

Variety and Characteristic Features

Micro-organisms

29 slides, 7 Flash activities

This presentation is designed to teach:

- what micro-organisms are
- the structures of bacteria, viruses and fungi
- how humans use micro-organisms in biotechnology, e.g. yeast or penicillin, and how they might be used in the future
- that some micro-organisms cause disease.

Virus fact file

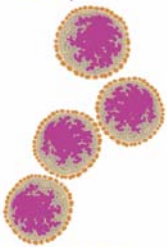
Micro-organism: Virus (e.g. flu virus and HIV)

Size: 1/1,000,000 mm

Shape: Viruses have regular and geometric shapes.

Structure: A virus is a simple organism that does not display all the characteristics of a living thing. It is made up of a protein coating and some genetic material.

Reproduction: Viruses can only grow and reproduce within other living things.



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Variation, Inheritance and Classification

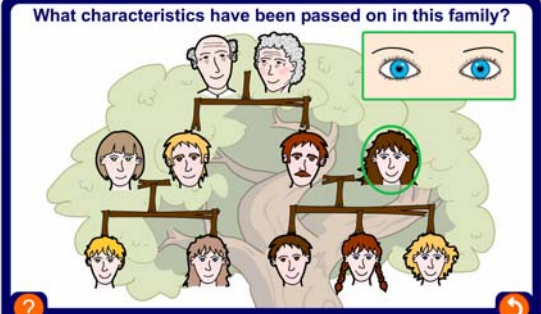
38 slides, 13 Flash activities

This presentation is designed to teach:

- the existence of differences between organisms and variation within species
- that variation is due to both inherited characteristics and environmental factors
- what DNA and genes are and where they are found
- how to classify different organisms.

Family resemblance

What characteristics have been passed on in this family?



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The Processes of Life

Animal and Plant Cells

36 slides, 16 Flash activities

This presentation is designed to teach:

- that cells are the building blocks of life
- what the typical features of plant and animal cells are and how they look in 3D
- how cells can be specialised for different functions
- that cells group to form multicellular organisms that have organs and systems
- that cell division provides new cells for growth, repair and reproduction.

Which body system?

Which organs are involved in each human body system?

| | |
|---------------------|---------------------------|
| breathing system | windpipe (trachea), lungs |
| digestive system | eyes, ears, nose |
| excretory system | heart, blood vessels |
| reproductive system | stomach, intestines |
| blood system | brain, nerves |
| sensory system | ovaries, testes |
| nervous system | kidneys, liver |

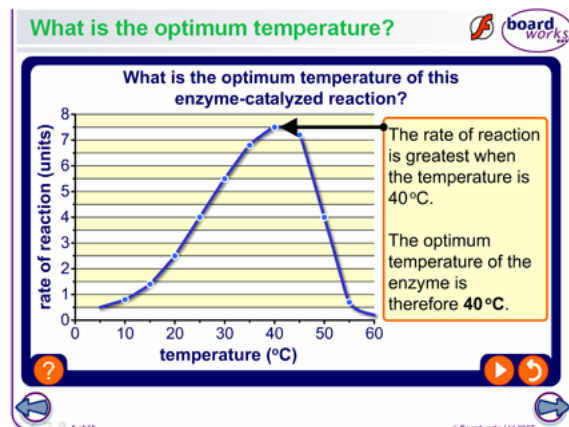
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Enzymes and Digestion

35 slides, 12 Flash activities

This presentation is designed to teach:

- that enzymes are biological catalysts
- that enzymes have optimum working ranges of temperature and pH and can become denatured outside this range
- how the digestive system is structured and how digestion breaks down the food we need
- which enzymes are involved in digestion and how they break down proteins, carbohydrates and fats.



Respiration and Breathing

20 slides, 7 Flash activities

This presentation is designed to teach:

- how the energy from digested food is released by respiration
- what breathing is, the structure of the lungs and where gas exchange occurs
- why there are differences between inhaled and exhaled air
- that anaerobic and aerobic respiration differ and occur in different circumstances.

Anaerobic respiration equations

What are the equations for anaerobic respiration?

? → ? + ?

? + ? → ? + ?

lactic acid energy oxygen

carbon dioxide water glucose lactic acid

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Plants and Photosynthesis

24 slides, 6 Flash activities

This presentation is designed to teach:

- how plants grow and make their own food through photosynthesis
- that chlorophyll, sunlight, carbon dioxide and water are all essential for photosynthesis to occur
- that glucose produced in photosynthesis is converted to starch for storage
- how leaves are adapted for photosynthesis
- how plant roots are adapted to anchor the plant and absorb water.

What is needed for photosynthesis?

What four things do plants need to make food by photosynthesis?

water ✓ oxygen carbon dioxide ✓ sunlight ✓

fertilizer

nitrogen Well done! chlorophyll ✓

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Human Reproduction

31 slides, 13 Flash activities

This presentation is designed to teach:

- the structure of the male and female reproductive systems and their roles
- the adaptations of sex cells
- the definitions of ovulation, fertilization and implantation
- the stages of fetal development during pregnancy
- what puberty is and the changes that occur in male and female bodies
- what the menstrual cycle is.

How does the placenta work?

Stage 2
Oxygen and food move from the mother's blood to the fetus's blood.
Carbon dioxide and waste products move from the fetus's blood to the mother's blood.

oxygenated blood
deoxygenated blood

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Interaction of Living Things With Their Environment

Feeding Relationships

30 slides, 8 Flash activities

This presentation is designed to teach:

- what producers and consumers are, and the meanings of herbivore, carnivore and omnivore
- how food chains link the feeding of all organisms to an initial producer
- how predator-prey relationships can cause fluctuations in food chain populations
- how food chains link to build food webs
- that at each level of a food chain, energy is lost with very little transferred to the predator.

Food chain populations

Food webs in action

plankton → shrimp → tuna → dolphin

Due to a lack of food, the numbers of **plankton** have dropped dramatically.

How will this affect the rest of the food chain?

less more

less more

less more

next

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Evolution

30 slides, 9 Flash activities

This presentation is designed to teach:

- how fossils are formed and what the fossil record shows
- a comparison of Lamarckian and Darwinian theory
- how natural selection and natural variation relate to evolution
- how we can see evolution in action using the examples of peppered moths and MRSA.

Who was Charles Darwin?

The life of Charles Darwin

HMS Beagle (1831-1836)

Darwin visited the Galapagos Islands during his time as official naturalist aboard the HMS Beagle. He made detailed notes about the animals he found and collected many animal skins, plants, insects, fossils and shells to study.

1825-31 1831-36 1846-54 1859-64 1864-82

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Competition

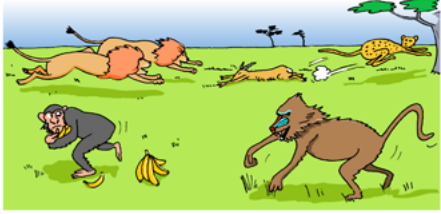
27 slides, 7 Flash activities

This presentation is designed to teach:

- what inter- and intraspecific competition are
- what the terms habitat, community, population and niche mean
- that species with overlapping niches will compete
- that competition keeps population size stable
- that individuals and species that are less competitive are more likely to die out, and in this way competition is the driving force behind natural selection and evolution.

What is competition?

All living things need natural resources, but the problem is that there is not enough for everyone. This means that individuals have to fight for them in order to survive.



This struggle for resources is called **competition**.

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Adaptation

46 slides, 11 Flash activities

This presentation is designed to teach:

- that there are many types of ecosystem but all are made up of a habitat and a community
- that adaptations aid an organism's survival
- that most organisms have general adaptations to life on land or in water, but that organisms also have specific adaptations that make them specifically suited to their habitats and feeding habits
- how specific organisms are adapted to their specific environments.

Which adaptation?

What adaptations do these organisms have?

| | |
|-------------------------------|----------------------------------|
| polar bear | fish |
| | gills increase oxygen uptake ✓ |
| camel | cactus |
| large surface area:volume ✓ | spines prevent predators ✓ |
| a white coat for camouflage ✗ | waxy surface limits water loss ✓ |
| sweats very little | |

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