Metals

Metals make up over three-quarters of the elements found naturally on Earth, and vary dramatically in appearance and behavior. However, there are key properties that most metals share.

Properties of metals

Metals are crystalline substances, so they tend to be hard, shiny, and good conductors of electricity and heat. They are dense, with high melting and boiling points, but are easily shaped by a variety of methods. But some metals buck the trend. Mercury is liquid at room temperature because its outer electrons are very stable, so it does not tend to bond to other atoms.

RUST

Many metals are highly reactive, particularly the group 1 metals (see pp.34–35). Most metals form oxides when they combine with oxygen. For example, iron forms iron oxide, also known as rust, when exposed to the oxygen in the air or water.

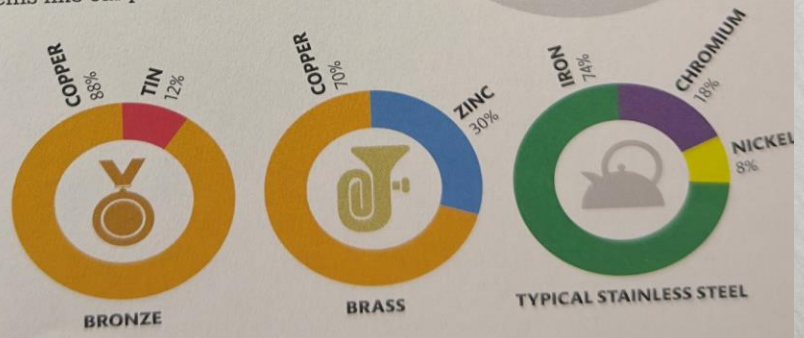
Alloys

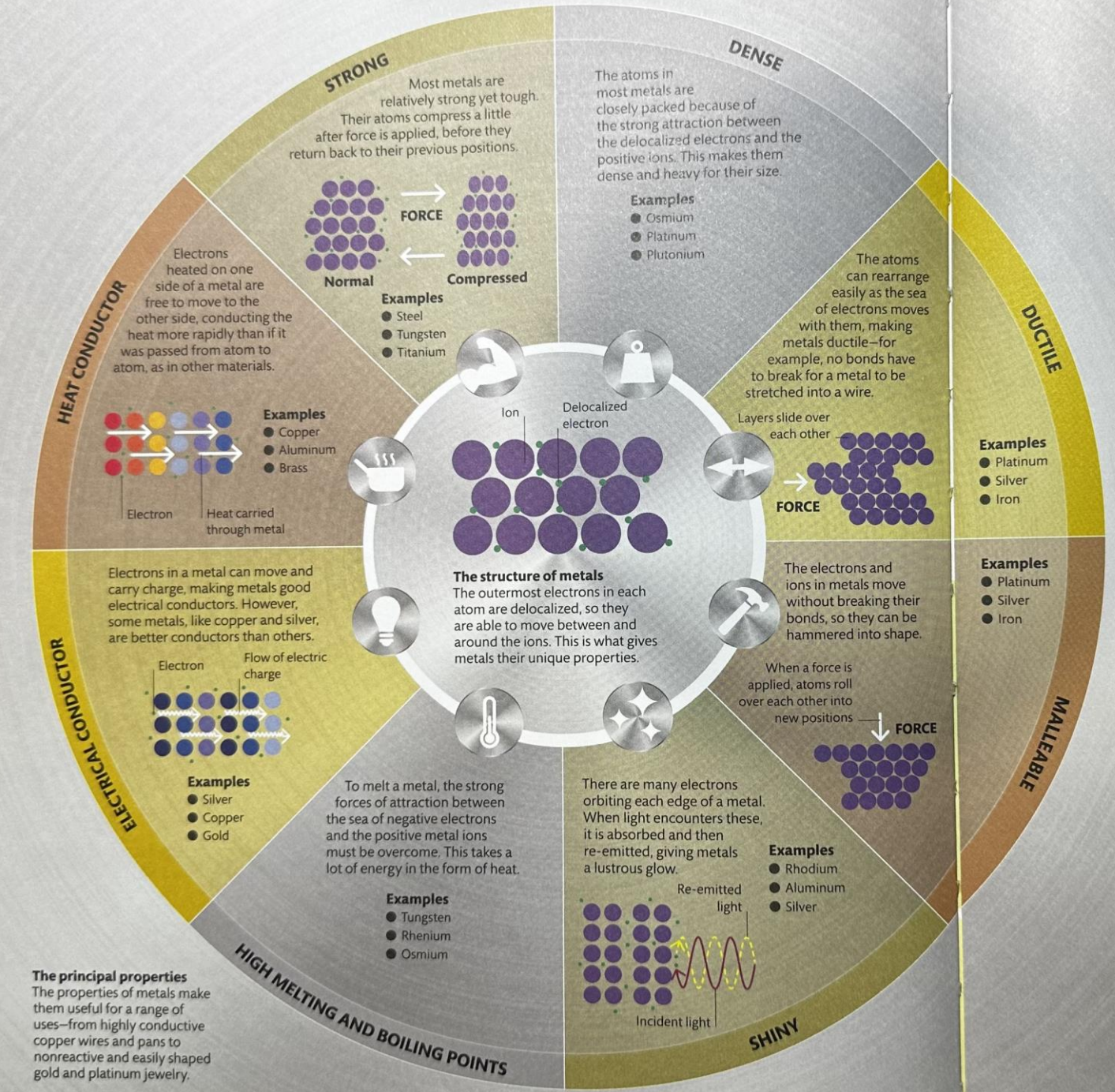
Most pure metals are too soft, brittle, or reactive for practical use. Combining metals or mixing metals with nonmetals forms alloys, often with improved properties. Varying the ratios and types of metals changes the properties of alloys. One common alloy is steel—a mixture of iron, carbon, and other elements. Adding more carbon makes harder steel, which is good for building. Adding chromium creates corrosion-resistant stainless steel. Other elements can also be included to increase heat resistance, durability, or toughness for use in items like car parts or drills.

IS AN OLYMPIC GOLD MEDAL ACTUALLY GOLD?

Only 92.5 percent of a gold medal is actually gold. The last solid gold Olympic gold medal was awarded in 1912.

Alloy composition
Copper forms two common alloys: bronze (tin is added to increase its hardness) and brass (zinc improves the alloy's malleability and durability). Stainless steel, another common alloy, varies in composition.





The principal properties
The properties of metals make them useful for a range of uses—from highly conductive copper wires and pans to nonreactive and easily shaped gold and platinum jewelry.