

More atoms

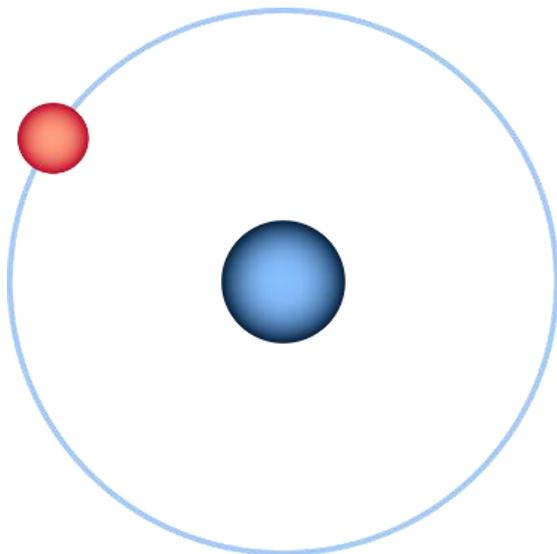
The world is made of tiny little things called atoms. Everything is made of atoms. There are at least 100 different sorts, but they have a lot in common.

All atoms have some lumpy bits in the middle [the middle is called the nucleus] and have some really tiny bits whizzing around the nucleus [these are called electrons]. An atom, with a nucleus in the middle and electrons whizzing around it, is a bit like the Sun with the planets whizzing around it.

An 'element' is a collection of atoms which are all the same. A hydrogen atom is different from a gold atom, which is different from a mercury atom, and so it goes on.

The simplest atom in the world is hydrogen. It has only one lump in the middle [the nucleus] and one little bit [electron] whizzing around.

Hydrogen



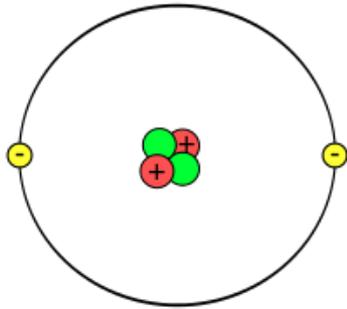
[Pixabay License Free for commercial use No attribution required
<https://pixabay.com/vectors/hydrogen-atom-electron-2750576/>]

Q: Why don't scientists trust atoms?

A: Because they make up everything.

Next comes helium. The helium atom has a bigger nucleus and two electrons going around outside.

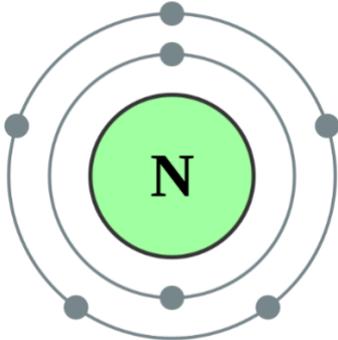
Helium



[Svdmolen/Jeanot (converted by King of Hearts)
<https://commons.wikimedia.org/wiki/File:Atom.svg>]

Now, the air is mostly made up of the element called nitrogen. The nitrogen atom has lots of stuff in the middle and going around the outside. It is much heavier than hydrogen or helium.

Nitrogen



[Author: Pumbaa (original work by Greg Robson). Many thanks
https://commons.wikimedia.org/wiki/File:Electron_shell_007_Nitrogen_-_no_label.svg]

More floating

[We spoke about floating in Chapter 26.]

So, hydrogen and helium are both lighter than nitrogen – and so they are going to float up in the air. We know that party balloons filled with helium float up in the air.

Now, about 100 years ago, there were ‘airships’. Some airships were called ‘zeppelins’ and some others were called ‘blimps’. They were

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big things that could carry lots of people over oceans. They were huge bags [balloons] filled with helium or hydrogen, which made them float up in the air.



You can see under the front of this one, a place where people could have seats and look out through the windows.

A problem was that hydrogen can explode and the airships full of hydrogen could easily explode and burn. This is a picture of an accident which happened in America – some passengers were killed.



Because of accidents, people stopped using these airships. They are not made anymore.

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We don't know whether this man is full of hydrogen or helium. What do you think? But, watch out, he might explode.

That footprint

In Chapter 24 we saw the first footprint on the Moon. It was made by Neil Armstrong in 1969. This chapter was written in 2019 – so that footprint was put there 50 years ago.

Would it still be there?

The answer is, yes! There is no air on the Moon, so there is no wind. There is no water on the Moon, so there is no rain. So, there is nothing to brush it away.

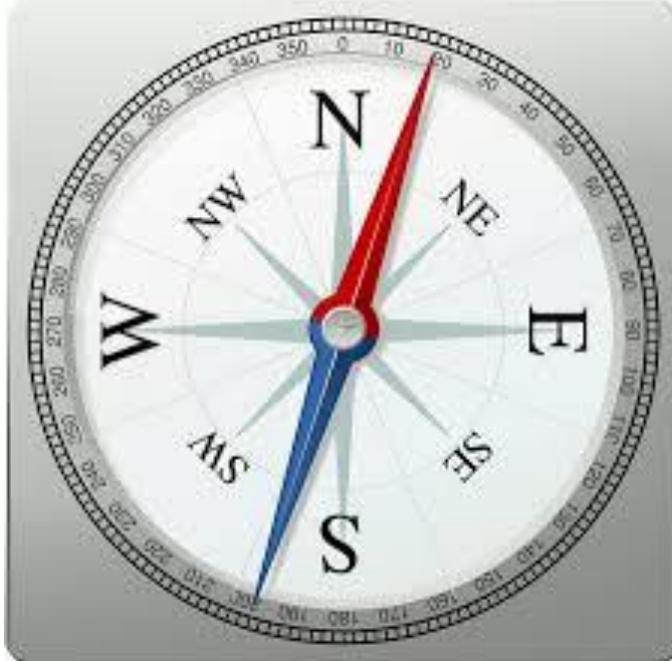
It is amazing – there is a footprint in powdery stuff, on the Moon, whizzing through space, and it just stays there, year after year.

Here is Neil Armstrong, arriving, just about to make that footprint.



A compass

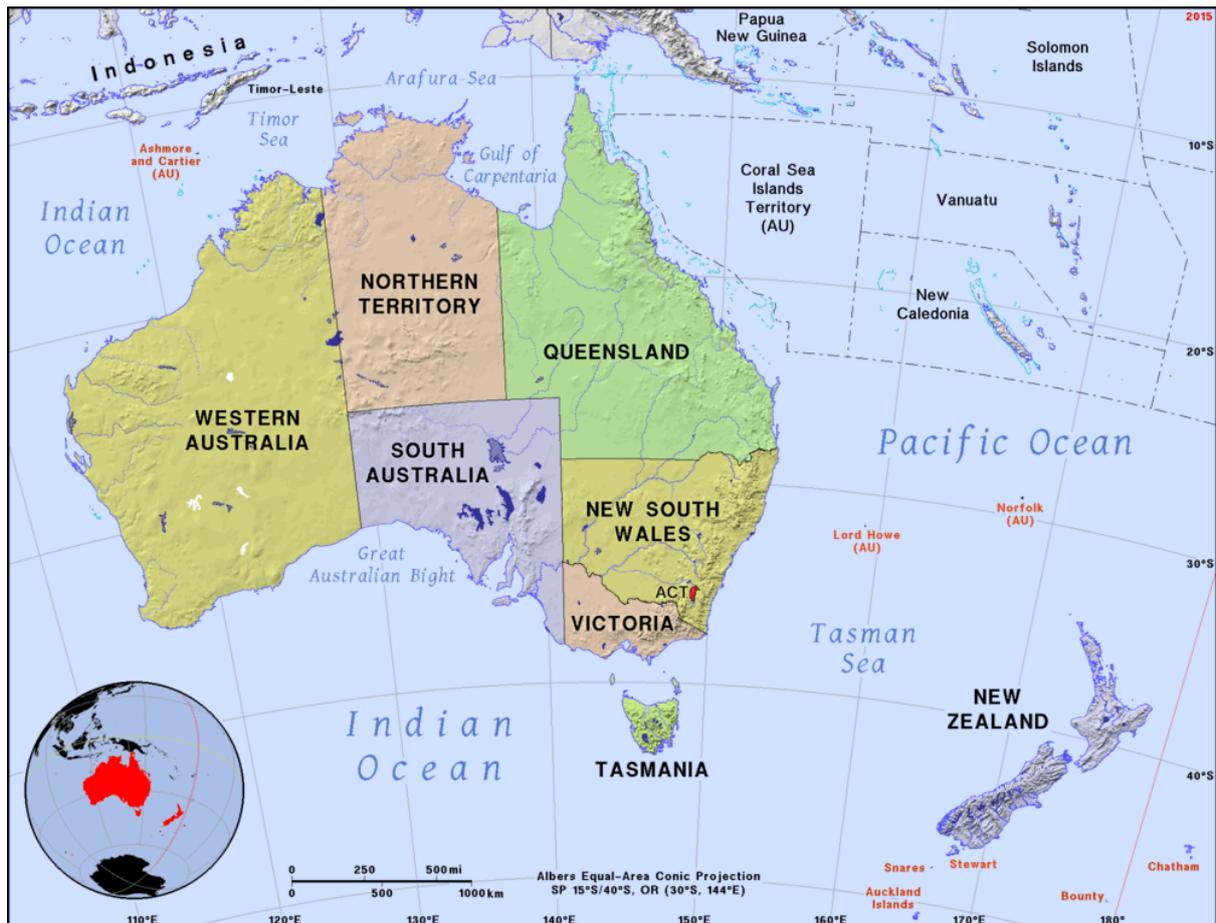
A compass is a thing to help you keep going in the right direction. It tells you where north is. Then you know where south is [because, south is in the opposite direction to north]. Then, right is east and going to the left is going to the west. OK, pretty simple.



[This bit is a bit hard – in Chapter 17 we learnt that the Earth has a magnetic field. The needle of the compass is a little ‘bar magnet’ which can move. This bar magnet needle lines up with the magnetic field of the Earth – so it always points in the direction of north.]

Now if you were in Tasmania – what direction would you go if you wanted to get to New Zealand?

The maps in books are always arranged so that north is at the top.



[Public domain maps of Australia and New Zealand.
<https://ian.macky.net/pat/map/aunz/aunz.html>]

This map shows that from Tasmania you would go to the right to get to New Zealand – and on the right of that compass there is an ‘E’. So, we would go to the east to get to New Zealand.

OK, if you were in Tasmania and you went north – which state of Australia would you come to first? Just go straight up – and you would come to Victoria.

OK, now this is a bit tricky. Can you see the state New South Wales? It is north of Victoria. Anyway, if you were in New South Wales, which direction would you go to get to the state of South Australia?

Well, South Australia is the purple state on the left of New South Wales. That means you would go west.

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[You would go west to get to a place called ‘South’ – that sounds a bit crazy – but, it makes sense when you think about it.]

Knock, knock.

Who’s there?

Stopwatch!

Stopwatch who?

Stopwatch you’re doing and open this door!

Q: What did the zero say to the eight?

A: Nice belt!

Q: What do you call a smart group of trees?

A: A brainforest.

Knock, knock.

Who’s there?

Spell.

Spell who?

Okay, okay: W. H. O.



[Darius Krause

<https://www.pexels.com/photo/brown-cat-in-selective-focus-photography-2305947/>]