

Variation exists within a species

CONTENT AND CONCEPTS

- Living things of the same type belong to the same species. For example, humans are one species and dogs are another species.
- Individuals of the same species can reproduce to make more.
- All people are human (*Homo sapiens*) and belong to the same species.
- Differences between living things of the same species is called variation.
- Variation amongst humans can be inherited. Some inherited characteristics are height and tongue-rolling.

TEACHER TASK

Explain: What do we mean by variation?

Variations are small differences that exist within a species.

All of us humans belong to one species (*Homo sapiens*). There are some very small genetic (inherited) differences between individual people. These small inherited differences are called variations. These differences are also influenced by environmental factors, such as diet and lifestyle. We inherit certain physical characteristics from our parents that we can't change, but we can adapt to many different circumstances through learning.

We all have the same basic body organs, for example, a skeleton, legs and arms. All humans can reproduce with other humans because we belong to the same species.



Inherited characteristics

Humans have evolved quite recently in Earth's history and not many variations exist in humans.



Some people can roll their tongues and some people cannot.

But there are a few simple physical variations we inherit from our parents, for example, our ABO blood groups, eye shape and colour, skin and hair colour.

Another physical characteristic you might have inherited is the ability to roll your tongue.

Inherited diseases

Unfortunately, in rare cases, there are some serious diseases such as cystic fibrosis and sickle cell anaemia, which can be inherited.

We are also learning about the influence of genetic (inherited) variation on more familiar conditions such as heart disease, cancer, diabetes and mental disorders like schizophrenia and bipolar disorder.

People may inherit the possibility of getting the disorder, but environmental factors might influence whether they actually get the disorder or not.

Organ transplants and blood transfusions

When doctors need to perform an organ transplant on a patient, they must use a donated organ from a person who is genetically similar to the patient. Otherwise the patient's body will reject the organ.

Similarly, when a patient receives a blood transfusion with blood that is not compatible with their own ABO blood type, their body will reject it and the patient may die. So it is important for you to know your blood group. Hospitals will match the blood group with the patient before giving a transfusion.

In the South African population, these blood groups are found in the following proportions:

- 37% have blood group A
- 14% have blood group B
- 4% have blood group AB
- 45% have blood group O

However, most common genetic variations do not affect our ability to survive. Our survival as humans mostly depends on things we have learnt. Learning makes us flexible and helps us survive in new circumstances.

