

# 3 Material changes

## 3.1 Reversible and irreversible changes

### Reversible changes

*Words to learn*  
reversible  
irreversible



### Observing changes to ice

Place the ice cubes in the sun or other warm place for five minutes.

What has happened to the ice after five minutes?

What causes the ice to change?

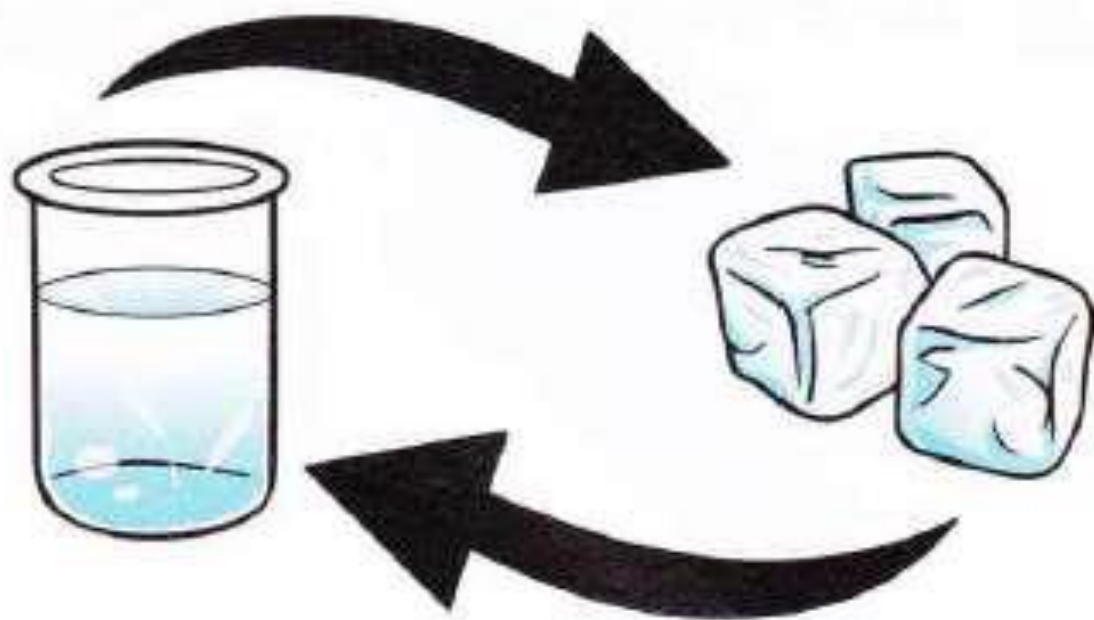
What will happen to the ice if you put it back in the freezer? Why?

### You will need:

ice cubes • saucer • watch



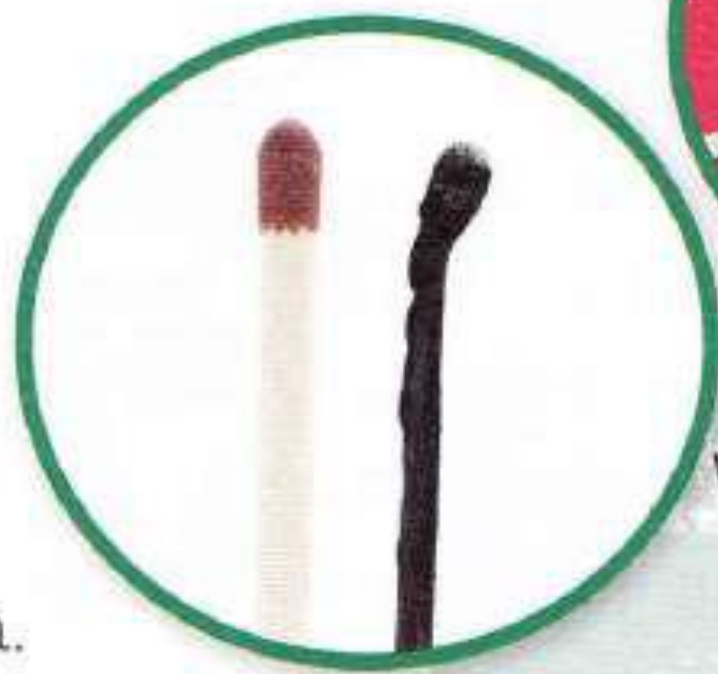
In a warm place the solid ice becomes liquid water. When you put the ice back in the freezer it becomes a solid again. We say that the changes are **reversible** because we can change solid ice back to liquid water and liquid water back to solid ice. Heat causes the ice to melt. When the water loses heat and cools it becomes solid again. This diagram shows phase changes between ice and water





## Irreversible changes

When some substances are heated, the changes cannot be reversed. We call these **irreversible** changes. Sometimes irreversible changes turn one substance into another substance. For example, when we burn a match the wood changes into a black substance called carbon.



What happens when we burn a match?  
Can the match change back to the way it was?

**1**

Say whether each of these changes is reversible or irreversible:

a melting butter in a hot pan \_\_\_\_\_

b baking a cake \_\_\_\_\_

c dissolving salt in water \_\_\_\_\_

d burning wood on a fire \_\_\_\_\_

e rusting on a tin can \_\_\_\_\_

## ***What you have learnt***

- ⑤ Heat makes substances change.
- ⑤ Some changes are reversible, for example, ice melting and refreezing.
- ⑤ Some changes are irreversible, for example, burning a match.
- ⑤ Some changes cause a new substance to form.