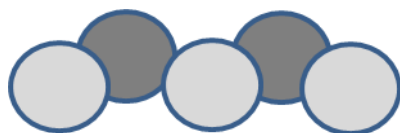


Task card 1

Aluminium is a metal that is found in the crust of the Earth. It is not found as pure aluminium, but as a compound, and therefore needs to be removed. The process that does this called **electrolysis**. Electrolysis uses an electrical current to separate the aluminium atoms from the oxygen atoms that it is joined to.

The symbol for aluminium oxide is Al_2O_3 , and it is represented in the diagram below.

Which of the circles represents aluminium, and which oxygen? How did you work your answer out?



Task card 2

Before the process of splitting the aluminium oxide compound can start, the ore has to be removed from the ground, mixed with another substance called cryolite and then heated to a temperature of $950\text{ }^\circ\text{C}$.

An electrical current is then passed through the substance which causes the aluminium oxide to chemically release the aluminium. This is then drained off and left to cool.

What energy stores and transfers are involved during the process of extracting the aluminium from the aluminium oxide?

Draw a flow chart to show this process, and at each stage suggest which energy stores and transfers are involved.

Task card 3

Although there is a lot of aluminium in the Earth's crust, it will become more difficult to find and eventually it will run out.

Aluminium is a light, shiny metal that is resistant to heat and corrosion. These properties make it very useful. Some examples of its uses include aeroplane parts, drink cans, foil, window frames, mirrors, building material, smartphones, tablets, and other electrical devices.

Choose three of the uses of aluminium and suggest alternative materials.

Consider the three suggestions that you have made above and list a disadvantage of using each of them.

Task card 4

Recycling aluminium has become more popular in recent years, especially recycling aluminium cans.

Let's look at how this is done; after putting an aluminium cans in the recycling bin, they are taken to the recycling facility where it is sorted. The aluminium is then sent to a special factory where it is shredded into smaller pieces and is melted. The molten aluminium is then poured into bars called ingots, which are then left to cool. The ingots are then sent to mills where they are heated and rolled out. The aluminium is now ready to be reused!

Produce a flow diagram to show how aluminium is recycled.

Where appropriate include the energy stores and transfers.

Teaching notes

This resource is most suitable to use with KS3 high achievers. No additional resources are required to run the activity.

The resource can be used in a variety of ways e.g. students working individually to complete two tasks or in pairs to complete three tasks.