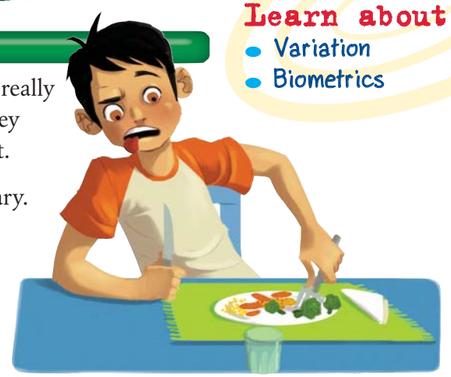
3.1 Identifying differences

Learn about
- Variation
- Biometrics

Spot the difference



Ben hates broccoli. He says it tastes bitter, and it really does to him. One in four people are like Ben. They can taste bitter chemicals that others can't detect.

We have thousands of features like this which vary.

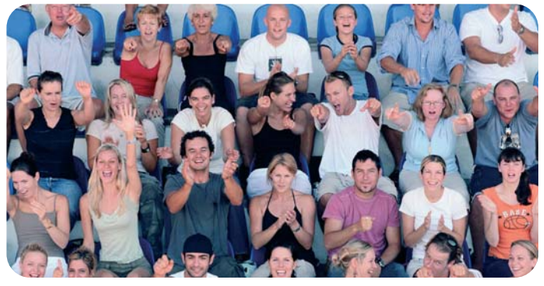
The differences between us are called **variation**.

1 What word describes our differences?

2 Why might some people dislike broccoli or olives?

You can recognise hundreds of people – friends, family, people you see only see now and then, and celebrities. It's easy. The shapes of their faces differ and their hair, eye and skin colours vary.

You can spot people you know from a long way off. They have different heights and builds, individual voices and distinct ways of walking.



3 The people in the photograph show a lot of variation. List **five** features which vary.

4 You notice a friend on the opposite side of a football pitch. How can you tell who it is?

5 Your cousin has grown a lot since you last saw her. Her hair is shorter and she has dyed it blond. Why do you still recognise her?

Hidden variation

Some differences are easy to spot, but most variation is hidden. You might be able to hold your breath for longer, or maybe your heart beats more times per minute. Your blood looks the same as your friend's but it may belong to a different blood group.

Variation makes our bodies work differently. It also affects our behaviour. We prefer different television programs and laugh at different jokes.

There are about 7 billion people in the world. But we all have different combinations of features, so we are all unique.

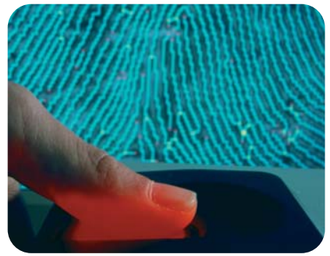
6 Explain why photos can't show all our differences.

Identification

Ben reads a lot. He changes his library books every week. He used to have a library card. But now he just puts his finger in a scanner. It's very quick and he doesn't have to worry about losing his card.

Everybody's fingerprint has a unique pattern of lines. Even identical twins have slightly different fingerprints.

Using features like fingerprints to identify people is called **biometrics**. Some of our other features are also unique. Most biometric systems use the shape of your face, the patterns on the coloured part of your eye (iris) or your fingerprint. But we also have unique voiceprints and different ways of walking. Since 2007, biometric data has been added to every UK passport.



7 Are identical twins totally identical?

8 List **three** features that could be used to identify you.

9 Which feature could identify people over the phone?

10 The latest fingerprint scanners check for a pulse in the finger. How does this help prevent fraud?

How do we decide... which biometric feature to use?

Security systems have to be convenient, reliable and as cheap as possible. Iris patterns vary more than fingerprints and face shapes. They change as the iris responds to light, so they can't be faked. But face shapes can be detected from further away. Fingerprint scanners are the cheapest, but they don't work well with dirty or damaged fingers.

11 Which biometric feature could be used to open your front door as you walked towards the house?

12 Which would be best to check who needed to pay for a meal from the canteen?

Summing up

13 How can common features like hair colour, eye colour and shoe size be used to identify people?

14 What advantage do biometric security systems have over keys, cards or PIN numbers?

15 Some people worry that thieves could steal your fingerprints and pretend to be you. Why would this be more serious than having your key stolen?

Brainache

Q Could a bank do without keys, cards or PIN numbers?

A In 2007 a Swiss bank became the first to try. It uses face scans and magnetic locks to control entry to the building, and iris scans to limit access to the most secure areas.

Get this

- Everyone has a different combination of features.
- Biometric systems use unique parts of our appearance or behaviour to identify us.