a place of mind

FACULTY OF EDUCATION

Department of
Curriculum and Pedagogy

Life Science
Plant Growth and Changes:
Plant Life Cycle

Science and Mathematics
Education Research Group

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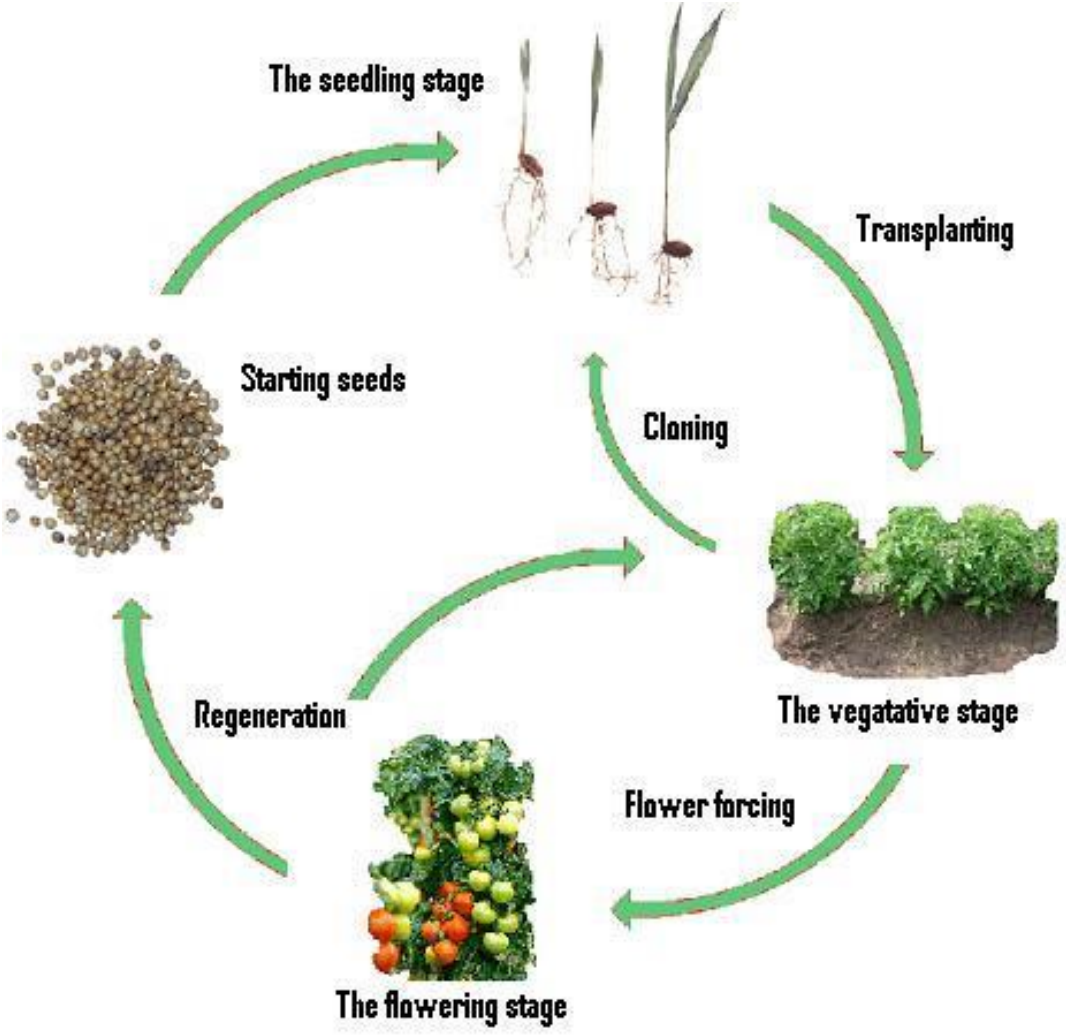
Plant Life Cycle



Plants I

We are around plants and animals every day.

What makes a plant different from an animal?

	Plants	Animals
A.	Get energy from the ground	Get energy from the sun
B.	Have seeds	Have babies
C.	Find food to eat	Make their own food
D.	Both can move around on their own	

Solution

Answer: D

Justification: There are many differences between plants and animals.

Plants can make their own food, while animals cannot. Plants absorb nutrients from the ground and get energy from sunlight to breakdown the nutrients. Animals get nutrients from eating plants and other animals and their bodies break them down for energy.

In order to reproduce, plants produce seeds which then grow into new plants. Animals either lay eggs or carry their young inside the body until they are ready to be born.

Plants also have roots, which limits their ability to move around. Animals have the ability to move from one place to another.

Plants II

Which of the following is not a plant?

A. Moss

B. Mushroom

D. Fern

C. Coniferous tree

Solution

Answer: B

Justification: Mushrooms are fungi, a close relative to plants! Fungi are different from plants because of the way they get nutrients.

Plants photosynthesize, making energy from the sun. Fungi do not photosynthesize. Fungi get energy through **osmotrophy**, meaning they absorb nutrients from their surroundings.

Moss, conifer trees and ferns are all plants that grow in British Columbia rainforests. It is interesting to see how plants can be many different sizes and shapes.

Extend Your Learning: Activity

Making a Spore Print

Some mushroom spores are white; others are yellow, pink, purple, black or brown. See this for yourself: make “spore prints” of different kinds of mushrooms.

1. Take each mushroom and pull off the stem. You will only use the cap.

2. Put the cap on a piece of paper, with the gills resting face down on the paper. Use a half white/half black piece of paper, so you can see different spore colours).

3. Cover with a glass container.

4. In an hour or two, lift up the glass and mushroom cap. Enough spores will have fallen on the paper to make a print.

5. If you spray the print with lacquer/hairspray, you can keep it as a record. Just as no two people have identical fingerprints, no two species of mushrooms have the same spore print!

Plants III

Plants have many different parts. All plants have roots, a stem, and a combination of leaves, flowers, and seeds.

Which diagram below correctly labels the roots, stem, leaves, and flower on this plant (dandelion)?

A.

Flower

Leaves

Roots

Stem

B.

Leaves

Flower

Roots

Stem

C.

Flower

Stem

Leaves

Roots

D.

Leaves

Stem

Flower

Roots

Solution

Answer: C

Justification: All parts of the plant are labeled correctly in this diagram.

In general, plant roots are always under the ground, and the stem is always above ground. Both the stem and the root always have a cap on the end of it. For the stem, this is often the leaves, flowers, or seeds.

Also, although all plants have some combination of leaves, flowers, and seeds, they don’t have to have all of them. This plant has all three, but you cannot see the seeds! They aren’t visible to the naked eye because they are too small. The seeds are in the flower. The wind will blow them out of the flower. When they land in the grass, they will grow into new plants.

Extend Your Learning: Compare and Contrast

Plants and fungi have very similar parts and structures.

Using what you know about plants, what can you guess about the parts of fungi?

Plants IV

Plant's have basic needs that must be met for them to grow.

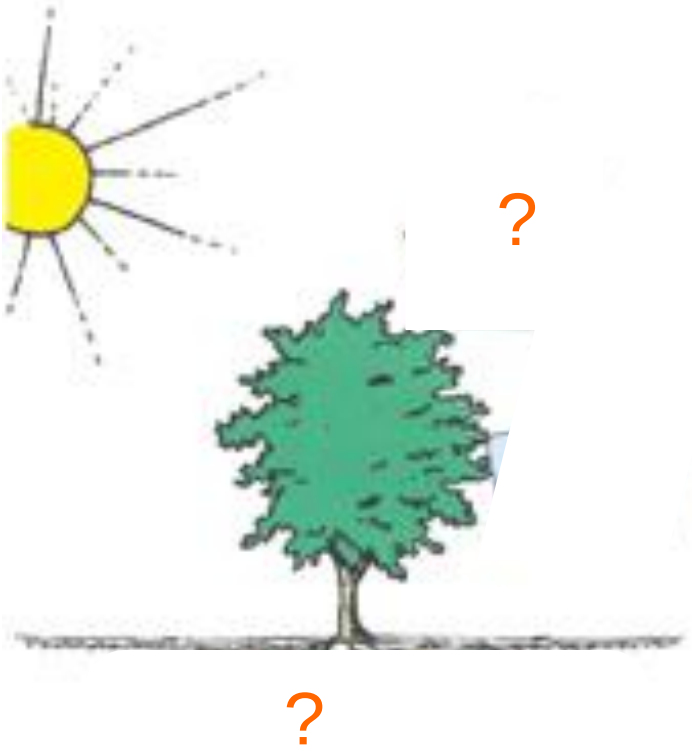
What are a plant's basic needs?

A. Sunlight and nutrients

B. Sunlight, nutrients, air and water

C. Sunlight, air and water

D. Sunlight, air, water, nutrients and shelter



Solution

Answer: B

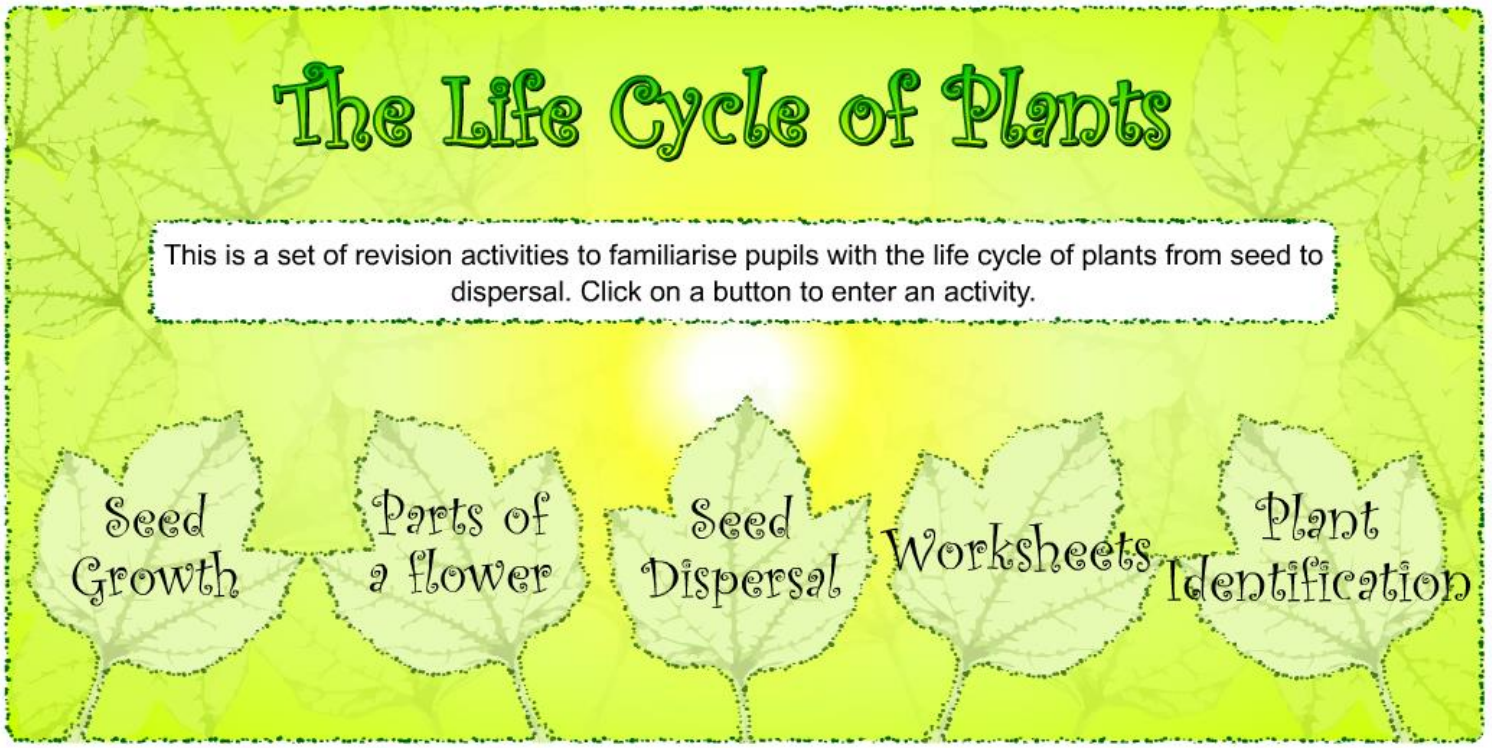
Justification: Plants have four basic needs – sunlight, air, water, and nutrients (from the soil). Plants do not need shelter.

Plants must have all of their needs met in one spot, since they do not travel, and they do not have the option to travel once they have rooted down.

Humans also have four basic needs, which are slightly different from plants. Humans needs water, air, food, and shelter. Humans, unlike plants, cannot withstand the elements and seasons, and need some sort of shelter. Plants, unlike humans, cannot move around to find food so they must be able to get nutrients from their direct surroundings.

Extend Your Learning: Online Activity

Title: The Life Cycle of Plants



Plant Life Cycle V

Many organisms experience a **life cycle**: a series of changes an organism goes through in a life time.

For example a plant's life cycles includes being a seed, sprout, adult plant, and flowering plant.

Looking at the images below, which does not have a life cycle?

A. Flower

B. Tree

C. Soil

D. Beaver

Solution

Answer: C

Justification: Only living organisms have a life cycle and soil is not a living organism. Soil is a mixture of organic matter (dead stuff) and minerals that provide a habitat for other plants to grow. Therefore soil does not have a life cycle.

All living organisms (including all plants and animals) have a life cycle, but the growth stages, and the length of each stage, differ. A flower and a tree are both plants, and a beaver is an animal. Therefore they all have life cycles.

Plant Life Cycle VI

For plants to grow and move through their life cycle, they need energy. They use a process called **photosynthesis** to convert energy from the sun into energy they can use.

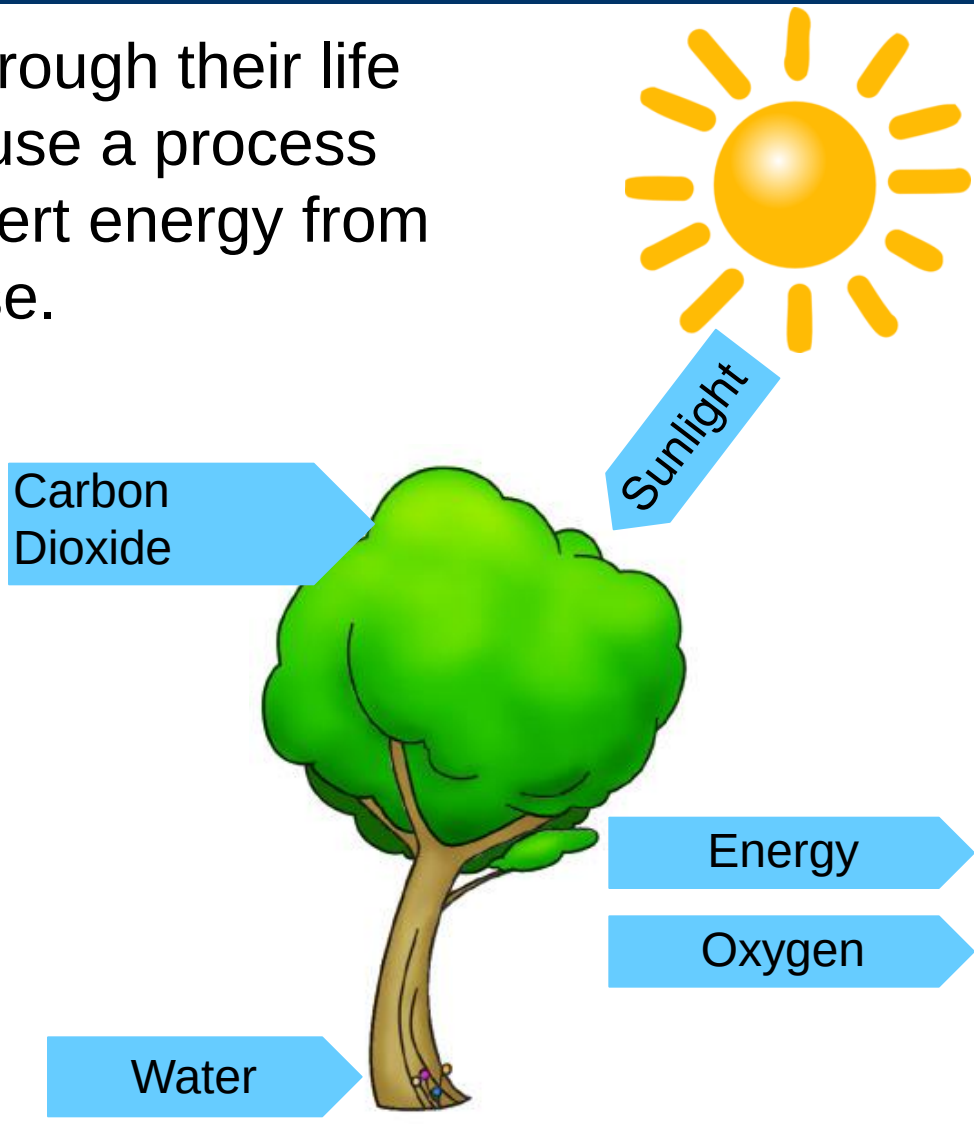
What kind of energy do plants take in and what convert it to?

A. Chemical → Mechanical

B. Light → Chemical

C. Mechanical → Light

D. None of the above

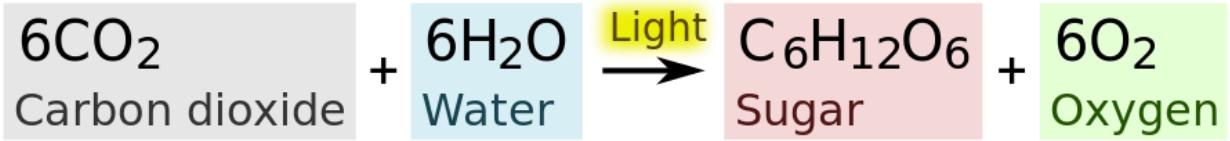


Solution

Answer: B

Justification: Photosynthesis is a process that converts light energy into chemical energy. The chemical energy can be used by plants! In order to convert light energy, plants also need water and CO_2 (carbon dioxide). Once it is converted to chemical energy, O_2 (oxygen) and sugar (glucose) are produced. The glucose is used to feed the plant.

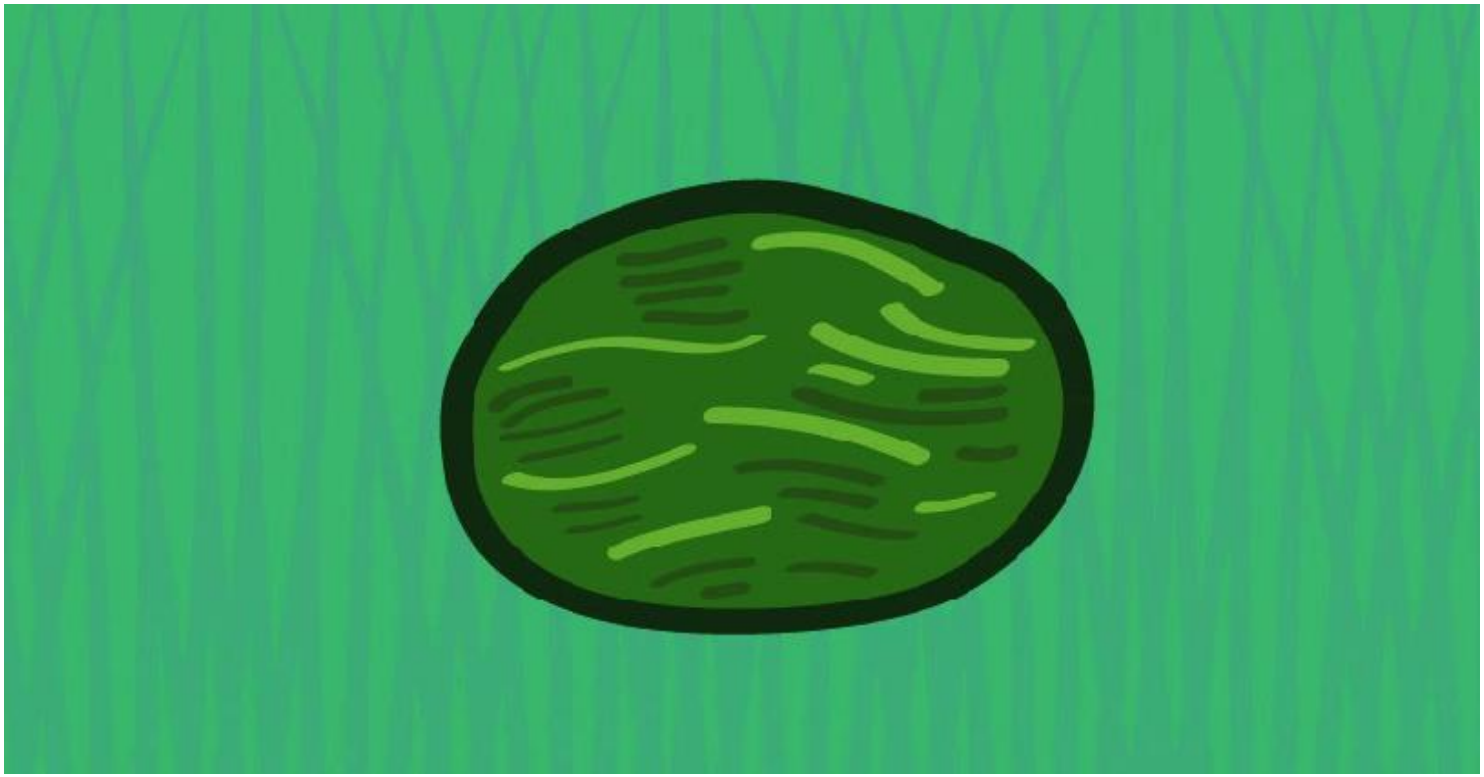
The process of photosynthesis can be described like this:



(Mechanical energy is the energy related to the position and movement of an object.)

Extend Your Learning: Video

Title: Photosynthesis



Extend Your Learning: Video

Title: The Carbon Cycle

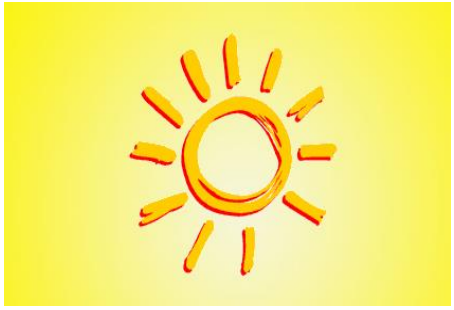
Title: The Nitrogen Cycle

There are two other cycles that interact with plants during photosynthesis and are important for its life cycle – the Carbon Cycle and the Nitrogen Cycle

Plant Life Cycle VII

Photosynthesis is necessary for plants to get energy and food. In addition, plants need nitrogen. They get nitrogen (a nutrient) from their surroundings.

Looking at these images, where could a plant get nitrogen from?



A. Sunlight

B. Soil

C. Rain

D. Air

Solution

Answer: B

Justification: Nitrogen gets incorporated into the soil from decomposed animals and plants, as well as rain fall. Once nitrogen is in the soil, it can be taken up by plant roots.

Each of the other components are necessary for plants to grow, but are either:
1) not sources of nitrogen (such as sunlight and air),
or
2) the nitrogen cannot be used by plants yet (such as nitrogen in water – it needs to be absorbed into the soil before it can be taken up into the plants roots).