Name: _____ Date: _____

# How Glass Is Made

Circle group

Look around the room. You will likely see glass in a window, a cup, or a bottle. Glass seems new, but people have made it for thousands of years. Its main ingredient is something you can find at any beach. It is sand.

To make glass, workers mix sand with a few other things, such as soda ash and limestone. These help the sand melt at a lower heat. They also keep the glass strong. The mix goes into a furnace that is hotter than 2,500 degrees Fahrenheit. At that heat, the sand turns into a glowing, thick liquid.

Soft glass can be shaped. A glassblower picks up a blob of it on the end of a long metal tube. Then the glassblower blows gently into the tube to make a bubble. Factories use machines to press or blow melted glass into molds. Thousands of bottles can be made in a day. Window glass is often floated on a pool of melted metal. It cools flat and smooth.

As glass cools, it gets hard. It must cool slowly, or it might crack. Glass is easy to recycle. Old bottles can be melted again to make new ones. No quality is lost.

## Questions

**1. What is the main ingredient of glass?**

_____

_____

**2. Why do workers mix soda ash and limestone with the sand?**

_____

_____

**3. How does a glassblower make a bubble?**

_____

_____

**4. Why is glass cooled slowly?**

_____

_____

**5. Why is recycling glass a good idea?**

_____

_____

## Words to know

ingredient: one of the things that something is made from
furnace: a very hot oven used to melt materials
glassblower: a person who shapes melted glass by blowing into it
molds: hollow shapes that give soft material its form
recycle: to use something again to make something new

## Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

# How Glass Is Made

Triangle group

Look around the room and you will probably see glass in a window, a cup, or a bottle. Glass seems like a modern material, yet people have been making it for thousands of years. Its main ingredient is something you can find at any beach, which is sand.

To make glass, workers start by mixing sand with a few other materials, such as soda ash and limestone. These ingredients help the sand melt at a lower heat and keep the finished glass strong. The mixture is poured into a furnace that is hotter than 2,500 degrees Fahrenheit. At that heat, the sand turns into a glowing, thick liquid.

While the glass is still soft, it can be shaped. A glassblower gathers a blob of it on the end of a long metal tube and blows gently through the other end, which makes a bubble. Factories use machines to press or blow melted glass into molds, so that thousands of bottles can be made in a day. Window glass is often floated on a pool of melted metal so that it cools flat and smooth.

As the glass cools, it becomes hard. It must be cooled slowly, or it might crack. Glass is easy to recycle, and old bottles can be melted again to make new ones without losing any quality.

## Questions

**1. What is the main ingredient of glass?**

_____

_____

**2. Why do workers mix soda ash and limestone with the sand?**

_____

_____

**3. How does a glassblower make a bubble?**

_____

_____

**4. Why is glass cooled slowly?**

_____

_____

**5. Why is recycling glass a good idea?**

_____

_____

## Words to know

ingredient: one of the things that something is made from
furnace: a very hot oven used to melt materials
glassblower: a person who shapes melted glass by blowing into it
molds: hollow shapes that give soft material its form
recycle: to use something again to make something new

## Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

# How Glass Is Made

Square group

Glance around the room and you will probably spot glass in a window, a cup, or a bottle. Glass may seem like a modern material, yet people have been manufacturing it for thousands of years. Its principal ingredient is something you can find at any beach, namely sand.

To produce glass, workers begin by combining sand with a few additional materials, such as soda ash and limestone. These ingredients allow the sand to melt at a lower temperature and help the finished glass remain strong. The mixture is poured into a furnace that is hotter than 2,500 degrees Fahrenheit, and at that temperature the sand turns into a glowing, thick liquid.

While the glass is still soft, it can be shaped in many ways. A glassblower gathers a blob of it on the end of a long metal tube and blows gently through the opposite end, creating a bubble. Factories use machines to press or blow melted glass into molds, so that thousands of bottles can be produced in a single day. Window glass is often floated on a pool of melted metal so that it cools perfectly flat and smooth.

As the glass cools, it hardens. It must be cooled slowly, or it might crack. Glass is also easy to recycle, because old bottles can be melted again to make new ones without any loss of quality.

## Questions

**1. What is the principal ingredient of glass?**

_____

_____

**2. Why do workers combine soda ash and limestone with the sand?**

_____

_____

**3. How does a glassblower create a bubble?**

_____

_____

**4. Why must glass be cooled slowly?**

_____

_____

**5. Why is recycling glass a good idea?**

_____

_____

## Words to know

ingredient: one of the things that something is made from
furnace: a very hot oven used to melt materials
glassblower: a person who shapes melted glass by blowing into it
molds: hollow shapes that give soft material its form
recycle: to use something again to make something new

## Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

# For the teacher: How Glass Is Made

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

### Circle: How Glass Is Made

Easier · 200 words · Flesch-Kincaid grade 3.2

1. Sand.
2. They help the sand melt at a lower heat and keep the glass strong.
3. By blowing gently into a tube holding soft glass.
4. Cooling it too fast might make it crack.
5. Old glass can be melted again to make new glass with no loss of quality.

### Triangle: How Glass Is Made

This passage · 219 words · Flesch-Kincaid grade 6.2

1. Sand.
2. They help the sand melt at a lower heat and keep the glass strong.
3. By blowing gently through a tube into a blob of soft glass.
4. Cooling it too fast might make it crack.
5. Old glass can be melted again to make new glass without losing quality.

### Square: How Glass Is Made

Harder · 227 words · Flesch-Kincaid grade 8.3

1. Sand.
2. They allow the sand to melt at a lower temperature and help the glass remain strong.
3. By blowing gently through a tube into a blob of soft glass.
4. Cooling it too quickly might make it crack.
5. Old glass can be melted again to make new glass without any loss of quality.