

Background information

Year 3–4, unit 2: Living and non-living things

Living and non-living things essential understandings

Living things:

- move
- reproduce
- are sensitive – respond to stimuli or their environment
- grow
- respire
- excrete
- gain energy or nutrition.

Terms to be aware of include:

- living
- dead – suggests that an object was once living. Sometimes the term **once living** is used.
- non-living – suggests that the object has never had the ability to carry out the life functions outlined above, eg metals, water, air, soil.

Characteristics of living things

Living things **all** show the following seven main life functions at some time.

1. **Movement** – Living things change their position in their environment to obtain essential requirements such as water, air and food as well as to protect themselves, or locate a mate. Most animals are mobile and move their whole body from place to place (eg by swimming, walking or flying). Plants are slower and more limited in their movement. These movements can be subtle as in a flower moving to face the sun.
2. **Reproduction** – Living things create similar organisms to themselves to survive through time.
3. **Sensitivity** – It is important that living things can sense and respond to changing factors in their environment. Information taken in through the senses is processed to provide a response, which helps it to survive. Plants sense and respond to light, water and gravity.
4. **Growth** – Over a period of time, living things make new cellular materials and become larger and more complex. Growth involves both an increase in size and repair of damaged parts. Damaged parts of both animals and plants can also be repaired by new growth. Living things use some of the energy released from their food for growing and food materials are incorporated into new parts or increased size.
5. **Respiration** – In the cells of living things, respiration is the process by which energy is released from food. Oxygen is usually required to do this and carbon dioxide and water are produced. All living things carry out respiration all the time. If a living thing stops respiring it is no longer alive. Respiration should not be confused with breathing. The function of respiration is to release energy from food for use by the organism. This process usually requires oxygen, but not

always. Plants differ from animals by being able to produce their own food using it later as an energy source.

6. **Elimination** – Life functions create wastes that must be removed from the organism. All living things get rid of the waste materials produced from living processes. Both animals and plants give off carbon dioxide as a waste material from respiration. Plants give off waste oxygen from photosynthesis.
7. In humans, excreted material is contained in the liquid known as urine. Other waste products include carbon dioxide (removed via the lungs), excess salts and water (removed through the skin and the kidneys), and unused waste food (removed as faeces). Excess heat is also continuously lost from the body through the skin.
8. **Nutrition** – In all living things, there is a continual need for the nutrients that are required for growth as well as energy. Plants make their food from carbon dioxide and water, using energy from sunlight, in the process known as photosynthesis. Animals get their food by eating plants or other animals.

Misconceptions

Students often have difficulty characterising things as living or non-living. They may describe anything that moves as alive. They also may not understand the cycle of life (birth, growth, death) and may therefore classify as non-living anything that has died.

Remind students that:

- in science **living** is used to describe anything that **is or has ever been alive** (eg dog, flower, seed or a log)
- **non-living** is used to describe anything that **is not now nor has ever been alive** (eg rock, mountain, glass, watch)
- all living things grow, breathe, reproduce, excrete, respond to stimuli, and have similar basic needs like nourishment
- plants do not 'breathe' and that in humans (and many other animals) breathing is the way in which we get air into and out of our lungs, and so get oxygen into the body and remove carbon dioxide.

How to draw a scientific diagram

General information

Scientific diagrams:

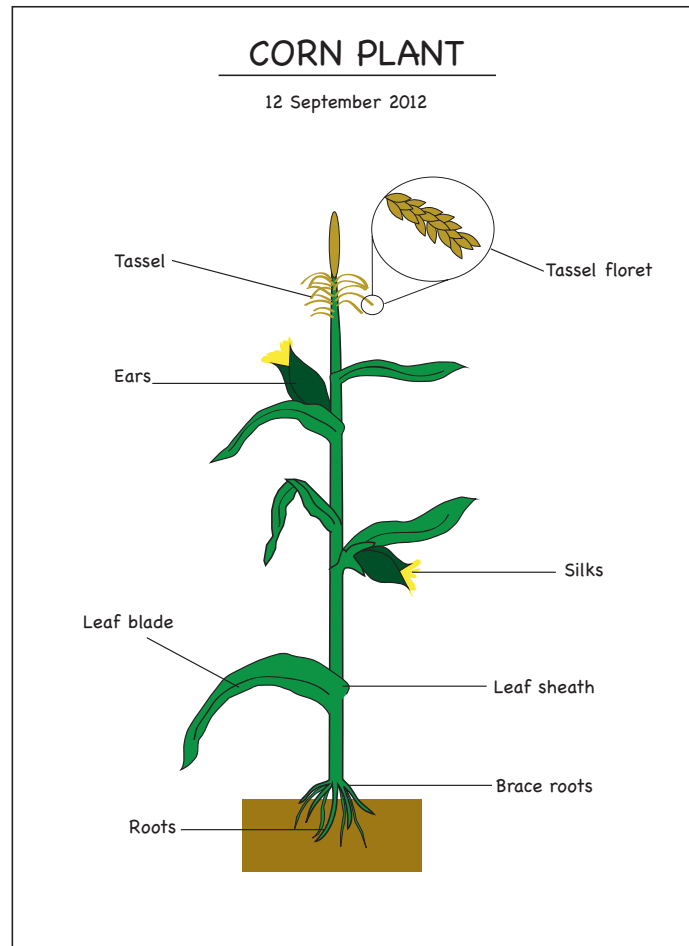
- help to communicate findings clearly
- show facts and are precise
- are clear and accurate line drawings.

Stages and rules for drawing a scientific diagram

1. Date the diagram, including year, at the top of the page eg. 10th August 2012. Numbered dating such as 10.08.12 is not advised, as the year must be clearly discerned. The '12' could be seen as either 1912 or 2012.
2. Print a heading for the diagram at the top of the page and underline it.
3. Draw a simple, side-on view of the subject. Include only the essential details.
4. Write labels horizontal to the diagram and close to each feature.

5. Arrange the labels neatly.
6. Rule a straight line from the label to the feature. Do not use an arrowhead.
7. Labels can include the purpose of the feature.
8. Use a ruler to draw lines, including underlining headings and titles.

Scientific diagram of a corn plant



Nurse logs

What is a nurse log?

A nurse log is a fallen tree, which as it decays, provides a food source and shelter (a nursery) for seedlings. As the tree decays or breaks down, plant life such as the seedlings, are supported in their growth by the companion growth of moss, lichens, fungi and other plants. These mosses, mushrooms and lichens hasten the log's decay and help retain water within the log.

Nurse logs also provide shelter for small animals and insects and provide shelter and food for plants. Animals' activities within the log, such as their scratchings and diggings and the leaving of food debris and scat, assist in the decay of the log.

Setting up a nurse log

Ideally, a nurse log would be a fallen tree within its natural environment, but you may need to source a log from elsewhere and introduce it into your school environment

Contact your school's officer or grounds-person to discuss whether they can locate a fallen log within the school's grounds and assist in the movement of the log to the proposed site.

Many fallen logs are extremely heavy, so assistance may be required to move a log. Always be cautious when handling fallen trees – wear gloves for protection. Never place your hands, arms and feet inside a hollow log. Watch out for spiders, ants and other stinging insects when handling a nurse log.

If you cannot locate a hollow log from a natural area you may be able to purchase natural logs from landscape suppliers or a local nursery. Local city councils often have a 'green waste' recycling programs where you may be able to locate a log that would suit.

Position your nurse log within a garden or in a corner that is protected from excessive activity. Preferably, the chosen area should be sparse in plant or animal life as the nurse log will encourage the growth of plants and assist in the improvement of biodiversity within the chosen site.

Do not remove fallen logs from National Parks or other parklands and bush reserves. These logs are part of the natural environment providing nurse log 'facilities' for local flora and fauna.

Monitor your nurse log regularly and observe the plant and animal wildlife that is bound to flourish. Providing moisture to the log with occasional watering will assist in decay and encourage plant growth.