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Opening extract from

Stuff You Should Know

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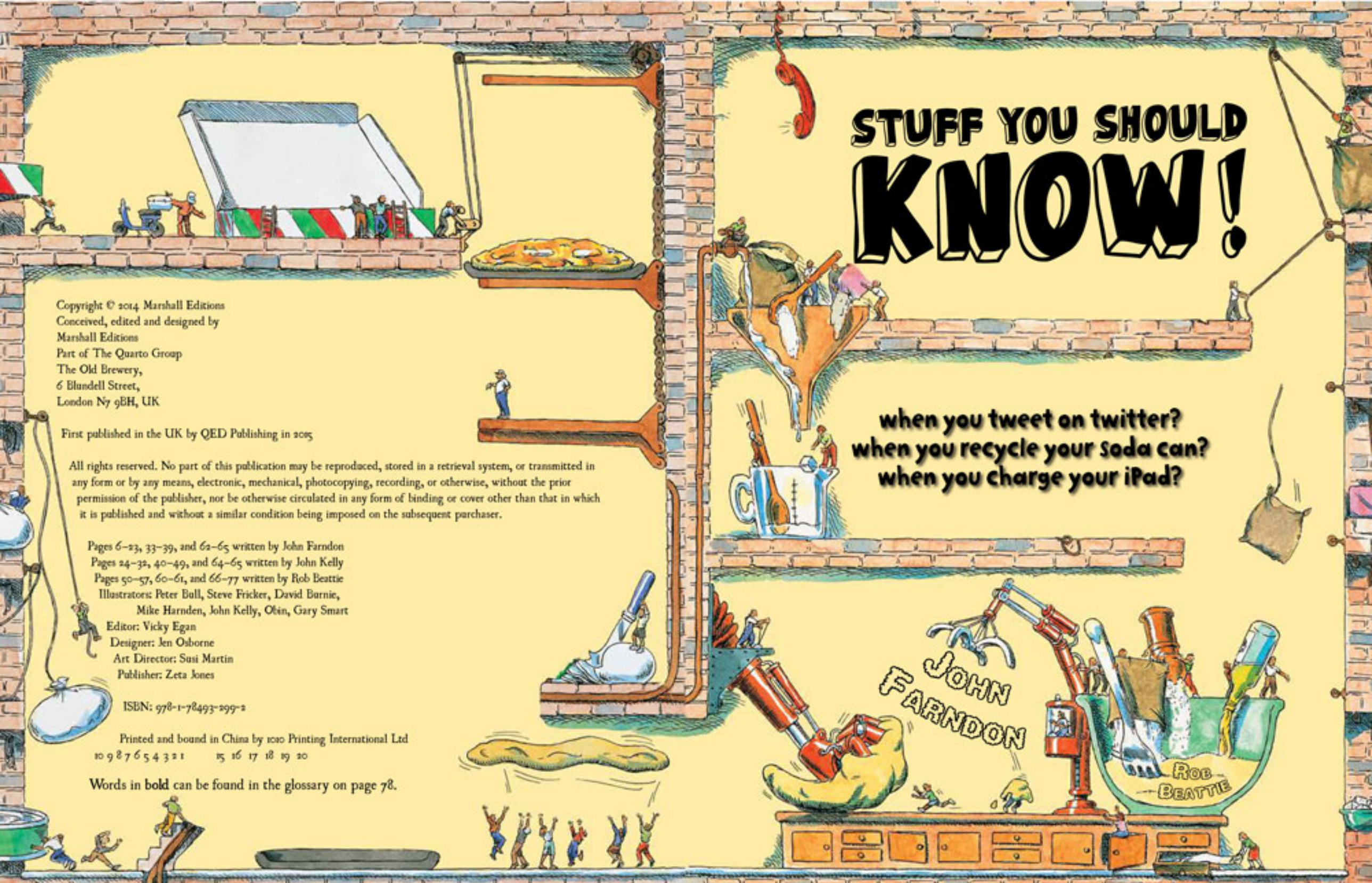
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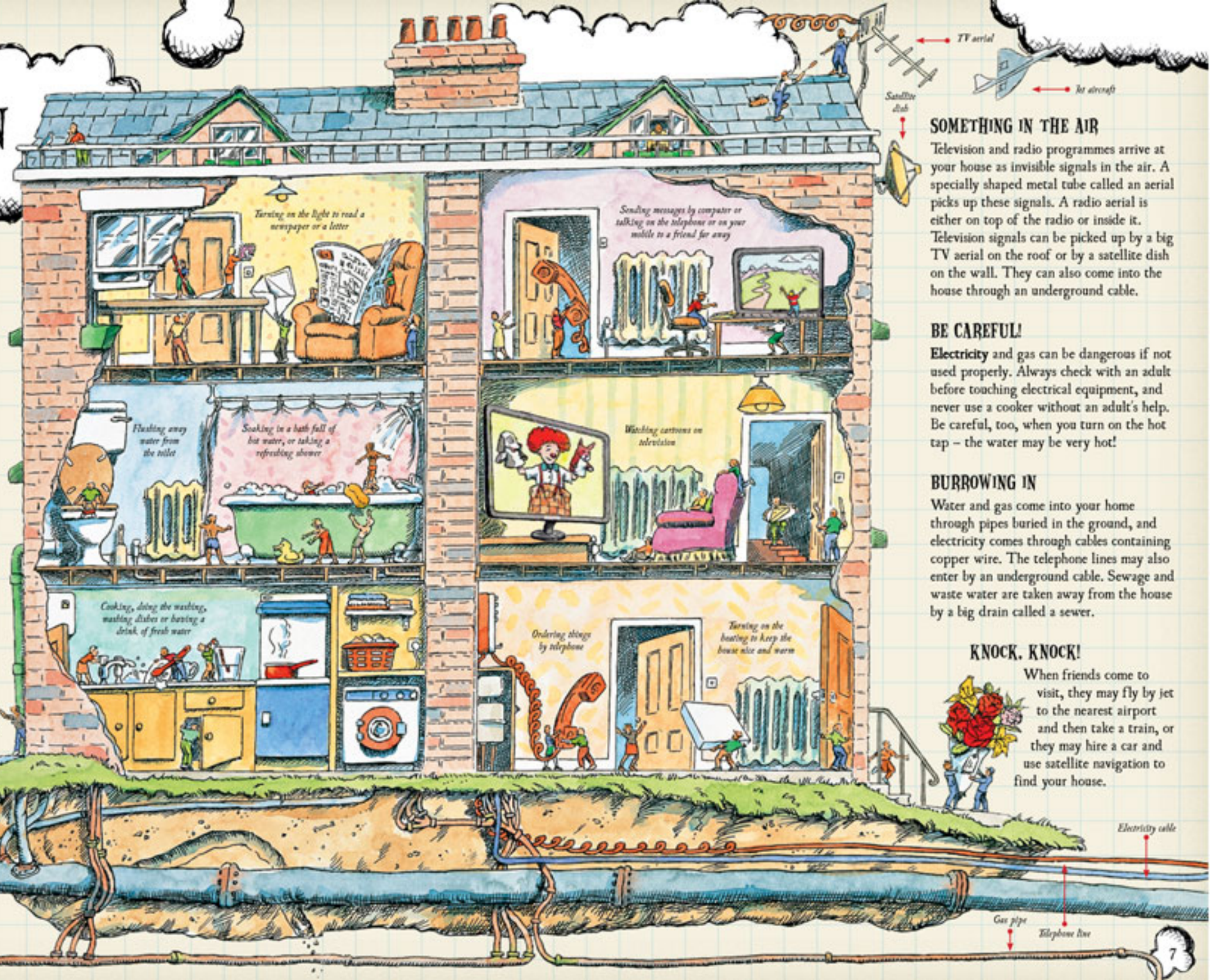
Words in **bold** can be found in the glossary on page 78.

INTRODUCTION

Two hundred years ago, if you wanted light, water or food in your home, you had to go and get it and carry it in yourself – unless you had servants to fetch it for you! Nowadays, you just flick a switch for light, turn on a tap for water and pick up your phone to get food delivered. It all seems so easy!

In this house, you can see some of the things that we often take for granted in our homes. But just how do they work? That's what the little people in this book will show you.

Words that need further explanation are in **bold** and can be found on pages 78–79.



SOMETHING IN THE AIR

Television and radio programmes arrive at your house as invisible signals in the air. A specially shaped metal tube called an aerial picks up these signals. A radio aerial is either on top of the radio or inside it. Television signals can be picked up by a big TV aerial on the roof or by a satellite dish on the wall. They can also come into the house through an underground cable.

BE CAREFUL!

Electricity and gas can be dangerous if not used properly. Always check with an adult before touching electrical equipment, and never use a cooker without an adult's help. Be careful, too, when you turn on the hot tap – the water may be very hot!

BURROWING IN

Water and gas come into your home through pipes buried in the ground, and electricity comes through cables containing copper wire. The telephone lines may also enter by an underground cable. Sewage and waste water are taken away from the house by a big drain called a sewer.

KNOCK, KNOCK!

When friends come to visit, they may fly by jet to the nearest airport and then take a train, or they may hire a car and use satellite navigation to find your house.

ELECTRICITY

When you turn on a lamp, an amazing invisible energy called electricity makes the lamp glow with light. Electricity is made, or generated, in a power station. But how does it get from the power station to the lamp in your house?

1 GETTING TO STEAM

Power stations burn coal, oil, gas or **nuclear fuel** to boil water into steam. The steam rushes along pipes and hits the blades of a wheel called a **turbine**, whirling it around fast. In **hydroelectric stations**, water rushing down from a dam spins the turbine.

2 GOING FOR A SPIN

As the turbine spins, it turns a coil of copper wire between the poles of a huge **magnet**. This is a **generator**.

3 MAKING CURRENTS

The magnet's power drags tiny energy bundles, called **electrons**, through the wire. The electrons form a flow of electricity called an electric **current**.

4 RAISING THE CURRENT

The current from the power station is too weak to reach your house. Its strength is raised, or stepped up, by sending it through an iron ring called a **transformer**.

5 SAFETY FIRST

The strong, stepped-up current is dangerous. It is carried in huge cables buried safely underground or strung between tall pylons.

6 TRANSFORMING THE CURRENT

A powerful current is needed to send electricity over long distances. When the electricity reaches your town, the current is reduced, or stepped down, by another transformer.

7 TAKE YOUR SHARE

The stepped-down current is then fed into cables called electric **mains**, which run beneath the streets. Other cables branch off from the mains and go into every house, factory or office. They deliver the electricity to wherever it is needed.

8 SAFETY WIRE

Inside your home, a **meter** measures how much electricity you use. You'll also find a row of **fuses** – thin wires that melt if the current reaches dangerous levels. This stops the current from flowing.

9 PLUGGING INTO POWER

Electricity flows around your house through wires called ring mains, which are hidden under the floor or in the wall. Sockets let you tap into the electricity in the ring main. When you plug your lamp into the socket and turn it on – zap! – instant power!

GAS

The gas used by gas cookers and central heating systems is not just any old gas. It is called natural gas, because it forms naturally under the ground. Natural gas is very flammable, which means that it bursts into flame easily. So how does this dangerous gas get safely to your home?

1 LOOKING FOR GAS

You can tell if a tin can is full by listening to the sound it makes when you tap it. Geologists find gas in a similar way. They make explosions underwater, and then listen to the vibrations that travel through the rocks under the ocean floor. This tells them if any gas is trapped in hollows in the rock.

2 OLD BONES

Gas forms from the bones and shells of dead sea creatures buried under layers of sand, mud and rock. Over millions of years, the massive weight of the sand, mud and rock changes the bones and shells into natural gas.

3 TIME TO DRILL

When gas is found, a huge platform is built above the rock where the gas is trapped. A giant drill tunnels into the ocean floor and taps into the gas pocket. The gas is then pumped ashore through pipes, and is cleaned.

4 AT THE CLEANERS

Once on shore, the gas is sent to an extraction unit. Here, it is filtered to remove unwanted dust, sulphur and water.

5 MAKING THE GAS PURE

Squeezing and cooling the gas turns it into a liquid. As it warms up, it turns back into a gas and separates from its impurities, which remain liquid.

6 WHAT'S THAT SMELL?

Natural gas has no smell. A smell is added so you can detect gas leaks.

7 GO GAS

Now the pure gas (with added smell) is pumped through pipes at about 26 kilometres per hour. The gas may need to be sent long distances, so there are extra pumps, called compressor stations, along the way to keep it going.

8 GAS STORE

People use different amounts of gas from day to day and from season to season. Any gas that is not needed immediately is stored in tanks or pumped into giant underground caverns.

9 LIQUID SUPPLY

Natural gas is stored as a liquid, because this takes up less space. To change it into a liquid, the gas is squeezed and cooled.

10 BURN IT!

Finally, the gas is piped to your house. A meter records how much gas you burn as you heat the water, cook or run your gas central heating.

Geologists looking for gas
Gas platform
Drill
Cleaning the gas
Squeezing
Cooling
Squeezing the gas
Cooling the gas
Gas is released when needed
Compressor station
Hot-water boiler
Gas stove
Gas central heating
Gas meter
Pipes are put into the drill holes to suck out the gas