

Tuesday 23rd February 2020

L.O: I can recognise that characteristics are passed from parents to offspring.

Q: What does evolution mean?

Q: What does inheritance mean?

Q: Do these words have different meanings in different contexts?

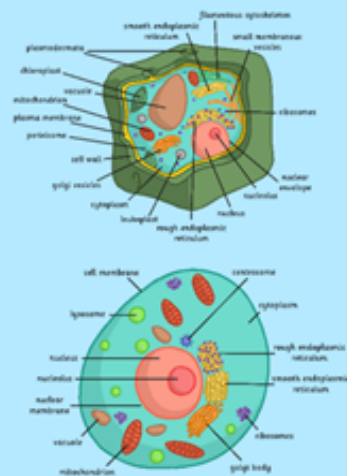
Evolution is essentially change over time - it is more complicated than that, but that is a good starting point.

Inheritance is when something is passed on to the next generation. e.g. eye colour, skin-colour, height etc.

Cells, Chromosomes, DNA and Genes

While you will not be examining these in detail, it is helpful to know about the building blocks of life for this unit.

Cells



Cells are the building blocks of all living things. All living things are made up of cells. Amoebas have one cell. Humans have trillions of cells!

Cells, Chromosomes, DNA and Genes

Chromosomes



DNA



Genes



The nucleus of a cell contains chromosomes, which are made up of DNA.

DNA carries the characteristics that we inherit. It is located in two places in the cell: the nucleus and the mitochondria. DNA can replicate and make copies of itself. When cells divide, each cell needs to have an exact copy of the DNA in the old cell.

Genes are short sections of DNA that contain specific information. This is often called the genetic code. All the genes in the whole cell are called the genome.

Variation

What does variation mean?

What causes variation?

Inheritance

These are characteristics that are passed on to offspring from their parents.



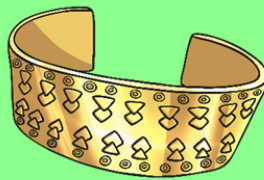
Adaptation

Over many generations, a species will adapt to its environment. Animals with the most successful characteristics are more likely to survive



Inheritance

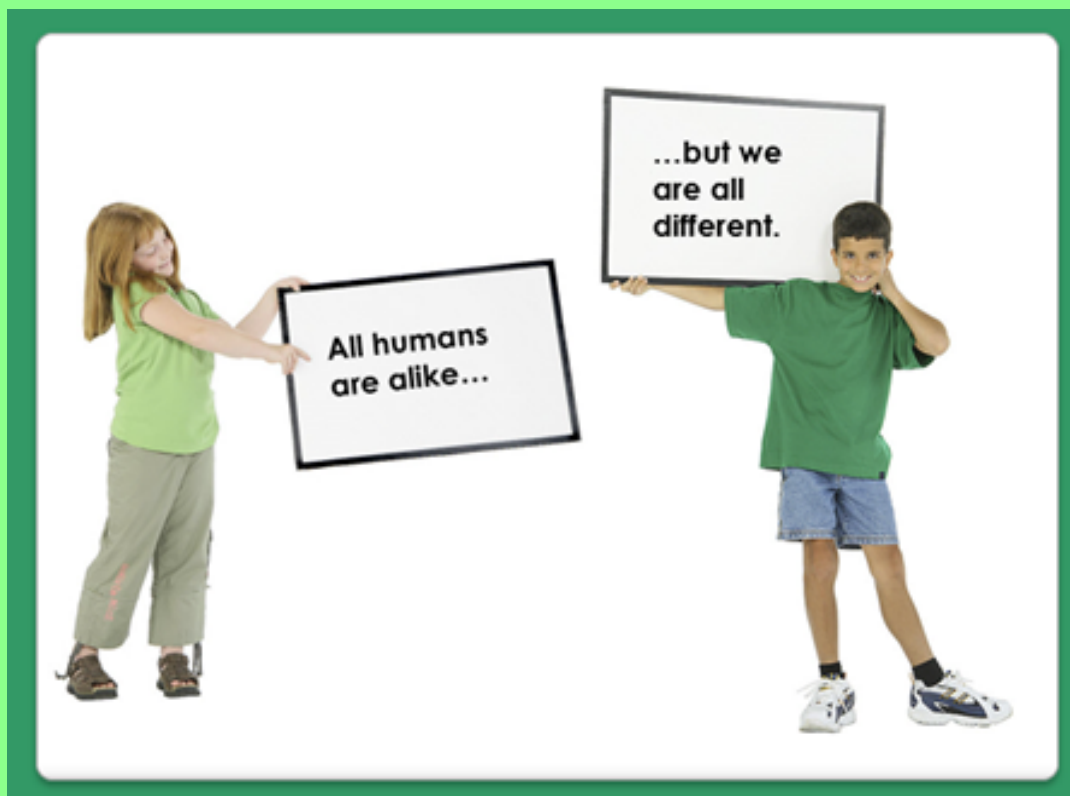
When we talk about inheritance, we often mean things that are passed on to us when one of our relatives or friends has died. Inherited items are sometimes houses or important objects.



Inheritance

In science, inheritance refers to the genes that are passed on from parents to offspring. When we refer to inherited characteristics we tend to focus on physical characteristics as these are easy to spot but inherited characteristics include abilities such as taste and smell.





We all have hair....

...but some of us have straight hair and some of us have curly hair.



We all have hair....

...but it can be all kinds of different colours.



We all have eyes....

...but they can be different shades of blue, brown and green.



Inheritance and Variation

How can inherited characteristics (similarities between parent and offspring) result in variation (differences)?

Well the majority of living things are the result of sexual reproduction so they have two parents. You inherit the characteristics from both parents but the way they combine makes the offspring unique.



Inheritance and Variation

The inherited characteristics can combine in different ways, which is the reason why siblings inherit the same characteristics but are not identical to each other.

Even identical twins that share the exact same combination of DNA are not 100% the same! This is due to the fact that genes develop separately when the twins are embryos or during later development.



Inheritance and Variation

When a child inherits a trait, he or she also passes that along to his or her children later in life.

An entire family can all share similar looks and characteristics.

The photo below shows two families at a wedding. Can you see any obvious difference?







Inheritance and Variation

The passing down of traits from parents to offspring is known as heredity.

This also occurs in all living things that need two different sexes to reproduce.



Here you can see what happens when you breed certain flowers together.

The two flowers at the top have been bred to produce the flowers on the bottom.

There is also some variation when children are being born. This is what stops children from looking exactly like their parents, allowing them to have traits that neither parent had.



This variation when children are born allows children to be taller than their parents, or have thicker hair or stronger bodies.

Here is a picture of Robert Wadlow, the tallest man in history.

His parents are stood next to him. Do you think his height was inherited or due to variation?



Variation (and a lot of training) is the reason Usain Bolt can run so much faster than his parents.

Usain might pass his athletic ability to his children or he might not, due to variation.

Task: Complete Part A on the activity sheet. We will come back and complete Part B later on in the lesson.

Task Part A: Copy the passages below using the key vocabulary.

Variation and Characteristics

All humans look _____ from one another. This is because we all have different _____ of features that make us who we are. These features are called _____.

The differences between humans (or any other organism) are called _____.

Characteristics can be _____, acquired or both.

Combinations Characteristics Variation Different Inherited

Inherited Characteristics

We get some of our characteristics passed down from our _____. These are called _____ characteristics.

These instructions for these features are passed down to us by _____, which are little sections of DNA found in the _____ of our cells.

We get half of our genes from our _____ and half from our father. This is because the nuclei of their _____ cells fuse together in _____ and make a full set of 'instructions' that makes us.

Nuclei Inherited Mother Fertilisation Parents Genes Sex

Characteristics = Traits

- You are a unique individual.
- Thousands of characteristics make you who you are.
- Characteristics are also called traits.
 - Examples: Eye color, basketball skills, height

Types of Traits

- A characteristic of an organism may be

inherited or **acquired**

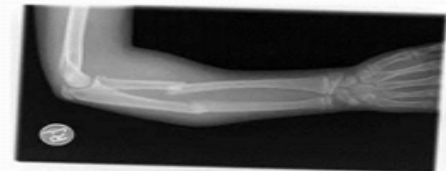
Inherited Traits



- Inherited traits are coded in your DNA
- You received from you biological parents
- Sometimes called *instinct*
- Examples: eye color, hair color, height, blood type, birds flying south for the winter
- Because inherited traits are coded in the DNA, they can be passed on to the next generation

Acquired Traits

- Acquired traits develop during life (organism is not born with it)
- Not in your DNA
- Examples
 - *Things you learned*
(riding a bike, reading, writing)
 - *Things that happened to you*
(short hair, broken bone)



Acquired traits end with you!

- Acquired traits cannot be passed on to offspring
- Organisms develop acquired traits
- They are NOT in DNA/genes!
- Example: This dog's puppies won't be missing a leg just because he is!



Task: Using the card resources, I want you to organise them into whether they are an inherited trait or an acquired trait.

Inherited Trait	Acquired Trait

Task: Now complete Part B of the activity sheet underneath your table.

Questions to answer in your book...

- 1) If a woman has dyed her hair purple, might her offspring have purple hair?
- 2) If Usain Bolt had a son, would he be a fast runner?

This is an optional activity to do if you can find pictures of yourself and your parent.

Try locate some pictures and place them in the correct space. At the side, write what characteristics you have inherited.

Investigating Inheritance and Variation

Investigate the characteristics you have inherited from your parents by closely examining their photographs and your own. Write down what you think you have inherited from that parent.

Inherited:

Inherited:

