Physical properties describe how matter looks and feels.

physical property: any feature of matter that can be observed or measured without changing the type of matter it is

All matter can be described by its **physical properties**. Physical properties are features of matter that can be observed or measured without changing the type of matter that something is. **Table 2.2** lists some physical properties that are often used to describe matter.

Table 2.2 Examples of Physical Properties Used To Describe Matter

Physical Property	What is it?	Examples
	**Conductivity** describes how well a substance lets heat or electrical current move through it. Metals tend to be good conductors, and non-metals tend to be poor conductors.	• Copper is used to make electrical wires, because it is a good conductor of electrical current. • One reason glass is good to make windows is that it does not conduct heat very well.
	**Density** describes how compact a substance is, and is calculated by dividing its mass by its volume.	• Ice (solid water) floats on liquid water, because ice is less dense than liquid water. • Iron sinks in liquid water because iron is more dense than liquid water.
	**Lustre** describes how well the surface of a substance reflects light.	• Many people are attracted to lustrous metals such as silver, gold, and chrome because they are shiny.
	**Solubility** describes how much of a substance dissolves in another substance.	• Salt crystals dissolve in water to form the mixture salt water.
	**Texture** describes how the surface of a substance feels (its roughness, softness, or smoothness).	• Window glass has a smooth texture. • Brick has a rough texture.

conductivity: describes how well a substance lets heat or electrical current move through it

density: describes how compact a substance is, and is calculated by dividing mass by volume

lustre: describes how well the surface of a substance reflects light

solubility: describes how much of a substance dissolves in another substance.

texture: describes how the surface of a substance feels (its roughness, softness, or smoothness)

Distinguishing Metals and Non-metals

One way that elements can be classified is to group them into two categories: metals and non-metals. **Metals** are elements that share physical properties such as these. (Refer also to Table 2.2.)

- lustre
- malleability (ability to be bent or hammered without breaking)
- ductility (ability to be stretched into a wire without snapping)
- good conductors

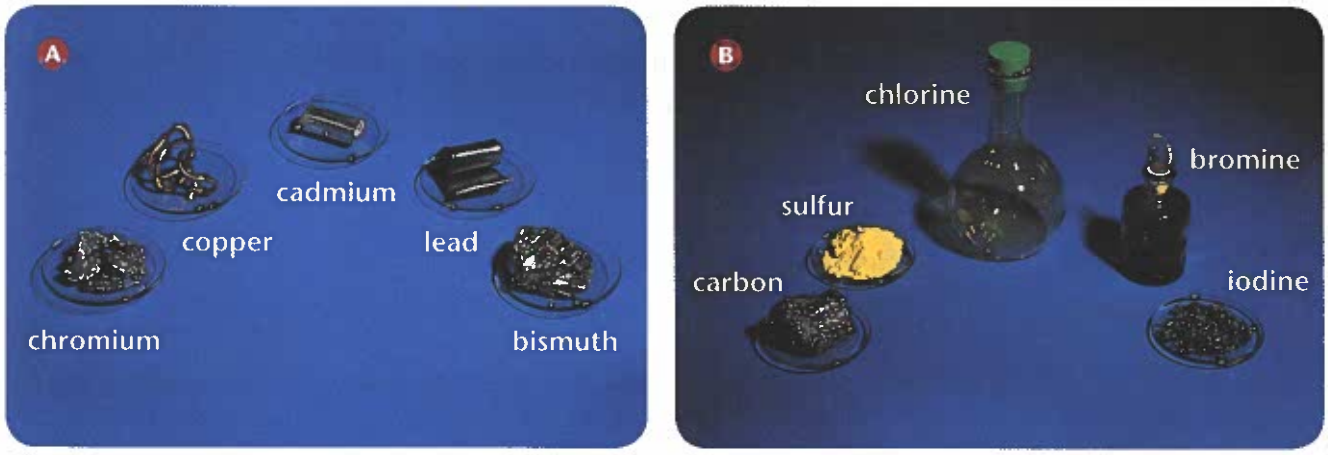
Non-metals are grouped together because they do not share the properties of metals. Table 2.4 compares the properties that help in classifying metals and non-metals. Figure 2.6 shows some examples of metals and non-metals.

metals: elements that are commonly solid at room temperature, shiny, malleable, ductile, and good conductors

non-metals: elements that can be solid, liquid, or gas at room temperature, dull, brittle, not ductile, and poor conductors

Table 2.4 Properties That Help To Distinguish Metals from Non-metals

Substance	State at room temperature	Lustre	Conductivity	Malleability	Ductility
Metals	solid (except mercury, which is liquid)	shiny (lustrous)	good conductors	malleable	ductile
Non-metals	solid, liquid, or gas	dull (not lustrous)	poor conductors	not malleable (brittle)	not ductile



▲ Figure 2.6 Samples of metals (A) and non-metals (B)

LEARNING CHECK

1. Refer to Figure 2.6. What properties do the metals have in common, and which are different? What properties do the non-metals have in common, and which are different?
2. Make a t-chart to summarize the properties of metals and non-metals.

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