



"Quête pour l'excellence"
"Yumi eim blo kasem exselens"

Central School

Home School Package

Year :7

HOME SCHOOL PACKAGE CONTENT

Week 6

Lesson 1.....Living things

Lesson 2.....Microscope

Lesson 3Cell

Week 7

Lesson 4.....Fertilization

Lesson 5.....Life cycle of chicken

Lesson 5.....Life cycle of frog

Lesson 6.....Flowering plants







Week 8

Lesson 7.....Pollination

Lesson 8.....Seed

Lesson 9Germination

LESSON Plan

 Teacher	Name : Lorien Subject : Basic science
 Date	Week 6 Day 1
	Topic : Reproduction,Growth and Development Lesson number 1 : Living things.
 Learning out Comes	<u>Specific learning outcomes</u> <ul style="list-style-type: none"> • <u>Differentiate living things from non living things.</u> • <u>Define the term Reprduction, Growth and Development.</u>
 Introduction	Activity 1 : The odd one out 1. Circle the odd one out from these words : Dog, Book, Grass, Yeast, Algae and Bacteria 2. Why is the word you circle the odd one out ? Give several reason to support your answer.
	Catch phrase for the lesson :



Learners notes

Living things.

Living things are classify into five different groups or kingdoms :

1. Plants
2. Animals
3. Fungi
4. Monera
5. Protista

Adding on, all this living things have seven characteristics which distinguish them from non living things.

1. Move
2. Reproduce
3. Sense
4. Grow
5. Respire
6. Excrete
7. Nutrition






Movement : The ability to move parts of the body. In animals muscles can contract.

Reproduction : Producing offspring. Flowering plants have a process of pollination followed later by fertilisation and seed dispersal.






Sensitivity : The ability to respond to changes in the surroundings. Plants can detect changes in light intensity and the light's direction. Humans can detect hot and cold ect.



Growth : All living things tend to grow to an adult size.

Respiration : The release of energy from food by combining it with oxygen in the cells of all living things.

	<p>Excretion : Releasing waste products. Waste products are removed by the lungs and in the urine.</p> <p>Nutrition : (feeding) Food is needed for growth and movement. Plants obtain food by photosynthesis.</p>
 Visual aids	
 Exercises	<p><u>Questions</u></p> <ol style="list-style-type: none"> 1. Living things are categories into how many kingdom ? 2. Give an example of each kingdoms you have stated above. 3. What are the seven characteristics of living things. 4. Define the following terms reproduction, growth and development in your own words. <p>-</p>
 Assignment	
 Assessment	<ul style="list-style-type: none"> • Short quiz
 References	<p>Devlin, H. C. (2000). <i>Heinemann Science links 1</i>. (S. Woollett, Ed.) Reed international Books Australia Pty Ltd 2000.</p>

LESSON Plan

 Teacher	Name : Lorien Subject : Basic science
Date 	Week 6 Day 2
	Topic : Reproduction, Growth and Development Lesson number 2 : Microscope.
 Learning out Comes	<u>Specific learning outcomes</u> <ul style="list-style-type: none">• Name the different parts of a light microscope.• Prepare a specimen and observe it under different objective lens.
 Introduction	<p>In this lesson we are going to learn how to use a microscope, the different parts of a microscope and the function of the different parts.</p> <p>Living things like animals, plants, Protista, fungi and monera are made up of tiny building blocks called cell. Cells are the basic unit of life. It was discovered 300 years ago by scientist using a special instrument called microscope.</p> <p>Microscope helps scientist to study cells into more</p>

	<p>detail. For instance, in 1839 after many observations Theodor Schwann a German scientist developed the cell theory which states that:</p> <ul style="list-style-type: none"> • All living things are made up of one or more cells. • Cells are the basic unit of structure and function in living things. • All cells come only from other living cells.
	<p>Catch phrase for the lesson :</p>
 <p>Learners notes</p>	

Microscopes

FIGURES 4.5 & 4.6

The Dutchman Anton van Leeuwenhoek was a highly skilled maker of microscopes and a careful and inquisitive observer. In 1683, he used a very simple microscope (far right) to see what he called 'little beasties' in drops of water (right). He was, in fact, the first person to observe bacteria under the microscope. His discovery opened up a whole new world of investigation to scientists.

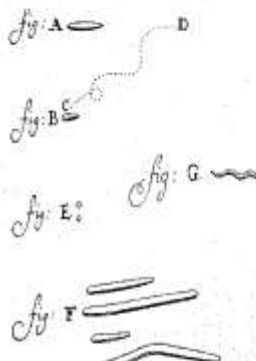


FIGURE 4.7 (right)

The modern light microscope is the type commonly used in school laboratories. These microscopes use a source of light to illuminate the object being studied.

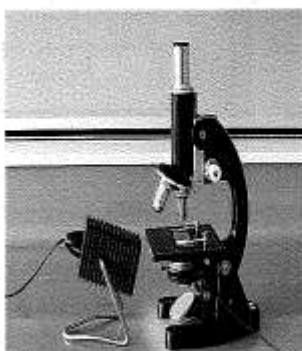
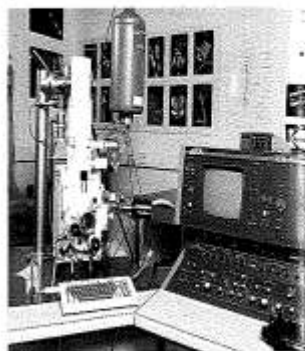
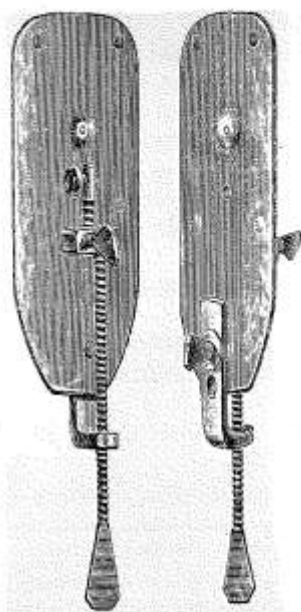


FIGURE 4.8 (far right)

The electron microscope uses a beam of electrons instead of light to produce images of the object being studied.



Today the microscope is one of the most important instruments used by scientists, particularly biologists. Microscopes have allowed us to discover many things: identifying which bacteria or viruses are responsible for a particular disease; examining evidence to determine whether a suspect is guilty of a crime; and enabling infertile couples to have children through in vitro fertilisation.

Most modern microscopes are **compound light microscopes**, which can magnify to approximately 1000 times. They work by shining light through the object.

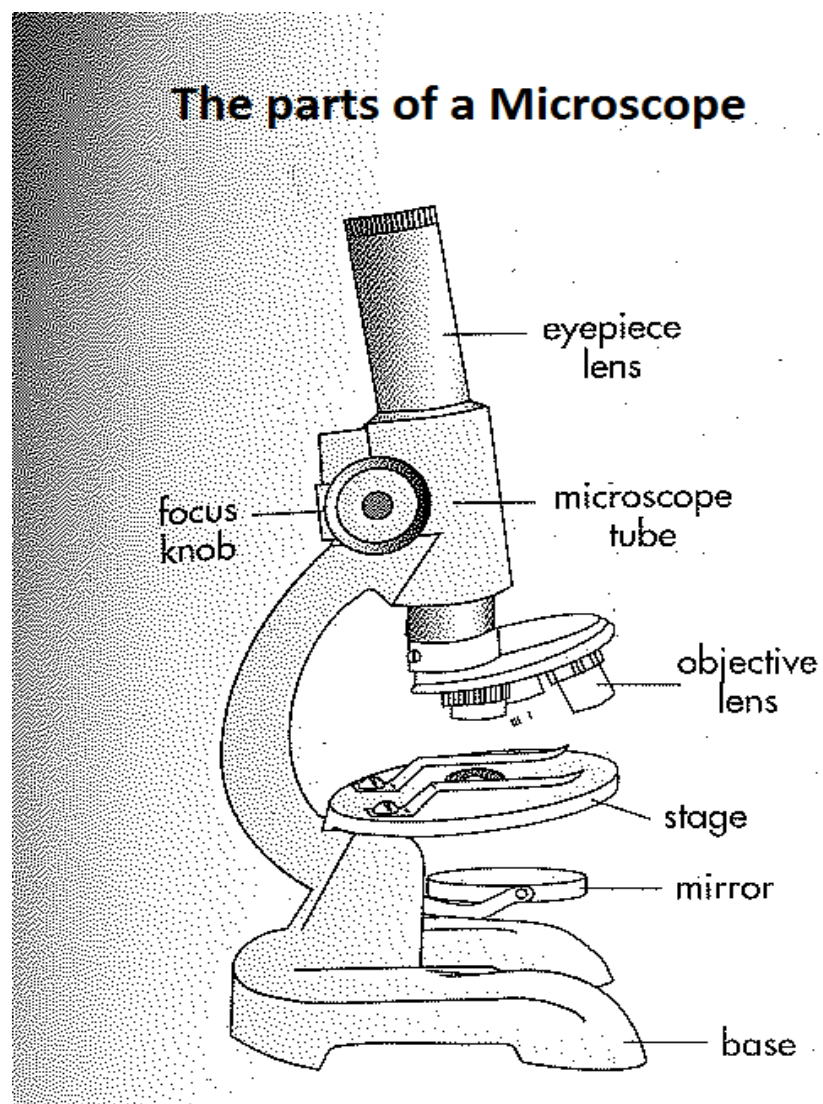
In the 1930s scientists developed the **electron microscope** which uses tiny

negatively charged particles called electrons instead of light. A TV set works in a similar way. These microscopes can magnify up to 500 000 times! **Scanning electron microscopes** show even more detail by giving a three-dimensional picture of the surface. This is useful in discovering the smallest details of a cell.

The parts of a microscope

Although the microscopes that are used in schools and laboratories may look different, they work in much the same way and have similar features.

The parts of a Microscope



Guidelines for working with microscopes

Microscopes are very expensive and delicate instruments. They should be used with care at all times. Here are five important rules to remember when using microscopes.

- 1 When carrying your microscope, always use both hands.
- 2 Keep your microscope well away from the edge of your work bench.
- 3 To prevent damage to your eyes, make sure that sunlight is not shining directly up the tube of the microscope.
- 4 Look from the side of the microscope and wind the tube down so that the objective lens is as close to the microscope slide as possible. You can then focus your microscope by looking through the eyepiece lens and winding the tube slowly upwards.
- 5 If your microscope lenses are dirty, use lens tissues to clean them. Never use your fingers.













Microscope part Description of function

Eyepiece lens	The lens you look through to see the object you are studying.
Objective lens	The lens that is closest to the object you are studying. (Some microscopes have more than one objective lens. There may be a low-power lens, a high-power lens and an oil immersion lens.)







Continued


Microscope part Description of function

Focus knob	A knob that can be turned to bring the object you are studying into focus.
Stage	The platform on which the object you are studying is placed.
Mirror	Usually positioned beneath the stage to direct light through the object you are studying.
Diaphragm	This controls the amount of light that passes up through the microscope.
Microscope tube	The adjustable tube between the eyepiece and objective lenses.
Base	The platform on which the microscope is built.

 Visual aids	https://www.youtube.com/watch?v=xzjowD1KN20																
 Exercises	<p>Answer the questions 1 to 3 and also answer the questions under the heading think about questions 1 to 3.</p> <table><thead><tr><th>Questions</th><th></th><th>Think about</th><th></th></tr></thead><tbody><tr><td>1 Why are microscopes needed to study cells?</td><td></td><td>1 Why was the invention of the electron microscope so important?</td><td></td></tr><tr><td>2 What are some of the things microscopes have allowed scientists to discover?</td><td></td><td>2 Does the electron microscope have any disadvantages?</td><td></td></tr><tr><td>3 List the differences and similarities between a light microscope and an electron microscope.</td><td></td><td>3 Read carefully through the five rules for working with microscopes. Why do you think each rule is important?</td><td></td></tr></tbody></table> <p style="text-align: right;">Cells—The Units of Life  67</p>	Questions		Think about		1 Why are microscopes needed to study cells?		1 Why was the invention of the electron microscope so important?		2 What are some of the things microscopes have allowed scientists to discover?		2 Does the electron microscope have any disadvantages?		3 List the differences and similarities between a light microscope and an electron microscope.		3 Read carefully through the five rules for working with microscopes. Why do you think each rule is important?	
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 References	Devlin, H. C. (2000). <i>Heinemann Science links 1</i> . (S. Woollett, Ed.) Reed international Books Australia Pty Ltd 2000.																

LESSON Plan

 Teacher	Name : Lorien Subject : Basic science
 Date	Week 6 Day 3
	Topic : Reproduction, Growth and Development Lesson number 3 : Cells
 Learning out Comes	<u>Specific learning outcomes</u> <ul style="list-style-type: none">Differentiate plant cells and animal cells.
 Introduction	 <h1>The Cell</h1> <p>The cell is the basic unit of life. Some organisms are made up of a single cell, like bacteria, while others are made up of trillions of cells. Human beings are made up of cells, too.</p> <p>Different Types of Cells</p> <p>There are lots of different types of cells. Each type of cell is different and performs a different function. In the human body, we have nerve cells which can be as long as from our feet to our spinal cord. Nerve cells help to transport messages around the body. We also have billions of tiny little brain cells which help us think and muscle cells which help us move around. There are many more cells in our body that help us to function and stay alive.</p>

	<p>Although there are lots of different kinds of cells, they are often divided into two main categories: prokaryotic and eukaryotic.</p> <p>Prokaryotic Cells - The prokaryotic cell is a simple, small cell with no nucleus. Organisms made from prokaryotic cells are very small, such as bacteria. There are three main regions of the prokaryotic cell:</p> <ol style="list-style-type: none"> 1) The outside protection or "envelope" of the cell. This is made up of the cell wall, membrane, and capsule. 2) The flagella, which are a whip-like appendages that can help the cell to move. Note: not all prokaryotic cells have flagella. 3) The inside of the cell called the cytoplasmic region. This region includes the nucleoid, cytoplasm, and ribosomes. <p>Eukaryotic Cells - These cells are typically a lot bigger and more complex than prokaryotic cells. They have a defined cell nucleus which houses the cell's DNA. These are the types of cells we find in plants and animals.</p>
	<p>Catch phrase for the lesson :</p>



Learners notes

4.4

Comparing animal and plant cells

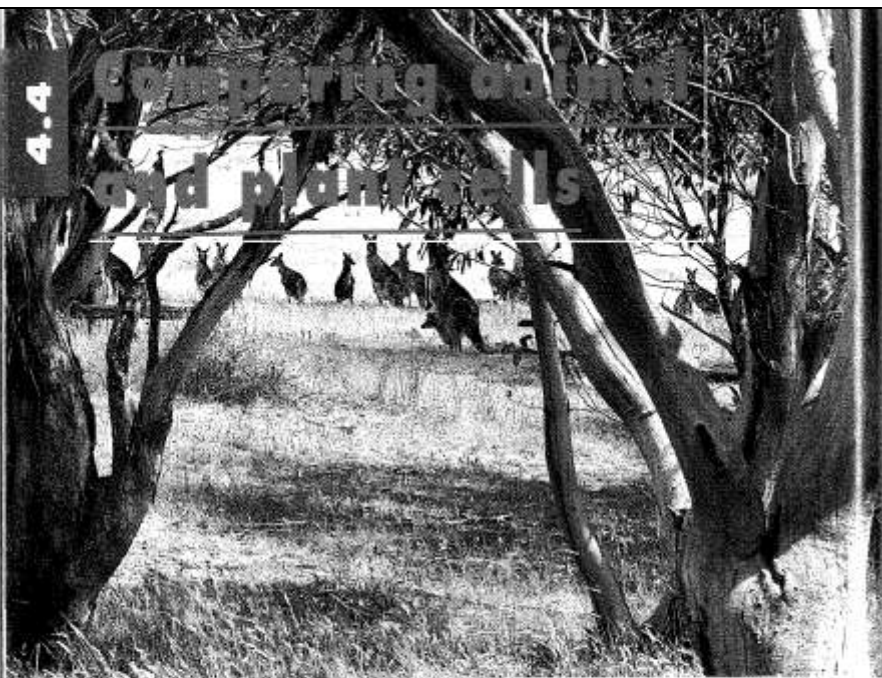


FIGURE 4.12
Plant and animal cells have to perform different functions, and so have different needs.

Most cells can be classified as either animal cells or plant cells. Although cells are basically similar, there are some differences between animal and plant cells. This is because animals and plants do some things the same, but do many other things differently.

There are three main parts, or structures, in every cell which can be clearly seen using a light microscope:

- the cell membrane
- the nucleus
- the cytoplasm.

The **cell membrane** is the thin layer that surrounds each cell. It protects the contents of the cell and gives the cell its shape. A cell membrane controls what enters and leaves the cell.

The **nucleus** is the 'control centre' of the cell. It is surrounded by a **nuclear membrane** which holds the contents of the nucleus together. Inside the nucleus are **chromosomes**. These chromosomes are made up of smaller units called **genes**. The genes carry the inherited information that is needed by both the cell and the whole organism.

The **cytoplasm** is a jelly-like liquid that fills up most of the space in the cell. The cytoplasm contains many smaller structures that carry out special functions in the cell. **Ribosomes** manufacture complex substances called **proteins**. Storage areas for food, water and wastes in the cytoplasm are called **vacuoles**. The **mitochondria** are the parts of the cell where energy is produced in a process known as **respiration**.

Animal and plant cells

Plants make their own food using light, carbon dioxide from the air, and water. This process is called **photosynthesis**. Photosynthesis happens in structures called **chloroplasts** using a green chemical called **chlorophyll**. Plant cells also have tough cell walls surrounding their cell membranes. These **cell walls** give plants the strength to support themselves, since they do not have skeletons like some animals. Cell walls contain a tough, fibrous material called **cellulose**.



Red blood cells do not have a nucleus. This means that they only live for a short time (120-130 days), and die at the rate of 2 000 000 per second. New ones are made at the same rate.

	<div data-bbox="510 217 1297 743" data-label="Image"> </div>
<div data-bbox="199 1070 387 1227" data-label="Image"> </div> <div data-bbox="186 1218 355 1256" data-label="Text"> <p>Visual aids</p> </div>	<p>https://www.youtube.com/watch?v=LdKcTtabr6Y&t=2s</p> <p>https://www.youtube.com/watch?v=VBdVARYWq1c</p>
<div data-bbox="193 1330 336 1442" data-label="Image"> </div> <div data-bbox="199 1447 351 1485" data-label="Text"> <p>Exercises</p> </div>	<div data-bbox="478 1344 791 1388" data-label="Section-Header"> <h3>Questions</h3> </div> <div data-bbox="1038 1317 1150 1420" data-label="Image"> </div> <ol style="list-style-type: none"> 1 What cell parts are found in both animal and plant cells? 2 Name two cell parts found only in plant cells. 3 What substance gives plants their green colour? What does this substance do? 4 What is the function of each of the following parts of cells? <ol style="list-style-type: none"> a mitochondria b ribosomes c vacuoles 5 what can you say about the shape of a plant cell and



Assignment

an animal cell ?

Plant cells and Animal cells

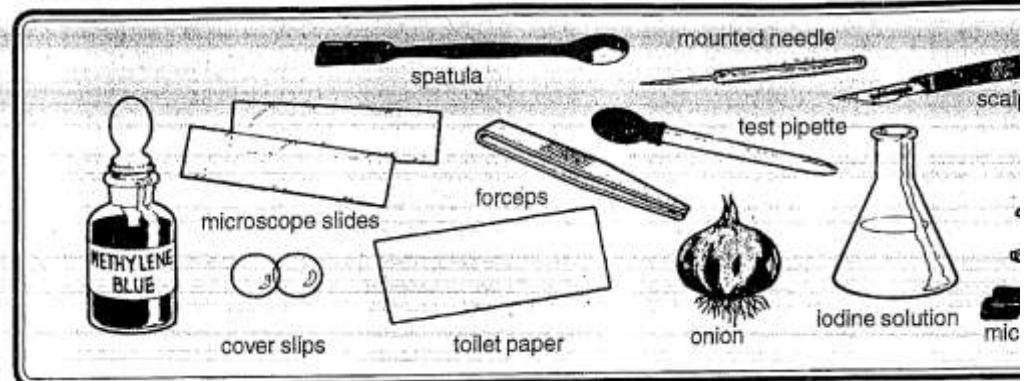
Aim:

To observe plant cells and animal cells under a light microscope.

Materials

Looking at cells

You will need:



Making a cheek cell

Method

1. Using a clean spatula, gently scrape a little skin from the inside of your cheek.
2. Put a small piece on skin on the Centre of the slide.
Add a drop of methylene blue stain.
3. Using a mounted needle, carefully lower the cover slip over the material. Try not to trap any air bubbles.
4. Look at your slide under a microscope. Compare what you see with the drawing on the other side of this card.

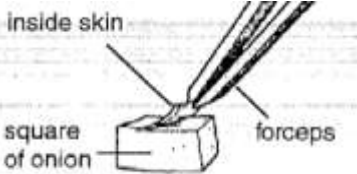



Exercise

1. Draw the diagram of your cheek cells under the low power and medium power.
2. Draw a diagram of you cheek cell under 400x and label your diagram using the following words:





Nucleus
Cell membrane
Cytoplasm
Cell wall
Air bubbles

Making a slide of onion skin cells

Method

	<ol style="list-style-type: none"> 1. Cut a small square of the flesh of an onion. 2. Put a drop of iodine solution on to the centre of a slide. 3. Peel off the inside skin from your square of onion.  <p>Put the skin onto the iodine solution on the slide.</p> <ol style="list-style-type: none"> 4. Carefully lower the cover slip, using a mounted needle.  <p>Try not to trap any air bubbles.</p> <ol style="list-style-type: none"> 5. Use blotting paper to soak up any excess liquid. 6. Examine your slide under the microscope. Compare what you see with the drawing below. <p>Exercise</p> <ol style="list-style-type: none"> 1. Draw a diagram of onion skin cells. 2. Label your onion skin cells. 3. Give two ways in which these plant cells (onion) and animal cells (cheek) are similar, and two ways in which they are different. 4. What magnification did you use?
 Assessment	Practical test
 References	<p>Devlin, H. C. (2000). <i>Heinemann Science links 1</i>. (S. Woollett, Ed.) Reed international Books Australia Pty Ltd 2000.</p>

LESSON Plan

 Teacher	Name : Lorien Subject : Basic science
 Date	Week 7 Day 1
	Topic : reproduction growth and development. Lesson One : Fertilisation
 Learning outComes	<ul style="list-style-type: none">• <u>Define the term fertilisation</u>• <u>Explain what is internal and external fertilisation</u>



Introduction

2

Fertilization

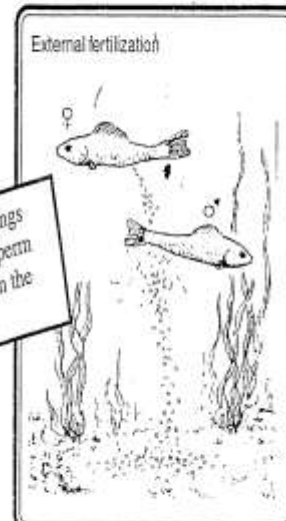
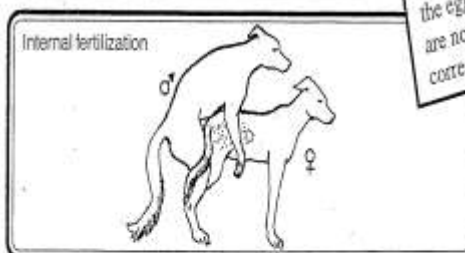
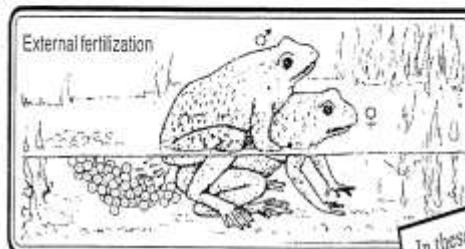
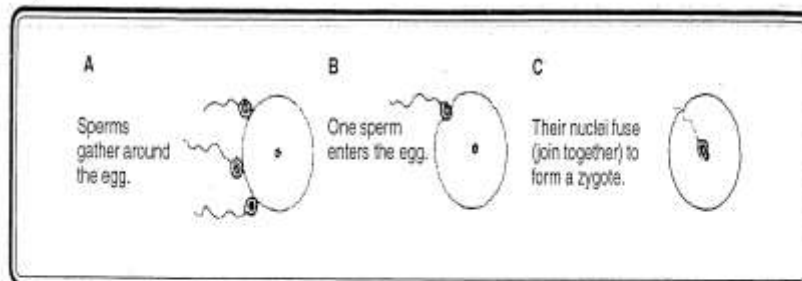
Q8 Copy this information.

A new young animal develops from a **zygote**. A zygote is made when an egg and a sperm nucleus join together. The joining of an egg and a sperm is called **fertilization**.

In some animals the egg and sperm nuclei join together inside the female's body. This is called **internal fertilization**.

In other animals the egg and sperm nuclei join together outside the body. This is called **external fertilization**.

Q9 Copy diagrams A, B and C and the information.



In these drawings the egg and sperm are not shown the correct size.

The symbols (signs) used in the drawings represent ♀ for female and ♂ for male.

Q10 Why do you think fish need to produce more eggs and sperms than frogs?

Q11 Why do you think frogs produce more eggs than mammals?

Q12 In which animal is the zygote safest? Give a reason for your answer.

NEW WORDS: gametes, egg, sperm, zygote, fertilization, internal fertilization, external fertilization



Catch phrase for the lesson :



Learners notes

6.2 Reproduction in animals

Starting off

Only the simplest animals reproduce by dividing in two. Most animals, including humans, produce special **sex cells** for reproduction.

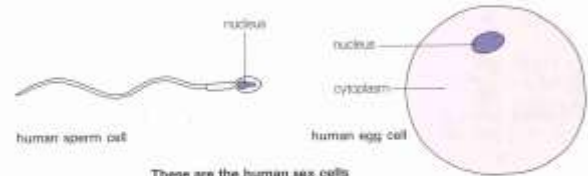
There are usually two types of sex cell. The smaller of the two can move on its own. It is called the **male cell** or **sperm**. The larger one cannot move on its own. It is called the **female cell** or **egg**.

Fertilisation

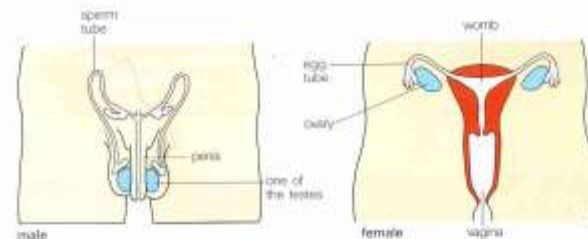
Fertilisation has to take place before a new animal can grow. In fertilisation, the sperm and the egg join up, making a **fertilised egg**. The new animal grows from this fertilised egg which divides, producing more and more cells.

Sexual reproduction

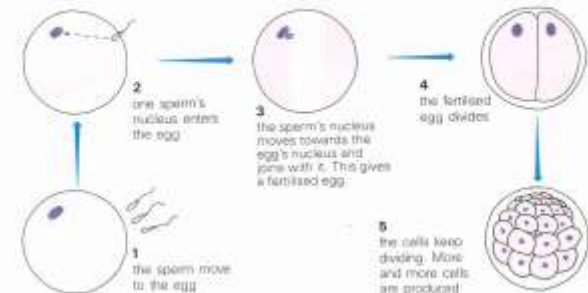
Reproduction of the type which begins when a sperm joins with an egg is called **sexual reproduction**. Most animals reproduce by sexual reproduction involving two parents. Each parent has special **reproductive organs** which produce the sex cells. The male has **testes** which produce the sperms. The female has **ovaries** which produce the eggs. The number of sperm cells produced by the male is far greater than the number of egg cells produced by the female.



These are the human sex cells



These are the human reproductive organs



This is what happens when an egg is fertilised

6.2 Sperm meets egg

Going further

'How does the sperm get to the egg?'

There is really only one answer to that question. The sperm gets to the egg by swimming! But in some cases, the sperm meets the egg outside the mother's body (**external fertilisation**). In other cases, the sperm and egg meet inside the mother's body (**internal fertilisation**).

In the case of most fish and amphibians, external fertilisation takes place. The male and female release their sperm and eggs into the water. If a sperm meets an egg, fertilisation takes place. If they don't meet, both sperm and eggs die. In fact, many of the eggs produced by the female are not fertilised.

Many animals pair up before the sperm and eggs are released. This gives a better chance of fertilisation. Here are three examples of animals pairing up:



Sperm meets egg



1 Many fish swim side by side when releasing sperm and eggs into the water.



2 Sticklebacks make a nest where the female lays her eggs. The male then covers the eggs with sperm.



3 The male frog sits on the female's back. He produces sperm while she is laying her eggs.

In the case of reptiles, birds and mammals, internal fertilisation takes place. These animals have reproductive organs which allow the male to pass sperm into the female's body. There, the sperm travel along tubes which lead to the egg. They swim through liquid which these tubes produce.



Visual aids

1. <https://www.youtube.com/watch?v=dMvYNTI8jy0>
2. <https://www.youtube.com/watch?v=LYzXwE9EswA>






Exercises

- 1 What are male sex cells called? Where are they produced? ▲
- 2 What are female sex cells called? Where are they produced? ▲
- 3 a) What happens when an egg is fertilised?
b) What happens to the egg after fertilisation? ▲
- 4 What is meant by sexual reproduction? ▲
- 5 a) Sperm cells, the male cells, are described as many, minute and mobile. Explain why.
b) What are the differences between egg cells and sperm cells?
- 6 **Try to find out:** what is meant by asexual reproduction.






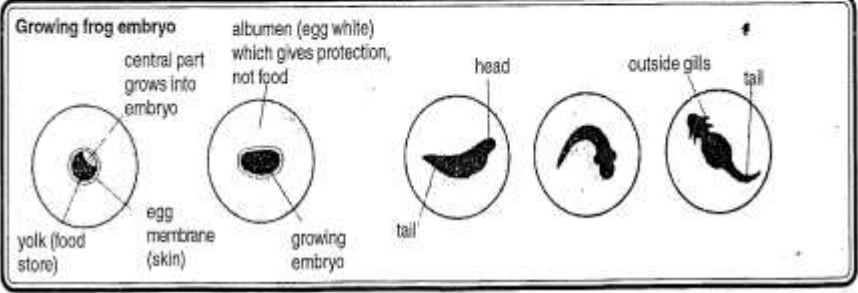
69

- 1 What is the difference between internal fertilisation and external fertilisation? ▲
- 2 Which sex cell moves by itself, the sperm or the egg? How does it move? ▲
- 3 Why is pairing important for animals whose eggs are fertilised outside the female's body?
- 4 Which method of fertilisation gives the egg the best chance of being fertilised? Explain your choice.

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	Answer questions on page 69 and 70 above.
 Assignment	
 Assessment	
 References	<p>Basic science card year 7</p> <p>Gilchrist, A. f. (1985). <i>starting science</i>. New york: Oxford University press.</p>

LESSON Plan

 <p>Teacher</p>	<p>Name : Lorien</p> <p>Subject : Basic science</p>
 <p>Date</p>	<p>Week 7</p> <p>Day 2</p>
	<p>Topic : reproduction growth and development.</p> <p>Lesson 2: Life cycle of chicken and Amphibians.</p>
 <p>Learning outComes</p>	<ul style="list-style-type: none"> Recognise the cycle of reproduction, growth and development .
 <p>Introduction</p>	<p>Q1 Copy this information.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>Frogs and toads belong to a group of vertebrates (animals with backbones) called amphibians.</p> <p>Amphibians spend the first part of their lives in water. The adults live on land. They return to water to mate and lay their eggs.</p> </div> <p>Q2 Copy these drawings of a growing frog embryo.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>Growing frog embryo</p>  </div> <p>Look at the diagram above and explain in your own words what is growth and development. .</p>



Catch phrase for the lesson :



Learners notes

6.4 Growing up: non-human animals

Starting off

- Embryos of different animals have many things in common:
- They all grow from fertilised eggs which divide, producing more and more cells.
 - They all need food and oxygen to grow.
 - They are all surrounded by water as they grow.

But different embryos grow in very different ways:

- Some embryos grow in eggs which the mother has laid. Others grow inside the mother's body.
- Some embryos get all their food from the egg's yolk. The oxygen they need travels to them through the egg. Others get food and oxygen from the mother's blood.
- Most embryos grow into 'young adults'. But the embryos of insects and some amphibians grow into **larvae** (like caterpillars, maggots and tadpoles). The larvae change into adults later.

You have already read about the human embryo, which grows inside its mother's womb. Here are two embryos which grow inside eggs until they have completely developed:



A newly-hatched chicken







Visual aids







Exercises

- 1 Which two things do all growing embryos need? ▲
- 2 How does: a) a frog embryo b) a human embryo get the oxygen it needs?
- 3 a) What is the yolk's job in the egg? ▲
b) As the chicken grows, the egg's yolk gets smaller. Why?
- 4 Make lists of animals which grow: a) inside the mother
b) inside eggs which the mother lays.
- 5 Which animals produce embryos that grow into larvae? ▲
- 6 Try to find out: how lizard embryos grow.

	<div data-bbox="1289 208 1313 253">4</div> <div data-bbox="507 291 810 360"> <p>Q3 What are amphibian eggs called?</p> <p>Q4 What are young amphibians called?</p> </div> <div data-bbox="507 378 1313 680"> <div data-bbox="539 405 555 439">4</div> <div data-bbox="549 486 852 584"> <p>When your tadpoles hatch, put them in a tank.</p> <p>Feed them on finely-chopped island cabbage.</p> </div> <div data-bbox="948 412 1283 640">  </div> </div> <div data-bbox="507 719 1209 925"> <p>Q5 How long do tadpoles take to hatch?</p> <p>Q6 Which of the tadpoles' legs grow first?</p> <p>Q7 What happens to the tadpoles' tail?</p> <p>Q8 The frog's eyes and nostrils are on the top of its head. Why does this suit the frog's way of life?</p> <p>Q9 Describe the frog's legs. How does the frog move (a) on land, and (b) in water?</p> </div>
<div data-bbox="197 949 256 1059">  </div> <div data-bbox="185 1066 400 1111">Assignment</div>	
<div data-bbox="197 1122 316 1193">  </div> <div data-bbox="185 1207 400 1252">Assessment</div>	
<div data-bbox="236 1308 419 1518">  </div> <div data-bbox="185 1525 384 1565">References</div>	<p>Gilchrist, A. f. (1985). <i>starting science</i>. New york: Oxford University press. Basic science card year seven.</p>

LESSON Plan

 Teacher	Name : Lorien Aru Tamata Subject : Basic science
 Date	Week 7 Day 3
	Topic : reproduction growth and development. Lesson One : Flowering plants
 Learning outComes	<ul style="list-style-type: none">• Identify the parts of a flower.• Explain the function of the parts of a flowering plant.

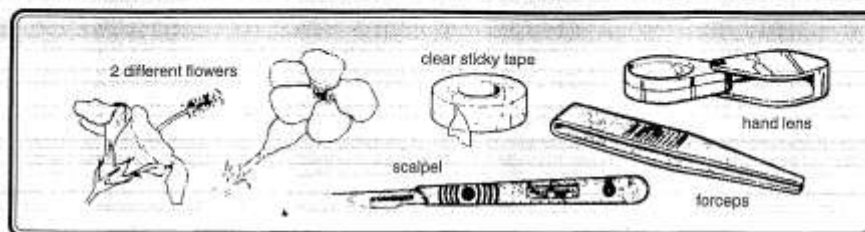


Introduction

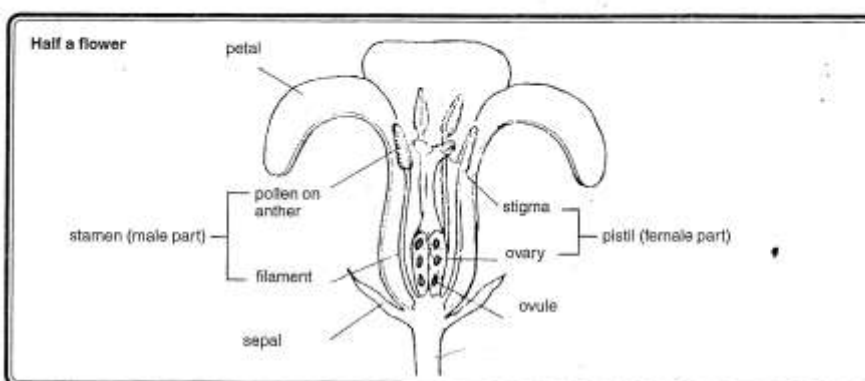
Reproduction, growth & development 5

Investigating flowers

You will need:



All flowers have similar structures (parts). Look carefully at the flower below.



Q1 Copy the drawing of the flower.

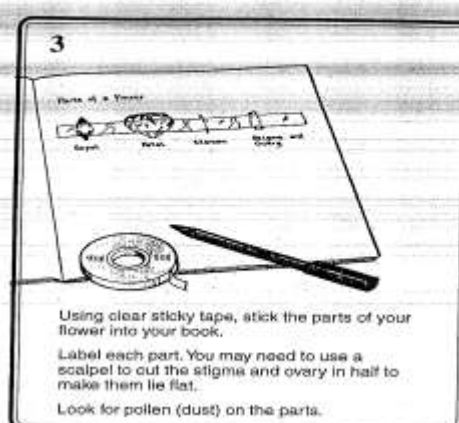
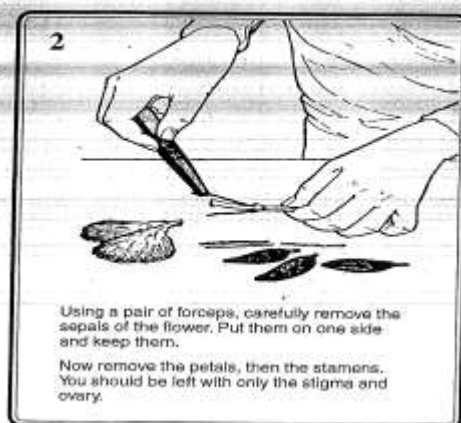
21

Compare a flower of hibiscus and one other flower with the one you have drawn.

Try to find all the parts of your two flowers.



YEAR 7



Q2 Copy and complete this table.

Number of stamens		Does the flower smell?	
Number of sepals		Pattern on petals	
Number of petals		Is pollen present?	
Number of stigmas		Colour of pollen	
Number of stamens		Does the flower smell?	

Q3 Copy and complete this information.

The s_____ are green and leaf-like. They protect the petals when they are closed. The brightly coloured p_____ attract insects which carry p_____ from one flower to another. The male part of the flower is the s_____, which makes pollen. Pollen contains the male gamete. The female parts of the flower are the s_____ and the o_____. The ovary contains the f_____ gametes.

Q4 For homework make a drawing of a half-flower of hibiscus and one other flower. Look at the flower as you draw it. Label all the parts.



Catch phrase for the lesson :



Learners notes

Angiosperms: flowering plants

The type of plants you are probably most familiar with are flowering plants (angiosperms).

Each main part of the flowering plant has a specific function as shown in the following table.

TABLE 5.2 Plant parts and functions.

Part	Function
Roots	Anchour plant in the ground; absorb water and mineral nutrients (such)
Stem	Supports leaves, flowers, etc.; allows for transport of water and food
Leaves	Manufacture food for the plant (photosynthesis)
Flowers	Reproductive part of the plant

The flower is the part of the plant responsible for reproduction. Most flowers have both male and female parts. The male part (**stamen**) produces **pollen** which pollinates the female part (**pistil**). **Pollination** can occur within a single flower or between two flowers. The beautiful colours and scents of flowers have a function too. They attract insects that transfer the pollen from one flower to another.

Plants without flowers

What about plants that don't have flowers? Using the classification key for plants, you can see that in some plants reproduction is carried out by spores or cones.

If you examine the back of a fern frond you may notice small reddish or brown spots. These spots are spore cases containing thousands of tiny spores, each of which is a potential fern plant. Like angiosperms, conifers have both male and female parts. The wind carries the male cells (pollen) from one cone to the female cells (eggs) in another cone. When the male pollen combines with the female eggs, **fertilisation** occurs and a new conifer can grow.

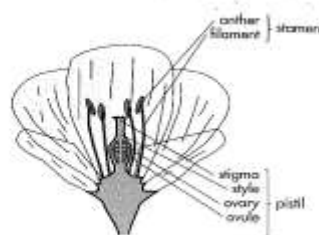


FIGURE 5.24
Which of the parts of the flowering plant in this diagram do you recognise?



Visual aids



Exercises

Questions

- 1 How are angiosperms different from other plants?
- 2a Why would light pollen be more useful to a flowering plant than heavier pollen?
- b Can you think of any other ways that pollen could be transferred from one flower to another, or from the stamen to the pistil on the same flower?
- 3a Draw a diagram of a leaf of a (i) monocotyledon (ii) dicotyledon.
- b Collect a sample of each type from your backyard or school ground.
- 4 What differences are there between the reproduction of angiosperms, ferns and conifers?
- 5 Draw and label a typical flower. Give the function of the labelled parts.



Assignment







Assessment



References

Devlin, H. C. (2000). *Heinemann Science links 1*. (S. Woollett, Ed.) Reed international Books Australia Pty Ltd 2000.
Basic science card year seven.
Gilchrist, A. f. (1985). *starting science*. New york: Oxford University press.

LESSON Plan

 Teacher	Name : Lorien Aru Tamata Subject : Basic science
 Date	Week 8 Day 1
	Topic : reproduction growth and development. Lesson One : Pollination
 Learning out Comes	<ul style="list-style-type: none">• Define pollination• Explain the term cross pollination and self pollination.

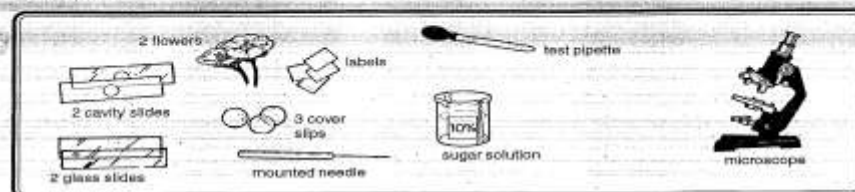


Introduction

Reproduction, growth & development 6

Pollen and pollination

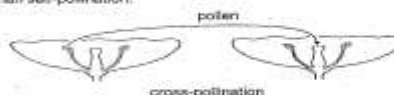
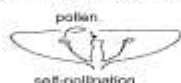
You will need:



Examining pollen

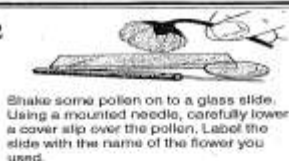
Q1 Copy this information and the diagrams.

Pollen is produced by the stamens. Pollination takes place when pollen lands on the stigma of a flower. Cross-pollination is much more common than self-pollination.



Q2 In what ways could pollen travel from one flower to another?

2



Shake some pollen on to a glass slide. Using a mounted needle, carefully lower a cover slip over the pollen. Label the slide with the name of the flower you used.

3

Examine the pollen under a microscope, using low power.



Repeat 1 and 2 with a different flowers.



hibiscus



thunbergia



pine

Pollen grains vary in size and shape and are dispersed in different ways. Pollen carried by insects tends to be spiky. Wind-carried pollen is light and may have wings.

Q3 Draw a few grains of pollen as seen under your microscope.

Q4 How do you think the pollen is carried?

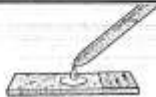
YEAR 7

Growing pollen

1 Label 2 cavity slides with the names of the flower pollens you are using.

2

Using a test pipette, put a drop of sugar solution into the cavity of each slide.



3

Shake a little pollen into each cavity.



4

Using a mounted needle, gently lower a cover slip on to each slide. Leave the slides in a warm place for half an hour. Then examine them under a microscope.

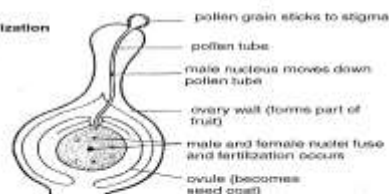


Q5 Write a short description of your experiment and results in your notebook.

Q6 Copy this information.

When a pollen grain lands on the correct stigma, it develops a tube which grows down to the ovary. The nucleus of the male sex cell travels down through this tube to the female sex cell. The two nuclei fuse to form a zygote which will become a seed (embryo plant). This process is called fertilization.

Fertilization



NEW WORDS: pollination



Catch phrase for the lesson :

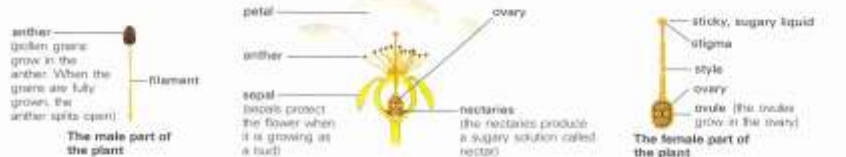


Learners notes

6.5 Reproduction in flowering plants

Starting off

Every part of a plant has its own special job to do. The flower's job is to allow the plant to reproduce by sexual reproduction. It produces the male sex cells (which are contained in **pollen grains**) and the female sex cells (contained in the **ovules**).



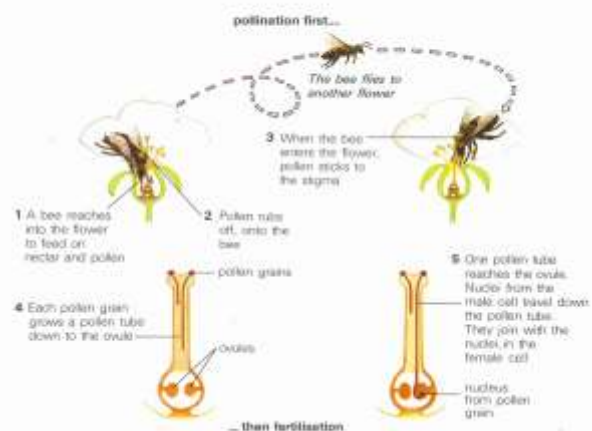
Pollination

The first step in reproduction is **pollination**. A flower is pollinated when a pollen grain lands on its stigma.

The pollen grain can be carried from an anther to the stigma of the same flower (**self-pollination**). Or, it can be carried to the stigma of another flower (**cross-pollination**). Some flowers' pollen is carried by insects. Other flowers' pollen is carried by the wind.

Pollination must be followed by **fertilisation**. The male sex cells must join up with female sex cells before a new plant can grow.

The diagrams opposite show how pollination and fertilisation take place in an insect-pollinated flower.





Visual aids





Exercises










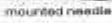
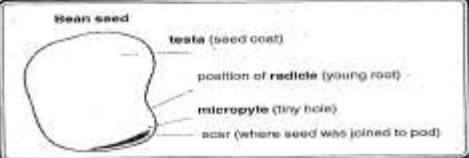
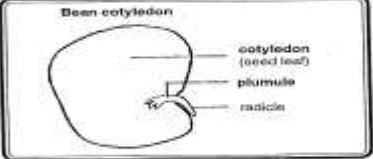

- Why are: a) sepals b) anthers c) ovaries important to a flower? ▲
- What happens in: a) pollination b) fertilisation? ▲
- Is the flower in the 5-stage diagram above being self-pollinated or cross-pollinated? Explain your answer.
- How can pollen be carried from flower to flower? ▲
- Pollen grain A is small and very light. Pollen grain B is sticky. One is pollen from a buttercup. The other is pollen from a grass. Say which is which, giving reasons for your answer.



Assignment	
 Assessment	
 References	Devlin, H. C. (2000). <i>Heinemann Science links 1</i> . (S. Woollett, Ed.) Reed international Books Australia Pty Ltd 2000. Gilchrist, A. f. (1985). <i>starting science</i> . New york: Oxford University press.

LESSON Plan

 Teacher	Name : Lorien Aru Tamata Subject : Basic science
	Week 8 Day 2

<p>Date</p>	
	<p>Topic : reproduction growth and development. Lesson One : Seeds</p>
 <p>Learning outComes</p>	<ul style="list-style-type: none"> Identify in any simple seed the following parts : seed coat, scar, micropyle, seed leaves, embryo, radicle and plumule. Explain the function of the parts stated above.
 <p>Introduction</p>	<h3 style="text-align: center;">Reproduction, growth & development 7</h3> <p>Looking at seeds</p> <p>You will need:</p> <div style="display: flex; justify-content: space-around; align-items: center;">     </div> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p>Q1 Copy this diagram.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Bean seed</p>  </div> <div style="width: 35%;"> <p>1 Look at a bean seed. Find all the parts labelled in the diagram.</p> <p>2 Gently squeeze the bean. Watch the micropyle as you squeeze.</p> </div> </div> <p>Q2 What happens to the micropyle when you squeeze the bean? Q3 What do you think is the job of the micropyle?</p> <p>Q4 Copy this diagram.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Bean cotyledon</p>  </div> <div style="width: 35%;"> <p>3</p>  <p>Using a mounted needle, carefully remove the testa. Separate the cotyledons. Find the parts labelled in the diagram.</p> </div> </div> <p>Q5 What is the job of the testa? Q6 How many cotyledons does a bean seed have? Q7 What do you think cotyledons provide for the young plant?</p> <p style="text-align: right;">YEAR 7</p>

4

Use a mounted needle and forceps to separate the tiny embryo plant from the cotyledon.
Put the embryo onto a watch glass. Examine it through a hand lens.



Q8 What colour is the plumule?

Q9 Can you see any leaves?

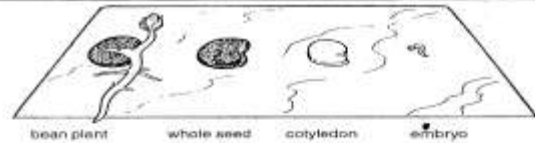
Q10 Draw a diagram of your embryo bean plant.

Embryo bean plant



5

Put a growing bean plant, a complete seed, a single cotyledon and an embryo plant on a sheet of paper.
Compare parts of the seed with the same parts of the grown plant.



Q11 Copy this table.

Part of the seed	Changes which have occurred during growth of the plant
Testa	
Cotyledon	
Plumule	
Radicle	

Q12 In what ways have the testa, cotyledon, plumule and radicle changed in the grown plant? Record your answers in the table.

NEW WORDS: testa, cotyledon, micropyle, radicle, plumule



Catch phrase for the lesson :



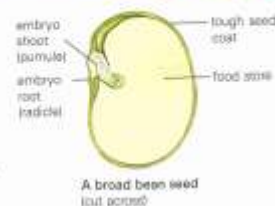
Learners notes

6.5 How a new plant grows

Going further

After the ovules have been fertilised, most of the flower withers and dies. At the same time, the fertilised ovules grow inside the ovary until they develop into seeds. Each seed contains a tiny embryo plant. It also contains a food store. Round the seed is a tough **seed coat** which protects it.

The ovary grows, too. The developed ovary, with the seeds inside it, is called a **fruit**. A pea pod, a plum and a sycamore propeller are all fruits.



Scattering the seeds

In many plants, the seeds are scattered. Often the whole fruit is scattered, with the seed inside. This scattering is important. Plants which are overcrowded don't grow well. Scattering gives the plants more room to grow.

dandelion fruit



Some seeds are scattered by the wind



sycamore fruit

burdock fruit



Some seeds are scattered by animals

cherry



On a hot day, when the pod is dry, it bursts open. This scatters the seed.

Some seeds are scattered by explosions

Germination

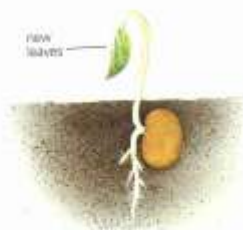
If the conditions are right, a seed will begin to grow or **germinate**. The seed which is scattered from the plant has very little water in it. A new plant begins to grow when the seed takes in water.



1 When the bean seed takes in water, the root begins to grow, using the stored food for energy.



2 The root continues to grow. The root hairs begin to take in water from the soil.



3 The shoot begins to grow. Then leaves appear.

Did you know?

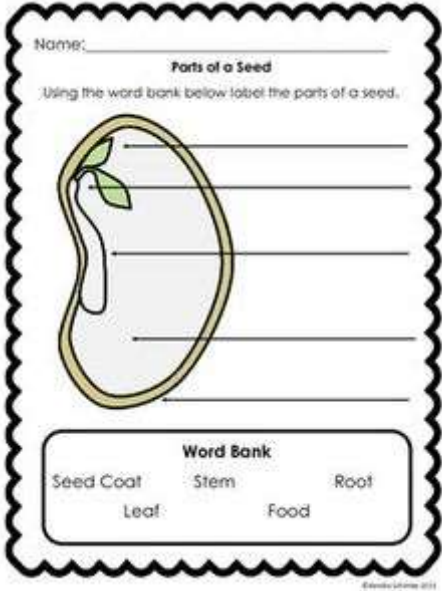





Visual aids







Exercises

- 1 What happens to: a) the flower b) the ovule c) the ovary wall after fertilisation takes place? ▲
- 2 a) Give one reason why it is better for seeds to be scattered from the plant.
b) Give three ways in which seeds are scattered. ▲
- 3 What happens when a seed germinates? Where does the growing embryo get its energy from? ▲
- 4 Seeds don't germinate in the packet. Why is this?
- 5 Try to find out: about other seeds, and how they are scattered.

	
 Assignment	
 Assessment	
 References	<p>Devlin, H. C. (2000). <i>Heinemann Science links 1</i>. (S. Woollett, Ed.) Reed international Books Australia Pty Ltd 2000.</p> <p>Gilchrist, A. f. (1985). <i>starting science</i>. New york: Oxford University press.</p> <p>Basic science card year 7.</p>

LESSON Plan

 Teacher	Name : Lorien Aru Tamata Subject : Basic science
 Date	Week 8 Day 3
	Topic : reproduction growth and development. Lesson One : Germination
 Learning outComes	<ul style="list-style-type: none">• Explain germination in your own words.• State the conditions required for germination.



Introduction

- **Germination** is the **start of growth in the seed**
- Three factors are required for successful germination:
 - **Water** – allows the seed to swell up and the enzymes in the embryo to start working so that growth can occur
 - **Oxygen** – so that energy can be released for germination
 - **Warmth** – germination improves as temperature rises (up to a maximum) as the reactions which take place are controlled by enzymes.



Catch phrase for the lesson :

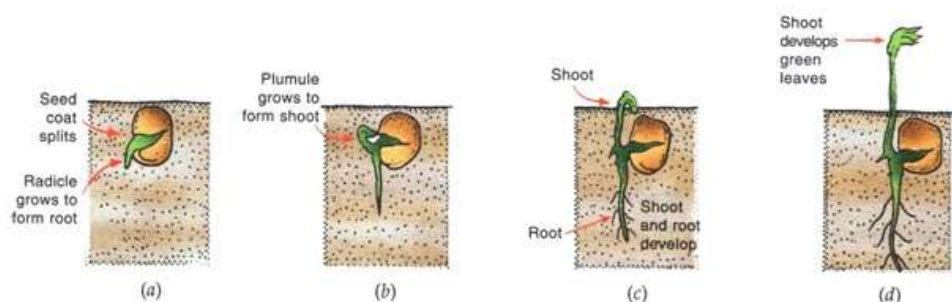


Learners notes

Germination of seeds






The seeds obtained from a plant are in dry and dormant state. It is only when they get water, air, soil, etc., that they begin to grow into a new plant. The beginning of the growth of a seed is called germination of seeds.

The germination of a seed begins when it absorbs water, swells and bursts through the seed coat. It is with the help of water that enzymes function in the seed. The enzymes digest stored food and make it soluble. With the help of soluble food radicle and plumule grow.



Seeds germinate under suitable conditions to produce new plants. These pictures show the germination of a bean seed to form a new bean plant.

First the radicle of the seed grows to form roots. These roots grow inside soil and absorb water and minerals from the soil. After this plumule grows upwards and shoots are formed. These shoots develop green leaves. The leaves begin to make food with the process of photosynthesis and gradually a whole new plant is developed.

 Visual aids	https://www.youtube.com/watch?v=TE6xptigNR0
 Exercises	1. What is germination ? 2. What are the conditions that plants need to germinate ?
 Assignment	
 Assessment	
 References	Devlin, H. C. (2000). <i>Heinemann Science links 1</i> . (S. Woollett, Ed.) Reed international Books Australia Pty Ltd 2000. Basic science card year 7.



WEEKLY CHECKLIST For Parents:

Term: 2 Week number 1 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 2 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
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Term: 2 Week number 3 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
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	3				
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Term: 2 Week number 4 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
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	5				
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Term: 2 Week number 5 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
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	3				
	4				

	5				
	6				

Term: 2 Week number 6 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 7 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
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	3				
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	5				
	6				

Term: 2 Week number 8 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 9 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
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	3				
	4				

	5				
	6				

Term: 2 Week number 10 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
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	3				
	4				
	5				
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Term: 2 Week number 11 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
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	2				
	3				
	4				

	5				
	6				

Term: 2 Week number 12 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
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	2				
	3				
	4				
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	6				

Term: 2 Week number 13 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				

	3				
	4				
	5				
	6				