



Why do men have nipples? Why does hair go grey? Can you hear anything in space? In the first of a two-part series to mark National Science week, **Graham Readfearn** answers these and many more quirky questions.

What are the origins of the word science?

From the Latin word for knowledge: scientia. The word wasn't used until the mid-17th century, when it emerged as a new term to describe various areas of knowledge such as chemistry, biology and astronomy.

Which is the tallest mountain on Earth?

This depends on where you start measuring. If you begin from the ocean floor, then Mauna Kea, on Hawaii, is the tallest at about 10,000m. If you start at sea level, then Everest, on the border of Nepal and Tibet, is the tallest at 8848m. But the point on Earth farthest from the centre of the planet is the peak of Chimborazo, in Ecuador, which is 6267m above sea level but 6384.4km from the Earth's centre. That's two metres farther than the summit on Everest.

Does water really spiral down the plug hole the opposite way in the northern hemisphere?

The world of science is still divided on this question. Some scientists have claimed to have successfully proven that water spirals clockwise in the southern hemisphere and anti-clockwise in the north. Some argue that the coriolis effect caused by the earth spinning is to blame. Others say the force isn't strong enough, and the direction of the water is down to the shape of the sink or the plug hole.

What is the body's largest organ?

Skin.

What is DNA?

Deoxyribonucleic acid.



How many colours can the human eye detect?

As many as 10 million. Sir Isaac Newton listed the pure spectral colours we see in light as red, orange, yellow, green, blue, indigo and violet.

Where does some of the wax go when you burn a candle?

When wax burns (or oxidises) it generates water, carbon dioxide, heat and light. The water spreads out in the air, which also takes in the carbon dioxide. The hydrocarbon molecules are able to burn completely.

Why do men have nipples?

Several theories abound, but males and females share genetic characteristics. Embryos are formed on a female template, which includes nipples. They are there before other factors determine if the embryo will be male or female.

What's the difference between nuclear fusion and nuclear fission?

Splitting uranium or plutonium atoms generates energy by nuclear fission. Fusion draws energy by joining atoms of hydrogen. The biggest known local fusion reactor is the sun.

What's the difference between an

atom and a molecule?

An atom is a unit of matter with a nucleus of protons and neutrons, and a cloud of negatively charged electrons. Atoms that stay bound together are known as molecules.

Could you hear anything in space?

Sound needs molecules, such as air or water, to travel through. Space is a vacuum, which is why it is true that in space no one can hear a scream.

Why is the sky blue?

Molecules in the air scatter blue light from the sun more than they scatter red light.

How many bones are there in the body?

Depending on whether you count the breastbone as one or three bones, there are either 206 or 208 bones in the human body. There are 54 in the hands, 52 in the feet, 22 in the skull and 24 in the spine.

What is blood made of?

More than half of the ingredients of blood is straw-coloured plasma. More than 90 per cent of that is water and the rest is mainly protein, glucose and carbon dioxide. Red blood cells, also known as erythrocytes, are filled with the biomolecule haemoglobin and make up about 45 per cent of blood. The remaining ingredient is mainly white blood cells, or leukocytes (about one per cent).



How does the eye see?

Light goes through the windshield (cornea), through an opening in the iris called the pupil, through the lens and hits a tissue lining the inner surface called the retina, which acts like the film in a camera. The retina then triggers a complex sequence of chemical and electrical responses sent to the brain, which recreates the image.

Do our ears really keep growing until we die?

No. The outer ear stops growing at about age 18 but the cartilage in them can lose

elasticity, giving the illusion of growth.

How heavy is the heart?

An average female heart weighs from 250g to 300g and a male heart from 300g to 350g.

What is the heaviest organ in the body?

The liver is the largest internal organ weighing, on average, 1.6kg.

Why does hair go grey?

As we grow older, stem cells in the skin called melanocytes can die. These cells produce the pigment that colours hair.

What does Albert Einstein's equation

E=mc² mean?

Einstein's special theory of relativity led to the world's most famous equation. E stands for the energy of an object at rest, m is the mass of the object and c is the velocity of light. So energy is equal to mass, times the speed of light squared.

Later this week: The second part of our quirky science Q&A. What really killed the dinosaurs? Why didn't Einstein wear socks? Which planet has the most moons?

Biggest, farthest, smallest, tallest ...

1 The world's biggest animal is the blue whale. Its tongue weighs more than two tonnes.

2 The tallest living thing is a redwood tree in northern California at more than 115m high.

3 Until last April the farthest known object in the universe was Abell 2218, a galaxy that would take you 13 billion years, travelling at the speed of light,

to reach. But you would need to travel for another 100 million years to get to Gamma-Ray Burst 090423, thought to be the place where a star died.

4 The smallest observed thing could be the sub-atomic particle called a quark. Three quarks make a proton and come in six types, or flavours - up, down, charm, strange, top and bottom.

Space is a vacuum, which is why it is true that in space no one can hear a scream



CLOSER LOOK: Science tries to explain why men have nipples, why we see, how candles burn and the colour of the sky.