Grade 4 Science and Technology

Terms 1, 2 and 3 - notes for 9 topics

IN EVERY TOPIC

- What you will learn and the key words.
- Short, clear notes with worked examples.
- Questions to try and a topic test, with the answers at the back.

TOPICS IN THESE NOTES

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A TASTE OF THE FIRST TOPIC

Characteristics of living things

Living things share certain characteristics: they grow, reproduce (make more of their own kind), respond to their surroundings, need food/nutrients, breathe (respire), and eventually die.

Non-living things, like rocks or chairs, do not do any of these things on their own.

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Strand 1.0 Living Things and their Environment | Term 1

1.1 Plants

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- identify characteristics of plants as living things
- describe functions of external parts of plants

KEY WORDS

living thing, characteristic, root, stem, leaf, flower, photosynthesis.

1. What makes something a living thing

Characteristics of living things

Living things share certain characteristics: they grow, reproduce (make more of their own kind), respond to their surroundings, need food/nutrients, breathe (respire), and eventually die.

Non-living things, like rocks or chairs, do not do any of these things on their own.

2. Why plants are grouped as living things

Plants as living things

Plants show all the characteristics of living things: they grow taller and produce more leaves, they reproduce through seeds or spores, they respond to their surroundings (e.g. leaves turning towards sunlight), and they need water, air, and nutrients to survive.

Even though plants do not move around like animals, they are still classified as living things because they show these other characteristics.

3. A survey of plants around us

Practical: surveying local plants

Materials: manila paper; groups of four, walking around the school compound with supervision.

Walk around the school compound in small, supervised groups and list as many different kinds of plants as you can find: trees, shrubs, grasses, crops, and flowers.

For each, note where it was found and briefly describe it (tall/short, flowering/not).

4. The root: what it looks like and its main function

The root

The root is usually the underground part of a plant. Its main functions are to anchor (hold) the plant firmly in the soil, and to absorb water and nutrients from the soil for the plant to use.

Some roots (like carrots) also store food for the plant.

5. The stem: what it looks like and its main function

The stem

The stem is the main upright part of a plant, connecting the roots to the leaves and flowers. Its main functions are to support the plant, holding leaves up towards light, and to transport water and nutrients between the roots and the rest of the plant.

Stems can be thin and soft (like in a small flower) or thick and woody (like in a tree trunk).

6. The leaf: what it looks like and its main function

The leaf

The leaf is usually a flat, green part of a plant attached to the stem. Its main function is to make food for the plant through photosynthesis - using sunlight, water, and air (carbon dioxide) to produce food and release oxygen.
The flat, spread-out shape of most leaves helps them catch as much sunlight as possible.

7. The flower: what it looks like and its main function

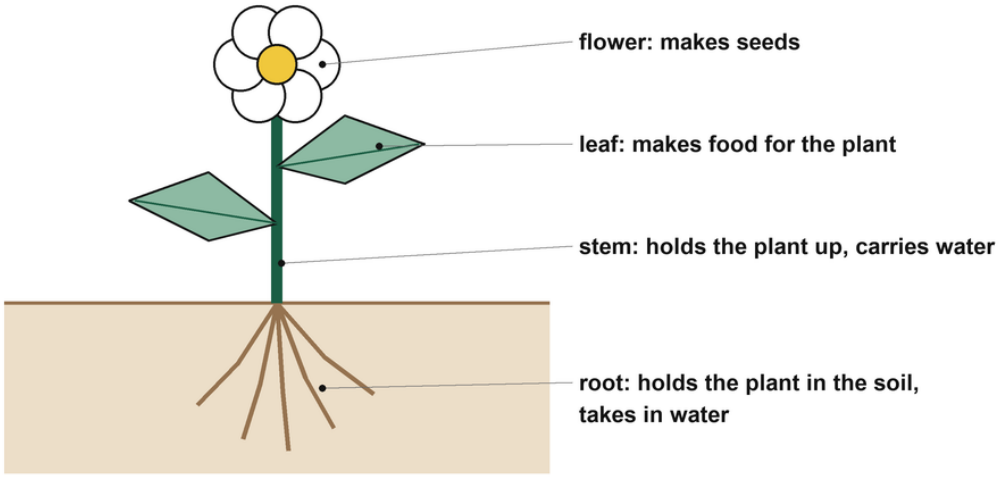
The flower

The flower is the reproductive part of many plants. Its main function is to help the plant reproduce, often by attracting insects like bees and butterflies (through bright colour and scent) to help with pollination, eventually leading to seeds and fruit.
Not all plants have flowers (like ferns and mosses), but the plants that do rely on them for this important role.

8. Labelling the external parts of a plant

Practical: labelling a real or drawn plant

Materials: a real plant with roots, or a drawing; groups of four.
Using a real plant (carefully pulled up with roots, if available) or a drawing, label the four main external parts covered this week: root, stem, leaf, and flower.
For each part, write one function alongside the label.



The external parts of a plant

9. Why plants need care

Why plants need care

Like all living things, plants need ongoing care to survive and grow well: regular watering, enough sunlight, healthy soil with nutrients, and protection from pests or damage.
Neglected plants can wilt, grow poorly, or die - the same way any living thing suffers without its basic needs met.

10. Practical: caring for a plant

Practical: plant care

Materials: a real classroom or school plant, water; whole class or groups.
As a class, identify a real plant at school (in a pot, or in the school garden) and carry out a simple caring task: watering it, removing weeds around it, or checking its leaves for damage.
Agree on a simple ongoing care plan (e.g. watering twice a week) so the plant continues to be cared for.

11. Comparing a cared-for plant with a neglected one

Comparing plant health

A well-cared-for plant typically has firm, green leaves, an upright stem, and steady growth. A neglected plant may show wilting, yellowing or dropping leaves, stunted growth, or even death.

Observing this contrast helps make the importance of plant care concrete and visible, not just something to be told about.

12. Appreciating and summarising plants as living things

Practical: our plant knowledge poster

Materials: manila paper; groups of four.

In groups, create a poster showing a labelled plant (root, stem, leaf, flower with functions), one reason plants are living things, and one way to care for a plant.

Present your poster to the class.

TRY THESE

1. Name two characteristics shared by all living things.
2. Is a rock alive? Explain.
3. Give one way a plant shows it is growing.
4. How do plants reproduce?
5. Name three different kinds of plants your group found.
6. Where was one of your plants found?
7. Where is the root usually found?
8. Name one function of the root.
9. What does the stem connect?
10. Name one function of the stem.
11. What is the main function of a leaf?
12. What three things does a leaf need for photosynthesis?
13. What is the main function of a flower?
14. Why are many flowers brightly coloured or scented?
15. Name the four external plant parts labelled in this activity.
16. What function did you write next to "root"?
17. Name two things a plant needs to survive and grow well.
18. What can happen to a plant that is not cared for?
19. Which real plant did your class care for?
20. What caring task did you carry out?
21. Describe one sign of a healthy, well-cared-for plant.
22. Describe one sign of a neglected plant.
23. Name one external plant part shown on your poster, with its function.
24. Give one reason plants are classified as living things.

TOPIC TEST

T1. Why might a car seem "alive" in some ways (it moves, needs fuel) but is not actually a living thing?

T2. Why are plants grouped as living things?

T3. Why might it be useful for a school to plant a variety of different plants, rather than just one kind?

T4. Why might a plant with very short, shallow roots be more easily blown over by strong wind than one with long,

deep roots?

T5. Why might a very tall tree need an especially strong, thick stem (trunk)?

T6. Why might a plant kept in a dark room, away from any sunlight, eventually struggle to survive?

T7. Why might a plant "spend energy" making a colourful, scented flower instead of putting all its energy into growing bigger leaves?

T8. Choose a real plant you have seen recently and describe what its root, stem, leaf, and flower (if it has one) look like.

T9. Why might a plant left in the same spot for a long time still eventually need repotting into a bigger container?

T10. Why might involving the whole class in caring for one plant help everyone understand plant needs better than just hearing about it?

T11. If you found a neglected plant, what immediate steps would you take to try to help it recover?

T12. What is one thing you will remember to do differently when caring for a real plant, based on everything learned this week?

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Strand 1.0 Living Things and their Environment | Term 1

1.2 Animals

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- identify the characteristics of animals as living things
- distinguish vertebrates from invertebrates in the environment

KEY WORDS

vertebrate, invertebrate, backbone, characteristic.

1. Why animals are grouped as living things

Animals as living things

Like plants, animals show all the characteristics of living things: they grow, reproduce, respond to their surroundings (often by moving), need food, breathe (respire), and eventually die.

Unlike most plants, animals can usually move from place to place, which is one of the most visible signs of their being alive.

2. What is a vertebrate

Vertebrates

A vertebrate is an animal that has a backbone (spine) inside its body. Examples include mammals (like cows and humans), birds, fish, reptiles (like lizards), and amphibians (like frogs).

The backbone gives these animals internal structure and support.

3. What is an invertebrate

Invertebrates

An invertebrate is an animal that does NOT have a backbone. Examples include insects (like ants and butterflies), spiders, worms, snails, and crabs.

Invertebrates make up the large majority of all known animal species on Earth, even though vertebrates tend to be more familiar to us.

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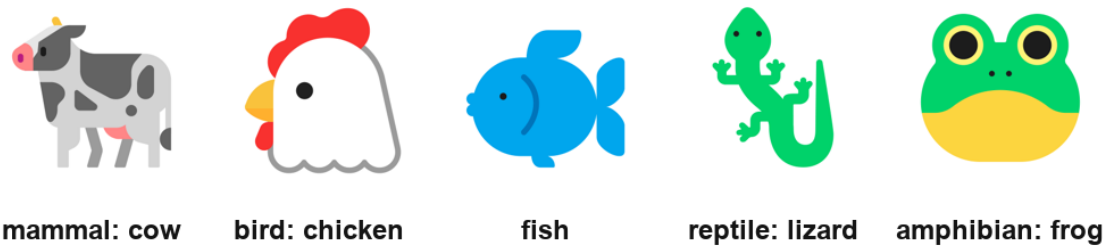
4. Sorting animals into vertebrates and invertebrates

Practical: vertebrate or invertebrate?

Materials: picture cards of various animals; groups of four.

In groups, sort a set of animal picture cards (or a list of named animals) into two columns: "Vertebrate" and "Invertebrate", using what you have learned about backbones.

Check your sorting against another group's for agreement.



The five groups of vertebrates

5. Vertebrate groups: mammals and birds

Mammals and birds

Mammals are vertebrates that are typically covered in fur or hair, give birth to live young, and feed their babies milk. Examples include cows, dogs, and humans.

Birds are vertebrates covered in feathers, that lay eggs, and most (though not all) can fly. Examples include chickens, eagles, and sparrows.

6. Vertebrate groups: fish, reptiles and amphibians

Fish, reptiles and amphibians

Fish are vertebrates that live in water, breathe using gills, and are usually covered in scales. Reptiles (like lizards and snakes) are typically covered in dry scales and lay eggs. Amphibians (like frogs) usually live part of their life in water and part on land, often with moist, smooth skin.

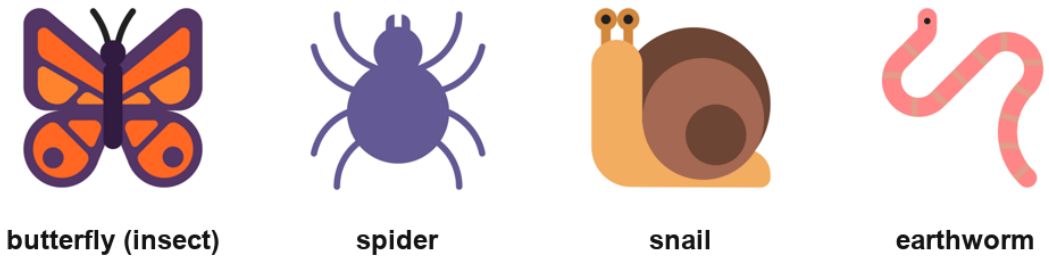
Each group has adapted differently to where and how it lives.

7. Invertebrate groups: insects and other small creatures

Insects and other invertebrates

Insects (like ants, bees, and butterflies) typically have six legs and a body divided into three main parts. Other invertebrates include arachnids (like spiders, with eight legs), worms (with soft, segmented bodies), and molluscs (like snails, often with a shell).

Invertebrates come in a huge range of shapes and sizes, adapted to many different environments.



Some invertebrates

8. Observing invertebrates in our environment

Practical: finding invertebrates

Materials: manila paper; groups of four, walking around the compound with supervision, handling any creature gently.

In small, supervised groups, carefully look for invertebrates around the school compound (under stones, in soil, on plants), observing without harming them, and return anything found to where it was.

Record what you found and where.

9. How animals survive in their environment

Animals and their environment

Animals have features suited to where they live: fish have fins and gills for swimming and breathing underwater, birds have wings and light bodies for flying, and many desert animals have features to help them survive with little water.

Some animals also use camouflage (colouring that blends with their surroundings) to hide from predators or sneak up on prey.