Whitley Academy

Biology Paper 2 (H) Knowledge Recall Booklet

Paper Biology 2H 8464/B/2H

For this paper, the following list shows the major focus of the content of the exam:

- 4.5.3 Hormonal control in humans
- 4.7.2 Organisation of an ecosystem
- 4.7.3 Biodiversity and the effect of human interaction on an ecosystem

Required practical activity that **will be assessed**:

- Required practical activity 7: measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.

Your teacher will tell you specific topic areas to focus on …

Topic	RAG			Revision technique					Date completed	Teacher Signed
	R	A	G	Flashcards	Mindmap	Notes	Video Watched (With notes)	Frog resource		

Required Practical – Measuring population size using sampling techniques

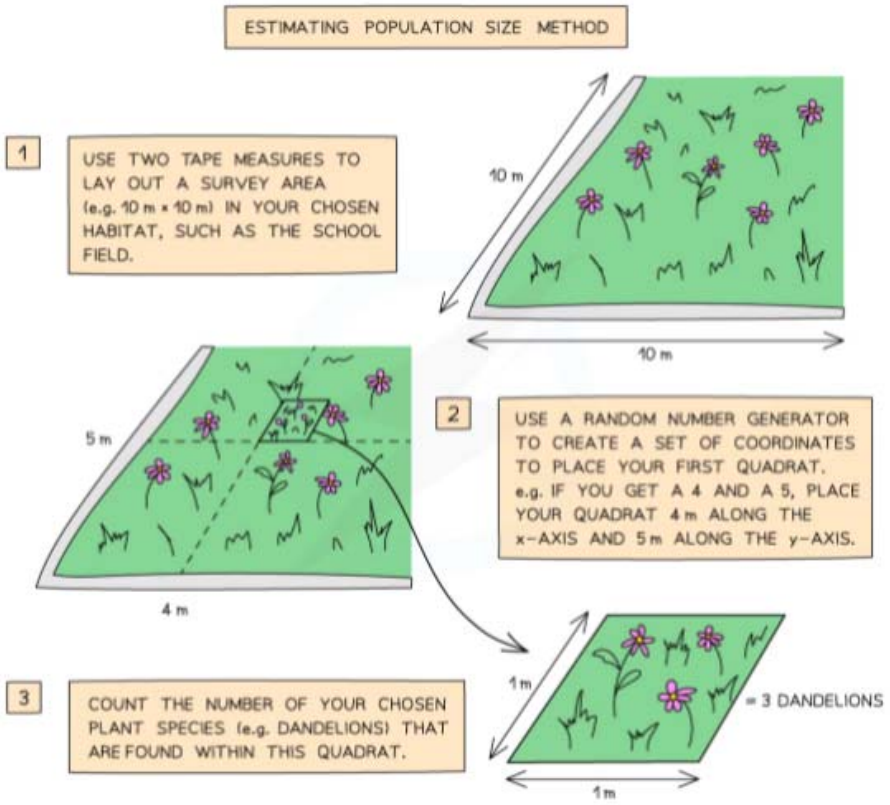
Recall it ...

Use the information in the following page(s) to answer these questions …

1. What is a quadrat?
2. How are quadrats placed?
3. What is counted within the quadrat?
4. How many times is the quadrat thrown?
5. How is the total number of species in the area estimated?

Required Practical – Measuring population size using sampling techniques

- Aim: To measure the population size of a common species in a habitat and use sampling techniques to investigate the effect of a factor on the distribution of this species
- You will:
  - Use a quadrat to estimate the population size of a plant species in a survey area
  - Use a transect line and a quadrat to investigate the effect of a factor on the number of plants in a survey area



Quadrat	Number of dandelions
1	3
2	4
3	2
4	1
5	0
6	0
7	2
8	5
9	3
10	1
Total	**21**

4 RECORD THIS NUMBER IN A RESULTS TABLE AND REPEAT STEPS 1–3 UNTIL YOU HAVE RECORDED THE NUMBER OF YOUR CHOSEN PLANT SPECIES IN 10 QUADRATS.

5 ESTIMATE THE POPULATION OF DANDELIONS IN YOUR SURVEY AREA USING THE EQUATION:

$$\text{ESTIMATED POPULATION SIZE} = \frac{\text{TOTAL AREA}}{\text{AREA SAMPLED}} \times \text{TOTAL NUMBER OF DANDELIONS COUNTED}$$

TOTAL SURVEY AREA WAS 10 m × 10 m

$$= \frac{100}{10} \times 21$$

$$= 210$$

EACH QUADRAT IS 1 m × 1m AND 10 QUADRATS WERE PLACED

Required Practical – Investigating the effect of factor on the distribution of species

Recall it ...

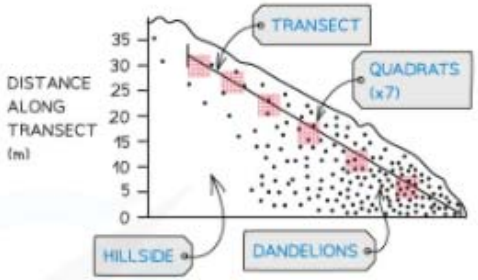
Use the information in the following page(s) to answer these questions …

1. What is a transect?
2. What is placed at intervals along the transect?
3. What is counted within the quadrat, and at intervals along the transect line?
4. How is the relationship determined?

Required Practical – Investigating the effect of factor on the distribution of species

INVESTIGATING THE EFFECT OF A FACTOR ON THE DISTRIBUTION OF A SPECIES METHOD

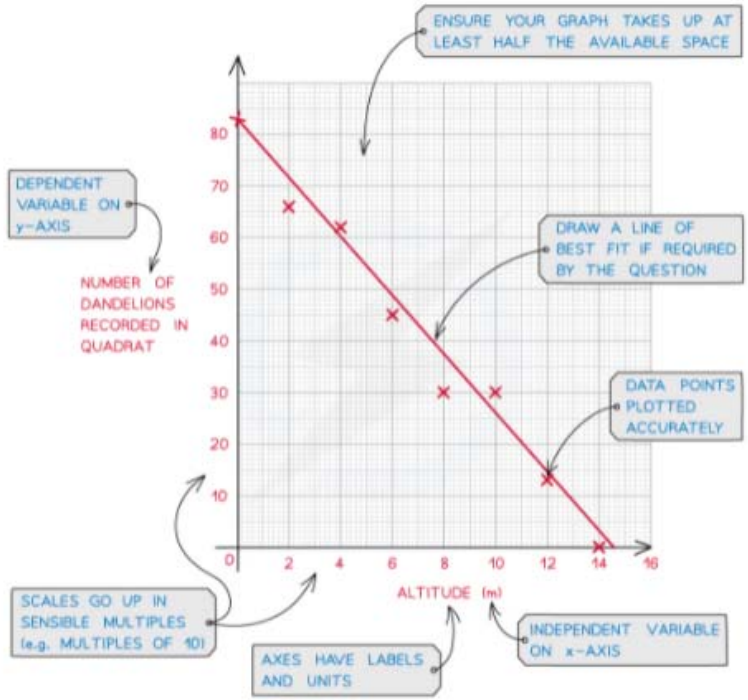
1 SET YOUR TRANSECT UP THROUGH THE AREA YOU ARE INVESTIGATING. IN THIS CASE, A 30 m TAPE MEASURE IS PLACED UP A HILLSIDE. PLACE A QUADRAT AT EQUAL INTERVALS (e.g. EVERY 5 m) ALONG THE TRANSECT.



Distance along transect (m)	Number of dandelions	Attitude (m)
0	84	2
5	66	4
10	62	6
15	45	8
20	30	10
25	30	12
30	13	14

2 RECORD THE NUMBER OF YOUR CHOSEN PLANT SPECIES INSIDE EACH QUADRAT. RECORD YOUR ABIOTIC FACTOR (e.g. ALTITUDE) AT EACH QUADRAT. RECORD YOUR RESULTS IN A TABLE.

3 PLOT YOUR DATA IN A GRAPH AND DESCRIBE ANY RELATIONSHIP THAT CAN BE OBSERVED.



RELATIONSHIP: "AS THE ALTITUDE INCREASES, THE NUMBER OF DANDELIONS DECREASES."

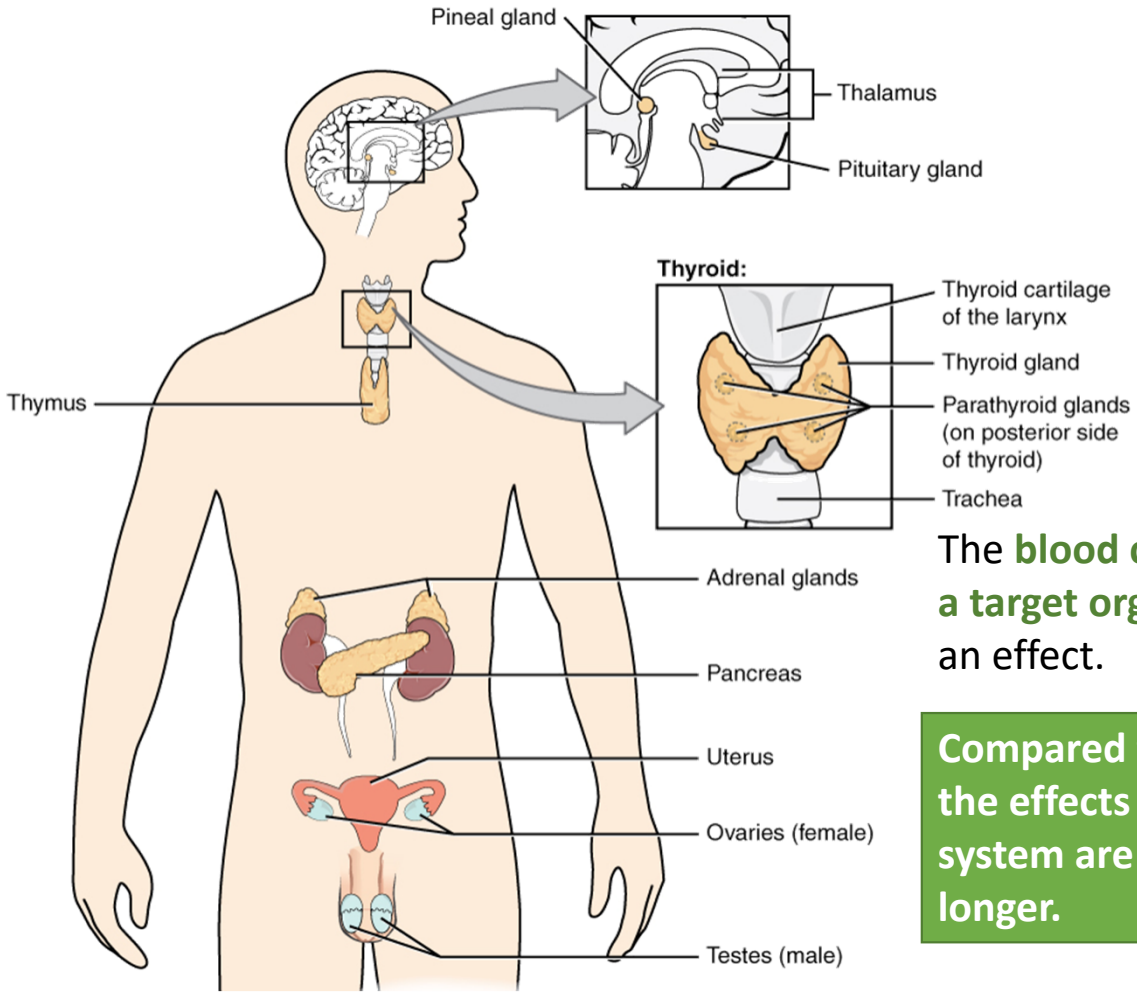
Recall it …

The Endocrine system

Use the information in the following page(s) to answer these questions …

1. What is the endocrine system? Describe how hormones are carried? Name 7 glands in the body? Describe what they adrenal and thyroid glands do?
2. Why is the pituitary gland called the master gland?
3. Name 6 hormones released by the pituitary gland, their target organ, and what they do?
4. What hormones are released from the pancreas? What do they do?
5. Describe what they pancreas and liver do if your blood glucose levels are too high?
6. What is diabetes? Describe the causes and treatment of type 1 and type 2 diabetes?

Hormonal coordination in humans Part 1 - Human endocrine system

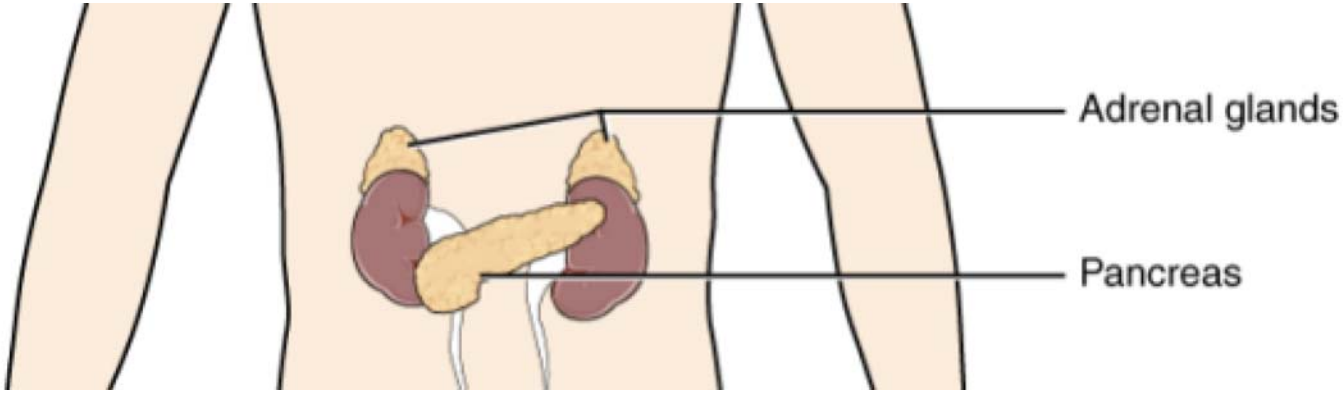


The **endocrine system** is composed of **glands** which **secrete chemicals** called **hormones** directly into the bloodstream.

The **blood carries** the **hormone** to **a target organ** where it produces an effect.

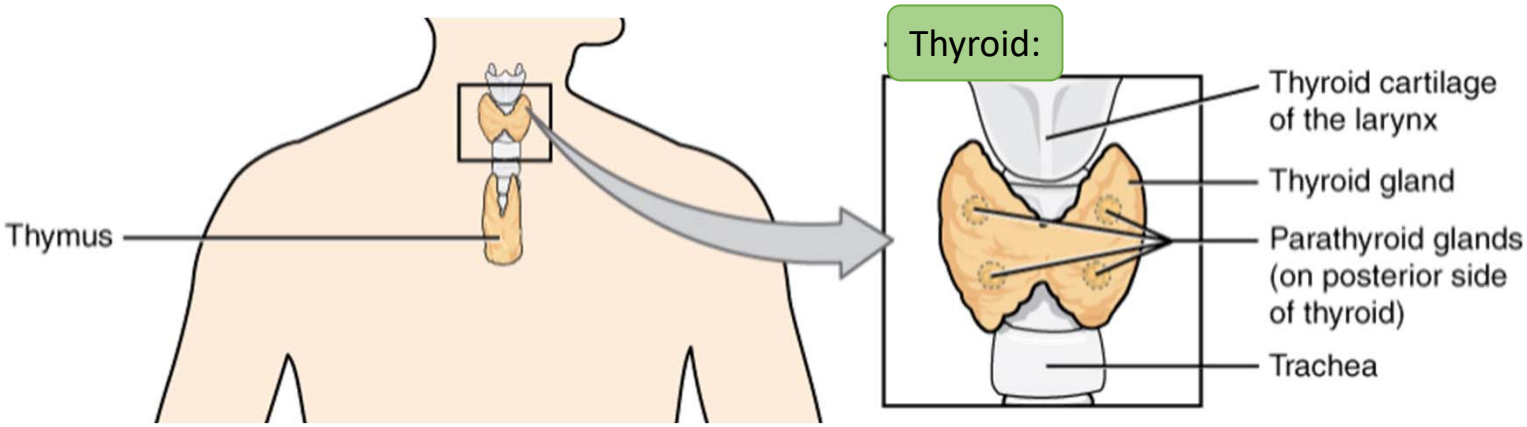
Compared to the nervous system the effects of the endocrine system are slower but act for longer.

Hormonal coordination in humans Part 1 - Human endocrine system



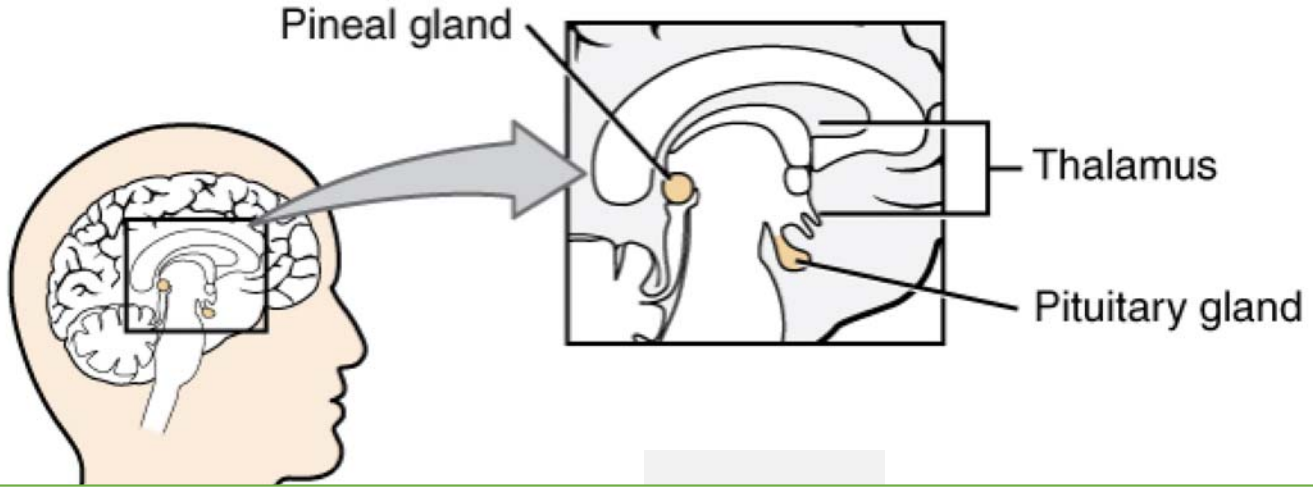
The **adrenal glands** produce and secrete the hormone **adrenalin. Adrenalin** prepares the body for **rapid activity** by increasing the **heart rate** and **blood glucose.** It diverts blood flow to the muscles and lungs. It is often called the **'fight or flight'** hormone.

Hormonal coordination in humans Part 1 - Human endocrine system



The **thyroid** produces and secretes the hormone **thyroxine. Thyroxine** regulates the **metabolic rate**, this is the rate at which **energy** is released in the body. Thyroxine **also** regulates **breathing**, **heart rate,** and **body temperature.**

Hormonal coordination in humans Part 1 - Human endocrine system

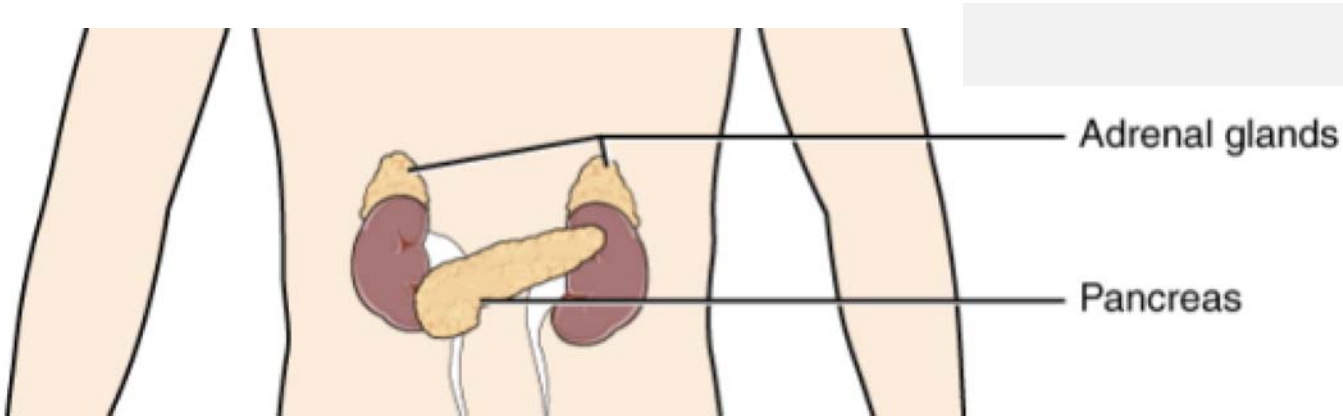


The **pituitary gland** in the brain is often called a 'master gland' as it it **produces** and **secretes many** hormones into the blood.
The hormones are **released** in **response** to **changes** in **body conditions**.
These hormones released act on **other glands** to stimulate other hormones to be released to bring about effects that regulate the body.

Hormones released by the pituitary gland

Hormone	Target	Effect
Anti-diuretic hormone (ADH)	Kidney	Controls water levels in the blood
Thyroid-stimulating hormone (TSH)	Thyroid	Stimulates the thyroid gland to secrete thyroxine
Luteinising hormone (LH)	Ovaries	Stimulates egg release and progesterone production in the ovaries
Follicle-stimulating hormone (FSH)	Ovaries	Stimulates egg ripening and oestrogen production (in ovaries)
Prolactin (PRL)	Breasts	Stimulates the breasts to produce milk
Growth hormone (GH)	All cells in the body	Stimulates growth and repair

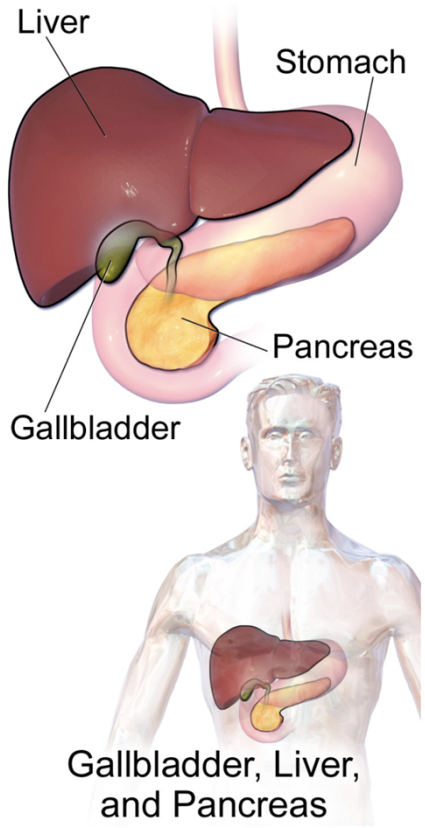
Hormonal coordination in humans Part 1 - Human endocrine system



The **pancreas** produces and secretes the hormones **insulin** and **glucagon.** These hormones **regulate** the **blood glucose** concentration. **Insulin reduces** the concentration and **glucagon increases** the concentration of the glucose in the blood

Hormonal coordination in humans Part 1 - Control of blood glucose concentration

Blood glucose concentration is **monitored** and **controlled** by the **pancreas**.



[Video - Regulating blood glucose]

Blood glucose concentration TOO HIGH

↓

The PANCREAS releases insulin

↓

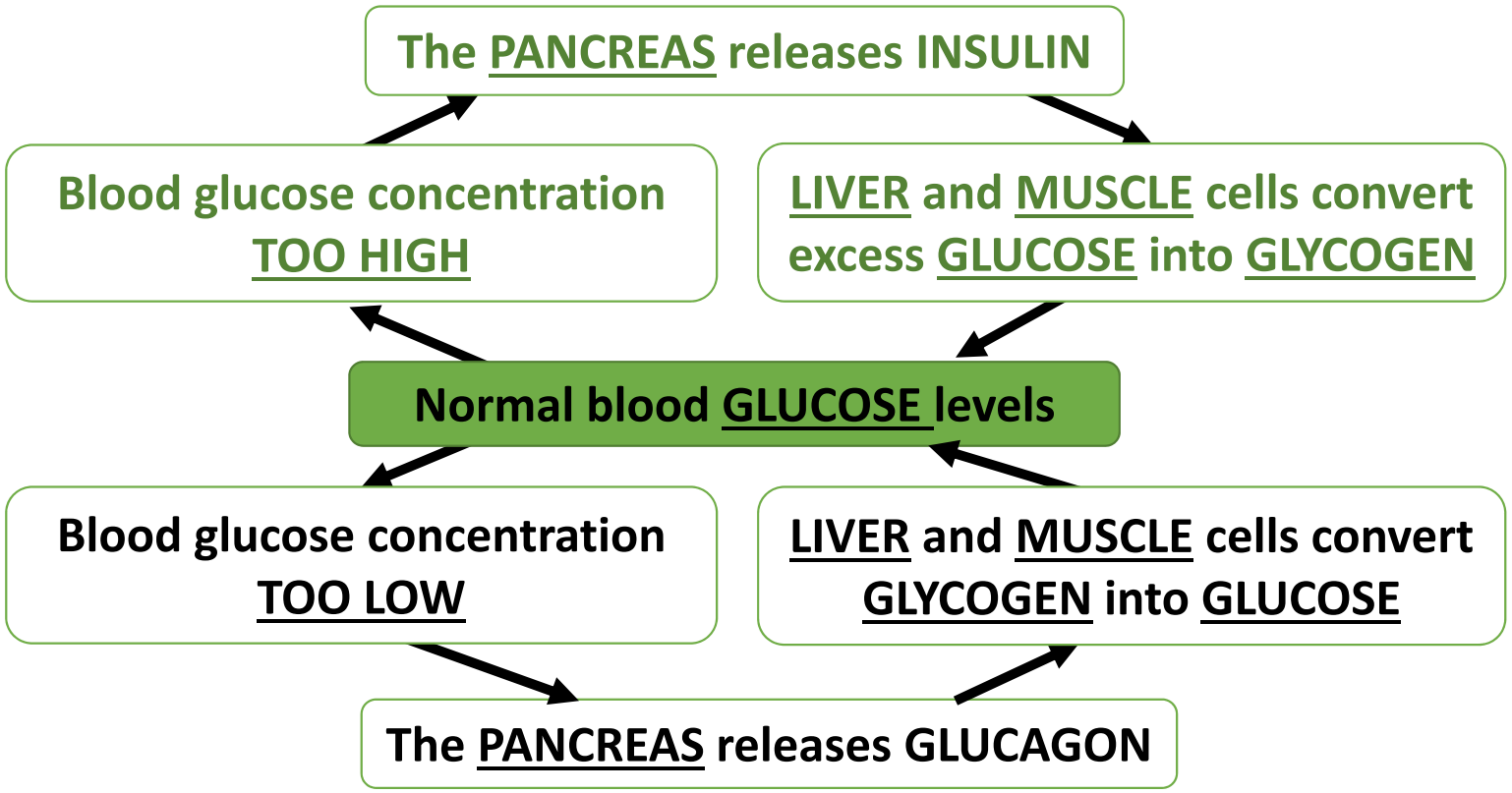
GLUCOSE is moved from the blood into the cells

↓

LIVER and MUSCLE cells convert excess GLUCOSE into GLYCOGEN for storage

Hormonal coordination in humans Part 1 - Control of blood glucose concentration **HT ONLY**

The control of **blood glucose concentration** is an example of **NEGATIVE FEEDBACK.** This ensures that, in any control system, **changes are reversed** and returned back to the set level.



Hormonal coordination in humans Part 1 - Control of blood glucose concentration

Diabetes is a condition that causes a person's **blood sugar level** to become **too high.**

Type 1 diabetes

- A **disorder** in which the pancreas **fails to produce enough insulin**.
- The lack of insulin **causes uncontrolled high blood glucose** levels.
- **Type 1** is normally **treated with insulin injections.**

Type 2 diabetes

- A **disorder** where the **body cells no longer respond to insulin** produced by the pancreas.
- **Obesity is a risk factor for Type 2 diabetes.**
- **Type 2** is normally **treated by controlling the carbohydrate in the diet and by exercise.**

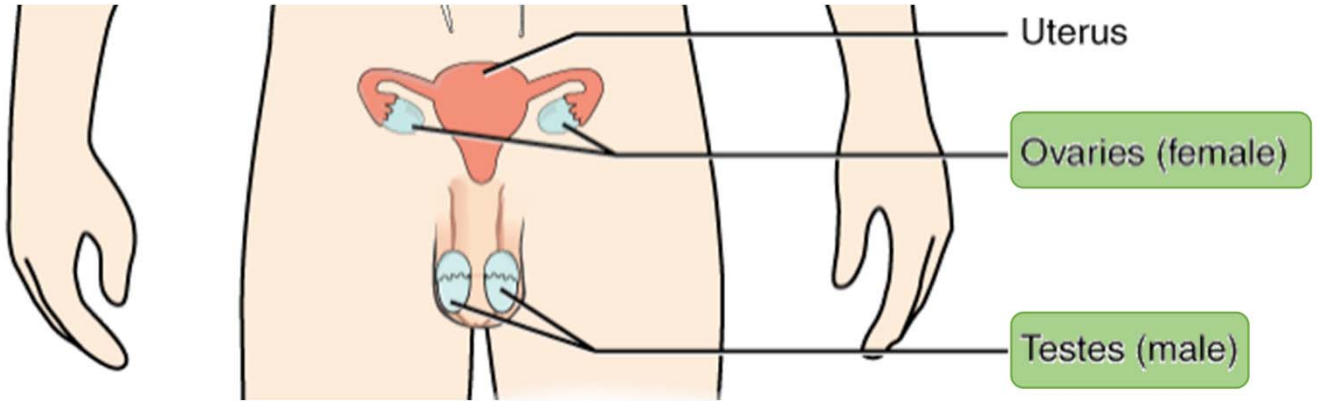
Recall it ...

Human Reproduction

Use the information in the following page(s) to answer these questions …

1. Which hormone is produced by the testes? Describe what it does?
2. Which hormones are produced by the ovaries? Describe what they do?
3. What is puberty? Describe both male and female secondary sexual characteristics?
4. What is the menstrual cycle? Describe the role of FSH, Oestrogen, LH and Progesterone in the menstrual cycle? Where are they produced? What do they do? Which hormones stimulate and inhibit other hormones?
5. Describe the following methods of contraception – pill, injection/implant, spermicides, barrier methods, intrauterine device, abstaining and sterilisation?
6. What do fertility drugs that are give to women contain?
7. Describe IVF treatment?
8. What are the risks with IVF treatment?
9. Describe a negative feedback response and a positive feedback response? Which is most common?

Hormonal coordination in humans Part 3 - Hormones in human reproduction



FEMALE: The **ovaries** produces and secretes the hormones **oestrogen** and **progesterone.**
Oestrogen controls the development of secondary sexual characteristics in females and inhibits FSH and stimulates the pituitary gland to produce LH.
Progesterone maintains the lining of the uterus during the menstrual cycle.

MALE: The **testes** produce and secrete the hormone **testosterone**, it controls the development of secondary sexual characteristics in males

Hormonal coordination in humans Part 3 - Hormones in human reproduction

Puberty is the stage in life when a child's body develops into an adult's body. The **changes take place gradually**, usually between the ages of 10 and 16. Changes occur at puberty because of **hormones:**

Testosterone - produced by the testes - controls the development of male secondary sexual characteristics

Oestrogen - produced by the ovaries - controls the development of female secondary sexual characteristics

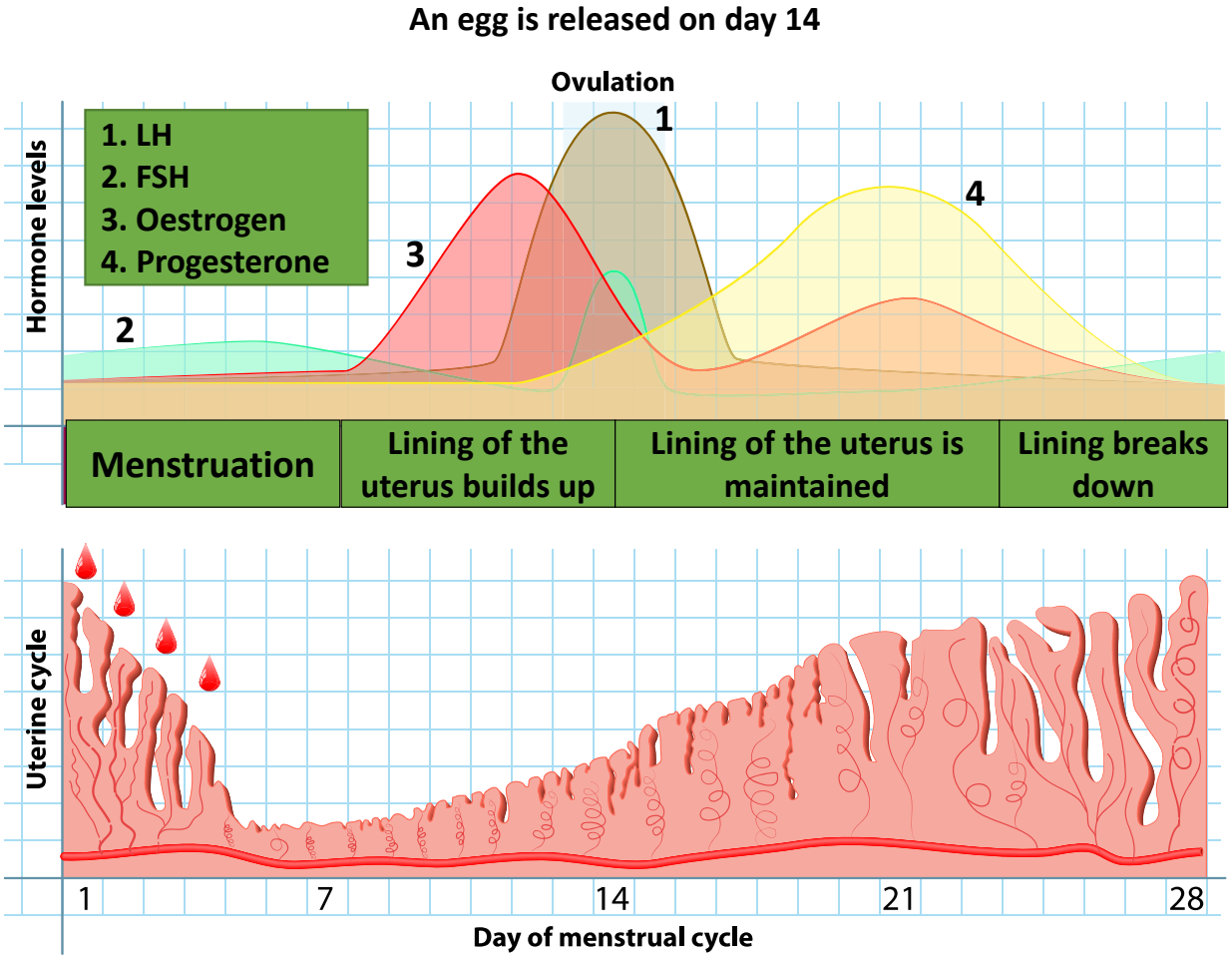
Female secondary sexual characteristics	Male secondary sexual characteristics
Breasts develop	**Voice deepens**
Hips get wider	**Body becomes more muscular**
Ovaries start to release eggs	**Testes start to produce sperm**
Pubic and underarm hair grows	**Facial, pubic, underarm and body hair grows**
Sexual organs grow and develop	**Sexual organs grow and develop**

Hormonal coordination in humans Part 3 - Hormones in human reproduction

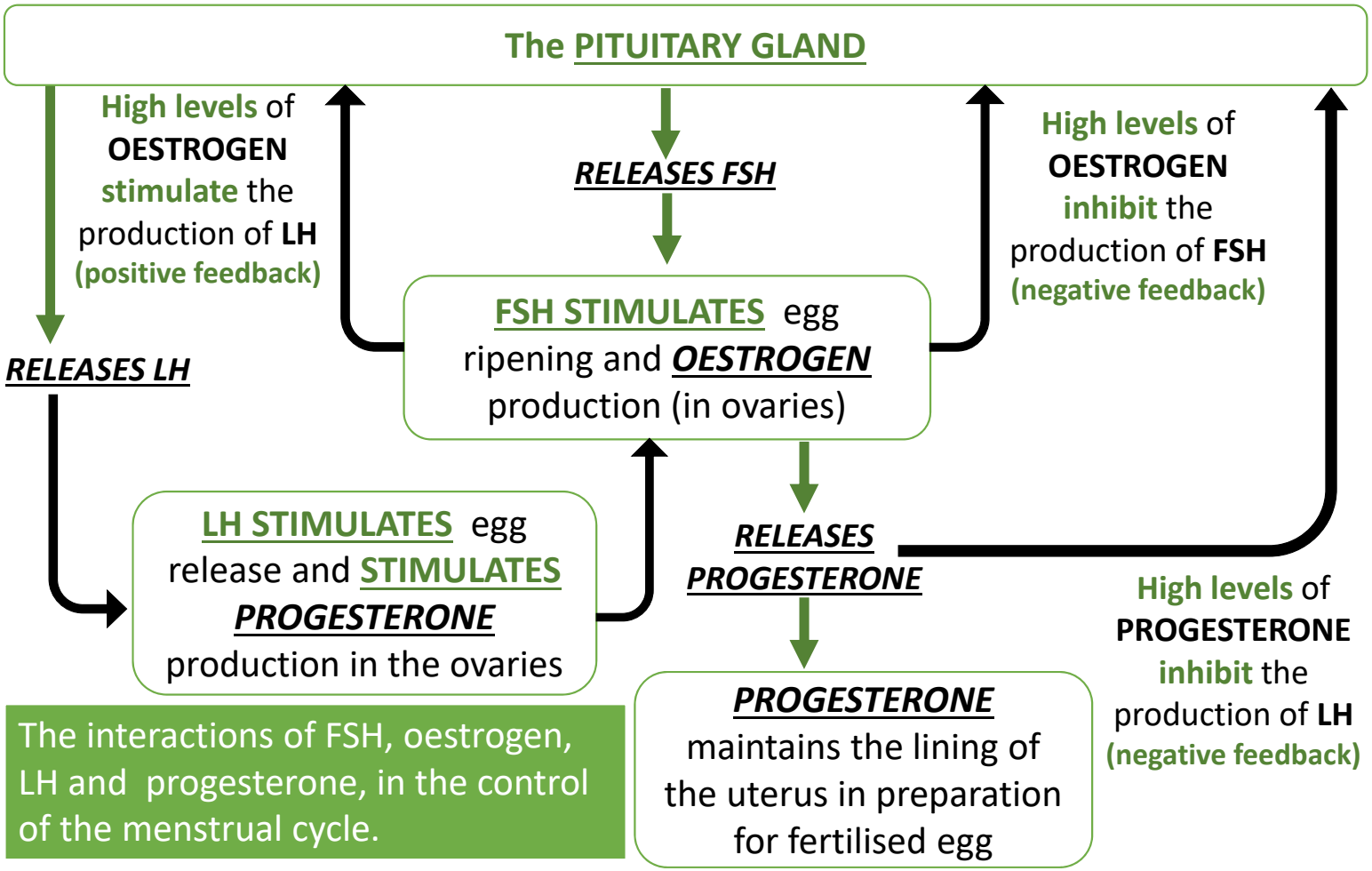
The menstrual cycle lasts 28 days: It is the reproductive cycle in women, it is brought about by ***hormones*****. Oestrogen** is the **main female reproductive hormone.** At puberty eggs begin to mature and one is released approximately every 28 days. This is called ovulation and it occurs half way through the cycle.

Hormone	Produced in...	Causes...
FSH Follicle stimulating Hormone	**Pituitary Gland**	**Stimulates egg ripening and oestrogen production (in ovaries)**
Oestrogen	**Ovaries**	**Lining of the womb to develop. Stimulates pituitary gland to make LH**
LH Luteinising hormone	**Pituitary Gland**	**Stimulates egg release and progesterone production in the ovaries**
Progesterone	**Ovaries**	**Maintains the lining of the womb**

Hormonal coordination in humans Part 3 - Hormones in human reproduction (HT only)



Hormonal coordination in humans Part 3 - Hormones in human reproduction (HT only)



Hormonal coordination in humans Part 3 - contraception

Controlling fertility – Contraception Fertility can be controlled by a variety of hormonal and non-hormonal methods of contraception.

These include:

- **The pill -** oral contraceptives that contain hormones **(oestrogen)** to **inhibit FSH** production so that **no eggs mature**

- **Injection, implant or skin patch** of slow release **progesterone** to inhibit the **maturation** and **release of eggs** for a number of **months** or **years**

- **Spermicidal agents** which kill or disable sperm

Hormonal coordination in humans Part 3 - contraception

Controlling fertility – Contraception Fertility can be controlled by a variety of hormonal and non-hormonal methods of contraception.

- **Barrier methods** such as **condoms** and **diaphragms** which prevent the sperm reaching an egg

- The 'coil', **intrauterine devices** which prevent the implantation of an embryo or release a hormone

- **Abstaining** from intercourse when an egg may be in the oviduct

- **Sterilisation** or **vasectomy** - surgical methods of male and female sterilisation.

Hormonal coordination in humans Part 3 - The use of hormones to treat infertility **(HT only)**

Some women find it difficult to get pregnant so they need to undergo fertility treatment.

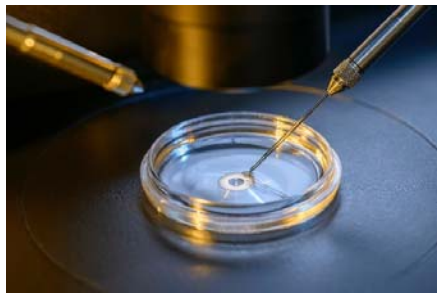
If a woman has naturally low levels of FSH and LH she can be given a **'fertility drug'** containing these hormones. **These can be in tablet form or injection form.**

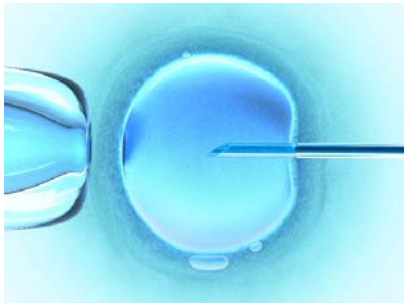
- **FSH stimulates the maturation of the eggs**
- **LH stimulates the release of the egg**

She may then become pregnant in the normal way.

Hormonal coordination in humans Part 3 - The use of hormones to treat infertility **(HT only)**

If she still cannot get pregnant after using the fertility drugs then IVF treatment may work.





In Vitro Fertilisation (IVF) treatment.

- IVF involves giving a mother **FSH and LH to stimulate the maturation of several eggs.**
- The **eggs are collected from the mother** and **fertilised by sperm from the father** in the laboratory.
- The **fertilised eggs develop into embryos.**
- At the stage when they are **tiny balls of cells**, one or two **embryos** are **inserted into the mother's uterus** (womb).

Hormonal coordination in humans Part 3 - The use of hormones to treat infertility **(HT only)**

Although fertility treatment gives a woman the chance to have a baby of her own:

- it is very **emotionally** and **physically** stressful; the success rates are **not** very high

- **increases** the **risk** of **complications** in pregnancy and childbirth, and may lead to **premature** or underweight babies

- it can lead to **multiple births** which are a risk to both the babies and the mother.

Hormonal coordination in humans Part 3 - Negative feedback (HT only)

Negative feedback is more common than **positive feedback.**

Negative feedback:

- occurs when there is a change in the body (i.e. blood glucose increases)
- the nervous system detects the change
- this stimulates an opposite hormonal response
- this reverses the effect back to homeostasis.

Positive Feedback: (less common)

- a change starts
- the nervous system detects the change
- then stimulates more hormones to be released to accelerate the change.

Ecology

Recall it …

Use the information in the following page(s) to answer these questions …

1. What is meant by a population, community and ecosystem?
2. What do animals compete for?
3. What do plants compete for?
4. What is interdependence? Give examples of interdependence?
5. What is a stable community?
6. What is an abiotic factor? Give examples?
7. What are biotic factors? Give examples?
8. What are behavioural, structural and functional adaptations? Give an example of each?
9. What is an extremophile? Give an example of an extremophile adapted to live in oceanic vents?
10. Describe what is a producer?
11. Describe what is biomass? How is biomass generated?
12. What do primary and secondary consumers feed off?
13. What are predators and prey?
14. How is carbon added to the atmosphere? How is carbon removed from the atmosphere? How is carbon locked into the soil?
15. How is water added to the atmosphere? How is water removed from the atmosphere? How does water run into the ground?

Adaptations, interdependence and competition part 1 - Communities

The different **levels of organisation** in an ecosystem are:

1 zebra

- **Organism** (an individual living thing)

zebra herd

- **Population** (the number of a particular species living in a habitat)

zebra buffalo

- **Community** (lots of different populations living in the area)

Everything

- **Ecosystem** (the **interaction** of a **community** of **living** organisms with the **non-living** parts of their **environment**)

Adaptations, interdependence and competition part 1 - Communities

To **survive** and **reproduce**, organisms require a **supply of materials** from their **surroundings** and from **other living organisms** there.

Plants in a community or habitat compete with each other for:

- Light
- Space
- Water and mineral ions from the soil

Animals in a community often compete with each other for:

- Food
- Mates
- Territory

Adaptations, interdependence and competition part 1 - Communities

Within a community each species **depends** on other species for their **survival**. This is called **interdependence.** If one species is removed it can affect the whole community.

Many flowering plants rely on insects like bees or butterflies for pollination.

Pandas rely on bamboo for food.

Animals or birds may carry plant seeds away from the parent plant to reduce competition.

Clown fish are protected from predators by the stinging tentacles of the anemone.

Adaptations, interdependence and competition part 1 - Communities

A **stable community** is one where **all** the **species** and **environmental factors** are in **balance** so that the **population** sizes remain fairly **constant**.

Competition is important in a community. It helps **maintain** the **balance**. When the weather is mild and **food is plentiful** in UK woodlands, rabbits **reproduce** and more **offspring survive** than is usual. This affects the amount of grass and vegetation being eaten by the increasing rabbit population leaving **less** for **other species**.

The fox population increases as there are plenty of rabbits for food and so more fox offspring survive. A greater number of foxes eat more rabbits and **reduce** their **population** back to normal. The fox population then slowly decreases as some foxes **starve** to death as they **compete** for food. The **balance returns** in the community.

Adaptations, interdependence and competition part 1 – Abiotic factors

'Bio' means **life** in Greek.

- Biology is the study of living organisms
- A biography is an account of someone's life

The prefix **'a'** in front of a science word often means 'not' or 'non'.

An **abiotic factor** is a **non-living factor**. Abiotic factors which may affect a community are:

- Light Intensity
- Temperature
- Moisture levels
- Soil pH and mineral content
- Wind intensity and direction
- Carbon dioxide levels for plants
- Oxygen levels for aquatic animals (living in water)

Adaptations, interdependence and competition part 1 – Biotic factors

Biotic factors means **living** factors.

Biotic factors which can affect a community are:

New predators which organisms might not be able to defend against.

Low **food availability** means organisms find it harder to survive and breed.

New pathogens being introduced and organisms having no resistance.

One species outcompeting another so the numbers are no longer sufficient to breed. In most of the UK, grey squirrels have outcompeted red squirrels.

Adaptations, interdependence and competition part 1
-Adaptations

Organisms have **features** (adaptations) which enable them to **survive** the conditions in which they normally live.

Adaptations can be:

- **behavioural** (actions an organisms takes)
- **structural** (how an organism is built)
- **functional** (how the organism works).

Migration or hibernation are examples of behavioural adaptation. They **increase** the **chances** of **survival** when food availability decreases in a habitat. Video Bowerbird behaviour

A duck with webbed feet, or trees having thick bark to resist fire, or cacti having needle like leaves to reduce water loss, are examples of **structural adaptations**.

Functional adaptations are not always easy to see. An example is a desert lizard producing very concentrated urine to conserve water.

Adaptations, interdependence and competition part 1
-Adaptations

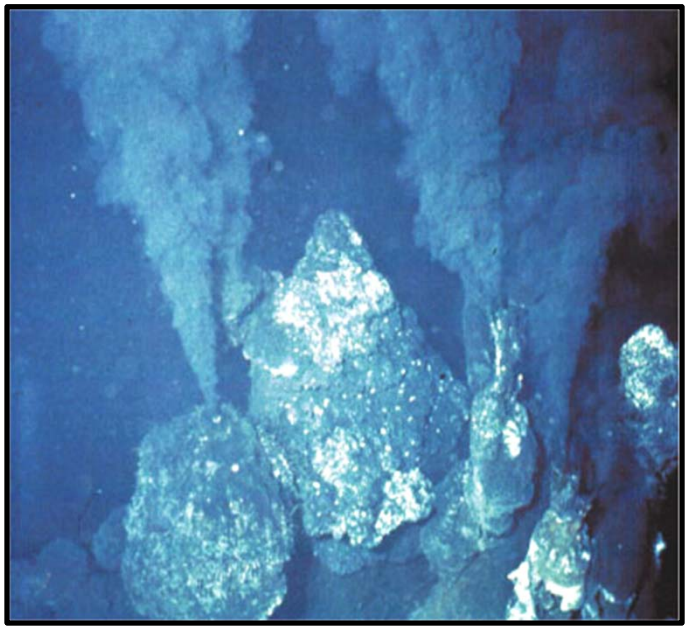
Some organisms live in environments which are very extreme, such as at **high temperature**, **pressure** or **salt** concentration.
These organisms are called **extremophiles.**

-phile means 'a strong liking for'.
Acidophile - describes an organism that lives in acidic conditions.
Hydrophilic means water loving.

The vivid colours in this hot spring in Yellowstone National Park are the results of micro organisms living in this **extreme** environment.

Adaptations, interdependence and competition part 1
-Adaptations

A particular species of **bacteria** has been found living 2500m below the surface of the sea in **hydrothermal ocean vents**.
Temperatures are over 100°C , it is very acidic and pressures are very high. These conditions are very extreme.
These bacteria are **extremophiles**.
In order to survive, the **enzymes** found in these bacteria are specially **adapted** so they do not denature at high temperature.



Organisation of an ecosystem part 2 – Levels of organisation

Food chains are used to represent the **feeding relationships** within a **community**. **All** food chains **begin** with a **producer** which **synthesises** molecules. Molecules are made when atoms are joined by chemical bonds. This is usually a **green plant** or **alga** which makes **glucose** molecules by **photosynthesis**.

Photosynthetic organisms are the producers of **biomass** for life on Earth.

Biomass is the mass of **living material** in an organism.

Producers are eaten by **primary consumers** which in turn may be eaten by **secondary consumers** which may be eaten by **tertiary consumers**.

Organisation of an ecosystem part 2 – Levels of organisation

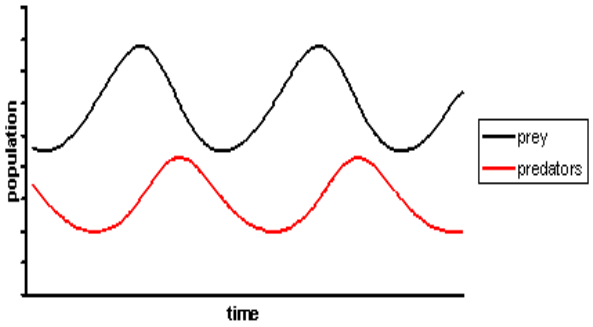
producer (grass)

primary consumer (rabbit)

secondary consumer (fox)

Consumers that **kill** **and** **eat** other animals are known as **predators** and those that are **eaten** are **prey.**

In a **stable community** the **numbers** of predators and prey **rise** and **fall** in **cycles**. The increases and decreases in predator population usually lag slightly behind that of the prey cycle.



Organisation of an ecosystem part 2 – Levels of organisation

It is important for **ecologists** to be able to determine the **distribution** and **abundance** (how many) of a **species** in an **ecosystem**. If one species is in decline, it can affect the whole ecosystem.

Sampling techniques are used to estimate the size of a population. **Quadrats** are often used to do this and they can be used in a random way or by placing them along a line through an area called a **transect**.

Quadrats are frames usually with an area of $0.25m^2$. They are placed on the ground and the organisms (usually plants) inside the frame are counted.

Quadrats are used to calculate population density, population frequency or percentage cover in an area. video

You need to be able to understand and calculate the mean, mode and median.

Link to required practical

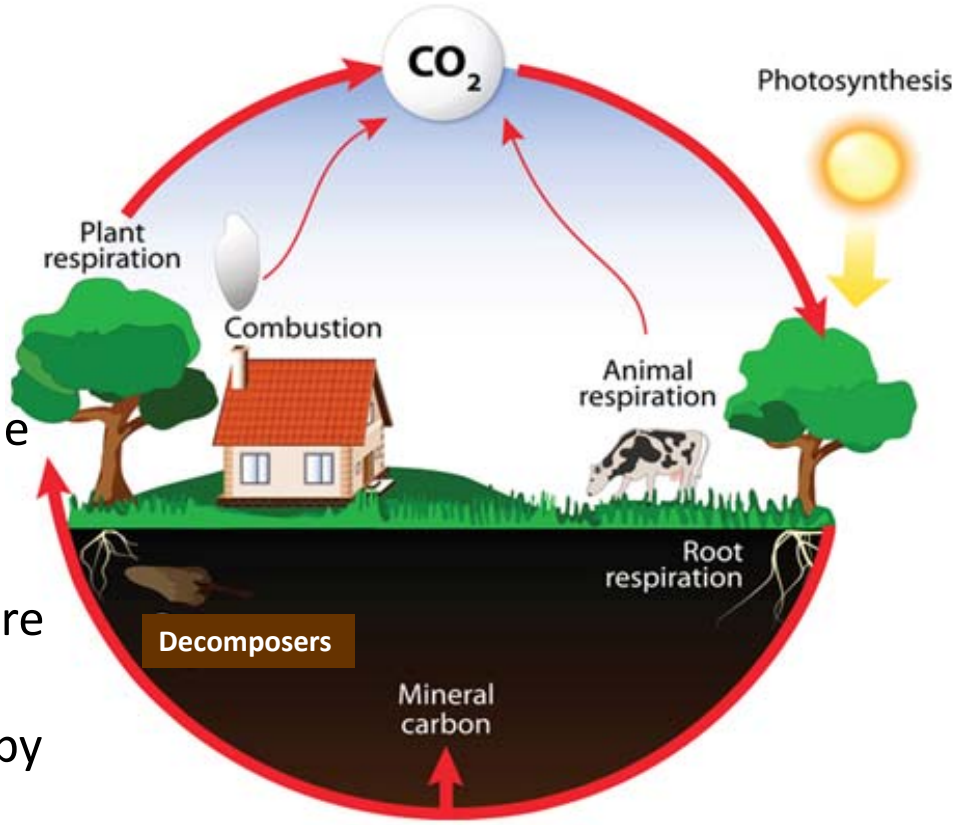
Organisation of an ecosystem part 2 – How materials are cycled.

All materials in the living world are **recycled** to provide the building blocks for **future** organisms.

The carbon cycle

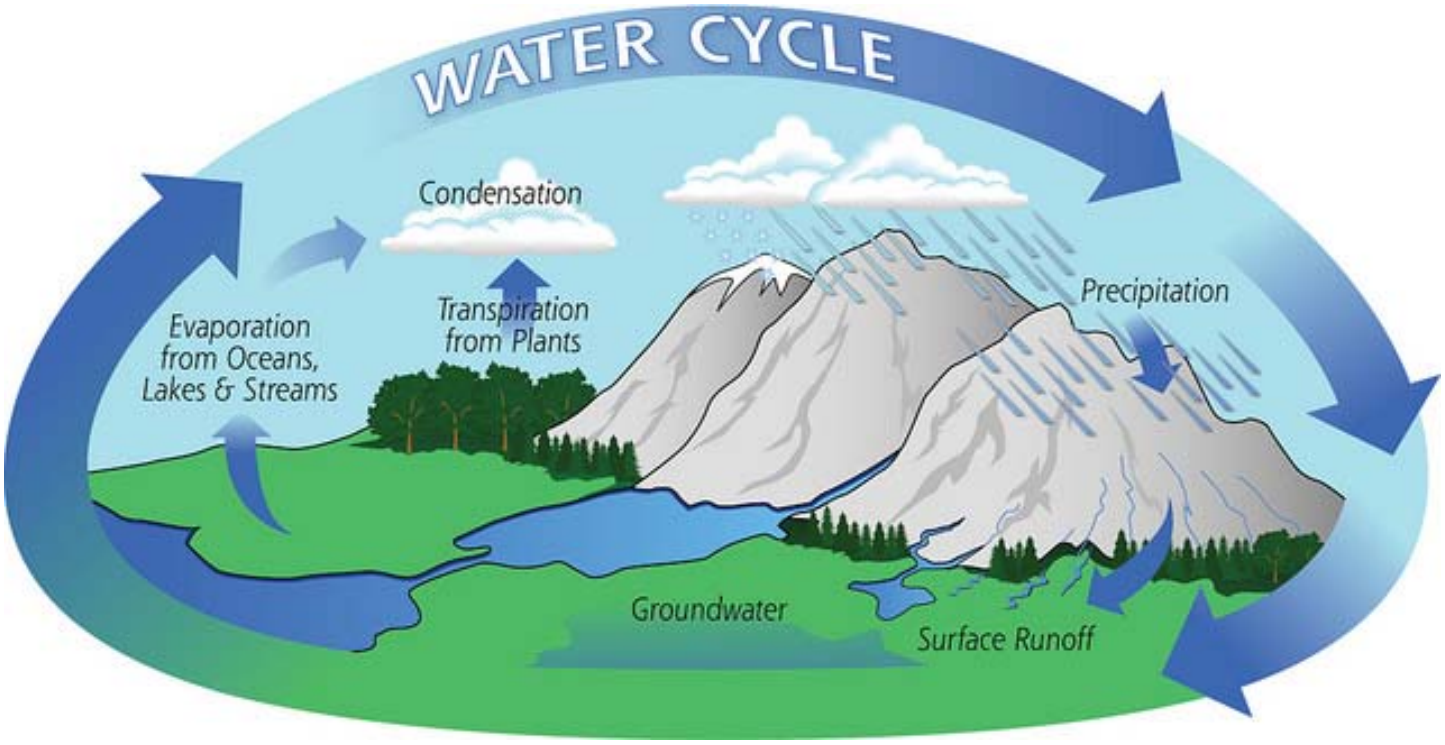
returns carbon from organisms to the **atmosphere** as **carbon dioxide.**

Plants use carbon dioxide in **photosynthesis**. **Microorganisms** return carbon to the atmosphere as carbon dioxide and **mineral ions** to the soil by **decomposition**.



Organisation of an ecosystem part 2 – How materials are cycled

The **water cycle** provides **fresh** water for plants and animals on **land** before **draining** into the **seas**.
Water is continuously **evaporated** and **precipitated**.



Recall it ... Biodiversity and Human Interaction

Use the information in the following page(s) to answer these questions …

1. What is meant by a biodiversity? What is the advantage of high biodiversity?
2. Name 4 human activities that are reducing biodiversity?
3. Describe the effects of increasing human population?
4. How do humans pollute water? Describe what is eutrophication?
5. How do humans pollute the air? Describe the effect of air pollution?
6. How do humans pollute the land? Describe the affect of land pollution?
7. What are peat bogs? How are peat bogs a unique environment? Why are they being destroyed? How does this lead to more carbon dioxide in the air?
8. What are the reasons for deforestation? Explain the effect of deforestation on biodiversity?
9. Which gases are contributing to global warming? What are the consequences of global warming?
10. Describe five ways in which humans are reducing the impact of negative affects of humans on biodiversity?

Biodiversity and the effect of human interaction on ecosystems part 3 –biodiversity

Biodiversity is the variety of all the different species of organisms on Earth, or within an ecosystem.

A high **biodiversity** ensures the **stability** of **ecosystems** by **reducing** the **dependence** of one species on another for **food**, **shelter** and the maintenance of the **physical environment.**

The physical environment includes abiotic factors such as the availability of water, soil quality and climate.

Coral reefs have a high diversity. The animals shown have a wide variety of food available, lots of space and plenty of places to shelter from predators and when there is poor weather.

Biodiversity and the effect of human interaction on ecosystems part 3 –biodiversity

The **future** of the **human** species **rely** on us maintaining a good level of **diversity**. Many **human activities** have **reduced** the **biodiversity** in particular places. It is only very **recently** that measures have been taken to try and **stop** this reduction.

The following activities are having a **negative effect** on **biodiversity:**

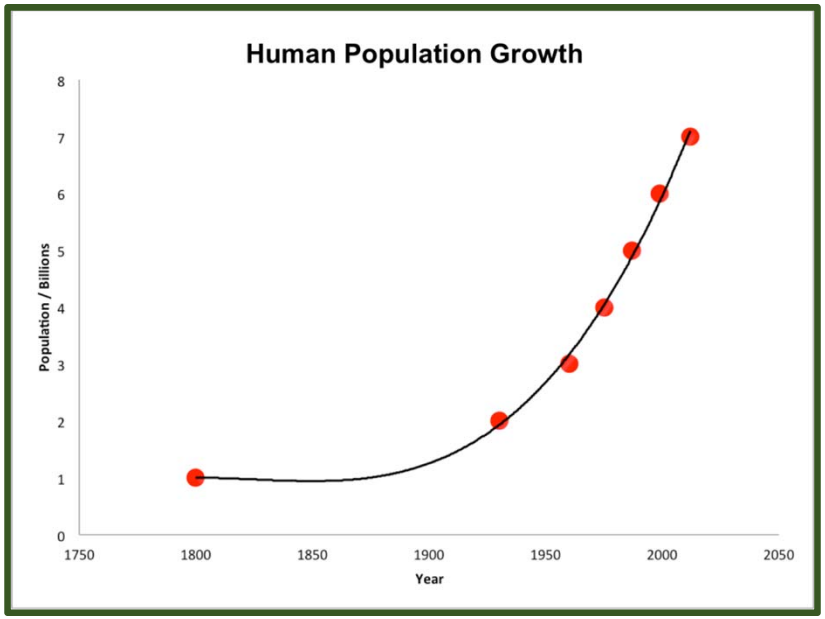
- How we **manage waste**
- How we **use land**
- **Deforestation**
- **Global warming**

Pollution kills plants and animals which can reduce diversity.

A turtle caught in a ghost net.

Biodiversity and the effect of human interaction on ecosystems part 3 –biodiversity

The **human population** has been **growing** rapidly along with the **standards of living**.



More resources are used to produce materials for humans and so **more waste** is also produced.

The amount of **pollution** caused also increases unless the waste and chemical materials are properly handled.

Land pollution from **human waste** and **toxic chemicals** is a concern.

Biodiversity and the effect of human interaction on ecosystems part 3 – Waste management

Water pollution can occur as a result of human activities.

Sewage or **toxic chemicals** may enter lakes, rivers or the sea.

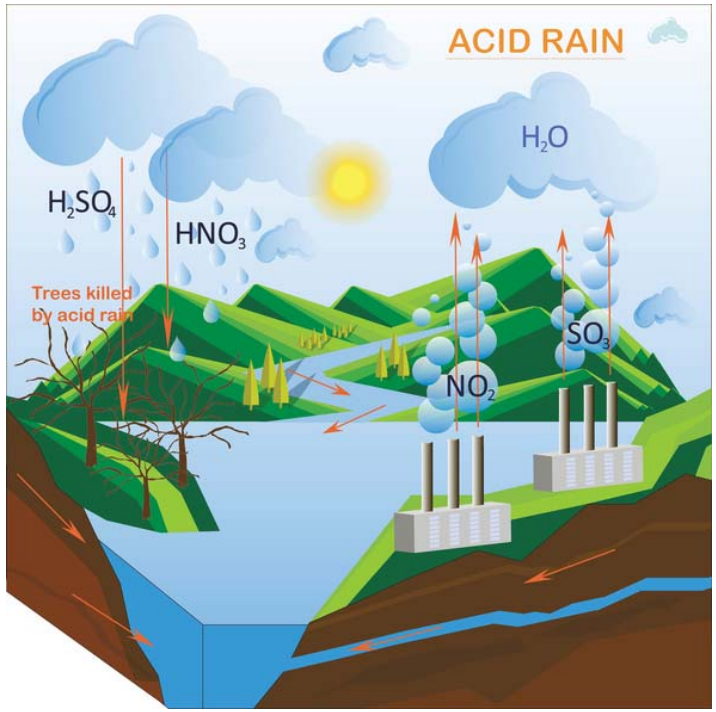
The use of **artificial fertiliser** to improve plant growth in farming may enter waterways via **run off** from the fields.

This can lead to **eutrophication**.
Algae in the water **grow rapidly** due to the fertiliser. The algae **reduce** the amount of **light** available for plants and so they die.
The decay process uses up **oxygen** and so other living organisms such as **fish die** as well.

Biodiversity and the effect of human interaction on ecosystems part 3 – Waste management

Air pollution can occur as a result of human activities. Without careful management, air pollution can cause serious harm to humans and other living organisms.

Burning **fossil fuel** produces **smoke** and **acidic gases**. As the population has grown and standards of living increased more fossil fuels are being used in industry, transport and in homes. Fossil fuels contain **impurities** such as **sulfur,** which reacts with oxygen to form **sulfur dioxide**. High concentrations can cause **breathing difficulties**.



Biodiversity and the effect of human interaction on ecosystems part 3 –Land Use

Quarrying

Humans **reduce** the amount of **land available** for other animals and plants by actions such as:

Building

Crop growing

Farming

Waste dumping

Biodiversity and the effect of human interaction on ecosystems part 3 –Land Use

Peat is made in **waterlogged** bogs over thousands of years. The moss and plants that grow there 'lock in carbon dioxide' and as they die, the **anaerobic** conditions **prevent decay**.

Peat bogs are being **destroyed** in order to sell peat as garden **compost**. This special **habitat** is being **reduced in size** and the **variety** of different plants, animals and microorganisms which live there is also **declining**.

Biodiversity is being **reduced** by the economic demand for cheap compost to **grow food** or as a fuel. **Decay** of peat as it mixes with soil or the **burning** of peat releases **carbon dioxide** into the atmosphere.

Biodiversity and the effect of human interaction on ecosystems part 3 –Deforestation

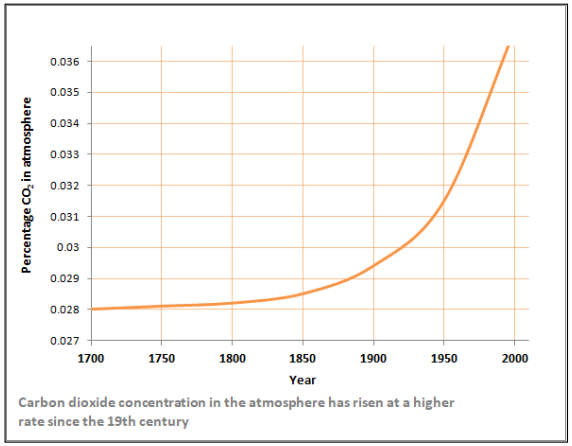
In some wooded areas, the land is more in demand than timber. The forest is cut down and the wood burned to get rid of it. No new trees are planted. The **removal** of the **forest habitat** is called **deforestation**. Deforestation reduces **biodiversity** in the area and it can **impact** on a **species** directly if the species is unable to move to a new area.

Large scale deforestation has happened in **tropical** areas to :

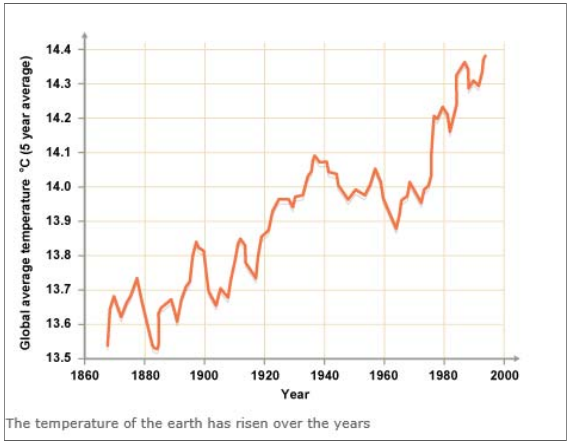
- Provide **land** for farming **cattle** which can provide food
- Provide **land** for **rice fields** to provide food
- Provide **land** to grow **crops** for producing **biofuel** (fuel produced by living organisms) such as **bio ethanol**, **wood** and **biogas**.

Biodiversity and the effect of human interaction on ecosystems part 3 –Global warming

The levels of **carbon dioxide** and **methane** in the **atmosphere** are **increasing**. These two gases **contribute** to **global warming**.



Carbon dioxide concentration in the atmosphere has risen at a higher rate since the 19th century



The temperature of the earth has risen over the years

Global warming has **biological consequences** such as:

- **Changes in weather** which include flooding and drought
- **Melting of ice caps** and increase in sea levels
- **Habitat loss** which can lead to species becoming **extinct** or critically **endangered**.

Biodiversity and the effect of human interaction on ecosystems part 3 –Global warming

Scientists and concerned citizens have put in place programmes to **reduce** the **negative effects** of **humans** on biodiversity and ecosystems. These include:

Reintroduction of field margins (the land between the crop and the field boundary) and **hedgerows** in agricultural areas where farmers grow one type of crop. This encourages diversity of wildlife as there is a variety of food.

Protection and regeneration of rare habitats. These are often designated as SSSI and managed by conservation organisations.

SSSI = site of special scientific interest.

Breeding programmes for endangered species to guard against extinction and be able to increase numbers in the wild.

endangered list

Recycling resources instead of dumping waste in landfill.

Reduction of deforestation and carbon dioxide emissions by some governments across the world. Almost 200 governments have signed the Kyoto protocol.