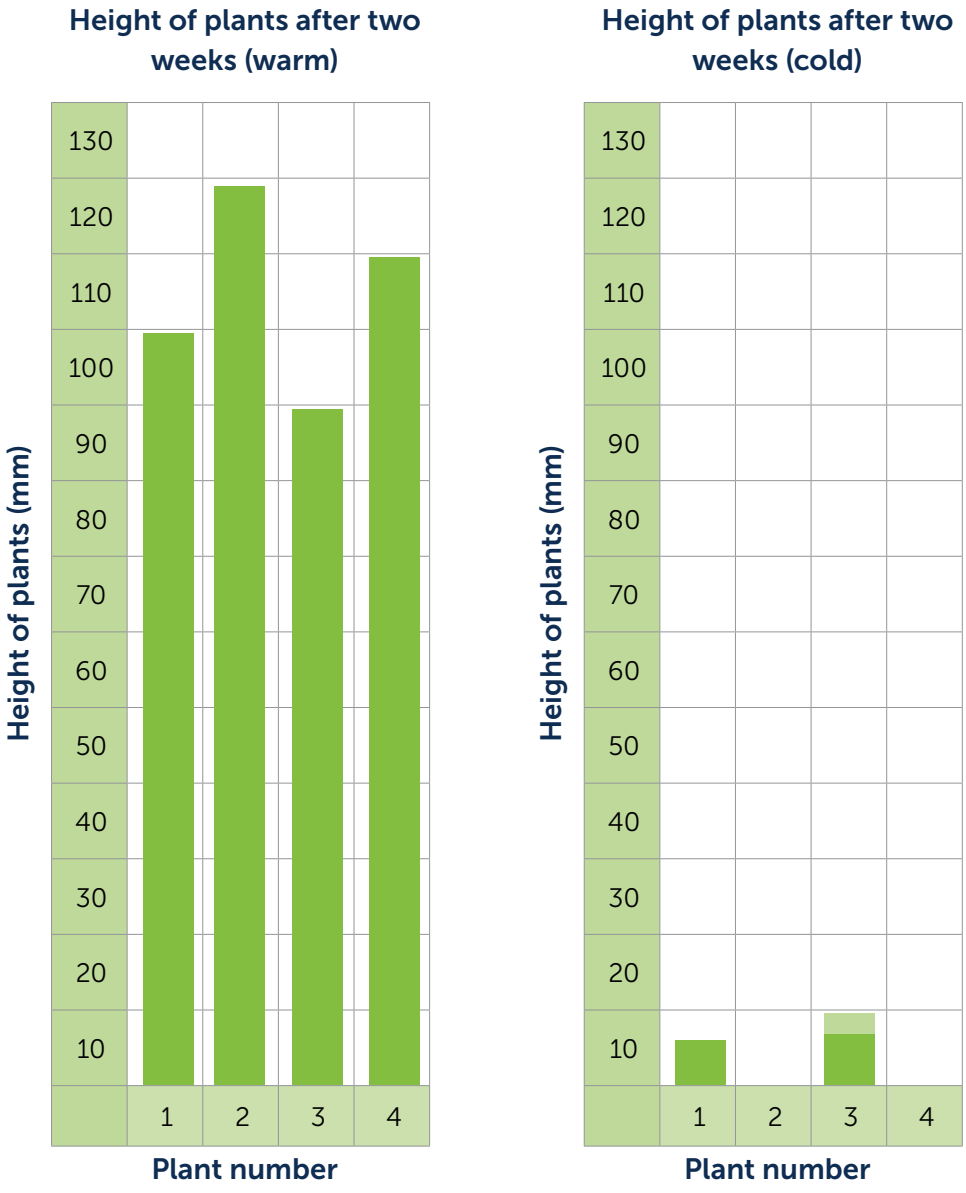
   For example:

Height of plants after two weeks		
Seed number	**Warm (mm)**	**Cold (mm)**
1	100	5
2	120	0
3	90	10
4	110	0

Two extra seeds should be planted in each cup as a backup in case there is a fault with some of them.
It also provides extra data for consistency.

7. Take the results from your table and record them in a column graph.

For example:



Explaining the results

8. What happened in your investigation?

   For example:

   The plants in the warmth grew quite well and were all about the same height. Two of the seeds in the fridge did not germinate at all and the other two only grew a little. The tallest plant in the fridge was 10 mm while the shortest plant in the warmth was 90 mm. This is a big difference.

9. Explain the reasons for these results.

   For example:

   The seeds did not grow very well in the cold temperature because one of a plant's needs is appropriate temperature. If the environment does not meet the needs of a plant, it will not grow. These seeds needed a warmer temperature than they had in the fridge to germinate and then to grow well. The plants in the warm temperature all germinated and then grew very well because their environment met their needs.

10. a) Do your results match your prediction? Yes No

    b) Explain any differences between your prediction and your results.

    For example:

    I said that the seeds in the cold would not grow at all. This was only true of two of the seeds. The other two did germinate but were still only very, very small compared to the plants in the warmth.

11. What worked well in your investigation setup? What was difficult or caused a problem?

    Students responses here should state any issues that made it difficult to complete the investigation. These may include:

    - ability to measure growth
    - mixing plants up
    - measuring out potting mix
    - knocking over plants

    or any other problems encountered.

12. How could you make this investigation fairer? How could you improve this investigation?

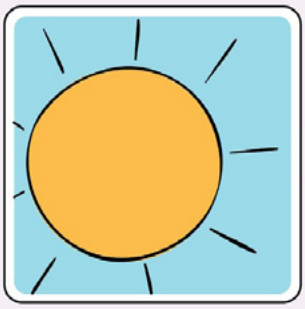
    For example:

    I could make sure that the plants in the fridge had lights on them the same amount of time as the plants in the warmth. When the fridge was closed there was no light and this could have affected the outcome.

Sheet 2 Answers

Non-living factors that affect living things

For example:

Environmental factors	How does this factor affect a habitat	Predict what might happen if there are extremes in these factors
	The amount of water from rain in a habitat influences the types of plants and animals that can live there. All living things need water. Plants and animals require water to live and grow. Different plants and animals require different amounts of water.	**Too much rain** Too much water: If there is too much rain, areas can flood killing plants and animals. Constant rain can wash away soil; plants with shallow roots may fall over and not grow well in those conditions. **Not enough rain** If there is not enough rain, this can cause a drought where there is not enough water for plants and animals to survive.
	The amount of sunlight influences what type of habitat it is and what types of plants and animals can grow there. Some animals and plants require sunlight to live and grow. Plants require sunlight for their energy needs.	**Too much sunlight** Some plants only require filtered sunlight, too much direct sunlight can kill them. Most animals need shelter from the harsh effects of the sun, too much sun can harm them. **Not enough sunlight** If there is not enough sunlight for some plants they can become stunted. Some animals require sunlight for essential vitamins, not enough can make them sick.
	The temperature influences what type of habitat it is and the types of plants and animals that can live there. Most plants and animals require a particular temperature to live and grow.	**Extreme heat** Extreme heat means that only plants and animals that can live in hot conditions will survive. Plants and animals that are not used to the heat may die. **Extreme cold** Only plants and animals that can live in freezing conditions will survive. Many plants and animals would die because of the cold freezing them and causing irreparable damage.

Sheet 4 Answers

Habitat retrieval chart

Rainforest habitat		
Living thing	**Relationship**	**Living thing**
For example, a snake	catches and eats	a bat
flying fox	lives in and eats fruit from	moth
quoll	catches and eats	moth
native bee	makes hive in, and takes pollen from	fruiting tree

Pond	**habitat**	
Living thing	**Relationship**	**Living thing**
large fish	catches and eats	small fish
pond snail	eats	algae
duck	catches and eats	pond snail

Mangrove	**habitat**	
Living thing	**Relationship**	**Living thing**
algae	grows on	mangrove roots
mangrove robin	lives in	mangrove trees
ibis	catches and eats	prawn

Grassland	**habitat**	
Living thing	**Relationship**	**Living thing**
mouse	eats grass seeds and shelters in	grass
python	catches and eats	mouse
whistling kite	catches and eats	python

Choose one habitat and one relationship you have identified above and briefly describe how humans might affect the relationship.

For example:

Grassland **habitat**

Humans could affect the relationship between the mice and the python by killing the python because they were scared of it. If the python was not there, the mouse would not be caught by it. This might mean that the numbers of mice in the grasslands would become too large for the habitat to sustain.

Sheet 5 Answers

Aboriginal peoples of Australia and their environment

1. Read the following text about how Aboriginal peoples interact with the environment.
2. Highlight the scientific terms in the text.

Traditionally, Aboriginal peoples live as one with nature and have a strong spiritual respect for nature.

They depend on nature.

Traditionally, Aboriginal peoples are very adept at reading the life cycle signs of nature to understand the world around them.

They use life cycles to give them information about seasons and food availability.

Aboriginal peoples are very good at reading the signs of nature.

By studying unrelated things, they are able to know when things are changing and growing.

For example, they know that when a certain flower blooms, the stingrays are nice and fat and ready to eat. Yum!

Aboriginal peoples feel that all living and non-living things are tied together in nature and everything depends on each other to survive.

They know that all living things in a habitat need to remain in balance for the survival of all.

Aboriginal peoples were very good at using fire to help maintain their country.

They used fire for a variety of reasons.

Fire was used to clear land covered by dead branches and leaves, to reduce the danger of wildfires.

The ashes of the fire helped the soil to become very fertile.

They knew this cycle of nutrients was important for the continuing health of plants and animals.

Fire was also used to encourage new grass growth which attracted animals.

Aboriginal peoples could then hunt them.

These animals in turn relied on the fire to provide food for them.

Fire was also used for other reasons including opening up new areas of land and germinating seeds of plants.

Aboriginal peoples are now using their vast knowledge about fire to help reduce Australia's carbon footprint.

3. Complete the following statements using information from the text. Cut the statements into strips and arrange them in the Venn diagram.

Aboriginal peoples are good at reading the life cycles of nature to give them information about food availability.

Aboriginal peoples know that all living and non-living things are tied together in nature and everything depends on each other to survive.

They know that all living things in a habitat need to remain in balance.

Aboriginal people were good at using fire to help maintain their country.

Fire was used to germinate the seeds of plants.

The ashes of fire help the soil to become fertile.