

Homeostasis and response

Where is adrenaline produced?

Negative feedback (HT only)

Homeostasis and response

When is adrenaline produced?

Negative feedback (HT only)

Homeostasis and response

What is the effect of adrenaline on the body?

Negative feedback (HT only)

Inheritance, variation and evolution

What does meiosis lead to the formation of?

Reproduction

Inheritance, variation and evolution

What does mitosis lead to the formation of?

Reproduction

Inheritance, variation and evolution

What is sexual reproduction?

Reproduction

Inheritance, variation and evolution

Name the two gametes involved in sexual reproduction in flowering plants.

Reproduction

Inheritance, variation and evolution

Name the two gametes involved in the sexual reproduction in animals.

Reproduction

Inheritance, variation and evolution

Describe how variation occurs in sexual reproduction.

Reproduction

Inheritance, variation and evolution

Describe why clones are formed in asexual reproduction.

Reproduction

It is produced at times of fear or stress
(fight or flight response)

Adrenal glands

Non identical cells.

Adrenaline increases the heart rate and
increases the oxygen and glucose delivered
to the muscles.

The fusing of male and female gametes.

Identical cells.

Egg (female) and sperm (male).

Egg (female) and pollen (male).

There is only one parent cell and there is no
fusion of gametes. As a result there is no
mixing of genetic information.

During the formation of gametes by meiosis
and the mixing of genetic material during
sexual reproduction.

Inheritance, variation and evolution

Describe what happens to the number of chromosomes during meiosis and fertilisation?

Meiosis

Inheritance, variation and evolution

How are gametes formed?

Meiosis

Inheritance, variation and evolution

Describe the process of gamete formation?

Meiosis

Inheritance, variation and evolution

Describe how an embryo develops from gametes?

Meiosis

Inheritance, variation and evolution

Where is the genetic material found in the cell?

DNA and the genome

Inheritance, variation and evolution

What is the genetic material made of?

DNA and the genome

Inheritance, variation and evolution

Describe the structure of DNA.

DNA and the genome

Inheritance, variation and evolution

What structures in the nucleus are made from DNA?

DNA and the genome

Inheritance, variation and evolution

What is a gene?

DNA and the genome

Inheritance, variation and evolution

What does a gene code for?

DNA and the genome

By meiosis.

Meiosis halves the number of chromosomes during the formation of the gametes. During fertilisation the full number of chromosomes is restored in the fertilised egg.

Gametes fuse during fertilisation and restore the normal number of chromosomes. The new cell divides by mitosis. This increases the number of cells. Once the cells

Genetic information is copied. The cell divides twice to form single cells with half the number of chromosomes. All the gametes are genetically different.

DNA.

Nucleus.

Chromosomes.

A polymer made of two strands forming a double helix.

A sequence of amino acids which make a specific protein.

A small section of DNA on a chromosome.

Inheritance, variation and evolution

What is the genome of an organism?

DNA and the genome

Inheritance, variation and evolution

List three ways which demonstrate the importance of understanding the human genome.

DNA and the genome

Inheritance, variation and evolution

Define gamete.

Genetic inheritance

Inheritance, variation and evolution

Define chromosome.

Genetic inheritance

Inheritance, variation and evolution

Define gene.

Genetic inheritance

Inheritance, variation and evolution

Define allele.

Genetic inheritance

Inheritance, variation and evolution

Define dominant.

Genetic inheritance

Inheritance, variation and evolution

Define recessive.

Genetic inheritance

Inheritance, variation and evolution

Define homozygous.

Genetic inheritance

Inheritance, variation and evolution

Define heterozygous.

Genetic inheritance

Search for genes linked to disease, understanding and treating inherited diseases and tracing human migration patterns from the past.

The entire genetic material of an organism.

A long strand of DNA folded into structure.

A sex cell.

A different form of the same gene (e.g. blue and brown alleles for eye colour).

A section of DNA that codes for a specific protein.

A recessive allele is only expressed if two copies are present.

A dominant allele is always expressed in the phenotype even if only one copy is present.

Different copies of an allele.

Two copies of the same allele.

Inheritance, variation and evolution

Define genotype.

Genetic inheritance

Inheritance, variation and evolution

Define phenotype.

Genetic inheritance

Inheritance, variation and evolution

Give two examples of characteristics governed by a single gene?

Genetic inheritance

Inheritance, variation and evolution

At what level do alleles operate?

Genetic inheritance

Inheritance, variation and evolution

Name an inherited disorder caused by a dominant allele.

Inherited disorders

Inheritance, variation and evolution

Name an inherited disorder caused by a recessive allele.

Inherited disorders

Inheritance, variation and evolution

Name two methods that could alleviate suffering caused by genetic disorders.

Inherited disorders

Inheritance, variation and evolution

Discuss a social and an ethical issue around the issue of embryo screening.

Inherited disorders

Inheritance, variation and evolution

How many chromosomes do ordinary human body cells contain?

Sex determination

Inheritance, variation and evolution

What are the two sex chromosomes?

Sex determination

The physical expression of the genotype.
E.g. Tall or short.

The alleles present in an organism. e.g. TT
or Tt.

Molecular level.

Fur colour in mice and red-green colour
blindness in humans.

Cystic fibrosis.

Polydactyl.

Embryonic screening can be used to terminate an unwanted foetus due to gender.
E.g. some societies value male children more than female children for economic

Embryonic screening and gene therapy.

X and Y.

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Inheritance, variation and evolution

What combination of sex chromosomes produce a female?

Sex determination

Inheritance, variation and evolution

What combination of sex chromosomes produce a male?

Sex determination

Inheritance, variation and evolution

What is variation?

Variation

Inheritance, variation and evolution

Name three causes of differences in characteristics of individuals in a population.

Variation

Inheritance, variation and evolution

Describe the variation usually found in a population of a species.

Variation

Inheritance, variation and evolution

What causes variants in a genome?

Variation

Inheritance, variation and evolution

How do mutations affect the phenotype?

Variation

Inheritance, variation and evolution

How often do mutations occur?

Variation

Inheritance, variation and evolution

What will happen if a new phenotype is suited to an environmental change?

Variation

Inheritance, variation and evolution

What is evolution?

Evolution

XY

XX

Genes, the environment in which the individual developed or a combination of both.

The difference of characteristics of individuals in a population.

Mutation.

There is usually extensive variation within a population of a species.

Continuously.

Most have no effect, some influence the phenotype and a small proportion determine the phenotype.

A change in the inherited characteristics of a population over time.

It will lead to a rapid change in the species.

Inheritance, variation and evolution

By what process is evolution thought to occur?

Evolution

Inheritance, variation and evolution

What does the theory of evolution by natural selection state?

Evolution

Inheritance, variation and evolution

How does natural selection occur?

Evolution

Inheritance, variation and evolution

What is a species?

Evolution

Inheritance, variation and evolution

Describe how two populations of one species could form two new species.

Evolution

Inheritance, variation and evolution

What is another term for selective breeding?

Selective breeding

Inheritance, variation and evolution

Why do humans carry out selective breeding?

Selective breeding

Inheritance, variation and evolution

For how long have humans carried out selective breeding?

Selective breeding

Inheritance, variation and evolution

Describe the process of selective breeding.

Selective breeding

Inheritance, variation and evolution

List four examples of selective breeding.

Selective breeding

All species of living organisms have evolved from simple life forms that first developed 3 billion years ago.

Natural selection.

A group of individuals which can interbreed and produce fertile offspring.

By the selection of variants with phenotypes that are best suited to their environment.

Artificial selection.

The phenotypes of a species may become so different that the population can no longer interbreed.

Thousands of years.

To select useful genetic characteristics.

Disease resistance in food crops, animals which produce more milk or meat, domestic dogs with a gentle nature and large or unusual flowers.

Parents with the desired characteristics are bred together. The offspring which show the desired characteristics are then bred together. This happens over many

Inheritance, variation and evolution

What problems can arise from selective breeding?

Selective breeding

Inheritance, variation and evolution

What is genetic engineering?

Genetic engineering

Inheritance, variation and evolution

Give two examples of how plant crops have been genetically engineered.

Genetic engineering

Inheritance, variation and evolution

Give an example of how bacteria have been genetically engineered.

Genetic engineering

Inheritance, variation and evolution

How are useful genes used in genetic engineering?

Genetic engineering

Inheritance, variation and evolution

What is a genetically modified (GM) crop?

Genetic engineering

Inheritance, variation and evolution

Give three examples of GM crops.

Genetic engineering

Inheritance, variation and evolution

Describe the concerns about the use of GM crops.

Genetic engineering

Inheritance, variation and evolution

How could genetic modification be useful in humans?

Genetic engineering

Inheritance, variation and evolution

Describe the main steps in the process of genetic engineering (HT).

Genetic engineering

The process of modifying the genome of an organism by introducing a gene from another organism to transfer a desired characteristic.

Problems can arise from inbreeding and lead to some breeds which are prone to disease or inherited defects.

Bacteria are used to produce human insulin to treat diabetes.

Disease resistant and to produce larger fruit.

Crop plants (e.g. wheat or rice) which have had genes from other organisms transferred into them.

Genes are cut out of chromosomes and transferred to the cells of other organisms.

Their effect on wild populations of animals, plants and insects. The effect of eating GM crops on human health.

Resistant to insects, resistant to herbicides and increased yields.

Enzymes are used to cut out the required gene. This gene is then inserted into a vector (a plasmid or virus). The vector then inserts the gene into the required

To treat inherited disorders.

Inheritance, variation and evolution

Name two pieces of evidence for evolution.

Evidence for evolution

Inheritance, variation and evolution

What are fossils?

Fossils

Inheritance, variation and evolution

Describe three ways fossils may be formed.

Fossils

Inheritance, variation and evolution

Explain why the fossil record is incomplete.

Fossils

Inheritance, variation and evolution

Why are fossils useful?

Fossils

Inheritance, variation and evolution

What is extinction?

Extinction

Inheritance, variation and evolution

Describe the factors which may contribute to the extinction of a species.

Extinction

Inheritance, variation and evolution

Why can evolution in bacteria be studied?

Resistant bacteria

Inheritance, variation and evolution

Describe how an antibiotic resistant strain of bacteria could arise.

Resistant bacteria

Inheritance, variation and evolution

What is MRSA?

Resistant bacteria

The remains of organisms from millions of years ago found buried in rocks.

Fossils and antibiotic resistance in bacteria.

Early forms of life where soft bodied which left behind few traces. Many of these traces were destroyed by geologic activity.

From parts of organisms that have not decayed, when parts of organisms are replaced by minerals as they decay and as preserved traces of organisms such as

Extinction occurs when there are no remaining individuals of a species still alive.

They inform us how organisms have changed or stayed the same as life has developed on earth.

Because they reproduce rapidly (e.g. every 20 minutes).

Changes to the environment over a long period of time, new predators, new diseases, competition or a single catastrophic event.

A strain of bacteria resistant to antibiotics.

A mutation of a non resistant bacteria could lead to resistance. The resistant strain is not killed by antibiotics but the non resistant strains are. The resistant strains

Inheritance, variation and evolution

Describe three steps which would reduce the development of antibiotic resistant strains.

Resistant bacteria

Inheritance, variation and evolution

Why is the development of new antibiotics unlikely to keep up with the emergence of new resistant strains?

Resistant bacteria

Inheritance, variation and evolution

Who first developed a classification system?

Classification

Inheritance, variation and evolution

How did he group organisms together?

Classification

Inheritance, variation and evolution

Name the 7 levels of classification used by Linnaeus.

Classification

Inheritance, variation and evolution

What is the binomial system?

Classification

Inheritance, variation and evolution

Why were new models of classification proposed?

Classification

Inheritance, variation and evolution

What system did Carl Woese develop?

Classification

Inheritance, variation and evolution

Why did Carl Woese propose a new system?

Classification

Inheritance, variation and evolution

How are organisms divided up in the three domain system?

Classification

The development of new antibiotics is costly and slow.

Doctors should not prescribe antibiotics inappropriately, patients should complete their course of antibiotics and the agricultural use of antibiotics should be restricted.

Their structure and characteristics.

Carl Linnaeus

A system of naming organisms using their genus and species e.g. Homo sapiens.

Kingdom, phylum, class, order, family, genus and species.

The three domain system.

An increase in our understanding of the internal structures of the cell and increased understanding of biochemical processes.

Archaea (primitive bacteria), Bacteria (true bacteria) and Eukaryota (includes protists, fungi, plants and animals).

Due to evidence from chemical analysis.

Inheritance, variation and evolution

What is an evolutionary tree?

Classification

Ecology

What does abiotic mean?

Communities

Ecology

What is an ecosystem?

Communities

Ecology

What is a habitat?

Communities

Ecology

What do organisms need to survive and reproduce?

Communities

Ecology

What do plants compete for in a habitat?

Communities

Ecology

What do animals compete for in a habitat?

Communities

Ecology

What is a population?

Communities

Ecology

What is a community?

Communities

Ecology

Name 4 ways in which species in a community depend on each.

Communities

The non living parts of an environment.

A diagram used by scientists to show how organisms are thought to be related.

An environment in which a particular species lives.

The interaction of a community of living organisms with the non living parts of their environment.

Light, space, water and mineral ions.

A supply of materials from their surroundings and from other living organisms living there.

A group of individuals from the same species living in an environment.

Food, mates and territory.

Food, shelter, pollination and seed dispersal.

A group of populations living within the same environment.