

1. MRS GREN

Welcome to this Biology topic! Biology is about all living things. We are going to start by finding out how we decide if something is living or not.

Notes: Copy the table below into your jotter. You will be given a set of 10 cards. In groups of four, decide whether the item is living or non-living.

Name	Living or non-living?
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Living things have seven things in common. We can use MRS GREN to help us remember what these things are.

Movement

Respiration

Sensitivity

Growth

Reproduction

Excretion

Nutrition

Your teacher will show you a presentation about *MRS GREN*. Use the information you have learned to change any of your answers to the living or non-living quiz.

Activity:

Using what you have learned so far about how we decide if something is living or not, create a colourful mind map in your jotter including the following:

- what '*MRS GREN*' means
- a picture of what you imagine '*Mrs Gren*' would look like!
- diagrams to show each of the 7 things that show that something is alive
- 3 things that are living and 3 that are not

Now complete the crossword your teacher will give you on activities that living things do.

2. Animal Cells

Living things are made up of 'building blocks' called cells. Most animals have millions of cells joined together. Some living things are made of only one cell.

Cells are microscopic (very tiny), microscopes have to be used to see them.

Your teacher will demonstrate the parts of a microscope to you.

Collect: Microscope diagram, scissors and glue.

Notes: Label the diagram and stick this into your jotter.

Animal cells have 3 basic parts.

Notes: Copy the diagram and copy and complete the table below.

	Cell Part	Function
Collect: Motic Microscope Cotton bud Microscope slide and cover slip Stain and dropper		Controls cells activities
	Cytoplasm	
		Allows the entry and exit of small molecules

Experiment:

1. Take a fresh cotton bud

2. Move the end of the cotton bud over the inside of your cheek on one side of your mouth for approximately 1 minute
3. Smear the used cotton bud over the centre of your clean, dry slide
4. Place the cotton bud immediately in the disinfectant
5. Add one drop of stain to the cheek cell smear using a dropper
6. Cover the cheek cells with a cover slip and examine under a microscope (starting with the x20 objective).

Notes: Draw a diagram of your cheek cells at 2 different objectives.

Discuss: Why was the stain added to the cheek cells.

Extension: Collect a wordsearch from your teacher and complete.

Lesson 3. Plant Cells

Plants, like animals, are also made from cells. Some plants contain only one cell, but most are made of millions of cells joined together.

Notes: Copy the plant cell diagram below into your jotter and answer the questions

1. What features do animal and plant cells have in common?
2. What are the differences between animal and plant cells?

Collect: A set of matching cards

Activity: Match each cell part with the correct cell function.

Notes: Copy and complete the following table

Cell Part	Function
Nucleus	
	Site of chemical reactions
Cell membrane	
Chloroplasts	
	Large space filled with cell sap
	Gives cell shape and support

Collect: Piece of onion

Microscope

Microscope slide and cover slip

Iodine solution

Experiment:

1. Set up your microscope
2. Peel a very thin layer of onion from the inside of your piece of onion
3. Lay the onion flat on the middle of the microscope slide
4. Apply 2 drops of iodine onto the onion
5. Cover the onion with a coverslip
6. Examine the onion slide under the microscope

Notes: Draw a diagram of your slide

Discussion: Why can you not see chloroplasts on your onion slide?

Extension:

Starting Science Book one. Read page 74 and answers questions 1-5.

4. Cells, Tissues and Organs

Your teacher will run through a power point with you - listen carefully.

Notes: Copy the information below.

Cells are organized into groups. Groups of the same type of cells are called tissues and tissues that work together form organs. Each organ carries out a particular function and may be part of a system.

Activity:

Brainstorm with your teacher all the body systems in a human.

Each system is made up of several organs. You will be given packs of cards - match up each body system with the organs that are involved in it.

Notes:

Match up the systems with the organs - your teacher will check your answers. Draw the following table in your notes, filling in the answers

Body System	Organs involved

Specialised Cells

If we are to look at the various cells in the body they look remarkably different. This is because cells are suited to their FUNCTION.

For example

Red blood cells

- Red blood cells carry oxygen
- They have a large surface area to pick up lots of oxygen

Nerve Cells

- Has lots of connections and passes information on through these

Notes

Use the above information on specialised cells to create a mind map to summarise all the points

Stem Cells

You may have heard about stem cells in the news. They are special cells which have the ability to become any kind of cell. They are found in bone marrow or embryos. Scientists have been exploring uses of stem cells to help cure diseases such as Parkinson's disease, Alzheimer's disease, diabetes and cancer.

You will now watch a 15-minute film about how stem cells might be used to cure Parkinson's disease.

Lesson 5. Respiratory System

Our lungs are a vital organ in our bodies that make up a large part of the respiratory system.

Collect: A respiratory system diagram.

Activity: Label the diagram and stick it into your jotter

The main function of the respiratory system is breathing. We get all the oxygen we require into our bodies and all the carbon dioxide out of our bodies by breathing.

Copy and complete:

When we breathe in, the muscles _____ the ribs move _____ and outwards. The diaphragm moves _____.
The volume inside the chest _____.
This causes air to rush _____ your lungs.

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When we breathe out, the muscles _____ the ribs move _____ and inwards. The diaphragm moves _____.
The volume inside the chest _____.
This causes air to rush _____ your lungs.

Activity: Collect a "What's in Cigarette Smoke?" information sheet and copy and complete the table below using information from the passage.

Constituent of smoke	Effect(s) on the body
Tar	
Nicotine	
Carbon monoxide	

Activity: Using information from the lesson and your general knowledge, design a campaign poster or a new label for a cigarette packet that should stop people from smoking.

6. Heart, Pulse and Exercise

The heart is made of muscle. The function of the heart is to pump blood around the body. It has 4 chambers:

1. Right Atrium
2. Right Ventricle
3. Left Atrium
4. Left Ventricle

Notes: Copy the note above into your jotter.

Collect: Heart diagram, label and stick into your jotter.

Activity: Your teacher will show you an animation of the heart pumping

Notes: The heart works as 2 pumps that work at the _____ time. 1 pumps blood to the _____ and the other pumps blood to the _____.

Your _____ is felt every time your _____ beats.

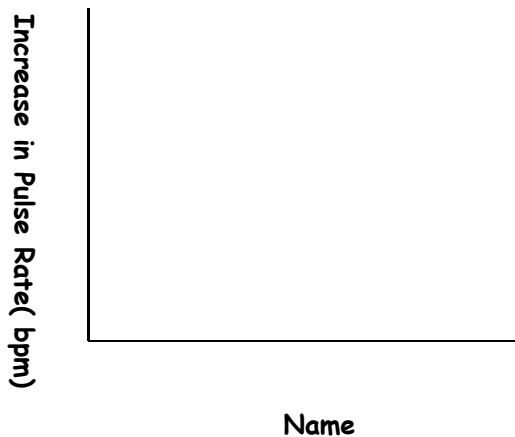
Copy:

Name	Resting Pulse 1	Resting Pulse 2	Average Resting Pulse	Pulse after Exercise 1	Pulse after Exercise 2	Average pulse after Exercise	Increase in Pulse Rate

Activity:

1. Find your pulse in your wrist or neck.
2. Using the classroom clock/ a watch or a timer on the activeboard find you pulse rate (in beats per minute)
3. Record the result in the table
4. Repeat this at rest
5. Exercise for 2 minutes.
6. Take your pulse rate
7. Rest for 2 minutes
8. If you feel recovered, exercise for 2 minutes
9. Immediately take your pulse rate

Draw a bar graph showing the average increase in pulse rate for each member of your group.



Copy and Complete:

Exercise causes an _____ in pulse rate. After a period of recovery, pulse rate returns to _____.

7. Human Reproduction

Special cells are produced by living things - these are called **sex cells**. A new individual is made when one sex cell from a female joins with a sex cell from a male to form a fertilised egg cell in a process called **fertilisation**.

Activity: Cut out the diagrams of human reproductive organs and stick them into your jotter.
Label your diagrams.

Copy the two tables below.

Match each word with its correct meaning.

Write each word and its correct meaning into your jotter.

Female Reproductive Organs

Part	What is does
	Produces eggs
	Where egg is fertilised
	The baby grows here

Male Reproductive Organs

Part	What is does
	Where sperm are made
	Make liquid for sperms to swim in
	Carries sperm
	Injects sperm into vagina

Work Bank of Parts

Uterus

Testes

Sperm Tube

Gland

Ovary

Penis

Oviduct

Fertilisation

For a new individual to form the male and female sex cells must fuse. This is called fertilisation and occurs in the oviduct.

After fertilisation the cell starts to divide. By the time it reaches the uterus it is a ball of many cells. This will implant into the wall of the uterus and develop into an embryo

Copy:

Ovulation - Release of an egg from an ovary

Fertilisation - A sperm and an egg join together

Cell division - Produces a ball of cells from a fertilised egg

Implantation - Ball of cells sinks into womb

What Changes Happen to Boys and Girls during Adolescence?

What changes happen to boys and girls during adolescence?

Brainstorm this with your teacher and try to come up with two lists on the board - one for changes that happen to boys and one for changes that happen to girls.

Activity - Dear Auntie Anne:

You need to write a letter to 'Auntie Anne' the Knox Academy Agony Aunt.

You should outline a problem that occurs during puberty in a letter, and then create a reply from Auntie Anne.

Present this on an A4 piece of paper and your teacher will collate a class set.

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For a new individual to form the male and female sex cells must fuse. This is called fertilisation and occurs in the oviduct.

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9. Plants and Flowers

Plants are incredibly useful and are vital for sustaining life. All plants release oxygen into the atmosphere and remove carbon dioxide. This affect is being "copied" with the use of fake trees to try and reduce carbon pollution.

Other uses of plants include making rope, clothing dye, food, soap, building materials and medicines.

Note: Using the information above create a mind-map showing at least 4 uses of plants.

Flowers are the reproductive organs of plants. They have male **and** female parts.

The male part of the flower is the **anther**. This contains the male sex cell (pollen).

The female parts of a flower consist of the **stigma** and **ovary**. Inside the ovary are **ovules** containing female sex cells.

Collect: A flower diagram

Notes: Label the diagram using the example above to help you

Activity: Flower dissection

1. Collect a flower, laminated sheet, marker pen, tile, hand lens and scalpel.
2. Start at the base of the flower and remove the ring of brown or green parts (the sepals). Place these onto the laminated sheet and label.
3. Remove the petals and place these on the laminated sheet and label.
4. Remove the anther followed by the stigma and place onto the laminated sheet then label.
5. Place the flower on the tile. Use the scalpel to cut the ovary in two lengthways. Use the hand lens to examine the ovary contents.
6. Place the ovary onto the laminated sheet and label.
7. Look at each part of your dissected flower under the microscope.

Notes: Copy the table into your jotter.

Sepal	Protects the flower when it is a bud
Petal	Brightly coloured to attract insects
Stamen	Male part of flower where pollen is made
Pollen	Contains a male sex cell
Stigma	Female part that pollen sticks to
Ovary	Contains the ovules and develops into a fruit
Ovule	Female sex cell which develops into the seed

Extension:

Collect a copy of the games to play with your partner. Play one game at a time, finish this game and return it before collecting a new one.

Lesson 10. Plant Reproduction

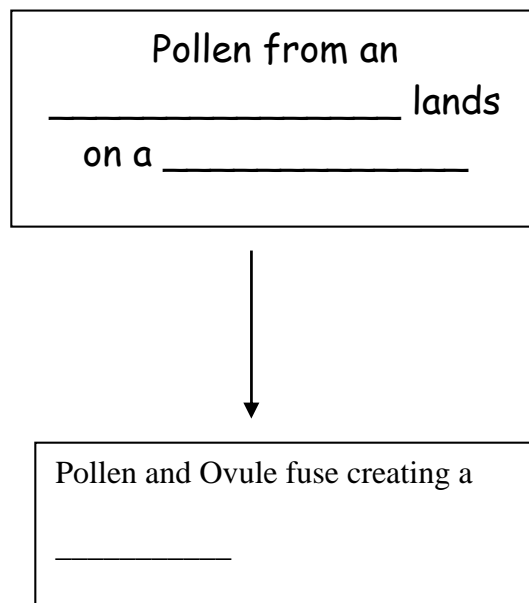
Last lesson you learnt about the parts of a flower – your teacher will now show you a presentation with questions and pictures. You should use the ‘show me’ boards to name the part of the flower shown or answer the question. Keep a note of your score.

Flowers make pollen so that they can reproduce. Each type of flower produces pollen that is different.

Pollen is the male SEX CELL. Ovules are the female SEX CELLS. For a new plant to arise a pollen grain and ovule must fuse. Pollination is when pollen is transferred from the anther to the stigma. This allows a seed to form.

Notes:

Copy and complete this flow diagram



Pollen can be transferred by insects or can be carried by the wind. Look at the following pictures

Insect pollinated flowers have brightly coloured petals and a scent. The anthers and stigma are located inside the flower
The pollen is sticky to be carried by the insect

Notes:

Wind pollinated flowers lack brightly coloured petals or a scent. The anthers and stigma hang loose below the sepals so the wind can catch the pollen easily
The pollen is light and smooth to be carried by the wind

Copy and complete the following table using the information above

	Insect Pollination	Wind Pollination
Description of petals		
Location of anthers		
Location of stigma		
Description of pollen		

After pollination the pollen and the ovule fuse to create a seed. For this seed to develop into a new plant, germination must occur

What conditions do you think a seed needs to germinate?
Brainstorm in groups and write down some ideas.

Notes:

Copy the following:

The three main conditions a seed needs to germinate are

Water

Oxygen

Warmth (a suitable temperature)

Remember WOW!!!!

You are going to set up an experiment to investigate the effects of temperature on germination.

Discuss with your teacher how you could do this

Experiment:

Collect

- 3 film cans
- Cotton wool
- 3 labels
- 30 mustard seeds
- Dropper or syringe
- Water

1. Label the film cans with your initials and A, B or C.
2. Place a thin layer of cotton wool in each film can and add 10 mustard seeds.
3. To all cans add 10ml of water
4. Place can A in the fridge

5. Place can B at room temperature.
6. Place can C in an incubator
7. After 2-3 days observe your seeds and count how many have started to grow.

Notes:

Write a report to include -

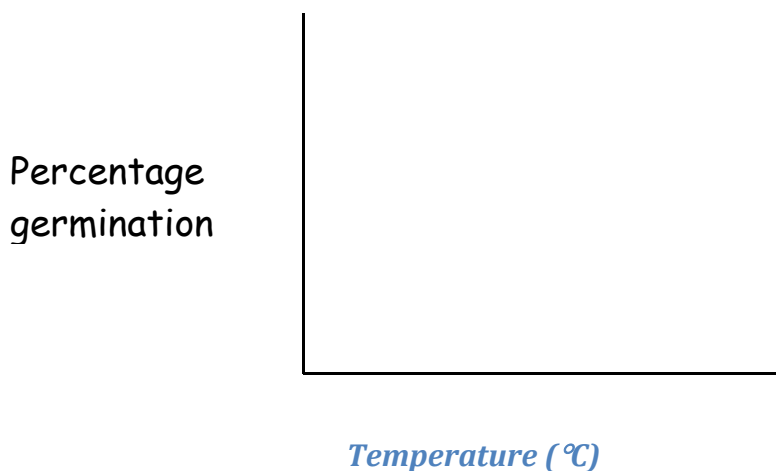
- 1) How you carried out your experiment
- 2) Your results (in a table)

Temperature (°C)	Number of seeds that have germinated	Percentage germination

HINT on percentages

$$\frac{\text{Number that have germinated}}{\text{Number that were planted}} \times 100$$

- 3) A Line graph of your results (Remember ask for help with your scale if you are stuck)



12. Digestive System: The Gut

In the last lesson we learned about the first stage of digestion - the teeth. In this lesson we'll learn how food that we chew passes through our body.

Above is a diagram of the digestive system, which is also known as the gut. It starts in the mouth and goes all the way to the rectum. If it were unravelled, it would be about 9 meters long!

Digestion begins with the teeth and ends at the anus. Balls of food are squeezed forward through your gut by muscles. This is called peristalsis (per-ry-stalsis). It normally takes 24 - 48 hours for food to pass through your digestive system.

The table below tells you what job each part of the gut does.

Part of the gut	Function
Oesophagus	Straight muscular tube going to stomach
Stomach	Acid bath! Digestive juices and acid mixed. Food is churned.
Small intestine	More juices added from the liver and pancreas to finish digestion. Food passes into blood.
Large intestine	Fibre and food that cannot be digested are removed through the anus. Water is taken back here.

Using the information in the table above, answer these questions in your jotter:

1. Name the 4 main parts of the digestive system
2. What's the oesophagus?
3. What happens to food when it reaches the stomach?
4. What happens in the small intestine?
5. What happens in the large intestine?
6. What happens to food and fibre that can't be digested?

Now label the diagram of the digestive system that your teacher will give you.

Experiment: Have you got the guts?

Your teacher will organise a class experiment to show the movement of food through the gut.

Activity:

In your jotter, describe what happened to the last meal you ate as it travelled through your digestive system. Make sure you include:

- what the last thing you ate was
- information on what happens in the mouth (teeth and digestive juice)
- the journey through the four main parts of the digestive system
- how food is squeezed through the gut (peristalsis)
- how fibre and food that cannot be digested are removed

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- how fibre and food that cannot be digested are removed

14. Bees and Birth

You are going to choose between the following topics:

- The phenomenon of the disappearing honeybees
- Multiple Births

Activity: Using the background information sheets or your own research skills produce an information leaflet for the topic of your choice.

Your leaflet should include:

- At least ten relevant points of information
- Appropriate images
- Colour