contain their own oxygen. This means the fuels inside them can catch fire very easily – sometimes just by knocking them!

What happens inside a sparkler?

- A fuel burns in oxygen.
 This gives out heat energy.
- Tiny flakes of magnesium, iron or aluminium catch fire. We see shimmering sparks.

magnesium + oxygen

 \rightarrow

magnesium oxide

reactants

product

Where does a sparkler get its oxygen?

There is not enough oxygen in the air for a sparkler's burning reactions, so it supplies its own oxygen. A sparkler contains a compound like potassium nitrate (KNO₃) that has oxygen joined to other elements.

The compound decomposes and gives out oxygen gas when it gets hot.

What's inside a firecracker?

A firecracker is a paper tube packed with gun-powder, and a fuse. Gunpowder is a

- mixture of: A fuel (the 2 elements carbon and sulphur)
 - A source of oxygen (the compound potassium nitrate).

How does a firecracker explode?

- The fuse burns and gives heat energy to the gunpowder
- The fuel ignites and the firecracker explodes.

carbon+ oxygen sulphur + oxygen

 \Rightarrow

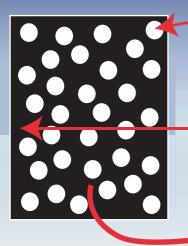
carbon dioxide sulphur dioxide

reactants

products

What happens inside an aerial firework?

Fuse



Sparkler chemicals ('stars')

Gunpowder

- The fuse burns and gives heat energy to the gunpowder.
- The gunpowder catches fire and the shell explodes.
- The 'stars' ignite and make bright showers of sparks.

Making your model Firework

- Use the information to write and draw on each section.
- Cut the body. Roll and stick it as a tube.
- Cut the head.Roll and stick it as a cone.

- Fold the chemical strip lengthways.
 Attach it to the cone head and put it through the body.
- Attach the streamers to the base of the body.

Chemical Strip

Choose **one** reaction that happens in a firework. Write the **reactants** in the box below.

Write the **product(s)** for the same reaction in the box below. Link the reactants and products with an arrow so you have an equation.

BODY Say why fireworks are so dangerous. Cover the rest of the body in safety warnings.

HEAD Show the energy transfers that happen in a firework



An interesting fact about sparklers is ...

An interesting fact about firecrackers is ...

An interesting fact about aerial fireworks is ...