



THE BEGINNING OF THE EARTH

- life began on earth about 3500 million years ago
- new species evolved from very simple living things
- evidence for evolution is provided by
 - fossils
 - comparing DNA
- first species developed from molecules which self-copied

EVOLUTION

- happens due to **natural selection**
- if species **survive** they **reproduce**
- to survive they must **adapt** to...
- habitat, prey and predators, competition for food & space
- **variation** in a species can occur; it can be
 - genetic**
 - environmental**
- only genetic variation can be passed on
- changes can occur in genes - **MUTATIONS**
- mutated genes in sex cells can be passed on to offspring
- mutated genes occasionally produce new characteristics
- a **combination** of mutation, environmental changes **and** natural selection can produce new species
- evolution could have been different if the conditions on earth had changed anytime in the past

CONFLICTING THEORIES

- When provided with information about alternative views on the origin of life on earth or evolution of life you should...
- identify statements that are data
 - identify statements that provide an explanation
 - recognise data which conflict with an explanation
 - identify imagination and creativity
 - suggest why some scientists may disagree with new data
 - suggest why scientist might disagree with each other

COMMUNICATION SYSTEMS

These are involved in maintaining a constant internal environment or **HOMEOSTASIS**

NERVOUS SYSTEM

- co-ordinated in humans by **central nervous system**
- central nervous system includes **spinal cord** and **brain**
- uses electrical impulses
- produces **FAST** responses
- produces **SHORT-LIVED** responses
- nerve cells (**neurons**) link receptor to effector cells
- **receptor cells** are found in...
 - eyes
 - skin
 - ears
 - muscles
 - glands
- **effector cells** are found in...
- **receptor cells detect stimuli**
- **effector cells respond** to stimuli
- **examples** ...
 - touching a hot plate
 - putting your hand on a drawing pin
 - looking at a bright light

HORMONAL COMMUNICATION

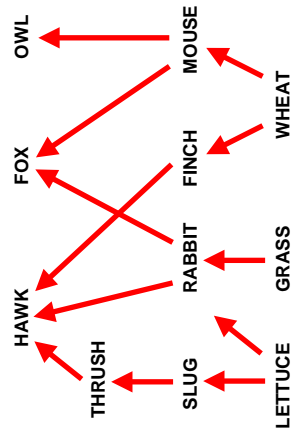
- involves chemicals (**hormones**) which travel in the blood
- produces **SLOW** and **LONG-LASTING** responses
- **THYROID GLAND** makes a hormone that controls chemical reactions in the body
- **PANCREAS** makes **insulin** for controlling blood-sugar levels
- **ADRENAL GLANDS** make **adrenaline** which speeds up heartbeat and breathing rate
- **TESTES (Male)** make **testosterone** which causes body changes at puberty
- **OVARIES (Female)** make **oestrogen** and **progesterone** which cause body changes at puberty and control the menstrual cycle

SURVIVE OR DIE!

Living organisms are dependant on the environment and other species for survival

- competition between species exists in the same habitat
- changes affecting one species can affect another
- rapid changes in the environment can cause extinction if...
 - a **new competitor** or a **new predator** arrives
 - another species in the food web **becomes extinct**
 - a **new disease** appears
- **human activity** can cause a species to become extinct...
 - DIRECTLY** - being hunted to extinction (*passenger pigeon, great auk*)
 - INDIRECTLY** - having their habitat destroyed (*trees cut down or houses built*)
 - bringing new species into a habitat (*grey squirrels, mink*)

A FOOD WEB



Removing one species from the web can affect others
If there is a shortage of rabbits, hawks will hunt thrushes
foxes will have to eat mice
grass will grow better