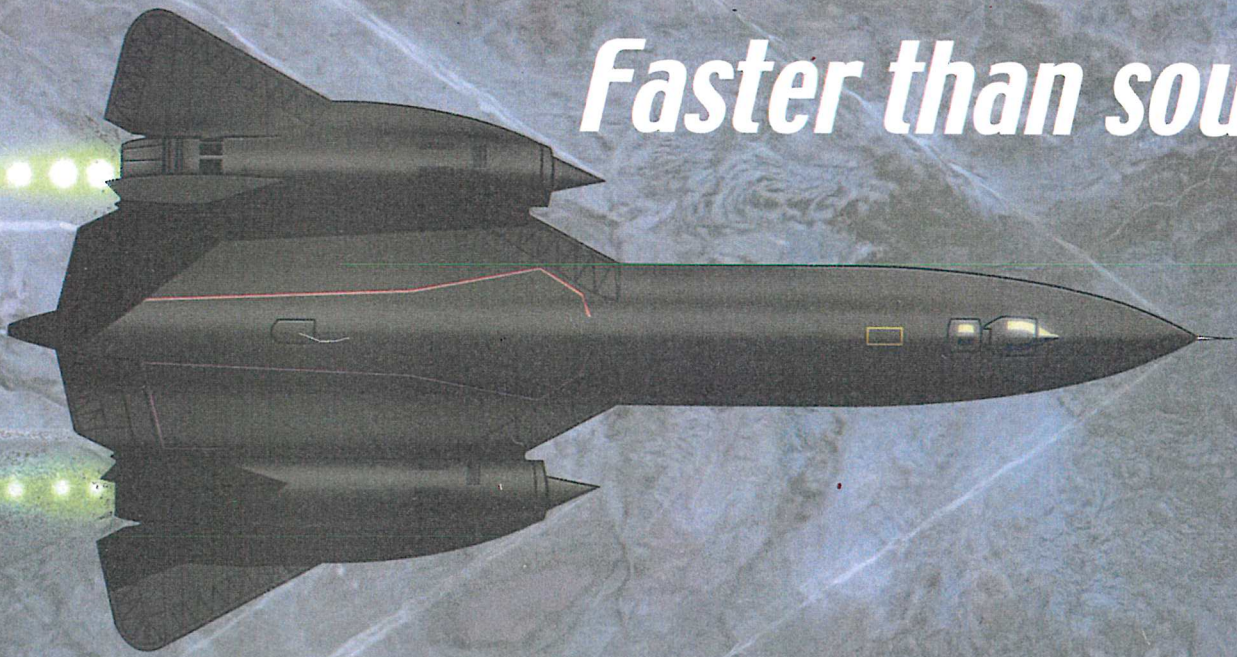


Faster than sound



- 1 Sound can move through the air. This is why we can hear loud sounds from something happening far away just after it happens. But sound is not the only thing that can move fast through the air. Some planes can fly as fast as sound. When they move at the speed of sound, they are travelling at **Mach 1**. This is about 1220 kilometres per hour.
- 2 Some aircraft can move even faster than Mach 1. A plane moving faster than the speed of sound flies at **supersonic** speeds. The Concorde was a supersonic passenger plane. It flew people around the world much faster than other planes. However, it was also very expensive and loud. When a plane moves at supersonic speeds it uses a lot of fuel and makes a sound like thunder, called a **sonic boom**. The Concorde planes stopped flying in 2003.
- 3 Now most supersonic planes are used by the military. Some of them can move twice as fast as sound, a speed called **Mach 2**. Some can go even faster! Once a plane flies faster than **Mach 5** (five times the speed of sound), it is called **hypersonic**.
- 4 In 2004, NASA flew the X-43A, a hypersonic plane, at almost Mach 10. It reached a top speed of over 12 000 kilometres per hour. This is about twelve times faster than the passenger planes we usually fly in.
- 5 Imagine one day flying in hypersonic planes. Instead of taking over 21 hours to fly from Sydney to London, it could take you less than 2 hours!

Questions

- 1.** A plane that carries people is called a:
(a) *passenger plane.* (b) *supersonic jet.* (c) *navy plane.*
- 2.** NASA flew a plane at nearly how many times the speed of sound?
(a) *two* (b) *three* (c) *ten*
- 3.** A plane makes a sonic boom when it flies:
(a) *at supersonic speeds.* (b) *at Mach 1.* (c) *too high.*
- 4.** How fast did the X-43A fly?
(a) *about 10 000 km/h*
(b) *about 12 000 km/h*
(c) *about 9000 km/h*
- 5.** The main idea of Paragraph 1 is:
(a) *Mach 1 is about 1220 km/h.*
(b) *sound and some aircraft can move fast through air.*
(c) *sound moves through air.*
- 6.** One plane company claims in 25 years it will have a hypersonic passenger plane. This:
(a) *is totally impossible.*
(b) *will definitely happen.*
(c) *is possible.*
- 7.** The word part **sonic** means:
(a) *sound.*
(b) *light.*
(c) *fly.*
- 8.** In Paragraph 3, the word **them** means:
(a) *supersonic planes.*
(b) *the military.*
(c) *hypersonic planes.*



Something extra

- ★ Draw and label a supersonic plane of your own design.
- ★ Imagine you are one of the first people to travel in a hypersonic plane. Write an email to your friend telling him or her what the flight was like.

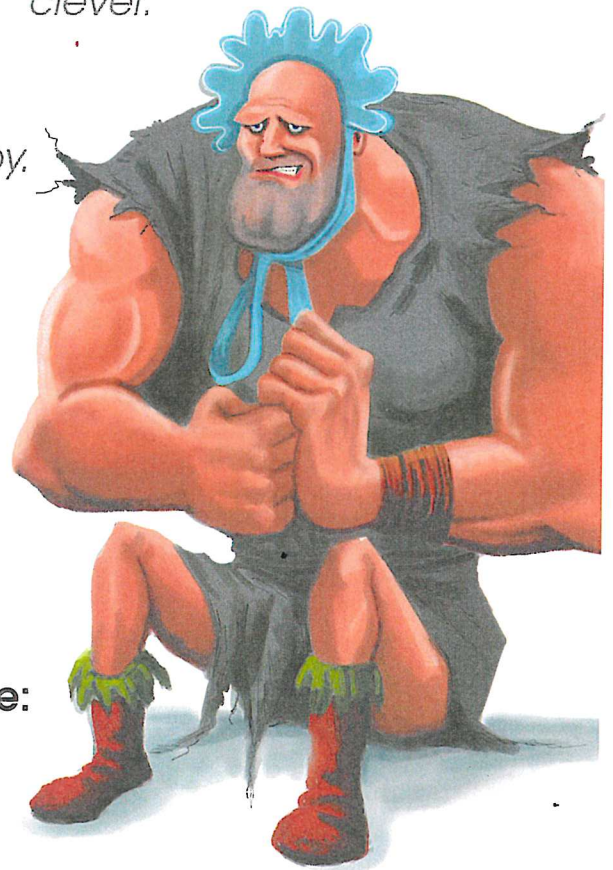


Legend of the giant's bridge

- 1 Have you heard of the Giant's Causeway in Ireland, where towering rock pillars lead into the sea just like a giant path? Legend says they are the remains of a bridge between Ireland and Scotland, built by the Irish giant, Finn MacCool (Fionn mac Cumhaill). Could this possibly be true?
- 2 Many years ago, the mighty Scottish giant, Benandonner, shouted across the sea to the Irish giant, Finn MacCool. He invited him to Scotland to have a contest to see who was stronger.
- 3 Finn MacCool took up the challenge and set to work immediately, building a bridge across the sea. When he arrived in Scotland, MacCool caught sight of his mighty opponent. He was truly gigantic! MacCool was so filled with fear, he ran away, back to Ireland.
- 4 When he reached home, MacCool was exhausted and fell fast asleep. He did not know that Benandonner had crossed the bridge and was planning to surprise him.
- 5 MacCool's wife, Oonagh, saw the Scottish giant running towards their house. She quickly tied a bonnet around Finn's head and wrapped him in a blanket.
- 6 Benandonner reached the house ready to fight. But when he saw the sleeping giant baby, he let out a cry of terror. He ran back to Scotland as fast as he could, destroying the bridge as he went.
- 7 Poor Benandonner thought to himself, 'If MacCool's baby is that big ... MacCool himself must truly be the mightiest of all giants!'

Questions

1. In Paragraph 1, the word *pillars* means:
(a) cushions for the head. (b) tall rocks. (c) paths.
2. Who built the Giant's Causeway?
(a) Finn MacCool (b) Benandonner (c) Oonagh
3. In Paragraph 5, Oonagh shows that she is:
(a) strong. (b) foolish. (c) clever.
4. Which happened first?
(a) Oonagh dressed MacCool as a baby.
(b) MacCool built the pathway.
(c) Benandonner invited MacCool to Scotland.
5. Oonagh dressed Finn as a baby to:
(a) trick Benandonner.
(b) stop him fighting.
(c) make him look silly.
6. In spite of their great size, both giants were:
(a) cowards.
(b) brave.
(c) lazy.
7. Benandonner destroyed the bridge MacCool had built:
(a) because he liked destroying things.
(b) to stop MacCool from following him.
(c) because he didn't like it.
8. In Paragraph 2, the word *he* means:
(a) Finn MacCool.
(b) Benandonner.
(c) the Irish giant.



Something extra

- ★ Make a list of all the words you can make from the letters in 'giant's causeway'.
- ★ Draw a story map of the legend of the Giant's Causeway.
- ★ Write a list of adjectives to describe the two giants.

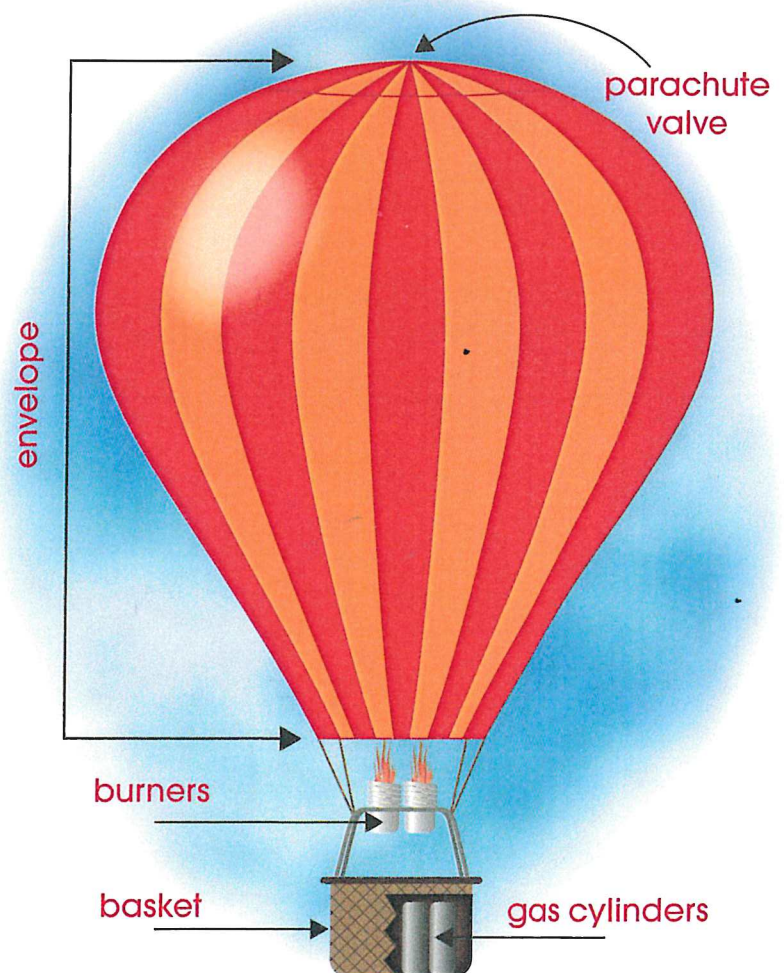
How a hot-air balloon works



- 1 A French science teacher, Pilâtre de Rozier, invented the first hot-air balloon. He named the balloon *Aerostat Reveillon*. On 19 September 1783, he loaded a sheep, duck and rooster into the balloon for a flight lasting fifteen minutes.
- 2 On 21 November 1783, Joseph and Etienne Montgolfier, two French brothers, took to the air in their hot-air balloon. Their flight took off from the centre of Paris and lasted twenty minutes. This was the first time people had travelled in a hot-air balloon.

- 3 A hot-air balloon has three main parts:

- The basket, or gondola, holds the pilot, passengers and gas cylinders. Some baskets are large enough to carry more than twenty people.
- The burner is like the engine of the balloon. It uses propane gas to push hot air up into the envelope.
- The balloon, or envelope, is made of airtight, durable fabric. Balloons come in many colours, shapes and sizes.



- 4 A hot-air balloon stays in the air because the warm air inside the envelope is lighter than the cold air outside. This makes the balloon float. To keep the balloon in the air, the pilot fires the burner so the air in the envelope stays warm. When the pilot wants to land, he or she opens the parachute valve at the top of the envelope to let out some of the warm air.

- 1.** Which part of the balloon is like the engine?
(a) gondola (b) envelope (c) burner
- 2.** What do you think the word ***durable*** in Paragraph 3 means?
(a) tough
(b) weak
(c) washable
- 3.** Where will you find the parachute valve?
(a) on a passenger
(b) on the gondola
(c) on the envelope
- 4.** Who were the first people to ride in a hot-air balloon?
(a) a sheep, a duck and a rooster
(b) passengers
(c) Joseph and Etienne Montgolfier
- 5.** What do you call a person who controls the hot-air balloon?
(a) pilot (b) passenger (c) inventor
- 6.** Would your whole family be able to fit in a gondola for a hot-air balloon ride together?
(a) yes (b) no (c) hard to tell
- 7.** From which country did the hot-air balloon originate?
(a) Paris (b) France (c) England
- 8.** The hot-air balloon is:
(a) an eighteenth-century invention.
(b) an English invention.
(c) a recent invention.



Something extra

- ★ Draw a colourful hot-air balloon.
- ★ Make a list of other inventions which fly in the sky.

Skin – the body's blanket

1 Skin is the largest organ of the body. If we were to lay out the skin of an adult, it would cover a two-metre by two-metre blanket. Of all the different parts of the body, the skin is the heaviest! The thickest skin is found on the soles of the feet, while the eyelids have the thinnest skin.

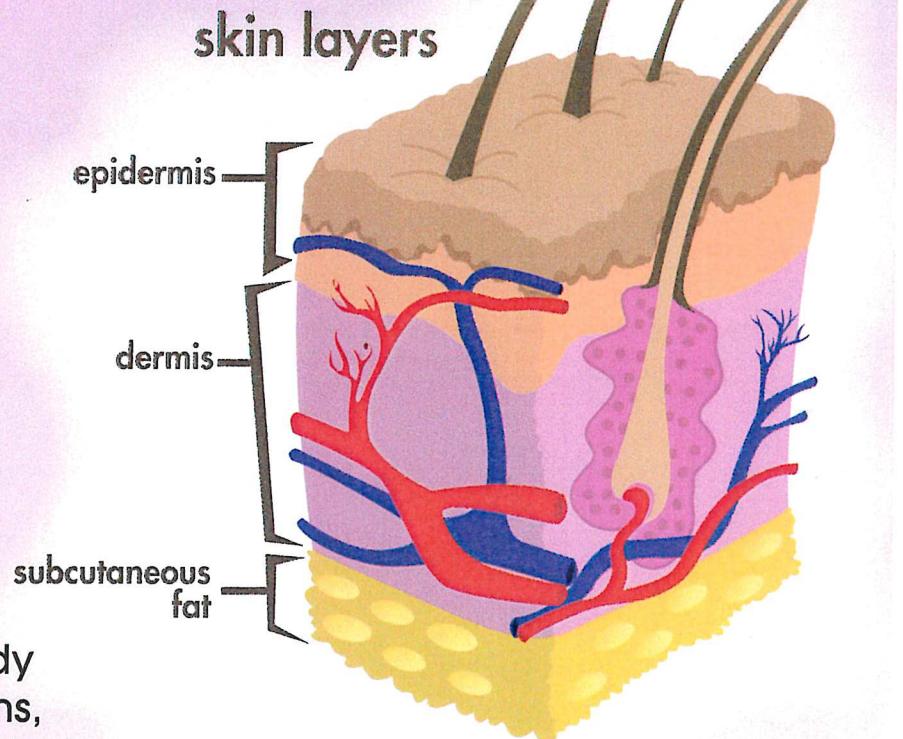
2 Skin covers our whole body and protects us from germs, water and sunshine. The skin

also keeps our body at just the right temperature. If it is too hot, the skin sweats to cool down and if it is too cold, tiny hairs stand up to trap warm air which helps to keep the body warm. Skin also plays an important part in keeping all our inside bits ... well ... inside!

3 Skin has three layers. The outside layer, called the epidermis, is the bit we can see. New skin is always being made at the bottom of this layer. The new skin works its way up to the surface and the dead skin on the surface falls off. We lose about 10 million dead skin cells from our body every day. About every four years, we shed our own body weight in dead skin! This layer also has a chemical called 'melanin'. Melanin works to protect us from the sun. The more melanin in the skin, the darker it is.

4 The second layer of skin, called the dermis, can't be seen. This part of our skin gives us our sense of touch. The nerves and blood vessels are found here and they send messages to our brain if something is painful, hot or cold.

5 The third layer is called 'subcutaneous fat'. This layer of fatty tissue cushions us from any knocks or bumps, helps to keep us warm and attaches the skin to the tissue underneath.



- 1. Which of these sentences is true?**
- (a) *We lose all of our skin when we are four.*
 - (b) *It takes four years to shed our body weight in dead skin.*
 - (c) *We lose about 10 million dead skin cells every four years.*

- 2. We feel pain because of the nerves found in the:**
- (a) *subcutaneous fat.*
 - (b) *epidermis.*
 - (c) *dermis.*

- 3. When we are too hot:**
- (a) *the skin sweats.*
 - (b) *tiny hairs stand up.*
 - (c) *the skin gets thicker.*

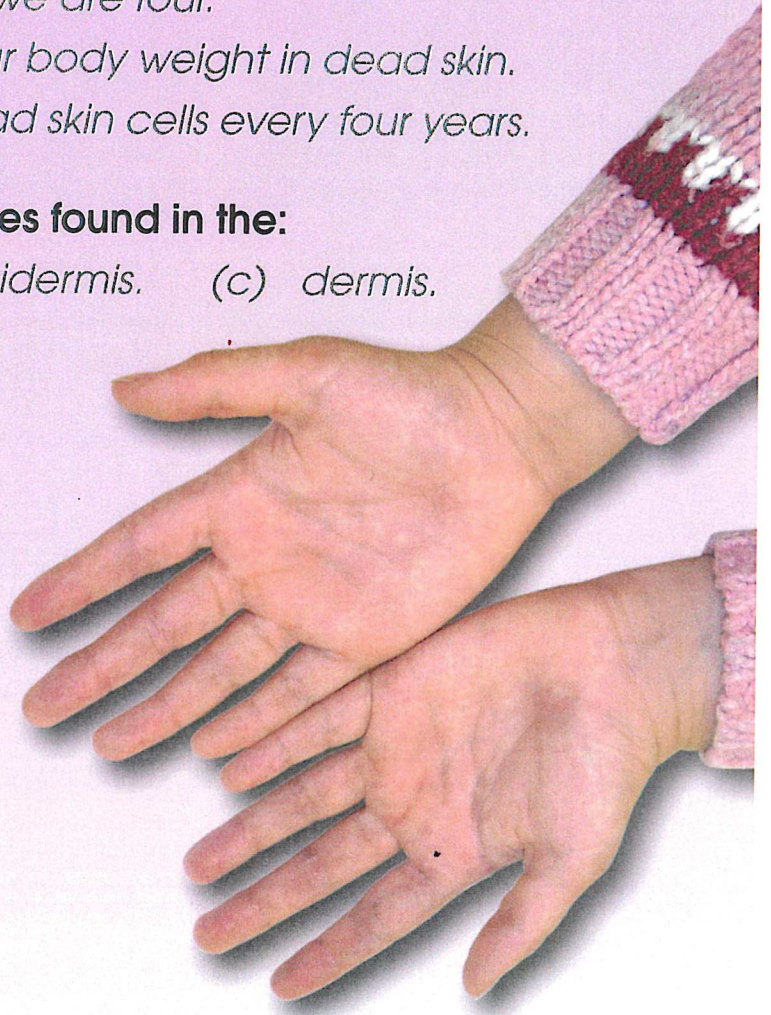
- 4. The word *it* in Paragraph 1 is used instead of:**
- (a) *the body.*
 - (b) *the skin of an adult.*
 - (c) *a blanket.*

- 5. Fair-skinned people have:**
- (a) *lots of melanin.*
 - (b) *thin skin.*
 - (c) *little melanin.*

- 6. New skin is made in the:**
- (a) *epidermis.*
 - (b) *dermis.*
 - (c) *subcutaneous fat.*

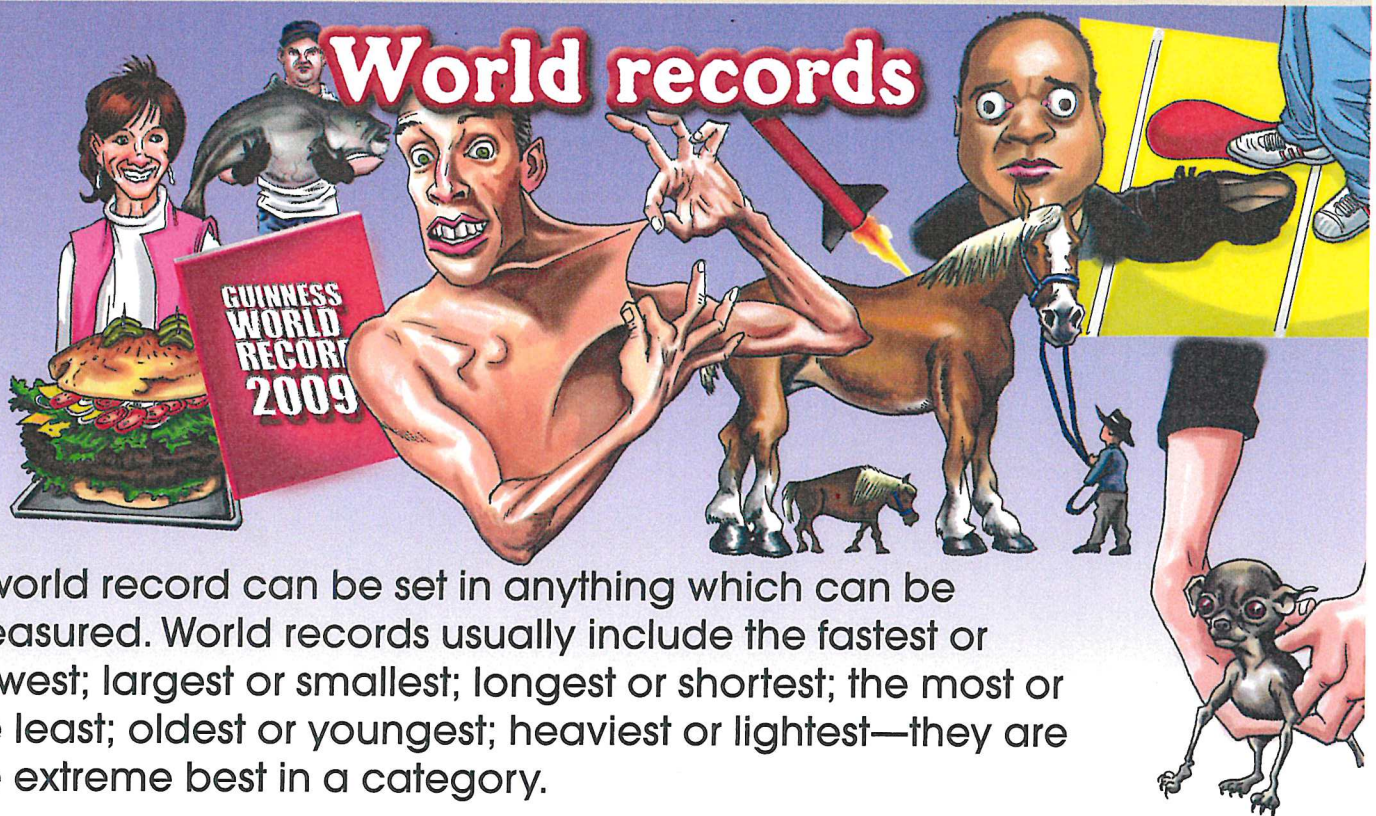
- 7. The word *organ* in Paragraph 1 means:**
- (a) *a type of piano.*
 - (b) *a blanket.*
 - (c) *a part of the body.*

- 8. The surface of the skin is:**
- (a) *dead.*
 - (b) *alive.*
 - (c) *too heavy to carry.*



Something extra

- ★ Measure out an area of 2 m x 2 m to see how big it is.
- ★ Draw a poster showing how to protect our skin from the sun.



- 1 A world record can be set in anything which can be measured. World records usually include the fastest or slowest; largest or smallest; longest or shortest; the most or the least; oldest or youngest; heaviest or lightest—they are the extreme best in a category.
- 2 You might be surprised to know that the *Guinness book of world records*TM was first published in August 1955, in Britain. Now titled *Guinness world records*[®], it is printed in 24 different languages and sold in more than 100 countries around the world. The book has many categories of world records. These include the human body, arts and media, amazing feats, modern society, the natural world, travel and transport, sports and games, and science and technology.
- 3 An American man by the name of Ashrita Furman is known as 'Mr Versatility'. He holds the world record for the most number of world records and also for the most number of world records held at any one time. By 2008, he had set or broken 204 official world records. He set his first world record in 1979 by doing 27 000 continuous jumping jacks. In June 2008, he set a world record when he crushed 53 eggs with his head in just 30 seconds.
- 4 Between 1200 and 1500 people attempt to set or break a world record each week. If you would like to set or break a world record, you must contact *Guinness world records*[®] and apply to do so. You must tell them what you want to do and they will send you information about the current record and rules to follow. If it is a new type of record, they will tell you whether or not they are interested and send you rules to follow!

- 1.** A world record can be set:
- (a) *by humans only.*
 - (b) *in anything which can be measured.*
 - (c) *in anything.*
- 2.** In which section of **Guinness world records®** would records relating to animals be found?
- (a) *sports and games*
 - (b) *modern society*
 - (c) *the natural world*
- 3.** What is the main idea of Paragraph 3?
- (a) *records set by Ashrita Furman*
 - (b) *American men's records*
 - (c) *jumping jacks*
- 4.** **Guinness world records®** was first published in:
- (a) *America.*
 - (b) *Britain.*
 - (c) *Australia.*
- 5.** **Guinness world records®** will only publish a record if a person:
- (a) *applies first.*
 - (b) *sets a world record.*
 - (c) *tells what they did.*
- 6.** What would be the best meaning for the word **versatility** used in Paragraph 3?
- (a) *able to turn backwards or forwards*
 - (b) *having many uses*
 - (c) *able to change from one task to another*
- 7.** **Guinness world records®** sets rules for:
- (a) *all records.*
 - (b) *new records*
 - (c) *old records.*
- 8.** **Guinness world records®** was first published in:
- (a) *2008.*
 - (b) *1955.*
 - (c) *1979.*



Ashrita Furman

Something extra

- ★ How many jumping jacks can you do in one minute?
- ★ Which category of world records do you find most interesting? Explain why.

What's the difference?

hedgehog



erinaceinae

echidna



monotreme

porcupine



rodent

mammal

description

small enough to fit in your hand; covered with thousands of very sharp spines mixed with coarse hair

covered in spines and coarse hair for warmth; has a long snout and long tongue for finding food

large rodent covered in 30 000 barbed quills along back, sides and tail; has coarse hair for warmth

activity

nocturnal; rests in a den burrowed into the ground or a nest of leaf litter

nocturnal when it is hot; active day and night when it is cooler

nocturnal; rests in caves or rocky crevices

diet

omnivore: insects, snails, frogs and toads, snakes, bird eggs, mushrooms, grass roots, berries, melons, earthworms

insectivore: ants, termites and grubs

omnivore: grass, clover, grubs, roots, bulbs, berries, fruits, bark, nuts

defence

rolls into a tight ball with spines pointing outwards; can also run away or climb to escape danger

on hard ground; rolls into a tight ball on soft soil; lowers its head and digs quickly, sinking into the ground, leaving its spines showing

backs up to the attacker; if quills are touched, they are released into the attacker and are difficult to take out

native to

Europe, Asia and Africa

Australia and New Guinea

Asia, Italy, Africa and North and South America

habitat

anywhere there is well-drained soil, dry shelter and plenty of insects

anywhere with ground cover and plenty of ants

forests, hillsides, rocky outcrops, deserts, grasslands

interesting fact

Some people think they make good pets because they control pests in the garden.

They don't like the heat and are very good swimmers.

Most live on the ground, but some climb trees—even though they are very clumsy.