

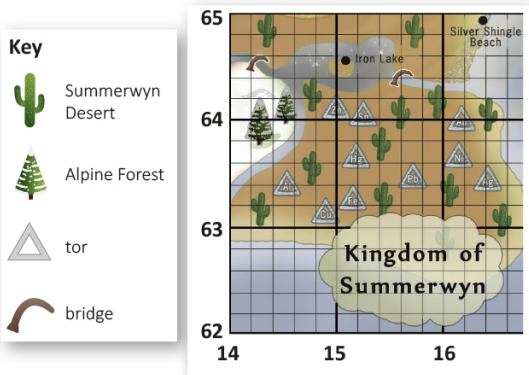
# Alchemy Island

## What is alchemy?

Alchemy is an ancient study of how to turn basic metals into gold. Alchemists used metals, salts, acids and many other chemicals in their attempts to make gold. They also tried to create potions that would cure all diseases and allow people to live forever. This was all in a time before people understood science as well as they do today.

## Maps and coordinates

Maps have been used for thousands of years to help people find their way around unfamiliar areas. Coordinates are used to pinpoint a specific location on a map and are usually written in brackets. The coordinates (156,644) show the position of the bridge on the map below. The first three numbers refer to the position along the x-axis of the map, and the second gives the location along the y-axis. Symbols on the map show particular features of the area. Maps have a key that lists the symbols and what each of them represents.



## Properties of materials

The properties of a material refer to its appearance, behaviour and structure, for example, whether it is hard or soft, rigid or flexible. There are a variety of ways the properties of materials can be tested.

| Property              | Test                                                                                                                                                                                                        |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hardness              | Squeeze the material between two fingers. If the material squashes, it is soft.                                                                                                                             |
| magnetism             | Test the material with a magnet. If the material is attracted towards it, it is magnetic.                                                                                                                   |
| transparency          | Shine a torch through a sample. If all the light shines through the material, it is transparent. If some of the light shines through, it is translucent. If none of the light shines through, it is opaque. |
| electrical conduction | Add the material to a simple series circuit containing a lamp and battery. If the lamp lights up, the material is an electrical conductor.                                                                  |
| thermal conduction    | Warm the material between two hands and place on thermochromic sheet, which changes colour when it is heated. If the sheet changes colour, the material is a thermal (heat) conductor.                      |

## Metals

A metal is a solid material that conducts heat and electricity and that is often hard, strong and shiny. The properties of a metal determine its uses. Electrical wiring, for example, is made from copper because it is a very good conductor of electricity. Precious metals, such as gold and silver, are expensive and decorative so they are used to make jewellery.

| Metal                                                                                                  | Properties                                                                                | Uses                                                          |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------|
|  <b>gold (Au)</b>   | shiny yellow, malleable, non-magnetic, good conductor of electricity and heat             | jewellery, wire, money, tooth fillings, electrical components |
|  <b>silver (Ag)</b> | shiny, malleable, non-magnetic, excellent conductor of electricity and heat               | jewellery, mirrors, cutlery, ornaments, money                 |
|  <b>iron (Fe)</b>   | dull, strong, malleable, magnetic, good conductor of electricity and heat, rusts easily   | bridges, railings, machinery, steel production                |
|  <b>copper (Cu)</b> | shiny reddish-brown, malleable, non-magnetic, excellent conductor of electricity and heat | wiring, motors, coins, piping                                 |

### Gold

Gold is a very precious metal that has been valued since ancient times. Gold is a shiny, yellow colour, it doesn't tarnish, it is easily shaped and it conducts electricity, so it is used to make decorative objects, jewellery, coins and electrical components in computers and mobile phones. Gold is found around the world and is usually mined from the Earth's crust. However, tiny flakes can also be found in rivers and streams and removed using a sieve called a pan.

### Gold timeline

|           |                                                                                                                                            |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 3000 BC   | Ancient Egyptians use gold to make jewellery, statues and death masks.                                                                     |
| 2000 BC   | Gold is first used to replace teeth in ancient China.                                                                                      |
| 800 BC    | Ancient Greeks prize gold and make it into jewellery, statues and coins.                                                                   |
| 1300      | Hallmarks, stamps that prove a precious metal is pure, are used for the first time by the Goldsmiths' Company, London.                     |
| 1370–1420 | European gold mines are emptied.                                                                                                           |
| 1500      | Spanish fortune hunters called conquistadors conquer South America in search of gold.                                                      |
| 1800      | Thousands of people move to areas of Australia and America where nuggets of gold have been found. These events are known as 'gold rushes'. |
| 1961      | Gold is used on the first manned space flight to protect instruments from radiation.                                                       |
| 2015      | Investors are able to buy gold coins and bars directly from the Royal Mint, London.                                                        |

### Fantasy

Fantasy is a type of story that involves magical people or beings who live in strange or unusual places. It often centres on mythical or supernatural beings, such as talking animals or witches and wizards.

### The Tempest

In the fantasy play *The Tempest* by William Shakespeare, survivors of a shipwreck land on an island, where the magician Prospero, his daughter Miranda and his servants live. Some of the characters plot against Prospero, some plot against each other and some fall in love. Prospero uses his magic to control the characters but at the end of the play, he gives permission for his daughter to get married, forgives his enemies and loses his magical powers. Prospero delivers a soliloquy to finish the play.



A scene from *The Tempest* by William Shakespeare

### Prospero's soliloquy

A soliloquy is a speech where a character talks out loud to oneself, so the audience knows what they are thinking. This quote from Prospero's soliloquy explains that he has lost his magical powers and is now an ordinary man:

*Now my charms are all o'erthrown,  
And what strength I have's mine own*

Prospero wants to leave the island and take up his role of the Duke of Milan again so he asks the audience to set him free with their applause:

*But release me from my bands  
With the help of your good hands.*

### Glossary

|              |                                                                                   |
|--------------|-----------------------------------------------------------------------------------|
| conductor    | A substance that allows electricity or heat to flow through it.                   |
| durable      | Lasting a long time, without wearing out or becoming damaged.                     |
| fantasy      | Something imagined that is very different from real life.                         |
| malleable    | A material that is easily changed into a new shape.                               |
| mythical     | Imaginary or not real, especially in stories.                                     |
| potion       | A liquid or substance that is believed to cure illness or have a magical effect.  |
| precious     | Rare, important or valuable.                                                      |
| property     | The way a material behaves, looks and is structured.                              |
| sieve        | To remove large solids from a liquid.                                             |
| supernatural | Forces that cannot be explained by science.                                       |
| thermal      | Relating to heat. For example, a thermal conductor will let heat flow through it. |
| x-axis       | The horizontal axis on a map or graph.                                            |
| y-axis       | The vertical axis on a map or graph.                                              |