



Lesson Ideas

Introduction

Below you will find a selection of curriculum-linked lesson ideas, written for primary and middle years students, on the topic of metal recovery and recycling.

Broad learning outcomes

Using this curriculum material will assist students in achieving the following broad learning outcomes:

- Students will investigate various metals and identify their elements and properties.
- Students will discover how Sims Metal processes used metals.
- Students will explore the environmental benefits of recovering and recycling metal products.
- Students will learn about the history of Sims Metal (an Australian business success story).

Science

- Students to investigate the properties of several common metals. They can record their information on the **'What's in the metal?'** worksheet.
- Students to use magnets to test if various metals are ferrous or non-ferrous.
- Students to select a metal and investigate its origins, including:
 - Where do the raw materials come from?
 - How are they formed?
 - How are they extracted?
 - In which parts of the world do they occur?
 - How is the mining process managed in order to protect the environment and preserve the natural resources?



- Students to investigate changes that can happen to metal. For example:
 - What happens when the metal is heated or cooled?
 - How can reversible changes be used to recycle materials?
 - How does rust effect various metals? Can this be prevented or reversed?
- Students to find a copy of the periodic table and identify which of the elements are metal.
- Some metals (such as gold, platinum or silver) are considered precious. Students to investigate why this is (hint: it relates to the way these metals react with oxygen). Make a list of items that are made from precious metals.
- Students to complete the '**Metal recycling brainstorm**' worksheet to record their thinking and learning.

Maths

- Students to complete the calculations on the '**Emissions reduction**' worksheet to explore how metal recycling helps to reduce carbon emissions.

Technologies

- Students to find out how eddy currents, trommels and air systems are used to separate materials in the metal management process. Create an annotated flow chart to explain the process.
- Students to design their own sorting and separating machine. They will consider what technologies they will use to separate various materials (e.g. metal, plastic, glass, fabric etc.) from each other and what they will do with those materials once sorted. The designs can be realistic or creative.
- With a partner, students brainstorm all the different machinery involved in the process of metal recycling.
- Students to brainstorm as many uses for a particular metal as they can in 10 minutes. Create a list adding every possible idea. Keep adding to the list!



Humanities and Social Sciences

- Students to demonstrate their understanding of the 'circular economy' by completing the **'Recover and recycle'** worksheet.
- Students to conduct a recover and recycle audit of their school or home. What types of materials/products could they reuse or recycle, rather than send to landfill? Highlight the materials/products that contain metal.
- Students to conduct an internet search to discover what countries are the biggest producers of iron ore.
- Research to discover more about Albert G. Sims and/or Sims Metal and write a profile of the founder or the business.
- Starting from 1917, create a timeline of the history of Sims Metal. Students can find information at www.simsmm.com.au
- Sims Metal has more than 250 facilities in over 20 countries. On a world map, mark the countries in which these facilities are located.

English

- Students to create a glossary of terms as they learn about metals. They can use the **'Metal terminology'** worksheet.
- Students to read the 'Sims Metal – what we do' fact sheet (found at www.kesab.asn.au/simsmm) then answer the questions on the **'Sims Metal – what do they do?'** worksheet.
- Students to use their creative writing skills to tell the story of a metal object going through the process of recycling.
- Students to research and then prepare a presentation about an interesting metal recycling statistic or fact.