timefornano

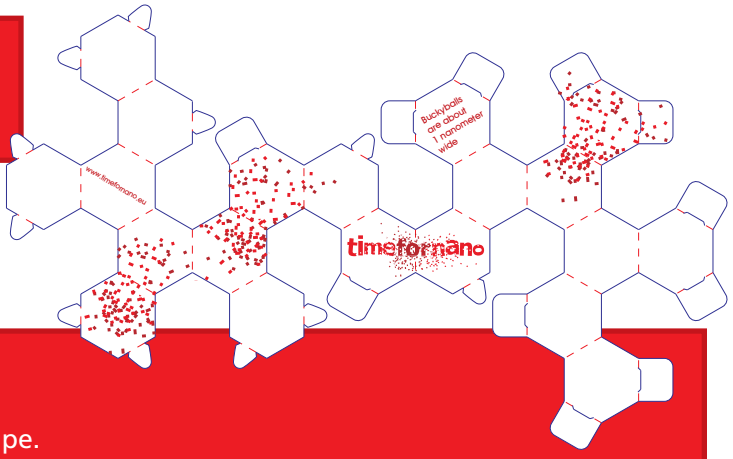
4

from 8 years

buckyball

You will need

- Pre-cut buckyball template



What you can do

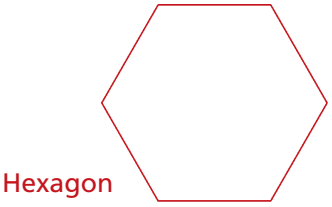
- Take the pre-cut paper shape.
- Fold it along the scored lines to make a model of a tiny, nanoscale molecule.
- Insert the tabs into the slots to hold it together.

What does your model look like?

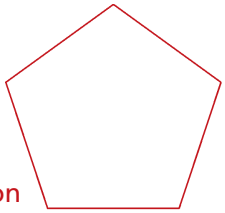
How many pentagons and hexagons can you count?

How many corners (which represent atoms of carbon) can you count?

Your model represents a buckyball that is just 1 nm across - can you think what buckyballs might be used for?



Hexagon



Pentagon

What's happening?

You have just made a model of a buckyball, a tiny football-shaped molecule made of 60 **carbon atoms** arranged in 20 regular hexagons and 12 regular pentagons. Buckyballs are only one **nanometre** in diameter!

Buckyballs were the first member of the 'fullerene' family to be discovered. Other famous members of this family are carbon nanotubes; long, hollow tubes made of carbon atoms. Fullerenes have special properties due to the way their carbon atoms are arranged.

Buckyball's hollow structure might make them useful for delivering medicine in the future.

Carbon nanotubes are very strong and light. They can be used to reinforce materials such as textiles or concrete, or strengthen sports equipment like tennis rackets. They can also conduct electric current. Researchers are studying ways to use carbon nanotubes in electronics, fuel cells and other applications.

To find out more

- http://www.science.org.au/nova/024/024key.htm
- http://mrsec.wisc.edu/Edetc/nanoquest/carbon/
- http://mrsec.wisc.edu/Edetc/IPSE/educators/carbon.html

What does it mean?

An **atom** is the smallest component of matter. Chemical elements (for example iron, carbon or oxygen) are made up of a single type of atom, whereas chemical compounds are made of two or more different types of atom. There are more than a hundred different elements, and 94 of them occur naturally on Earth.

Carbon is a naturally abundant element that occurs in many compounds.

The **fullerenes** are a family of cage-like molecules composed entirely of carbon atoms arranged in hexagonal and pentagonal shapes.

A **molecule** is a group of several atoms held together through very strong chemical bonds.

A **nanometre** is a billionth of a metre (0.000 000 001 m).

Carbon nanotubes are hollow tubes made of carbon. They are very strong and light and are used in some sport equipments.