

3

Reproduction in Animals

Animals reproduce

In Grade 4, Unit 4, you learnt that all living things go through a life cycle. Life cycles involve reproduction.

All living things reproduce. This is to make sure that each kind of living thing continues to live on.

- What would happen to living things if they did not reproduce?

Some animals reproduce by laying eggs. Others reproduce by giving birth to young. **They would become extinct.**

Fish, amphibians, reptiles, birds and insects lay eggs.



Life cycles
Grade 4,
Unit 4



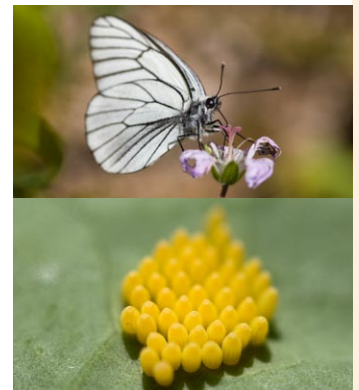
'Re' means 'again'. So 'to reproduce' means 'to produce again'.



Bird lay eggs



A frog is an amphibian. Frogs lay eggs.

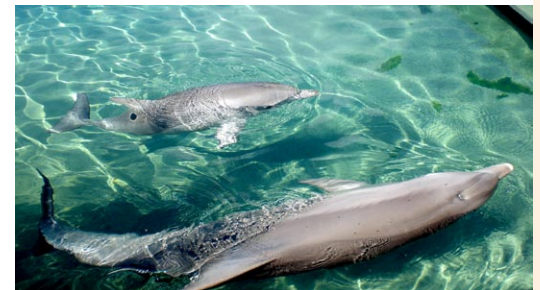


A butterfly is an insect. Butterflies lay eggs.

Mammals reproduce by giving birth to young.



A mother lion with her cubs.



A mother dolphin with her baby.

- How does reproduction happen in animals?

In this unit, we will answer this question.

Thinking



The life cycles of animals have several stages. Think about the following animals: butterfly, cockroach, fish, frog, birds.

For each animal, (a) state the number of stages in its life cycle, and (b) name the stages.

Useful question for revision and introduction to reproduction. Butterfly (4) – egg, larva/caterpillar, pupa, adult. Cockroach (3) – egg, nymph, adult. Fish (3) – egg, fry, adult. Frog (3) – egg, tadpole, adult. Birds (3) – egg, chick, adult. Refer also to Grade 4, Unit 4.

Reproduction in animals

Most animals cannot reproduce by themselves.

To reproduce, animals need two **sexes** – a **male** and a **female**.



A male peacock



A female peacock (peahen)



A male lion



A female lion (lioness)

As this reproduction requires two sexes, it is called **sexual reproduction**.

Mating

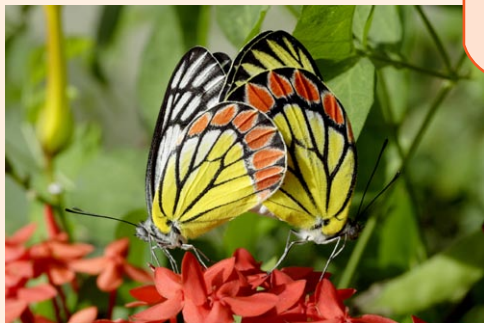
The male animals produce **sperm**. Sperm are also called **male sex cells**.

The female animals produce **eggs**. Eggs are also called **female sex cells**.

To reproduce, the male and the female must come together. This is called **mating**.



A male and a female lion mating.



A male and a female butterfly mating.

For many animals, it is difficult to tell the difference between a male and a female.



Fun Science

Many organisms have special adaptations to help them attract a mate. Frogs and insects make sounds. Male peacocks spread out their colourful feathers. Male chimpanzees pick fruit from trees and give them to the females.



A male frog makes mating sounds to attract a female frog.



Related words:
to fertilise (verb),
fertilisation
(noun), fertilised
(adjective).



The eggs we eat
from chickens,
ducks and
other animals
are usually not
fertilised eggs.

Thinking

1. Whales, dolphins and turtles live in the sea. Which method of fertilisation do they use? Explain.
2. Some fish lay about 50 000. Suggest one or more reasons why they lay so many eggs.

1. Whales and dolphins are mammals and use internal fertilisation. Turtles are reptiles and use external fertilisation.
2. (1) Many of the eggs will not be fertilised. (2) The water carries away many eggs and sperms. (3) Many eggs will be eaten by other animals. Large numbers of eggs ensure the survival of the species. This shows that external fertilisation is not always a good method of ensuring that fertilisation occurs.

WB ★ Activity 1

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Fertilisation

During mating, sperm meet eggs. One sperm joins with one egg. This is called **fertilisation**. The egg is now said to be a **fertilised egg**. That is:

sperm + egg → fertilised egg
(male sex cell) (female sex cell)

The fertilised egg is the beginning of a new life.

- How does fertilisation happen? *Answer given below.*

Fertilisation happens in two ways:

- 1 For many animals, such as frogs and fish, fertilisation occurs happens outside the body. This usually happens with animals that live in water.

The female lays eggs in the water. The male puts sperm over the eggs. Each egg is fertilised by one sperm. Because this happens outside the body, it is called **external fertilisation**.

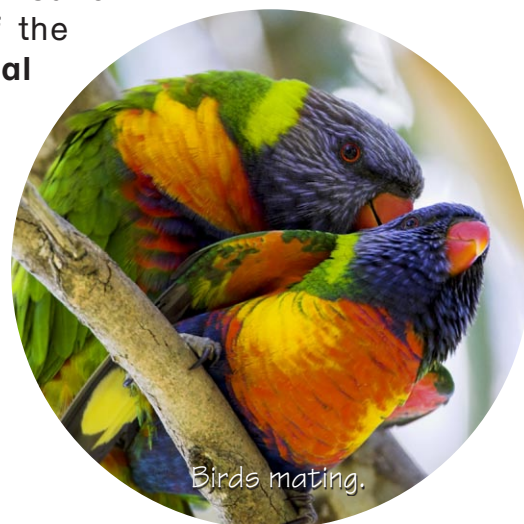


Frogs mating.

- 2 For most land animals, fertilisation happens inside the body of the female. This is called **internal fertilisation**.

All mammals, birds, reptiles and many insects use this method.

During mating, the male puts sperms inside the body of the female. The sperms swim to the eggs. One sperm fertilises one egg.

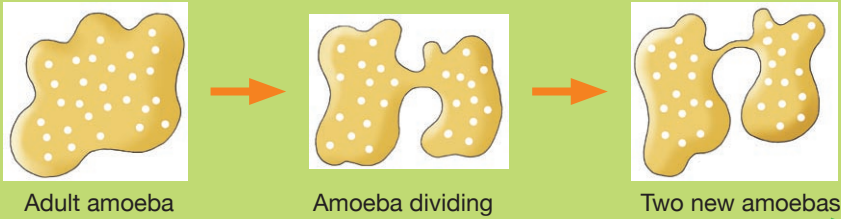


Birds mating.

Internal fertilisation ensures that most eggs are fertilised as sperms are placed near the eggs inside the female's body. Eggs and sperm are not washed away (as in external fertilisation) and other animals cannot eat the eggs.

Fun Science

In some microscopic organisms, such as amoebas and bacteria, reproduction is simple. The organism just divides into two. This method is called **asexual reproduction**. 'Asexual' means 'without sex', that is reproduction without a male and a female organism.



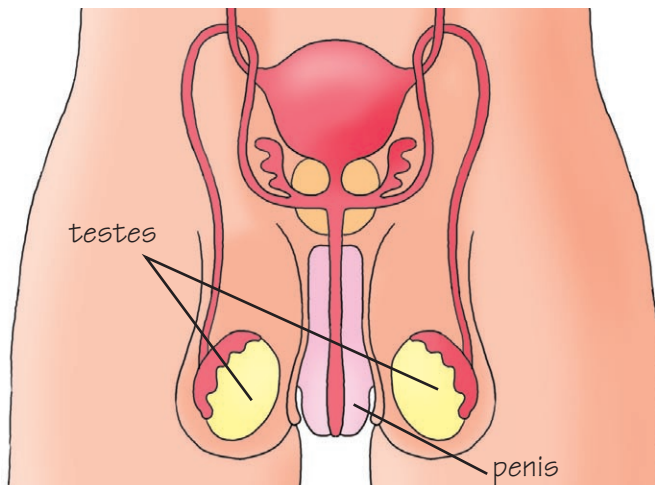
Reproduction in humans

Humans are mammals. Fertilisation happens inside the body of the female.

The male has a reproductive system to produce sperm. The female has a reproductive system to produce eggs.

Let's look at these two reproductive systems.

The male reproductive system

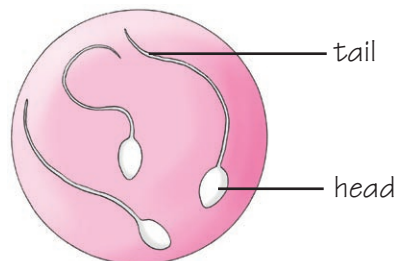


'Testes' is plural. The singular is 'testis' (or testicle).



The two testes make sperms. They produce millions of sperm every day.

Sperms are very small. They can only be seen under a microscope.

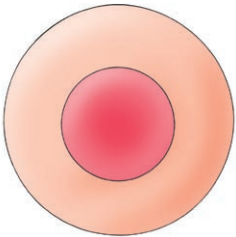


Human sperms



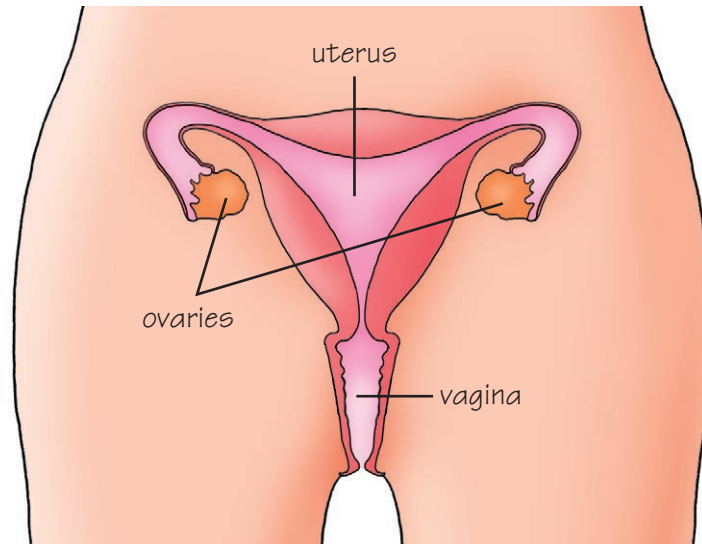
The uterus is also called the **womb**.

'**Ovaries**' is plural. The singular is '**ovary**'.



A human egg as seen under a microscope. An egg is much larger than a sperm.

The female reproductive system



The female has two ovaries. Inside the ovaries are eggs. At birth, a baby girl already has many eggs in her ovaries.



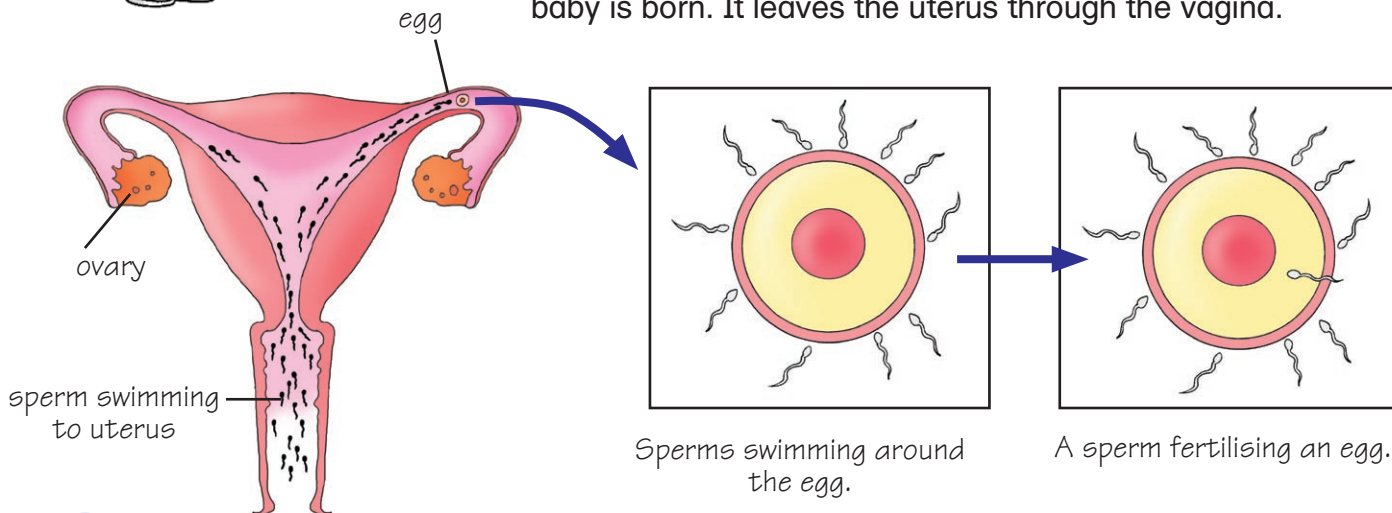
When an egg is fertilised, the woman is said to be **pregnant**.

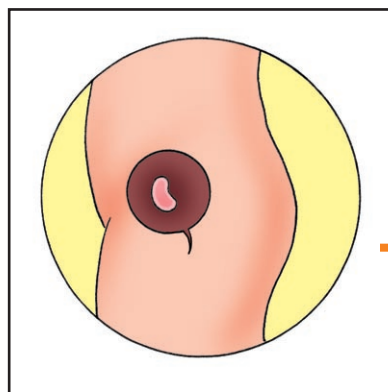
How is a baby created?

First, a man and a woman mate. During mating, many sperms are released from the man's penis into the woman's vagina.

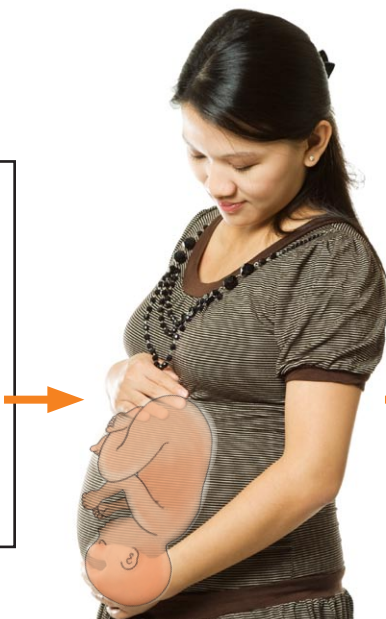
The sperms swim up the uterus to meet an egg. **One** sperm fertilises this egg. All the other sperms die.

The fertilised egg fixes itself to the wall of the uterus. There it changes and grows into a baby. After about nine months, the baby is born. It leaves the uterus through the vagina.





This is how the baby looks after about four weeks.



The baby after nine months. It is ready to be born.



A new-born body.



For a normal birth, the head comes out first.

Look at the pictures above. When the baby is born, which part of its body usually comes out first?

WB Activity 3

Fun Science

1. An **umbilical cord** joins the baby to the mother. It carries food and oxygen from the mother to the baby. Waste from the baby passes through the umbilical cord and is removed by the mother. When a baby is born, the doctor cuts off the umbilical cord. Do you know where your umbilical cord was?



Fraternal twins

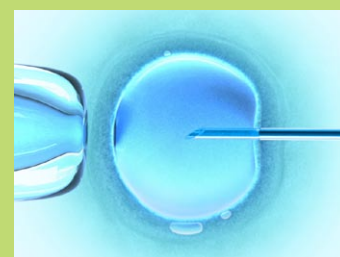
2. In humans, usually one egg is fertilised. This creates one baby. Sometimes, two babies are born. They are called **twins**. This can happen in two ways:

- (a) Two eggs from the ovaries are fertilised. The two babies are called **fraternal twins**.
- (b) One egg is fertilised. Then it splits into two and forms two babies. As the two babies are exactly the same, they are called **identical twins**.



Identical twins

3. Sometimes, people cannot have babies. One way to help them is called '**in-vitro fertilisation**'. An egg is taken from the woman's body. Sperm is taken from the man's body. They are joined in a glass dish ('vitro' means 'glass'). The fertilised egg is placed into the woman's uterus where it grows into a baby.



These babies are also called 'test-tube babies'. The world's first test-tube baby was a girl named Louise Brown. She was born in England on July 25th, 1978.

In-vitro fertilisation being carried out in a glass dish.

Feeding and parental care

A baby mammal cannot look after itself. The parents must:

- ◆ feed the baby. The mother feeds the baby with milk.
- ◆ protect the baby.
- ◆ teach it how to live.



A mother feeding her baby with breast milk.



Zebras are mammals. They feed their babies with milk.

Human babies may have mother's milk or powdered milk. Mother's milk is better than powdered milk because:

- ◆ It contains substances which kill bacteria and prevent the baby from becoming ill.
- ◆ It contains the exact nutrients needed by the baby.
- ◆ It is easier for the baby to digest.
- ◆ It is always pure and warm.

Only mammals protect their young for a long time.

Most birds protect their young. The young birds eat the same food as their parents.

Most other animals do not look after their young. Baby fish, amphibians and reptiles must look after themselves. They must also find food and protect themselves.

The young of all insects and other invertebrates look after themselves.



This bird is feeding its young with a spider.

Thinking



1. Fish, frogs and insects need to produce many young. Why?
2. Why do humans usually produce only one baby at a time?

1. The parents do not look after their young. Many die or are eaten by other animals. Producing many young ensures some will survive and become adults.
2. As most human babies receive care, food and protection, most survive until adulthood. There is therefore no need to produce many babies at one time.

Growing up



Look at a photograph of yourself when you were 3 or 4 years old. Give examples of how you have changed.

The bodies of boys and girls change as they grow.



Baby



Young person



Adult

- Have you noticed that you seem to be growing taller?
Or that other changes are happening in your body?

Discuss, sensitively, some of the changes that take place.

At your age, you are beginning to change from a child into an adult. This time is called **puberty**. Puberty starts at the age of 11 or 12 and lasts for several years.

Many changes happen to your body during puberty.

For most girls, puberty begins earlier than for boys.



Changes in boys

Here are some of the changes that happen:



Grow tall quickly



Muscles grow bigger and stronger.



There may be pimples on the face.



The appetite increases.

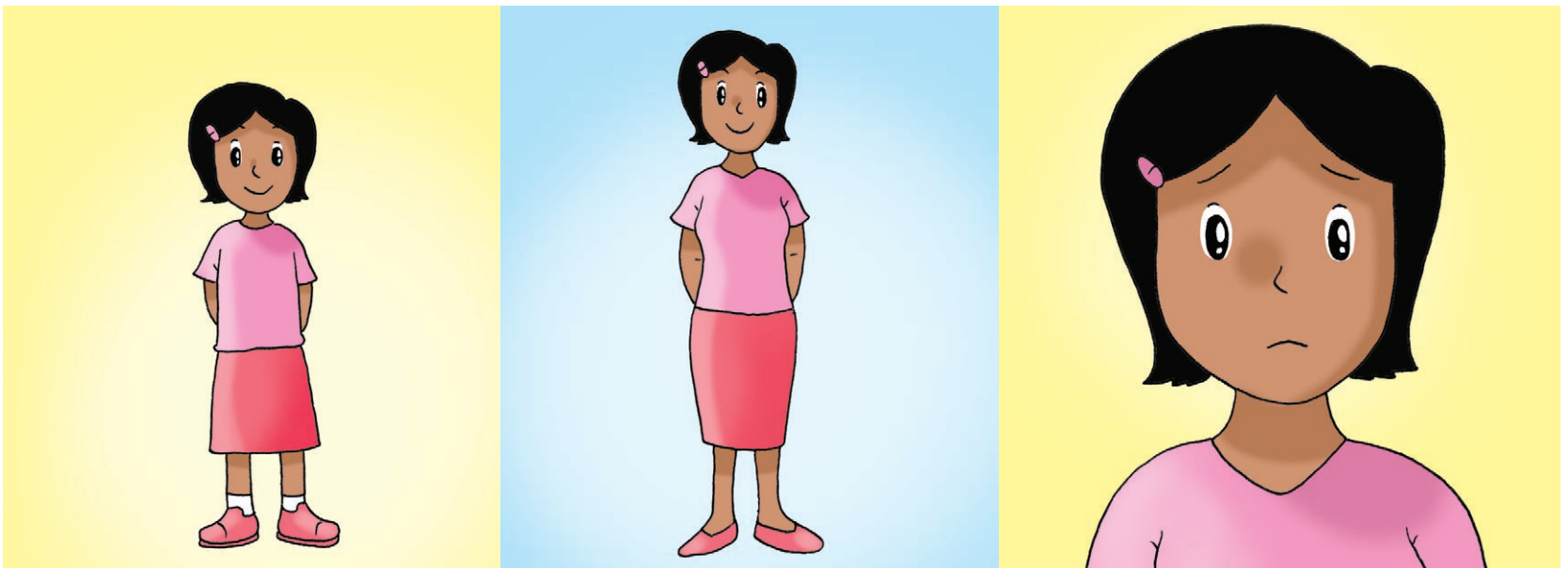


Others changes:

- ◆ The voice 'breaks', that is, it becomes deeper.
- ◆ Hair grows on the face, under the arms and around the reproductive organs.
- ◆ The penis becomes larger.
- ◆ The body starts to produce sperms.

Changes in girls

Here are some of the changes that happen:



Grow tall quickly.

Breasts grow larger.
Hips become rounder and wider.

There may be pimples on the face.

Others changes:

- ◆ The ovaries start to release eggs.
- ◆ Hair grows under the arms and around the reproductive organs.
- ◆ Menstruation begins.



Periods

At birth, a girl has many eggs in her ovaries. When puberty starts, the ovaries start to release eggs. About once every 28 days, one of the ovaries releases an egg. If the egg is fertilised, it grows into a baby. If the egg is not fertilised, it dies. It comes out from the vagina together with blood.

This is called **menstruation** or a **period**. A period lasts about 3 to 7 days.

The whole cycle from one period to the next is called the **menstrual cycle**. This cycle takes about 28 days, though cycles can be shorter or longer – from 23 to 40 days.

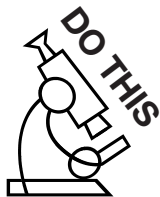
Emotions

At puberty, the feelings of young people begin to change. The opposite sex becomes more interesting and attractive. Boys and girls also look at themselves and ask questions, such as:

- Am I normal?
- Am I too tall or too fat?
- Am I attractive to the opposite sex?

Fun Science

The changes that happen during puberty are caused by substances called **hormones**. These are produced in the reproductive systems. Boys produce a hormone called **testosterone**. Girls produce a hormone called **oestrogen**.

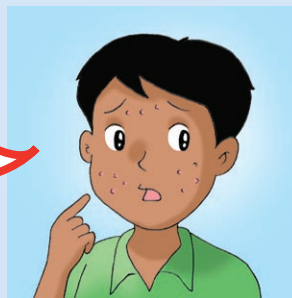


The questions above were asked by pupils. In groups, discuss how you would answer their questions.

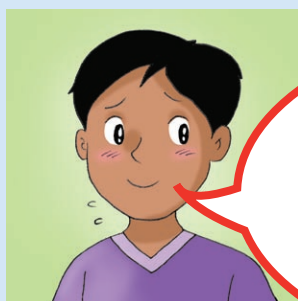
E.g. Most acne disappears when puberty finishes. Menstruation begins at different times in different girls so a late start is still normal. During puberty, the opposite sex becomes more interesting and attractive (a biological adaptation necessary to ensure that couples come together and reproduce the species). There is the 'growth spurt' which can be quite sudden in some young people but eventually stops. While the voice box of a boy is changing, the voice is sometimes high and sometimes deeper; later, the deeper voice dominates.

Here are some questions that pupils have asked:

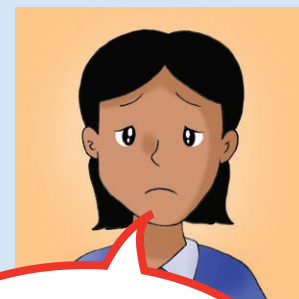
“There are many pimples on my face. I feel that I do not look attractive. How long will they last?”



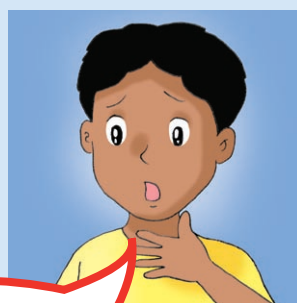
“My family often visits friends. When I was younger, I was good friends with the girl. But now I feel different when we are together. Why do I feel like this?”



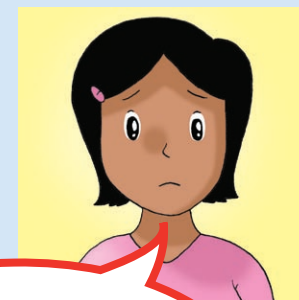
“Some of the girls in my class have started to have periods but I have not. Am I normal?”



“When I speak, my voice is sometimes high and sometimes low. What is happening?”



“I used to be very small. But now I am so tall. When will this stop?”



Puberty and health

During puberty, you need to look after your health. Here are some examples:

Diet

During puberty, you grow quickly. You need a good diet.

Link it!

Food and health
Grade 5, Unit 3

Proteins are needed for growth. So I must eat meat, fish, cheese and eggs.

I like milk. It gives me protein. It is also gives me calcium for growing my bones.

At this time, I need a lot of energy. Foods with carbohydrates give me energy.



My body needs vitamins. Fruit and vegetables are good sources of vitamins.

During my period, I lose blood. Iron is needed to make blood. So, I need to eat liver, kidneys, heart, green vegetables and dried fruits that are rich in iron.





Foods that are important at puberty.

Pimples

Many young people have pimples during puberty. Here are some ways to reduce the problem:



Keep your face clean.



Do not break pimples as the infection will spread to other parts of the skin. Apply pimple cream instead.



Eat less food that contains fat, oil or sugar.



Drink more water and eat more vegetables.



Foods to avoid if you have skin problems.



Exercise and sleep

During puberty, muscles and bones grow. Exercise makes the muscles and bones strong. Plenty of sleep is also needed to allow the body to grow.



Body odour

During puberty, you perspire a lot. Perspiration mixes with dirt and bacteria on the skin and gives off a bad smell. We call the bad smell 'body odour'.

- What can you do to prevent body odour? Refer to pictures below.



Change clothes often.



Wash clothes often.



Take a shower every day.



Keep your hair clean.



My Conclusions

1. All living things reproduce. This is to make sure that each kind of living thing continues to live on.
2. Fish, amphibians, reptiles, birds and insects reproduce by laying eggs. Mammals reproduce by giving birth to young.
3. Most vertebrates reproduce by sexual reproduction. This requires a male and a female organism.
4. Male animals produce sperm (male sex cells). Female animals produce eggs (female sex cells).
5. A new life begins when a sperm from a male fertilises an egg of the female.
6. Animals, such as frogs and fish, use external fertilisation. Most land animals use internal fertilisation.
7. The human male reproductive system includes the testes, and the penis. The testes produce sperm.
8. The human female reproductive system includes the ovaries, uterus and vagina. The ovaries produce eggs.
9. The fertilised egg grows in the uterus of the female to form a baby.
10. After birth, some animals, such as birds and mammals, look after their young.
11. Puberty is the time when a young person changes into an adult. Many changes happen to the body at puberty.
12. Girls start to have menstrual cycles during puberty.
13. During puberty, it is important to have a good diet, to do exercise, to have enough sleep and to keep the face and body clean.

WB ★

Activity 6

STRETCH YOURSELF

1. Cloning

Sexual reproduction requires two parents. Scientists have found a way to reproduce an animal from just one parent. This is called **cloning**. In 1996, scientists cloned the first mammal – a sheep called ‘Dolly’. Since then, scientists have cloned other mammals including mice, cats, dogs and horses. Cloned animals are exactly the same as the parent.



Dolly the sheep

In groups, discuss these two questions. Give your reasons.

- Do you think it is right to clone animals?
- Do you think we should clone people? Who should we clone – only clever people?

2. Ideas about pregnancy

“My mother is pregnant. Her stomach is bigger. The baby is in her stomach.”

“The baby gets food from the mother’s stomach.”

“Tell your mother not to wash her hair or take a bath. That will harm the baby.”

Do you think these statements are true or false? Talk about them in groups.

People in most societies have misconceptions about reproduction. These three are examples. A normal baby develops in the uterus, not the stomach. The baby gets food through the umbilical cord connecting the mother’s body to that of the baby. There is no evidence that washing hair or taking a bath during pregnancy has any effect at all on the mother or the baby. Other examples of misconceptions are:

- During pregnancy, the mother must not change the direction of her bed, renovate her house, sew any dresses or eat ice.
- After giving birth, the mother must not bathe, cool herself with air-conditioning or a fan for one month.

New words

male	female	sexual reproduction	male sex cell
female sex cell	sperm	mating	fertilisation
external fertilisation	internal fertilisation	testes	penis
ovary	uterus	vagina	pregnant
umbilical cord	parental care	puberty	period
menstruation	menstrual cycle	emotion	pimple
body odour			