

Physical Change

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CHAPTER

1

Physical Change

- Define physical change, and give examples of physical change.
- Explain how physical changes can be reversed.



These stunning rock arches in Utah were carved by wind-blown sand. Repeated scouring by the sand wore away the rock, bit by tiny bit, like sandpaper on wood. The bits of rock worn away by the sand still contain the same minerals as they did when they were part of the large rock. They have not changed chemically in any way. Only the size and shape of the rock have changed, from a single large rock to millions of tiny bits of rock. Changes in size and shape are physical changes in matter.

What Is a Physical Change?

A **physical change** is a change in one or more physical properties of matter without any change in chemical properties. In other words, matter doesn't change into a different substance in a physical change. Examples of physical change include changes in the size or shape of matter. Changes of state—for example, from solid to liquid or from liquid to gas—are also physical changes. Some of the processes that cause physical changes include cutting, bending, dissolving, freezing, boiling, and melting. Four examples of physical change are pictured in the **Figure 1.1**.



MEDIA

Click image to the left or use the URL below.

URL: <https://www.ck12.org/flx/render/embeddedobject/54899>

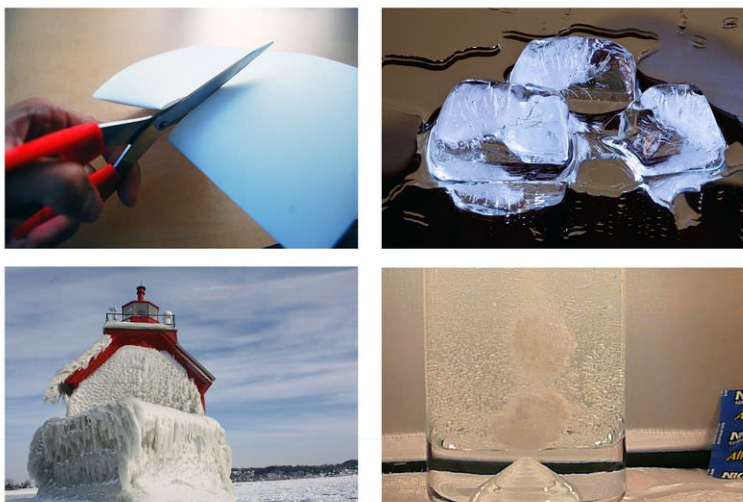


FIGURE 1.1

Q: In the **Figure 1.1**, what physical changes are occurring?

A: The paper is being cut into smaller pieces, which is changing its size and shape. The ice cubes are turning into a puddle of liquid water because they are melting. This is a change of state. The tablet is disappearing in the glass of water because it is dissolving into particles that are too small to see. The lighthouse is becoming coated with ice as ocean spray freezes on its surface. This is another change of state.

Reversing Physical Changes

When matter undergoes physical change, it doesn't become a different substance. Therefore, physical changes are often easy to reverse. For example, when liquid water freezes to form ice, it can be changed back to liquid water by heating and melting the ice.

Q: Salt dissolving in water is a physical change. How could this change be reversed?

A: The salt water could be boiled until the water evaporates, leaving behind the salt. Water vapor from the boiling water could be captured and cooled. The water vapor would condense and change back to liquid water.

Summary

- A physical change in matter is a change in one or more of matter's physical properties. In a physical change, matter may change its size, shape, or state, but its chemical properties do not change.
- Because the chemical properties of matter remain the same in a physical change, a physical change is often easy to reverse.

Review

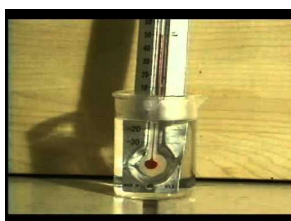
1. Define physical change.
2. What are some examples of physical change?
3. The wood in the **Figure 1.2** is being cut with a chainsaw. Is this a physical change? Why or why not?



FIGURE 1.2

Explore More

Watch the video about physical changes at the following URL. Then answer the questions below.



MEDIA

Click image to the left or use the URL below.

URL: <https://www.ck12.org/flx/render/embeddedobject/54900>

1. Describe an example of temperature causing a change in the size of matter.
2. How is temperature related to changes in the state of matter?

References

1. Scissors: Robert Lopez; Ice cubes: Flickr: jar (); Lighthouse: Flickr: wsilver; Tablet: F Delventhal (Flickr: krossbow). [Paper being cut by scissors](#), [ice cube melting](#), [tablet dissolving in water](#), [lighthouse being coated in ice](#) . Scissors: CC BY-NC 3.0; Ice cubes: CC BY 2.0; Lighthouse: CC BY 2.0; Tablet: CC BY 2.0
2. Alex Murphy (Flickr: APM Alex). [Wood being cut by a chainsaw](#) . CC BY 2.0