

Reproduction

I should already know:

The basic organs used for reproduction.

The work of Charles Darwin.

I will learn:

Explain the process of fertilization and gestation

Discuss the theory of natural selection and make links to selective breeding.

Discuss the main stages of the menstrual cycle.

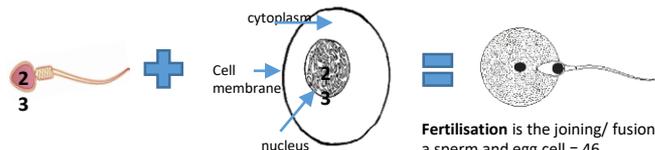
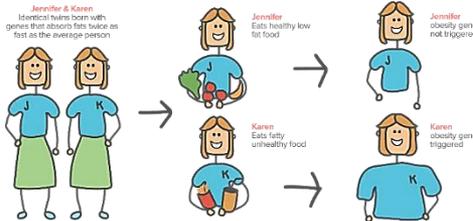
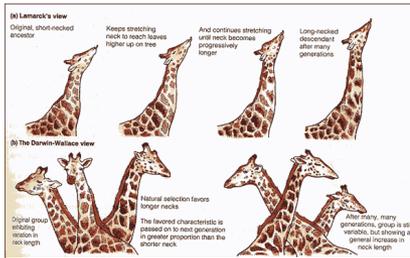
Make links between environmental and inherited variation

Compare the reproductive organs and comment on how they work.

Analyse the effect of competition and environment on adaptations.

Key Words

Egg cell	Female sex cell made in the ovaries that carries the mother's genetic information
Sperm cell	Male sex cell with a tail produced in the testes that carries the father's genetic information
Gamete	Sex cell; egg or sperm
Fertilisation	The process of the nucleus of the male and the female sex cell joining
Ovary	Where egg cells are made in females
Testis	Where sperm cells are made in males
Ovulation	The release of an egg cell from the ovary
Menstruation	The process in which the lining of the uterus is lost through the vagina every month
Placenta	Organ providing developing foetus with oxygen and nutrients
Embryo	An early stage in the growth and development of a foetus
Inheritance	Genetic information being passed from parent to offspring
Genetic variation	Differences caused by your DNA e.g. eye colour
Environmental variation	Differences caused by the environment e.g. tattoos and scars
Natural selection	A species changes over time to become better adapted to its environment; Darwin's theory for evolution
Evolution	The process by which living organisms have developed from earlier forms over time
Adaptation	The process by which organisms become better suited to survive in the environment they are in



Greater Depth Challenge

How are twins formed?

What are the different types of twins and how are they created?

This will help in the future:

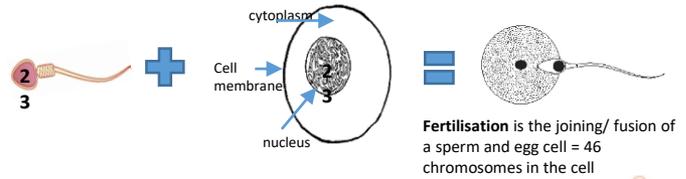
Careers in Biology such as genetics, researchers, medical technology.

Further Reading

BBC Bitesize, Educake.

Explain the process of fertilization and gestation.

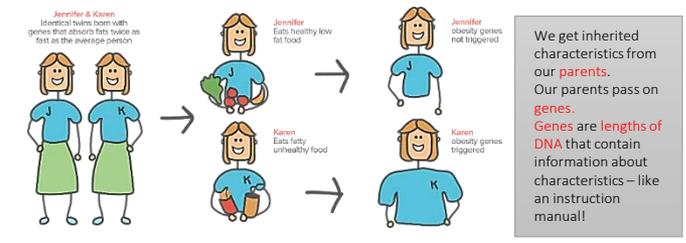
Gametes are sex cells. The male gametes are the sperm; female gametes are the eggs. Gametes contain one set of genetic information (23 chromosomes in the nucleus), while body cells contain two sets of genetic information (46 chromosomes).



Gestation: The period of development from fertilisation until birth (9 months for humans). There are 8 stages of pregnancy:

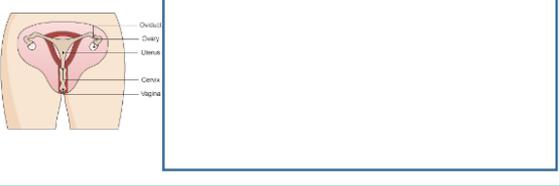


Make links between environmental and inherited variation.

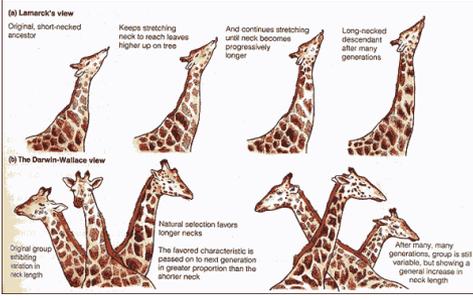


Variation	
Two categories of variation are...	
Continuous variation	
Discontinuous variation	

Compare the reproductive organs and comment on how they work.



Discuss the theory of natural selection and make links to selective breeding.

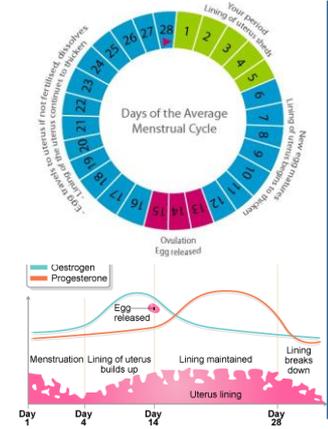


Natural Selection starts with...	
The next stage of natural selection is...	
Some characteristics are...	
These offspring will...	
The other offspring...	
Darwin was criticised for this theory as...	

Selective breeding – the process is the same as natural selection, except that the **characteristic is chosen** rather than a random mutation.

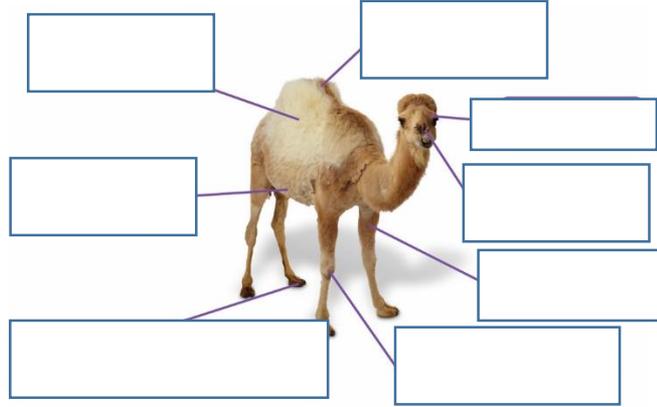
Farmers use this to get the best crops or animals.

Discuss the main stages of the menstrual cycle.



Analyse the effect of competition and environment on adaptations.

Adaptation	
Two adaptations of polar bears to help survive in the Arctic	

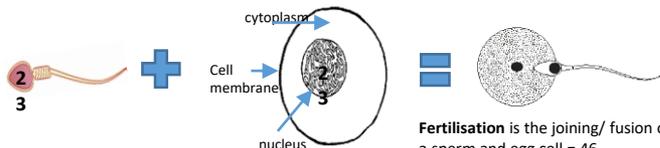


Extremophiles	
Examples of extremophiles	



Explain the process of fertilization and gestation.

Gametes are sex cells. The male gametes are the sperm; female gametes are the eggs. Gametes contain one set of genetic information (23 chromosomes in the nucleus), while body cells contain two sets of genetic information (46 chromosomes).



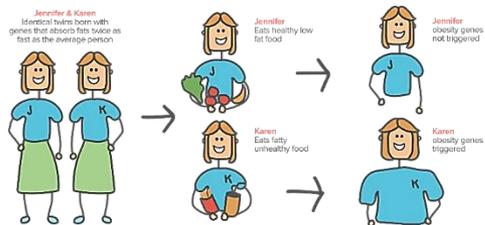
Fertilisation is the joining/ fusion of a sperm and egg cell = 46 chromosomes in the cell

Gestation: The period of development from fertilisation until birth (9 months for humans).

- There are 8 stages of pregnancy:
- 1) Ovulation: egg released from ovary
 - 2) Fertilisation
 - 3) Embryo: ball of multiplied cells
 - 4) 1st trimester: embryo develops into foetus, organs develop.
 - 5) 2nd Trimester: nervous system, eyelashes and fingernails develop.
 - 6) 3rd Trimester: Use of lungs, gains weight ready for birth
 - 7) Getting ready for birth
 - 8) Birth and after: baby is born, followed by placenta, umbilical cord cut



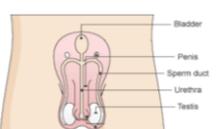
Make links between environmental and inherited variation.



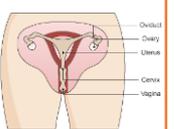
We get inherited characteristics from our **parents**. Our parents pass on **genes**. **Genes** are lengths of **DNA** that contain information about characteristics – like an instruction manual!

Variation	All the differences between members of the same type of organism.
Two categories of variation are...	Continuous and Discontinuous
Continuous variation	A characteristic can take any value within a range. Examples: height, weight.
Discontinuous variation	A characteristic has a limited number of possible values. Examples: eye colour, blood type.

Compare the reproductive organs and comment on how they work.

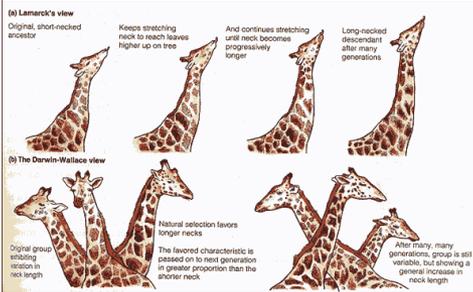


Bladder: A muscular sac that stores urine
Sperm duct: The tube where the sperm travels after they are released from testes
Testes: Make sperm cells
Penis: Male reproductive organ. Releases sperm into the vagina
Urethra: tube through which the semen (and urine) travels out of the penis



Cervix: Opening of the uterus
Fallopian tube (oviduct): the tube the egg travels along after it is released.
Ovary: The egg is produced here
Uterus: Where the baby is formed
Vagina: Female reproductive organ. The tube where the penis is placed during intercourse

Discuss the theory of natural selection and make links to selective breeding.

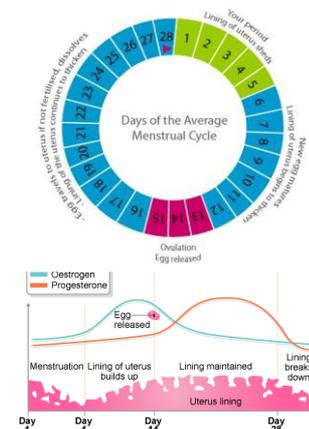


Natural Selection starts with...	Organisms having too many offspring (children) to survive.
The next stage of natural selection is...	There is variation between the offspring, creating different characteristics.
Some characteristics are...	Advantageous for survival.
These offspring will...	will survive, reproduce and pass on these advantageous characteristics to their offspring
The other offspring...	do not survive so cannot pass on their disadvantageous characteristics
Darwin was criticised for this theory as...	It was argued it went against religious beliefs.

Selective breeding – the process is the same as natural selection, except that the **characteristic is chosen** rather than a random mutation.

Farmers use this to get the best crops or animals.

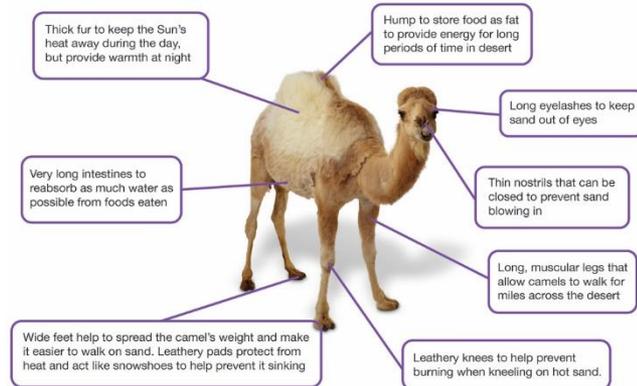
Discuss the main stages of the menstrual cycle.



1. The lining of the uterus breaks away and the woman starts her period.
2. The period lasts between 3 and 7 days.
3. An egg is released from an ovary and starts to travel down the fallopian tubes.
4. The lining of the uterus builds up as the egg travels down the fallopian tubes, ready to accept a fertilised egg.
5. If the egg is not fertilised, the lining of the uterus starts to break away and the cycle starts again.

Analyse the effect of competition and environment on adaptations.

Adaptation	A feature or characteristic that helps an organism to survive in its specific habitat (the place that it lives).
Two adaptations of polar bears to help survive in the Arctic	White appearance as camouflage from prey on the snow. Thick layers of fat and fur to insulate against the cold



Extremophiles	An organism that has adapted to live in extreme conditions that would kill other organisms.
Examples of extremophiles	A bacteria that lives in hot springs with very high temperatures.



Scientific equipment

	Name Bunsen burner	Use Heating by burning a gas		Name Stopwatch	Use To measure time
				Tongs	To hold hot things (not test tubes)
	Conical flask	To measure volume of liquids		Thermometer	To measure temperature
	Beaker	To hold, pour and heat liquids		Safety Goggles	To protect your eyes
	Measuring cylinder	To measure precise volume of liquid		Tripod	To hold a beaker above a Bunsen burner
	Evaporating basin	To heat and evaporate liquids		Gauze	Used to support a beaker

Risk assessment

Hazard / Chemical	Risks	Control measures	Emergency measures

Hazard – something that has the potential to cause harm to a person, property or environment.

Risk – is the chance or probability of the hazard causing harm or damage to people, property or the environment.

Control measures – minimises the risk of the hazard causing harm.

Drawing equipment

When drawing scientific equipment it must be drawn in 2D and not 3D.

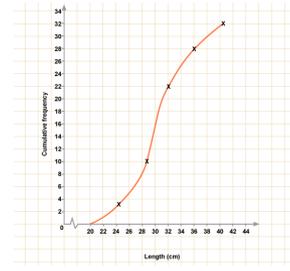
Equipment diagrams should be drawn as part of the method for the experiment.

	Test tube	
	Beaker	
	Conical flask	
	Round bottom flask	
	Measuring cylinder	
	Tripod	
	Gauze mat	
	Bunsen burner	
	Evaporating dish	
	Filter funnel (with filter paper)	

Hazard symbols

			
Flammable	Corrosive	Toxic	Explosive
			
Harmful to environment	Serious health hazard	Oxidising	Harmful

Graphs

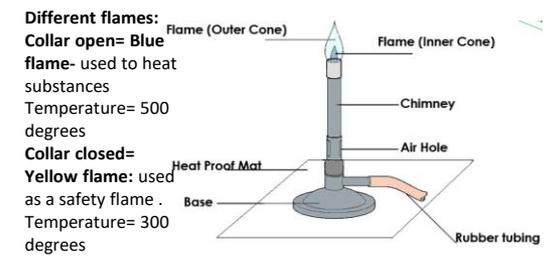


- Rules for a graph**
- Title
 - Size
 - Appropriate scale
 - Labelled axis
 - Plot points accurately
 - Line of best fit

When describing graphs make sure you...

- Identifying if it's an increasing or decreasing trend.
- Support your chosen trend with evidence from the graph.
- Give a reason or opinion for the observed trend.

Bunsen burner



Calculation

Formula

Numbers

Answer

Unit

Write the formula you are using.

Substitute in the known numbers.

Calculate the answer.

Add units if appropriate.