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Bryan Milner, Jean Martin and Peter Evans
Excerpt
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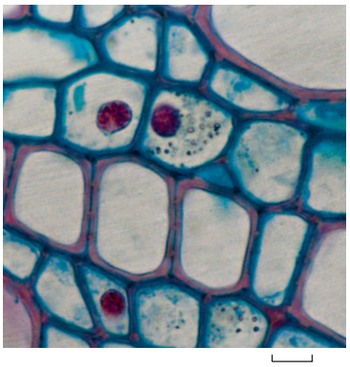
1.1 Cells

Every living thing is made up of small units called **cells**.

Look at the photograph of plant root cells.
It has been magnified many times so that you can see the cells.



Plant root cells.

1 Copy and complete the sentences.

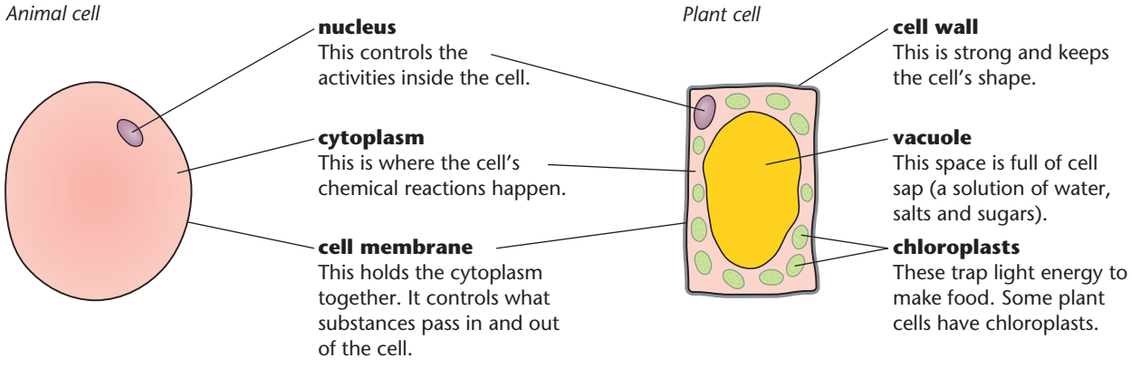
The plant root is made of small _____.
Each cell is about _____ of a millimetre across.

Animal and plant cells

Animals and plants are made from cells.

Animal and plant cells are the same in some ways. We say that they have some of the same features.

Animal and plant cells are also different in some ways.



2 What job do these parts of a cell do?

(a) the nucleus

(b) the cytoplasm

(c) the cell membrane

3 Copy the table. Then complete it to show differences between animal and plant cells.

Feature	Animal cell	Plant cell
Does it have a nucleus?	yes	
Does it have a cell membrane?		
Does it have cytoplasm?		
Does it have a cell wall?		
Does it have a vacuole?	no	
Does it have chloroplasts?		some plant cells do

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Living things with only one cell

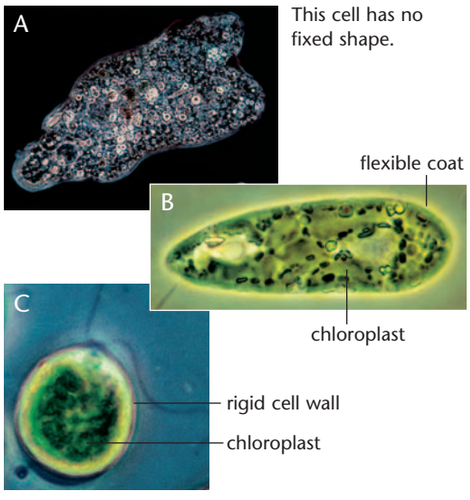
Some very simple living things are made of only one cell. We say they are **unicellular**.

Some unicellular organisms are like animals, but others are more like plants.

4 Look at the photographs.

(a) Which cell, A, B or C, is most like a plant?

(b) Write down two reasons for your answer.



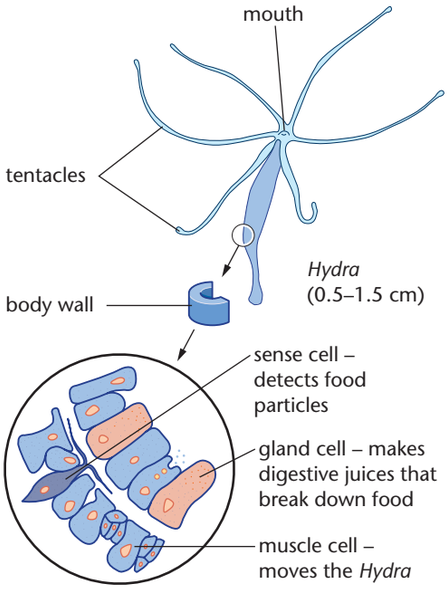
Living things with many cells

When a living organism is made up of many cells, we say it is **multicellular**.

Hydra is a simple multicellular animal. Its cells are not all the same. The *Hydra* needs different types of cell to do different jobs.

5 Write down one difference between unicellular and multicellular organisms.

6 Describe two different jobs done by two different types of cell in a *Hydra*.



WHAT YOU NEED TO REMEMBER (Copy and complete using the **key words**)

Cells

Living things are made up of _____.

Some living things have only one cell; they are _____.
Living things with many cells are _____.

Both animal and plant cells have a _____, _____ and _____ _____.

Only plant cells have a _____ _____ and _____, and some plant cells have _____.

More about cells: C+ 1.10

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1.2 Working together

Your body is made of millions of cells.

Each cell has its own special **job** to do, but it doesn't work on its own.

A large factory has many people working in it. The people work in teams to get things done. Each team has a particular job to do.

Cells work together

Cells that do the same job are often grouped together. A group of similar cells is called a **tissue**. For example, muscle tissue is made up of lots of muscle cells.

1 Look at the description of a factory. Then copy and complete the sentences describing the human body.

A human body has millions of living _____ working in it. Each _____ has its own _____ to do. Cells of the same type join together to make a _____.

Tissues work together

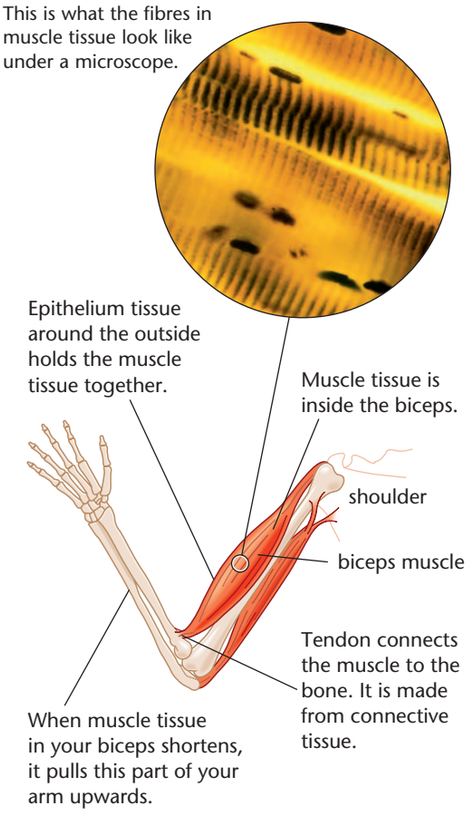
Different tissues join together to make **organs**, such as bones and muscles. For example, your biceps muscle is an organ. It pulls on bones to bend your arm.

2 Copy and complete the sentences.

My biceps is an _____, formed from several tissues joined together. Tissues in the biceps include _____, _____ and _____ tissue.

3 Copy and complete the table.

Tissue in the biceps (an organ)	What it does
	pulls lower part of arm upwards
epithelium tissue	
	connects muscle to bone



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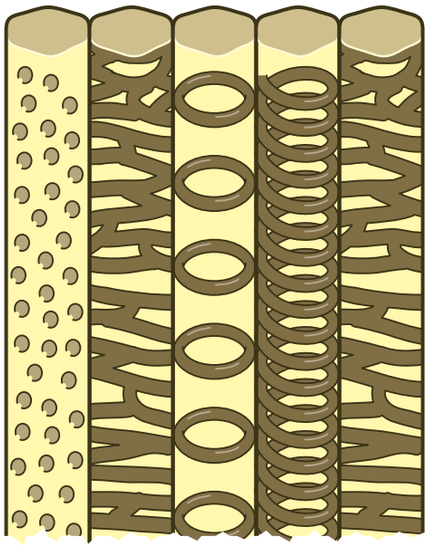
Plants have tissues and organs too

Xylem is a type of tissue found in plants. Xylem cells join to form long tubes inside the plant. Each cell is tiny, but the tubes they make are very long. These tubes carry water to all parts of the plant.

4 Why must xylem cells join together to form vessels or long tubes to do their job properly?

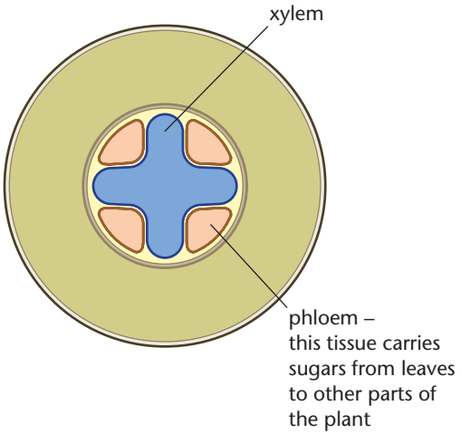


These xylem vessels go from the roots to the rest of the plant.

The picture shows where the xylem is in a root. A root is an organ, so it has other tissues too.

5 Copy and complete the table.

Tissue in a plant's root	What it does
xylem	
phloem	



A slice through a root.

WHAT YOU NEED TO REMEMBER (Copy and complete using the **key words**)

Working together

We call groups of similar cells a _____.
Different tissues are grouped together into _____.

Cells, tissues and organs are all suited to the _____ they do.

More about tissues and organs: C+ 1.11

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1.3 Life processes

All living things, from the smallest to the biggest, must do certain things to stay alive. We call these things life processes.

Living things are sensitive

Living things can **sense** changes around them.

1 Write down five things that a dog can sense.

2 Write down two things that plants are sensitive to.

DID YOU KNOW?

Your skin is sensitive to a change in temperature of only 0.5 °C.

Living things move

Animals **move** to find food.

Plants don't need to do this. Some parts of plants move though.

Living things respire

Living things need energy. They all get this energy from food and oxygen by respiration.

Animals and plants both **respire**.

3 Where in plants and animals does respiration happen?

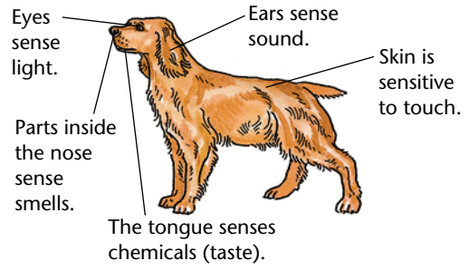
4 What waste product is made when cells respire?

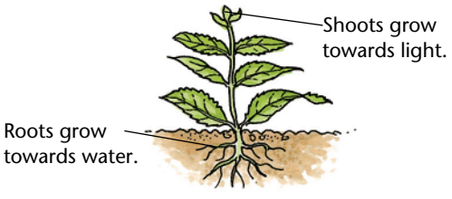
Living things reproduce and grow

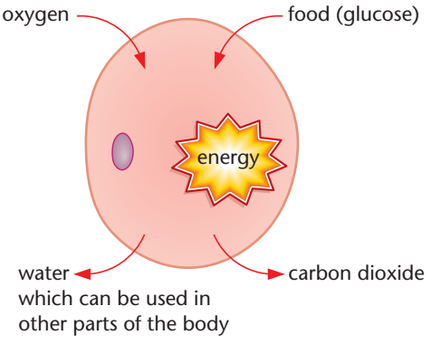
Living things eventually die. So they need to produce young. We say that they **reproduce**.

Young plants and animals then **grow** until they are old enough to reproduce themselves.

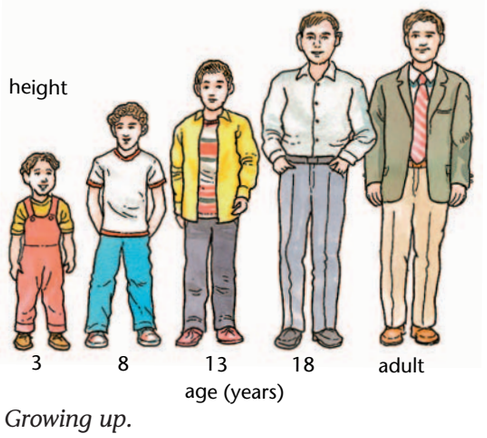
5 How many years do boys usually grow for?







Respiration happens in cells.



Growing up.

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Living things need nutrition

All living things must have **nutrition** (food). It gives them the energy and materials they need to move and to make new cells. They make new cells all the time so they can grow, reproduce, and repair damage to the body.

6 Copy and complete the table.

Living things	How they get their food
bacteria	
plants	
animals	

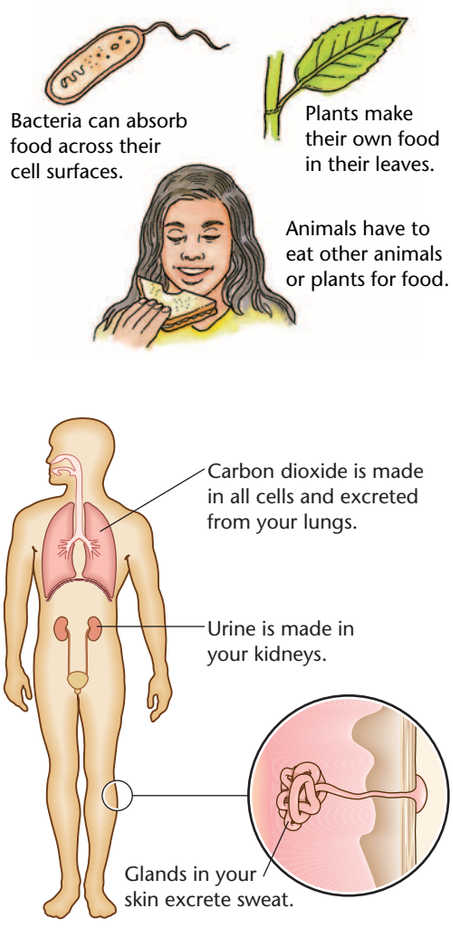
Living things excrete

All living things make waste materials. These wastes are poisonous. You must get rid of them from your cells and your blood. Getting rid of waste is called excretion.

7 List three things you excrete from your body.

What is special about living things?

Some non-living things move and can use oxygen to release energy from fuel. But non-living things cannot make new materials for their bodies. This means that they cannot **grow** or **reproduce**. Producing young that grow is something only living things can do.



*Humans **excrete** sweat, urine and carbon dioxide.*

DID YOU KNOW?

You don't excrete faeces. Undigested food never really gets inside your body. It just goes through a very long tube between your mouth and your anus.

WHAT YOU NEED TO REMEMBER (Copy and complete using the **key words**)

Life processes

Living things can s_____, m_____, r_____, g_____, r_____, e_____, and they need n_____.

Non-living things cannot _____ or _____.

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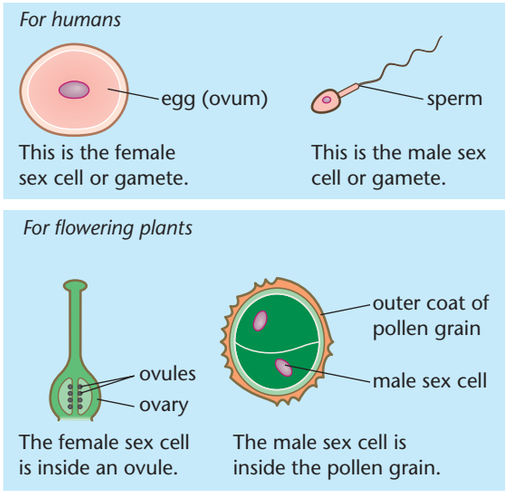
1.4 Cycles of life

All living things grow and change during their lives.

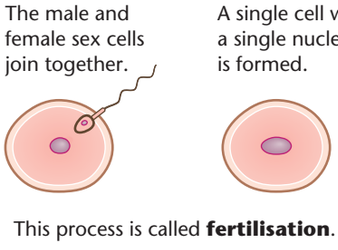
Flowering plants and many animals, including humans, start life as two special cells. These special cells are called sex cells or **gametes**.

1 Copy and complete the table.

	Female sex cell	Male sex cell
humans	_____	_____
flowering plants	inside _____	inside _____



For a new human or plant to grow, the male and female sex cells must join together. The diagram shows what happens in a human.

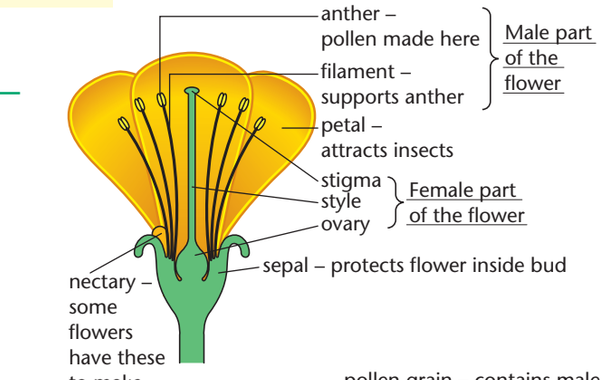


2 Copy and complete the sentences.

A male gamete and a female gamete join together to make a single _____.
This process is called _____.

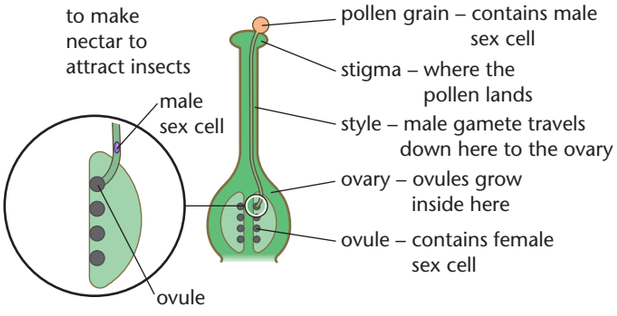
Getting plant sex cells together

Flowers produce sex cells. Male sex cells must meet up with female sex cells. To make sure this happens, each part of a flower has a different job to do.



3 Copy and complete the table.

Flower part	What it does
anther	
filament	
stigma	
style	
ovary	
petal	
nectary	



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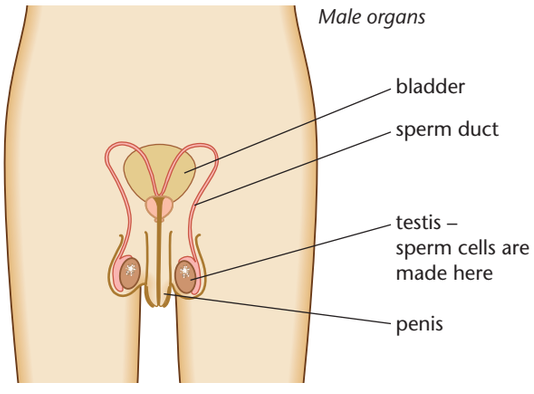
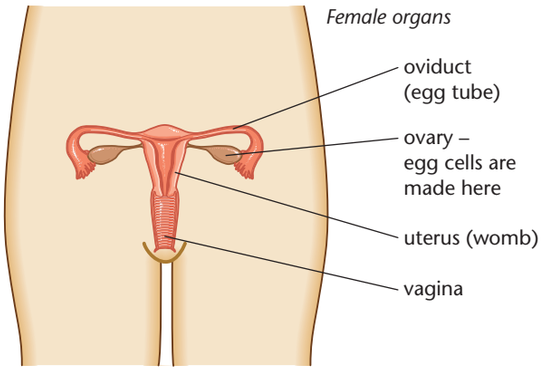
Sexual intercourse in humans

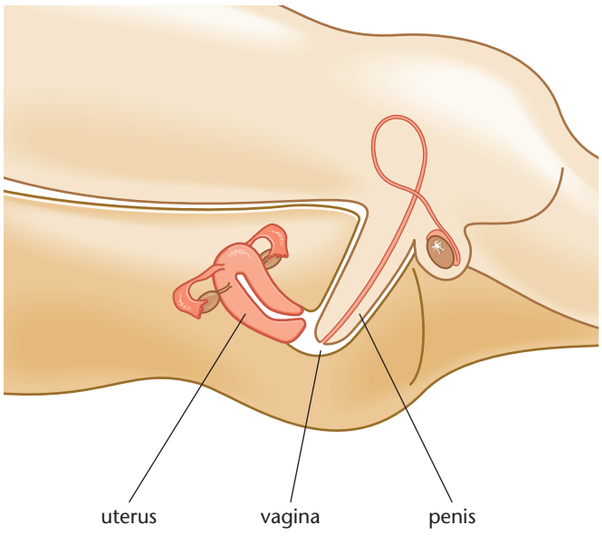
A new human develops inside a woman's body.

Sperm have to be placed inside her body so that one of them can reach the egg and fertilise it. This happens during sexual intercourse.





The sperm cells travel from the testes through to the penis. They are pushed into the vagina during sexual intercourse.



4 Where are human female sex cells made?

5 Where are human male sex cells made?

6 Copy and complete the sentences.

During sexual intercourse, sperm from a man's _____ travel through his _____. They go into the woman's body through her _____.

WHAT YOU NEED TO REMEMBER (Copy and complete using the **key words**)

Cycles of life

The sexual reproductive systems of plants and animals make special sex cells or _____.

Gametes join together in a process we call _____.

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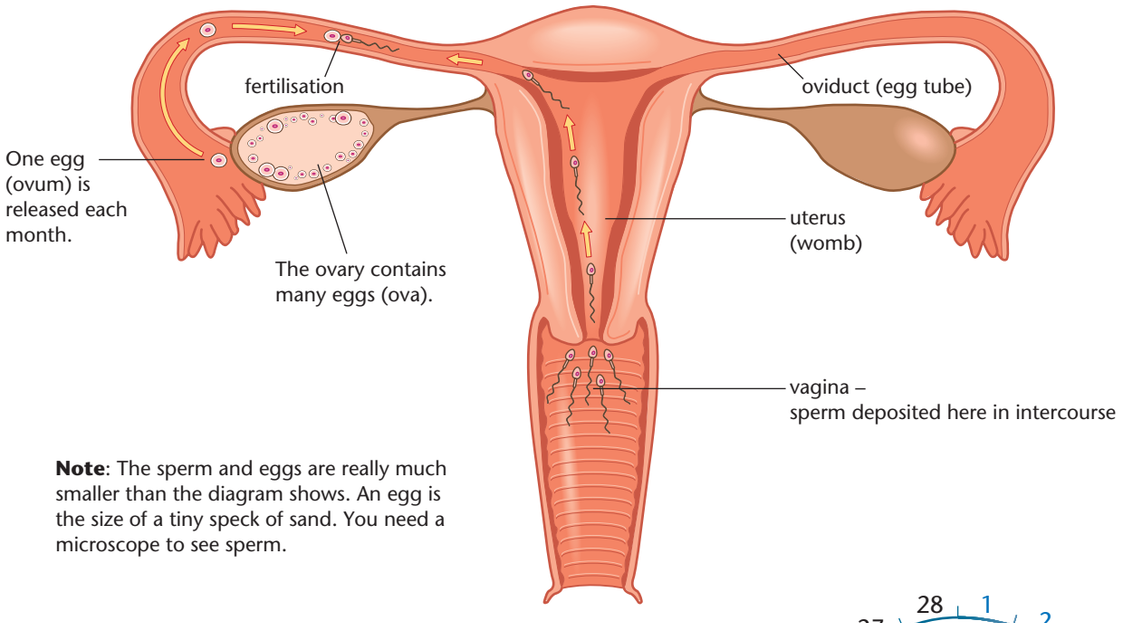
1.5 The start of pregnancy

Eggs are made in the ovaries. A woman releases an egg (ovum) from one of her ovaries once a month. The egg travels down the **oviduct** (egg tube). If the egg meets a sperm, they may join together. We call this **fertilisation**. From this moment the woman's pregnancy begins.

REMEMBER

Sexual intercourse is a way of bringing the sperm and egg together. The man puts his penis inside the woman's vagina and pushes millions of **sperm** into her.



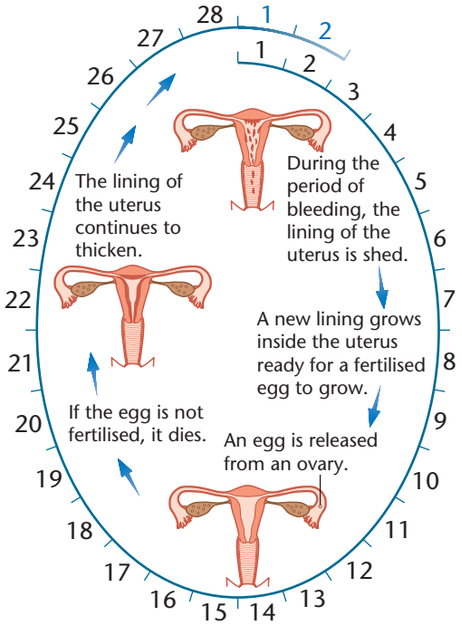
Note: The sperm and eggs are really much smaller than the diagram shows. An egg is the size of a tiny speck of sand. You need a microscope to see sperm.

1 Where inside a woman are sperm deposited?

2 How do sperm reach the egg?

3 Where inside a woman do the sperm and egg meet?

The inside of the **uterus** has a thick lining ready to receive a fertilised egg. If the egg released each month does not meet a sperm, the lining is changed for a new one. The old lining breaks down and leaves the woman's body through her vagina. This is her monthly **period**.



4 Why do women have periods?

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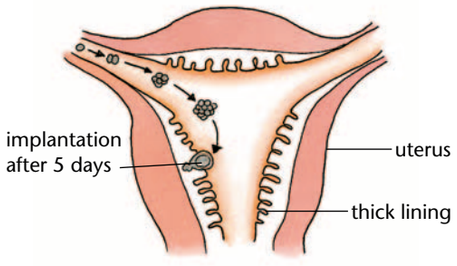
What happens to a fertilised egg?

As the fertilised egg travels down the oviduct to the uterus, it begins to grow. The first cell splits into two to form two cells. Then each of these cells splits, to make four cells altogether. This process continues, forming a ball of cells.

Inside the uterus, the ball of cells sinks into the thick, soft lining. We call this **implantation**.

The ball of cells changes shape as it grows, and forms a head, body, arms and legs. It is then called an embryo.

As the weeks go by and the embryo grows, it starts to look more and more human. We then call it a fetus.



5 Put these sentences into the right order. The first one is in the correct place.

- The fertilised egg grows into a ball of cells.
- The ball of cells grows into an embryo.
- The embryo grows into a fetus.
- The ball of cells attaches to the uterus.

6 Copy and complete the table.

Weeks since fertilisation	Size (cm)	What we call it
4		
8		
12		
38		

WHAT YOU NEED TO REMEMBER (Copy and complete using the **key words**)

The start of pregnancy

The _____ and egg (ovum) join in an _____. We call this _____.

The fertilised egg divides as it travels down the oviduct to the uterus.
The ball of cells sinks into the lining of the _____. We call this _____.

If an egg is not fertilised, the lining of the uterus breaks down and causes the bleeding called a monthly _____.

More about pregnancy and periods: C+ 1.12, 1.13

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