



S2 Science

Cells & Reproduction Topic

Name: _____

Form Class: _____

Science Teacher: _____

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Success Criteria

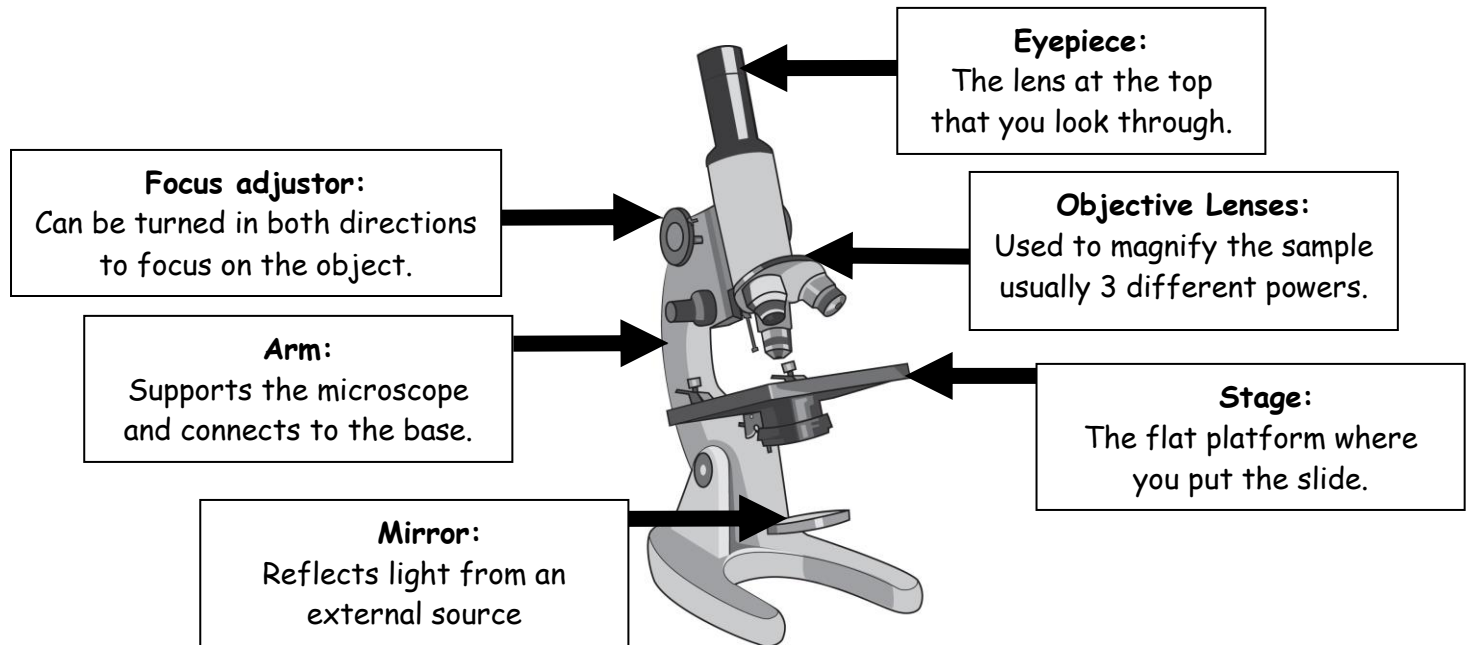
Level	Success Criteria - Cells I can.....	
3	Label a microscope and know how to use it	
3	Describe how slides are prepared to look at cells	
3	Identify the structures found in animal and plant cells	
3	Describe the function of the structures found in animal and plant cells	
3	Compare the similarities and differences between animal and plant cells	
3	Describe a specialised cell	
3	Describe how a specialised cell has structures to allow it carry out a particular function.	
3	Explain the function of DNA	
3	Explain what a gene is and how genes make us unique	
3	Describe what DNA profiling is and what it is used for.	
3	Debate the issues around collecting and storing DNA profiles.	

Success Criteria

Level	Success Criteria - Reproduction I can.....	
2	Identify the parts of the human reproductive systems	
2	Describe the function of the reproductive system	
2	Discuss ways that some fertility problems can be avoided	
3	State the function of each part of the reproductive system	
3	State that a sex cell contains half the genetic information needed to make a complete individual.	
3	Explain the process of fertilisation	
3	Describe how a fertilised egg forms an embryo	
3	Identify the main structures of the pregnant womb	
3	Describe the functions of the structures found in the pregnant womb	
3	Identify examples of substances that may be harmful to the unborn baby.	
3	Describe how these substances reach the unborn baby.	

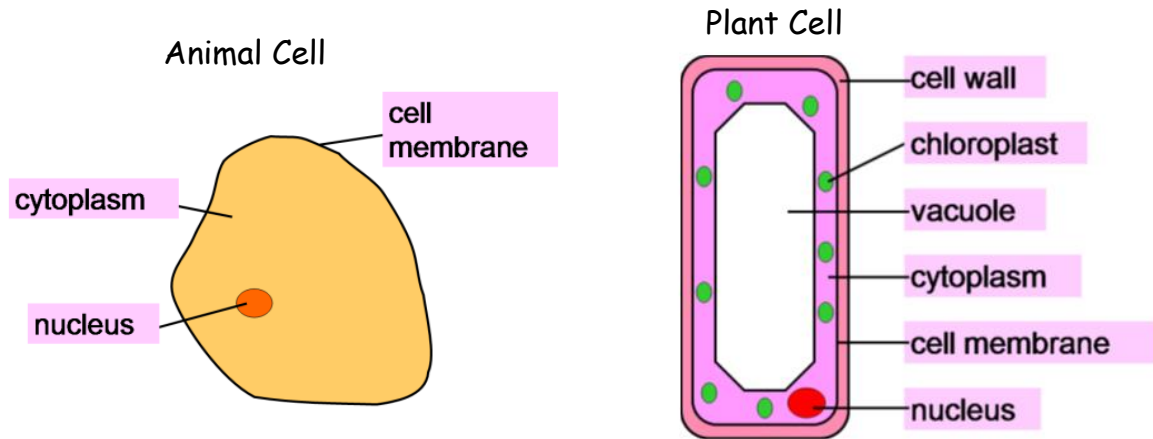
Summary Notes

Microscopes



- ☐ To make a slide, take your sample and spread it thinly onto the slide, add one drop of a **stain** (to help see the cell structures easier) onto the sample then gently lower a cover slip over the top and view it under the microscope.
- ☐ Microscopes have helped to improve our understanding of how living things work because
 - (1) Living things are made of cells, so studying cells helps us to understand how our bodies work
 - (2) Many organisms are tiny or microscopic. They cannot be seen without a microscope and we did not know they existed until we had microscopes.
 - (3) Microscopes help us to study the microorganisms that cause diseases.

Cells



Found in both animal and plant cells:

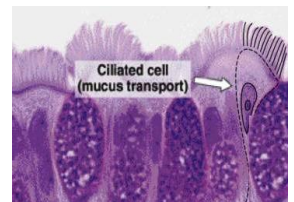
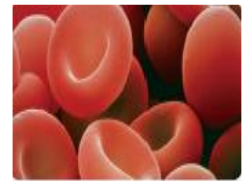
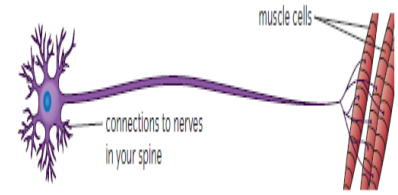
- ☐ **Cytoplasm** - Many chemical processes happen here such as: making new parts of the cell for growth; making chemicals to pass out of the cell; breaking down sugar to get energy.
- ☐ **Nucleus** - Controls cell activities and stores DNA instructions.
- ☐ **Cell membrane** - Controls which substances enter and leave the cell.

Only plant cells have these parts:

- ☐ **Cell wall** - Gives cell support and maintains its shape. Made of cellulose.
- ☐ **Vacuole** - Stores cell sap (water and food).
- ☐ **Chloroplast** - Carries out photosynthesis to make sugar. Only in green plant cells.

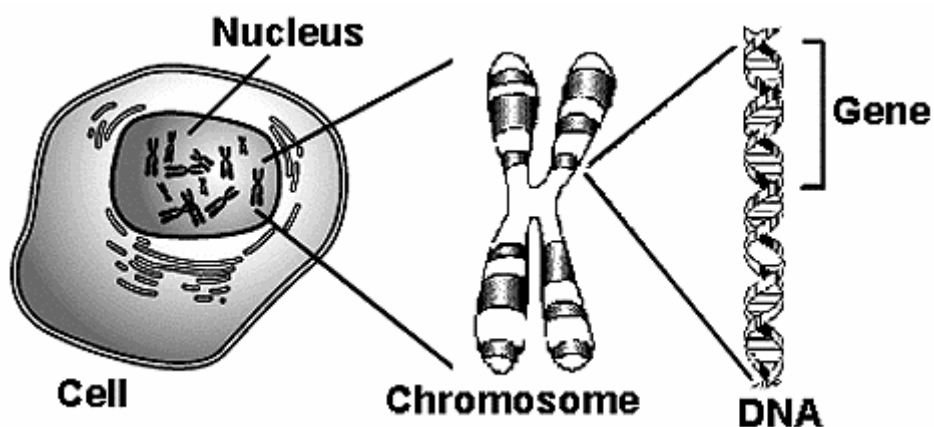
Specialised Cells

- ☐ **Nerve cells** - carry electrical signals round the body. The nerve impulses need to travel quickly so the cell membrane is stretched like a long thin wire which has branches to make connections with other cells.
- ☐ **Red blood cells** - carry oxygen around the body. The cytoplasm contains haemoglobin which absorbs the oxygen. No nucleus to make room for more haemoglobin. Disc shape gives more surface area to absorb oxygen.
- ☐ **Sperm cells** - carry the male instructions for making a baby with the mother's egg. The sperm have a tail so they can swim to the egg.
- ☐ **Ciliated cells** - clean the lungs by trapping and sweeping away dirt that you breathe in. The cell membrane has special hair-like cilia that beat to push the dirt and mucus up towards the mouth.
- ☐ Cells work together in teams called **tissues** e.g. many nerve cells together makes brain tissue.
- ☐ **Organs** are then made from different types of tissue working together e.g. heart organ is made of muscle tissue and nerve tissue.

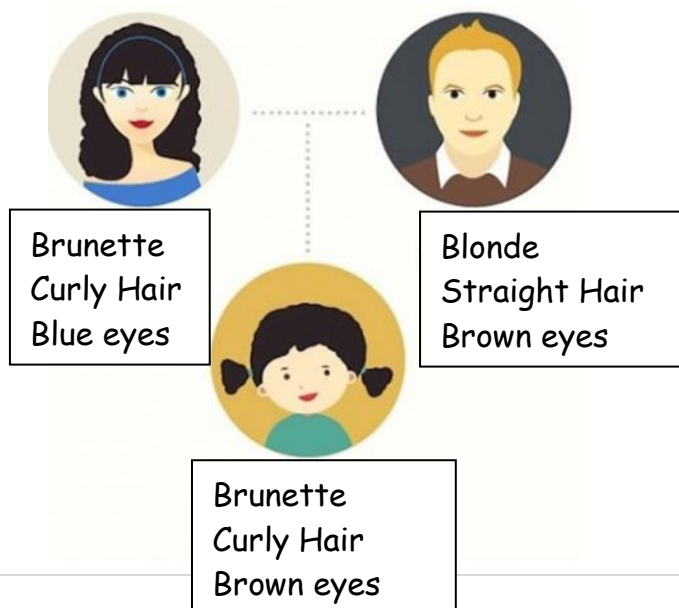


DNA

- ☐ DNA is found in the nucleus
- ☐ DNA contains the instructions for the development and functioning of living things- The Genetic Code
- ☐ A section of DNA is called a **gene**



- ☐ Each individual has a unique combination of genes
- ☐ Genes control characteristics like eye colour and whether your hair is straight or curly.

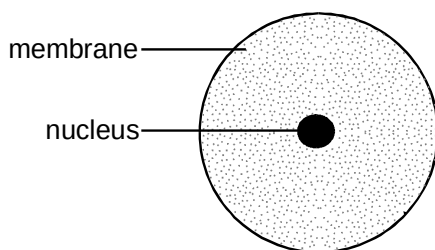


DNA Profiling

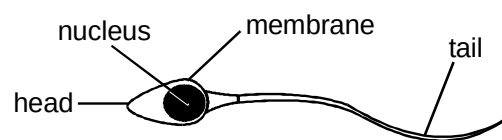
- ☐ The use of technology to analyse DNA
- ☐ Can be used by:
 - The police to solve crimes (forensics)
 - Lawyers to prove whose a child's parents are
- ☐ Your DNA can only be profiled or tested if you agree.
- ☐ Unless you have committed a crime your DNA profile cannot be stored.
- ☐ Profiling is controversial. Some people are for it and some people are against it.

Reproduction

- ☐ Sex cells are called **gametes**. Male sex cells are sperm and female sex cells are eggs.



human ovum (egg)

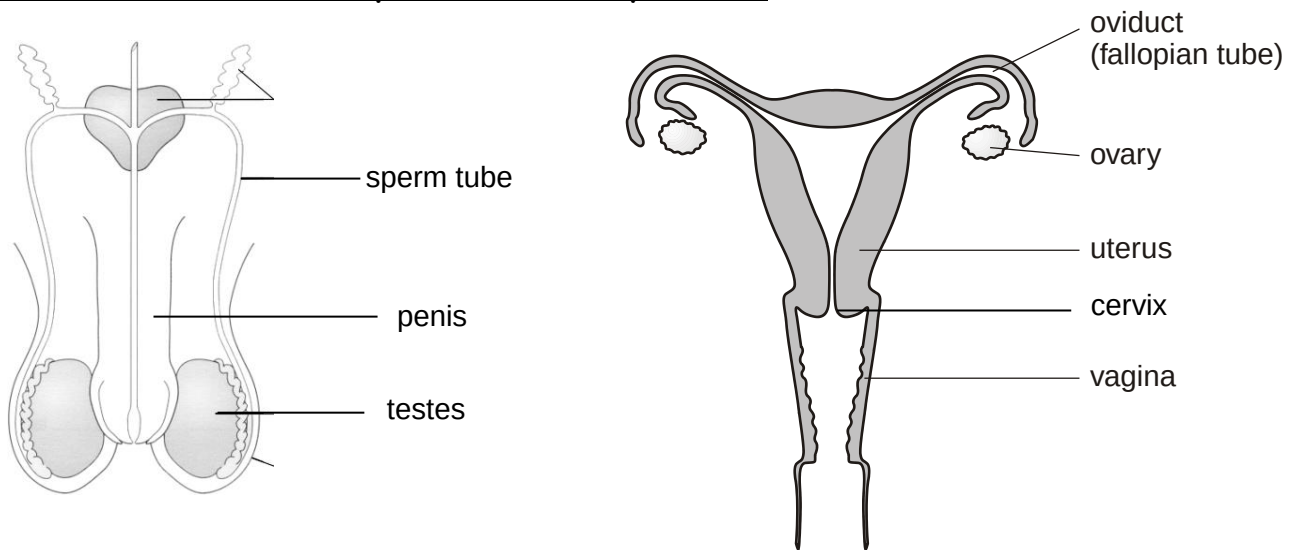


human sperm

not to scale

Egg Cells	Sperm Cells
Made before birth	Made during puberty
Large cells	Small cells
Do not have a tail	Have a tail to swim long distances
One released per month	Millions released at once

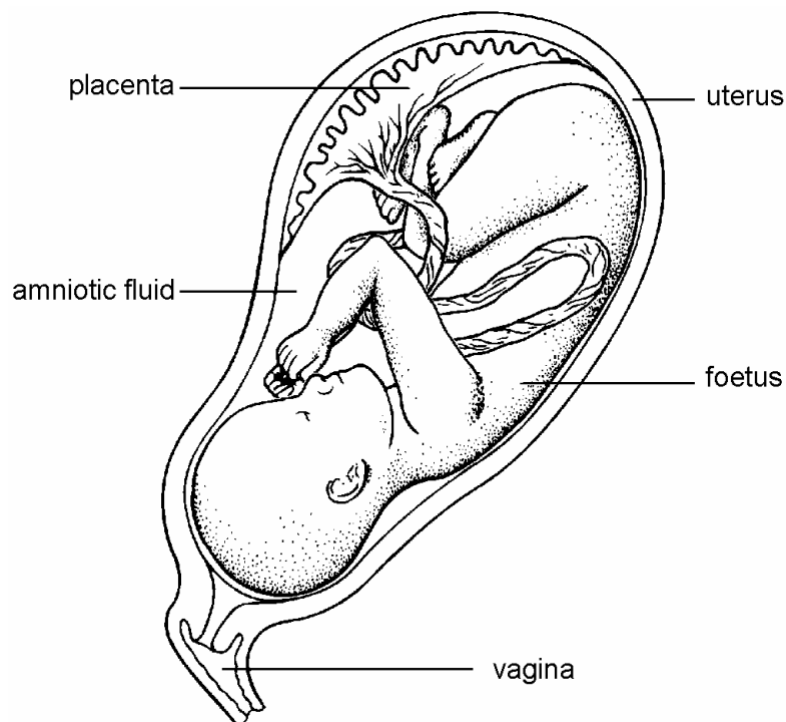
Male and Female Reproductive Systems



- ☐ Sperm are produced in **testes**. They travel along the **sperm tube**, out of **penis** and swim through the **vagina**. Then they swim up past the cervix and through **uterus** into the **oviduct** and fertilise the egg.
- ☐ When the nucleus of the sperm joins with the nucleus of the egg, this creates a fertilised egg. This is called **fertilisation**.

Pregnancy

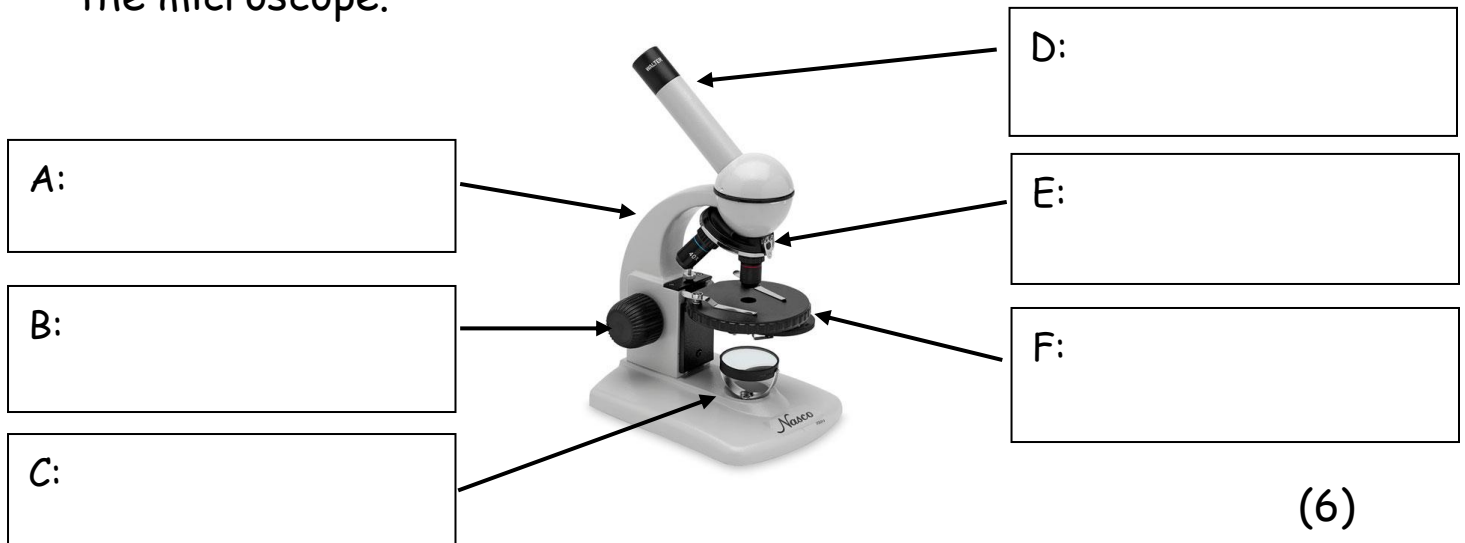
- ☐ Once **fertilisation** takes place in the oviduct, the fertilised egg cell begins to divide many times into a ball of cells. The ball of cells travel to the uterus and attaches onto the wall. The cells continue dividing and begin to specialise to form an embryo. After about 12 weeks the organs start to form and it becomes a **foetus**.



- ☐ The **foetus** is surrounded by **amniotic fluid** to cushion it inside the amniotic sac. The mother passes food and oxygen to the baby through the **placenta** and **umbilical cord**. The baby passes waste products e.g. carbon dioxide back to the mother.
- ☐ Any harmful substances e.g. smoke (tobacco), alcohol or drugs, in the mother will also be passed to the baby. These can cause miscarriages, low birth weight, learning difficulties, physical defects and breathing problems.
- ☐ Some couples find it difficult to conceive (make a baby). This can be caused by alcohol misuse, anorexia and obesity.

Homework 1

1. Use the wordbank under the diagram to label the diagram of the microscope.



Word Bank:

Objective lens

Stage

Focus Adjustor

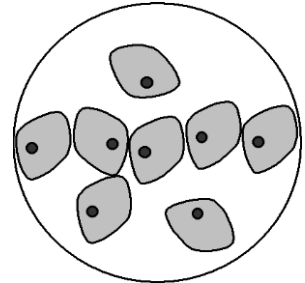
Arm

Mirror

Eyepiece

2. This is a view of cells seen with a microscope.

Each cell is 40 micrometers across. What is the distance across the view?



_____micrometers

(1)

3. Describe the purpose of using a stain when preparing a sample for viewing under a microscope.

_____ (1)

Total = /8

Homework 2

1. Complete the table using page 6 of this booklet to help you.

Part Of Cell	Function	Found in animal cells?	Found in plant cell?
Nucleus	Controls cell activities	Yes	Yes
Cytoplasm			Yes
Vacuole	Contains cell sap	No	Yes
Cell wall	Provides support and maintains shape		
Cell membrane		Yes	
chloroplasts	Carries out photosynthesis		

(4)

2. How is a sperm cell's structure specialised to allow it to carry out its main function?

(2)

3. Underline the correct word to complete the sentences.

Cells which work together in teams are called { tissues }
organs

A heart is an example of an { tissue }
organ

(2)

Total = /8

Homework 3

1. Where is DNA found in the cell?

_____ (1)

2. What is the function of DNA?

_____ (1)

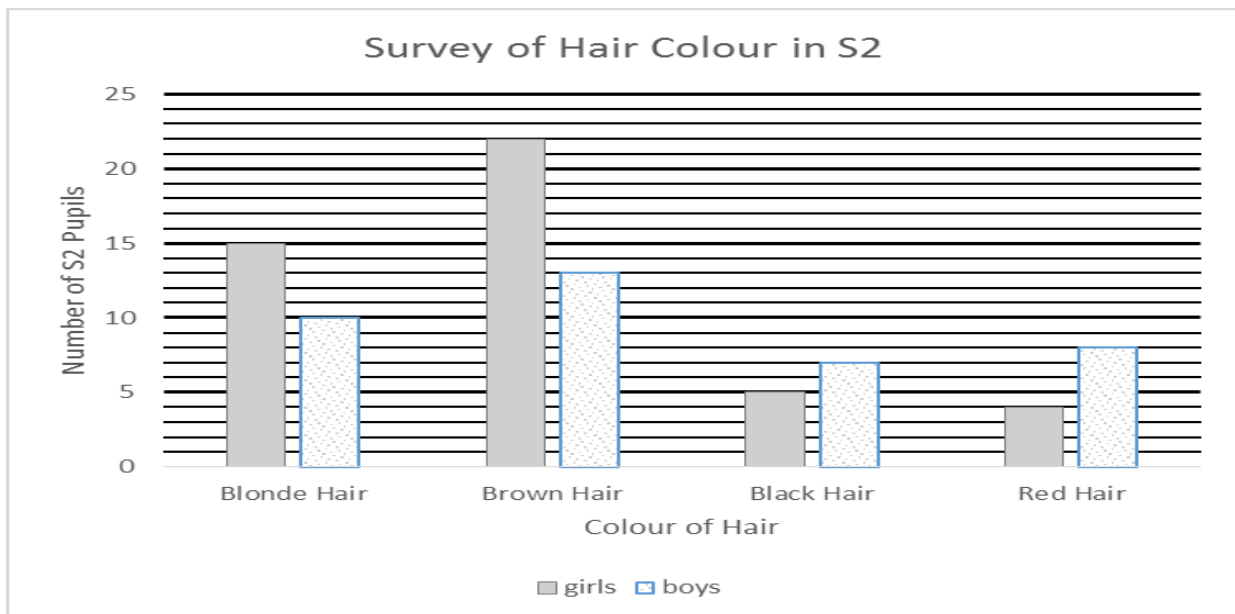
3. What is a gene?

_____ (1)

4. State two characteristics that are controlled by genes?

_____ (2)

Use the graph below to answer the questions:



5. How many girls are there in S2? _____ (1)

6. How many boys have brown hair? _____ (1)

7. Which hair colour is the most common? _____ (1)

Total = /8

Homework 4

1. State the scientific name for a sex cell.

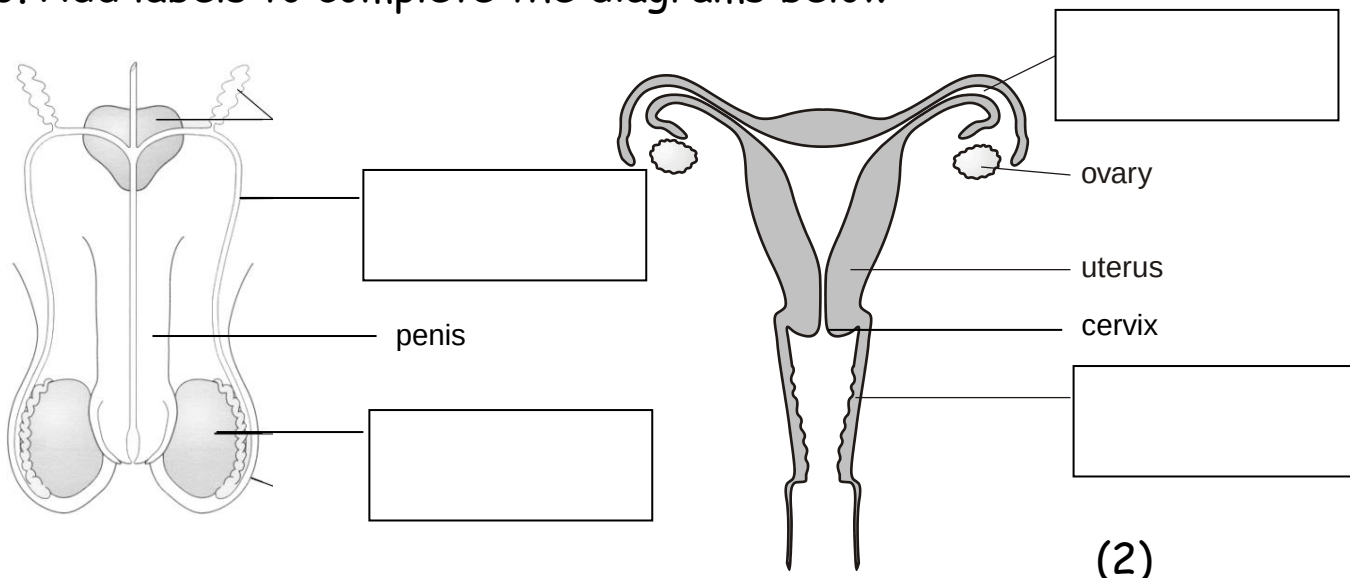
_____ (1)

2. State two differences between a sperm and an egg.

1) _____

2) _____ (2)

3. Add labels to complete the diagrams below:



(2)

4. Summarise how the developing baby is supplied with oxygen and food while in the uterus. Outline how it gets rid of waste. Use the following key words to help you:

Placenta, oxygen, food, carbon dioxide, umbilical cord.

_____ (3)

Total = /8

Home Activities- Extra Credit

1. Create an edible model of a cell using sweets, cake, jelly....or anything you can find. Take a picture and show it to your teacher.

Ideas:



This model uses jelly for cytoplasm, grapes as chloroplasts and an orange segment as a nucleus.



ANIMAL CELL MODEL
Using Candy



This model uses a cake with sweets as the cell structures.

2. Write a poem about the similarities and differences between animal and plant cells.
3. Write a letter to an unborn baby explaining what lifestyle choices its mother has made to protect it from harm.

Useful Websites



Cells Alive- How Big?

<http://www.cellsalive.com/howbig.htm>



BrainPop

<https://www.brainpop.com/science/cellularlifeandgenetics/cells/>



Quizlet-Flashcards

<https://quizlet.com/212506493/bge-cells-flash-cards/>



Developing Baby

<http://www.bbc.co.uk/education/guides/z9fgr82/revision/5>