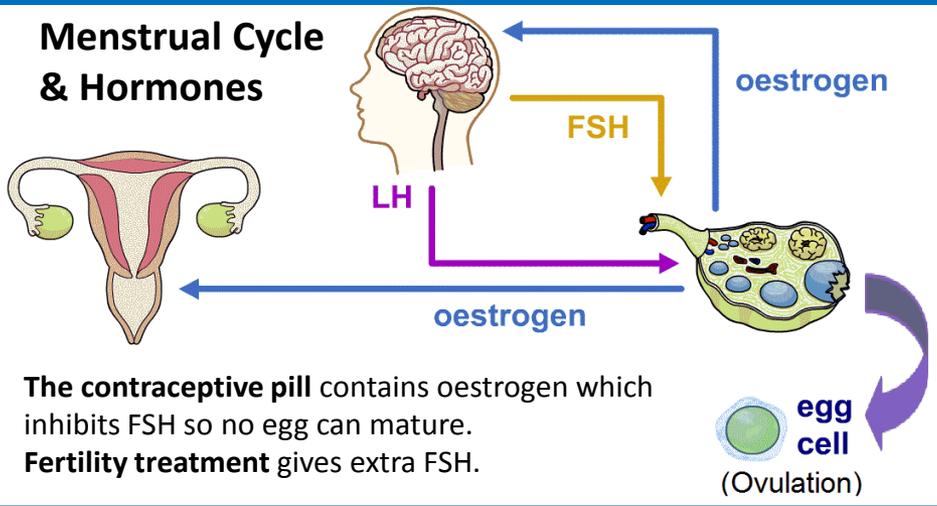


Keywords: impulse, glands, secret, sense organ, central nervous system, reflex arc, pituitary gland, IVF

# Menstrual Cycle & Hormones



**The contraceptive pill** contains oestrogen which inhibits FSH so no egg can mature.  
**Fertility treatment** gives extra FSH.

**Obesity** linked with arthritis, diabetes, high blood pressure & heart disease.

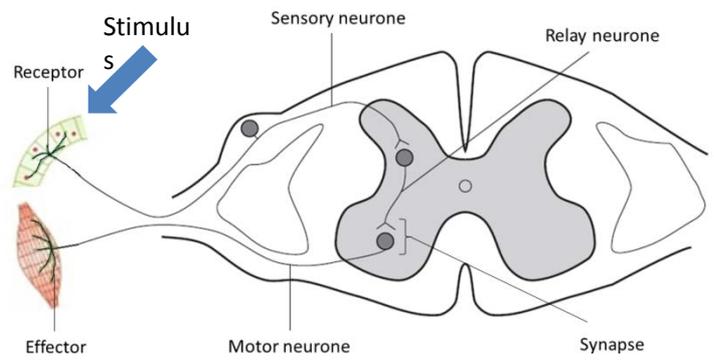


Body mass index  
 $BMI = \frac{\text{weight (kg)}}{\text{height}^2 \text{ (m)}}$

**Starvation** (or Anorexia nervosa) causes thinness, wasting muscles, poor immune system & periods to stop.

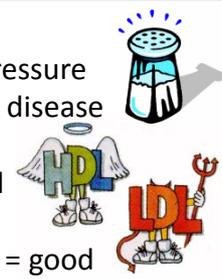
**Metabolic Rate** = how fast reactions take place in cells.

High in athletes, young, men



**Homeostasis** = controlling internal conditions including water, ions, blood sugar and temperature.  
**Water and ions** → kidneys & urine  
**Temperature** → skin and brain (so enzymes work properly)  
**Blood Sugar** → Pancreas

**High Salt** → high blood pressure  
**High Cholesterol** → heart disease  
 Statins lowers cholesterol  
 Saturated fats = bad  
 Mono & Polyunsaturated = good



- Fat
- Fibre
- Protein
- Carbohydrates
- Vitamins
- Minerals
- Water

If you don't get them all in the right amounts you are **malnourished**

HSW Word	Definition
Hypothesis	A possible explanation of a problem that can be tested experimentally.
Evidence	The data or observations that are used to support a given hypothesis or belief.
Theory	An idea that might explain the results which is based on scientific results.
Hearsay	A rumour or idea with no evidence to back it up.
Control	A experiment to show what would have happened if you had not changed the independent variable.
Precision	Small divisions on the measuring device gives high precision.
Accuracy	An accurate measurement is one which is close to the true value.
Reliability	The results of an investigation may be considered reliable if they can be repeated.
Ethical	Whether something is considered morally right or wrong.
Validity	Valid data answers the question asked by the investigation. Data are only valid if the experiment is a fair test.

Substance	Causes
Alcohol	Damage to liver & brain Slows reactions, loss of self control
Cannabis	Can lead to hard drugs Psychological (mind) problems
Nicotine	Addiction
Tar	Emphysema
Carbon Monoxide	Low birth mass in babies
Carcinogens	Cancer
Thalidomide	Limb abnormalities in babies Now treats leprosy & cancer



**Bacteria** → produce **toxins**. E.g. salmonella and MRSA. Antibiotics kill them by damaging the cell wall.

**Viruses** → **damage cells** and release **toxins**. They cannot be killed by antibiotics as they hide in human cells in order to reproduce.

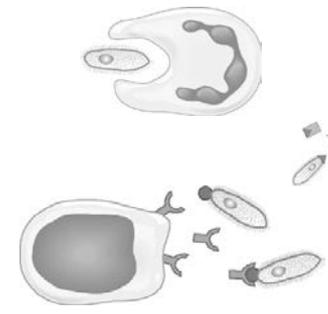


Infectious diseases are caused by **pathogens** bacteria and viruses.

**Semmelweis** realised that doctors need to washing their hands.



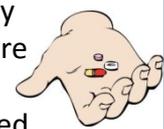
**STOP** Skin, blood clotting and mucus in the breathing system stop pathogens entering the body.



Your white blood cells help to defend you against pathogens by **ingesting** them, making **antitoxins** and making **antibodies**.

Some medicines relieve symptoms but do not kill the pathogen e.g. **painkillers**.

New medicines are extensively tested and trialled to make sure they work and are not toxic. Alexander Flemming discovered **penicillin**.



Many types of bacteria have developed **antibiotic resistance** as a result of **natural selection**.



Vaccines contain **dead or weakened microorganisms**. Your white blood cells produce **antibodies** as a practice. This makes you **immune** to bacteria and viruses.



The MMR jab is for **measles, mumps** and **rubella**. Some people worried that the jab caused autism.

If bacteria or viruses **mutate**, new strains can appear which spread rapidly to cause **epidemics** (one country) and **pandemics** (several countries).



**Drugs** → change the chemical process in your body making you **addicted** to them. When addicts stop they have **withdrawal symptoms**.

Some **recreational** drugs are **legal** and others are **illegal**. The overall impact of legal drugs on health is much greater.

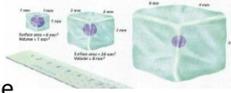


**Stimulants** → e.g. caffeine, cocaine & nicotine make you more alert by increasing the speed the nervous system works at.

**Depressants** → e.g. cannabis and alcohol slow your nervous system down by stopping nerve impulses.

**Keywords:** Adaptation, Competition, Inherit, Asexual Reproduction, Dominant, Recessive, Allele

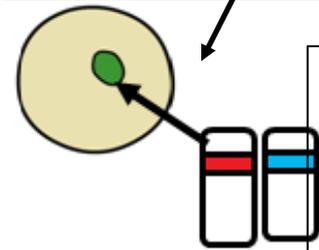
**white appearance** for camouflage  
**thick layers of fat and fur** for insulation  
**a small surface area to volume ratio**, to minimise heat loss  
**a greasy waterproof coat**  
**large furry feet** to distribute weight



**slit-like nostrils and two rows of eyelashes**  
**thin fur** to allow easy heat loss  
**a large surface area to volume ratio** to maximise heat loss  
**Hump which stores fat**  
**large, flat feet** to spread weight

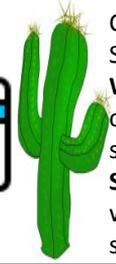


A cell nucleus contains 46 **Chromosomes**, which carry **genes** and are made of DNA. Different versions of genes are called **alleles**.



Sexual	Asexual	Reproduction
2 Parents; fusion of gametes	1 Parent	
Lots of Variation	No Variation; clones	

**Cacti adaptations:**  
**Stems that can store water.**  
**Widespread root systems** = collect water from a large area; support/anchor the plant.  
**Spines not leaves** = reduced water loss & protection. Fewer stomata = less water loss



Scientific names (binomials) provide info. on evolutionary relatedness

Genus	Species
<i>Pan</i>	<i>paniscus</i>



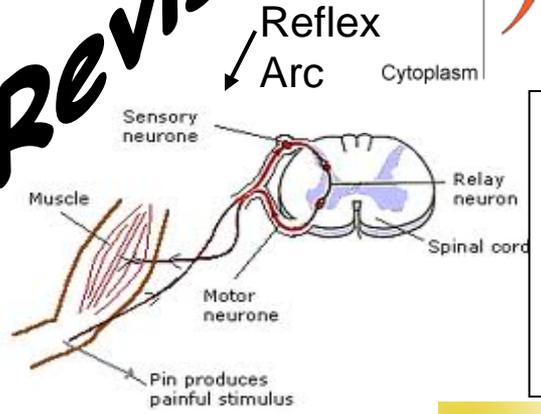
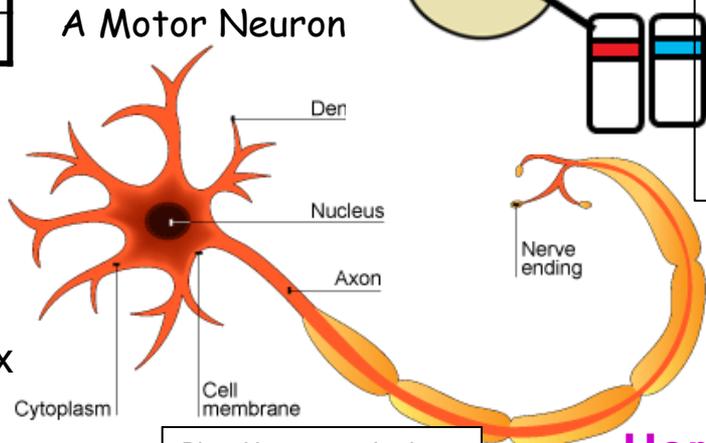
**B1 Revision**

**Temperature**  
 Monitored by thermoregulatory centre in brain and receptors in skin.



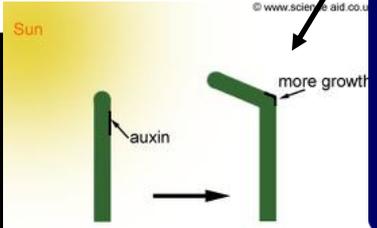
**Too Hot**  
 -hair lies flat  
 -blood vessels dilate so heat lost through skin  
 -sweat produced

**Too Cold**  
 -goosebumps & hairs trap air  
 -blood vessels constrict  
 -no sweat  
 -shiver, respiration releases heat



Stimuli/Receptor	Sense Organ
Touch/pressure	Skin
Sound	Ears
Light	Eyes

**Plant Hormones:** Auxin controls growth. Diffuse: away from light. Promote growth in shoots. Inhibit growth in roots. Shoots +ively phototropic (grow towards light); -ively gravitropic (grow against gravity). Roots = opposite.



**Competition**  
**Survival of the fittest!**

Animals	Plants
-food	-light
-water	-water
-territory	-space
-mates	-nutrients



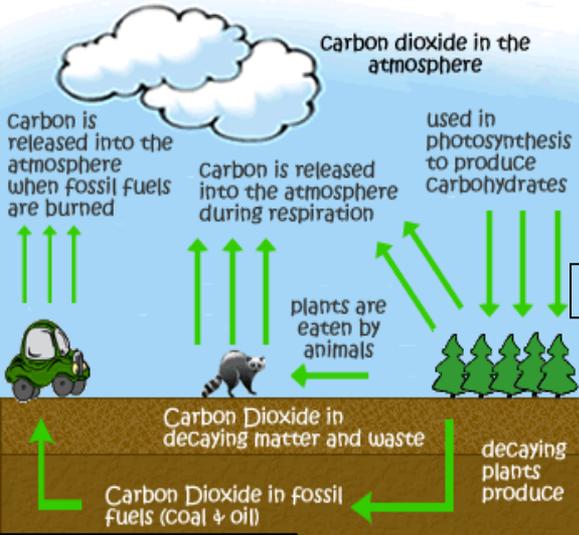
**Hormones**

**What is the sequence of changes in the menstrual cycle?**

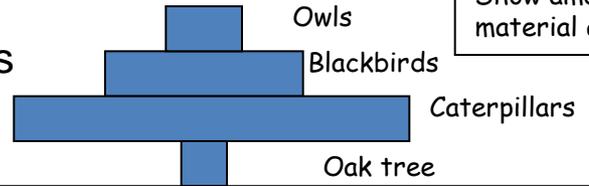
- The pituitary gland releases FSH
- Oestrogen causes the uterus lining to thicken
- FSH stimulates egg maturation and oestrogen release
- The ovaries release oestrogen
- LH stimulates egg release
- Oestrogen switches FSH off and stimulates LH release
- The egg is unfertilized – period occurs
- The pituitary gland releases LH

**solve**

Extinction, Evolution, Darwin, Natural Selection, Mutation, Vertebrate, Pollution, Acid Rain, FSH, LH, Hormone, Oestrogen, Maternal

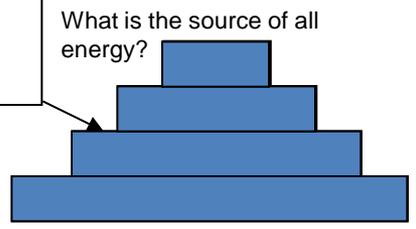


## Food Chains



## Pyramids of Biomass

Show amount of material at each stage



Pyramids of numbers show the number of organisms at each level; **not** always a pyramid shape

**Always** a pyramid shape because energy & carbon is lost....

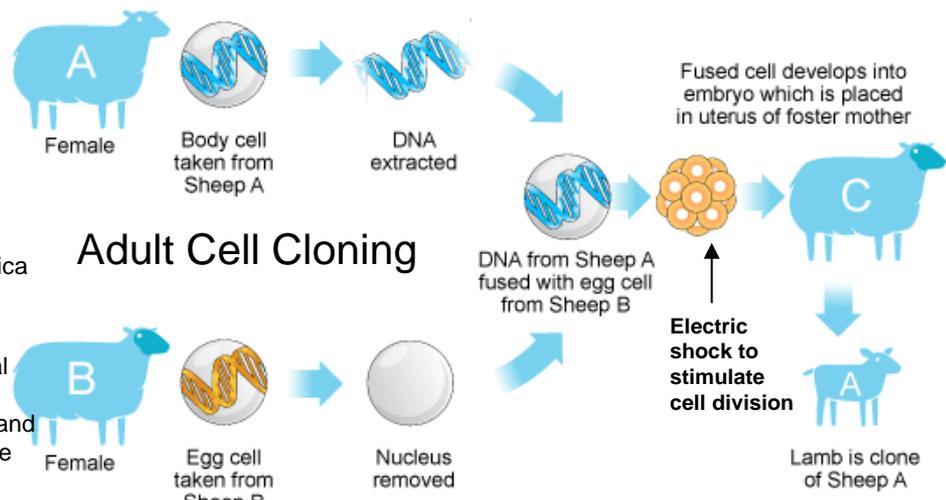
- Respiration: releases CO<sub>2</sub>, energy used in movement + heat production (mammals/birds)
- Not all organisms eaten
- Waste: faeces + urine

**The Carbon Cycle**

- Stored as CO<sub>2</sub>, or fats/proteins/carbs
- Decay carried out by decomposers

**Adult cell cloning:** new individual is an exact replica of just one parent

**Embryo transplant:** two parents' gametes, artificial insemination, embryo formed, split into several and each placed in a surrogate uterus



**Immune Response (1 of 3)**

White blood cells > produce antibodies > recognise foreign pathogens > faster response next time

What are the concerns with these procedures?

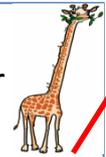
E.g. Believed that the offspring of mice who had their tails chopped (also have no tails...WRONG

## Theories of Evolution

**Evolution** = random progressive change over period of time

**Lamarck**- inheritance of acquired characteristics

**Darwin**- **natural selection** & survival of the fittest



Fossils show how organisms have changed, but don't often form and are usually fragmented



## Extinction due to....

- Changes in environment
- New predators
- New competitors
- Disease



1. **Mutation** causes...
2. Variation, with
3. Some individuals better adapted
4. Better adapted survive and reproduce
5. Offspring inherit adaptation and also benefit

## What is the sequence of events in making bacteria produce a human protein?

1. The gene is removed with enzymes.
2. The bacteria produce the required protein.
3. The gene for the human protein is identified.
4. A bacterial plasmid is cut open with enzymes.
5. The modified plasmid is inserted into the bacterium.
6. The gene is inserted into the plasmid.
7. The bacterium is added to a fermenter and replicates.