

Review

- What do you think the word “characteristic” means?
- Have a look at the person next to you.
 - Can you identify some of their characteristics?
 - Are they the same as yours or different?

Characteristics

- A **characteristic** is a feature of an organism. It can be something we can see (like hair colour) or something we can't see (like blood group).
- All humans have different combinations of characteristics, meaning we all look different.
- This difference in our characteristics is called **variation**.

What do these species all have in common?



Discuss your ideas.



They are all animals.

They are all mammals.

They are all primates.

You might have thought of some of these. Species in the order of primates have a number of things in common, including:

- Ability to climb trees
- Relatively large brains
- Excellent vision

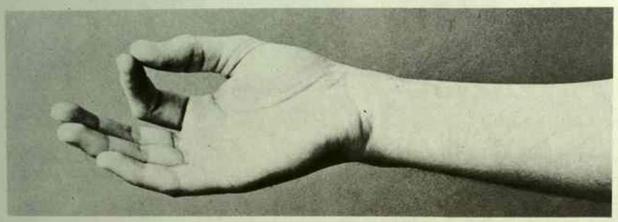
However, primates have evolved in different ways around the world...



KEY VOCABULARY

Precision grip – (“opposability”)

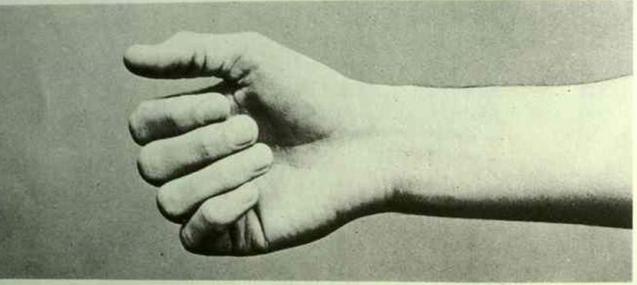
a grip that involves opposing the tip of the thumb to the tips of the other fingers



(4)
OPPOSABILITY is ability to sweep thumb across palm while rotating it around its longitudinal axis. Many primates can do this, but underlying structures are best developed in man.
Photographs by Robert Saracco

Power grip – (“prehensility”)

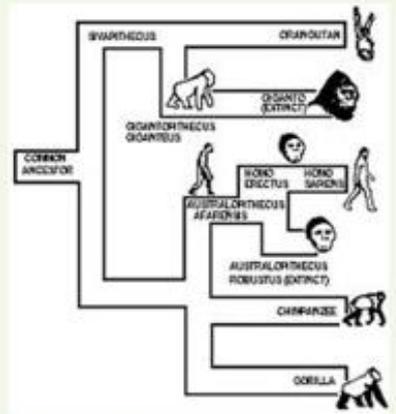
a grip involving all fingers of the hand equally, as in grasping a baseball



(3)
PREHENSILITY, the ability to wrap the fingers around an object, is a special primate characteristic, related to the emergence of the specialized thumb during evolutionary process.

Homonins and Homonids

- Homonin
 - A living or fossil species of the human lineage.
- Homonid
 - The group containing humans and African apes (Gorilla, Chimpanzee and Bonobo)



Cultural evolution = the acquisition of knowledge, beliefs, attitudes, customs, information by learning.

LO: To understand how human behaviour can affect change in species over time.

Fossils provide us with evidence for Evolution – but this is not the only evidence

The earliest human ancestors are called Hominids.

There were many different species of hominid that evolved from ape-like animals around 4 million years ago.

<http://videos.howstuffworks.com/science-channel/29288-100-greatest-discoveries-laetoli-footprints-video.htm>

<http://www.youtube.com/watch?v=w1Lu4VggDH0>

We have found many different fossil hominids

- We don't know much about their behaviour
- Human behaviour and our culture is what sets us apart from Apes, like Chimps and Gorillas

Think about some differences....

Apes vs Humans

You have 3
minutes

Communicate



Work together



Sometimes even walk 'upright'



Bild 3

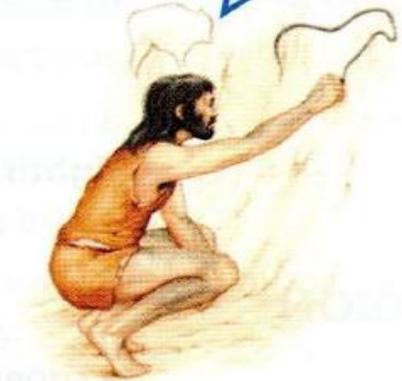
Chimpanzees

Use Tools



Summary of human evolution

BIGGER BRAINS, MORE INTELLIGENT, BETTER TOOLS



Australopithecus

- 4.5-2.0 million years ago
- Lived in Africa
- Walked on two feet
- Free hands
- First to use stone tools
- Varied diet: hunting and gathering
- Meat eaters (more protein = bigger brains)

Homo Habilis

- 2.3-1.6 million years ago
- First HUMAN
- Lived in Africa
- First to make stone tools
- Varied diet: hunting and gathering
- Bigger brains
- Tries to understand its environment

Homo Erectus

- 2 million – 300,000 years ago
- Migrations: lived in Africa, Asia and Europe
- Discovered fire and how to use it
- Varied diet: hunting and gathering
- Excellent hunter
- Lived in organized groups
- Specialization of labour: hunters, tool makers, gatherers

Homo Neanderthalensis

- 150,000 – 30,000 years ago
- Lived in Europe
- First to bury their dead
- Adapted to cold weather (warm clothes)
- Strong and resistant body
- Lived in organized groups
- Variety of tools; burials

Homo Sapiens

- 120,000 years ago
- Origin: Eastern Africa, then migrated to other continents
- Adapted to variety of conditions
- Taller, slimmer and more intelligent
- Made better tools with variety of materials: stone, bone, horn
- Take advantage of all kinds of resources
- Complex language
- Art



Over time, humans have spread out and now inhabit environments all around the world. Can you think of some characteristics that humans have that mean they can live in different environments?

Discuss your ideas.



Did you think of any of these? These characteristics have allowed human population to grow and develop in environments all around the world:

Walking upright. Humans can see predators from far away, and travel long distances.

Omnivorous. Humans can eat lots of different types of food.

Large brain. Humans can solve problems and change their environment.

Opposable thumbs. Humans can grip things and use tools.

Language. Humans can express themselves in a way no other species can.



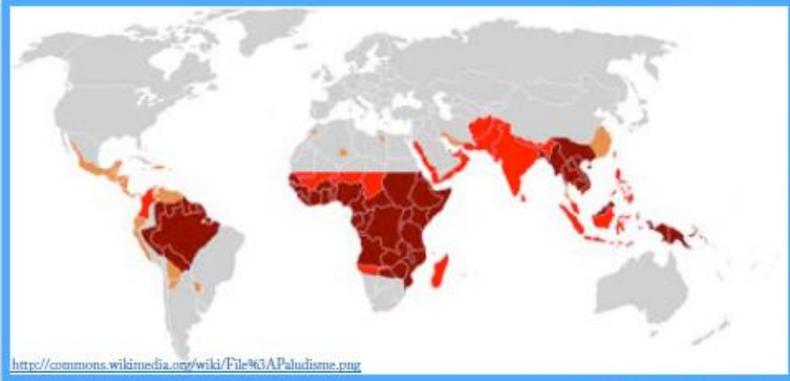
Did you know that external factors have led to some variation in humans in different parts of the world?



Humans whose ancestors have lived in Europe for generations are less likely to be *lactose intolerant*. This may be because dairy farming of cattle has been widespread in Europe for centuries. Milk has been an important and readily available food source in Europe, much more so than in other parts of the world.



The red areas of the map show where malaria is widespread. What do you notice?



Humans whose ancestors have lived in Africa for a long time are more likely to have a variation that makes them resistant to malaria - a disease transmitted by mosquitoes. Malaria is widespread in hot environments and tropical environments.



Human behaviour has had a significant effect on the evolution of other species.



Humans have cut down lots of forests to make room for farm land. Many species of animals have had their habitats destroyed.

Humans have hunted elephants for their tusks. So many have been hunted and killed that now, elephants are an endangered species.



What might have happened to these species as a consequence of human behaviour? Discuss your ideas.



Species of birds, mammals, insects, amphibians and reptiles are all threatened by *deforestation*. For example, the stone curlew is under threat in Northern Ireland due to meadows being turned into farmland.

The average tusk size of African elephants is smaller now than in previous generations. This is due to elephants with large tusks being hunted for their ivory. More elephants with small tusks survived and reproduced, spreading this variation throughout the population.



Humans are also changing the characteristics of species of plants and animals through selective breeding and cross-pollination...



Farmers have developed chickens that grow bigger and quicker by a process called *selective breeding*. Larger chickens are selected for breeding for generation after generation.



Gradually, these characteristics have spread throughout the chicken population.



Different species of flowers are cross-pollinated to create new species. Humans have created several new varieties of tulip in this way.



Task

Selective breeding is when humans breed plants and animals for particular genetic characteristics so that they are different to their actual wild ancestors and are now beneficial to humans.

Darwin wondered if a similar process could happen naturally to produce new species through natural selection. In selective breeding, characteristics are chosen by humans rather than the environment, so it is sometimes called artificial selection.

From the slides, there are 4 ways in which human activity can cause a change in species over time. What are they?

Write 3 advantages and 3 disadvantages of each of the human activity on plants and animals.

Use a laptop to research if necessary.

Learning check

- How can human behaviour affect change in species?
- Is this a good or a bad thing?
- Human activity on Earth is damaging environments and affecting the way species evolve. Do you agree or disagree? Justify your reasons.