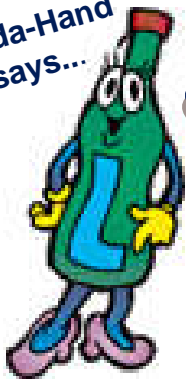


Linda-Hand
says...



glass is a hard, brittle, generally transparent or translucent material typically formed from the rapid cooling of liquefied minerals. Glass was discovered a long time ago, when some people saw lightning strike a sandy beach. The sand grew very hot and melted. When it cooled, the sand turned into glass. Today glass is made in factories where millions of bottles are made each day. Most commercial glass is made from a molten mixture of soda ash, sand, and lime.

did you know...

| When glass is made in factories, sand is mixed with soda ash and limestone. Then it is heated in a large furnace. When the sand gets hot, it melts, turning into a hot, thick liquid called molten. Finally, the molten glass is poured into molds and air is blown through to create the shape of a bottle.

| Glass bottles and jars can be recycled over and over again. There is no limit.

| Glass furnaces are heated to 2700 degrees in order to melt cullet (crushed glass) into molten. That is 27 times as hot as a 100 degree summer day.

| Cullet melts more easily than sand. So when recycling factories use cullet, they can turn down the temperature in their furnace and that saves energy!

| Using cullet in place of other natural ingredients saves natural resources.

| If any metal gets mixed in with the molten glass, the new glass will break easily. This is why it is important to remove all metal caps, rings, and lids from containers.

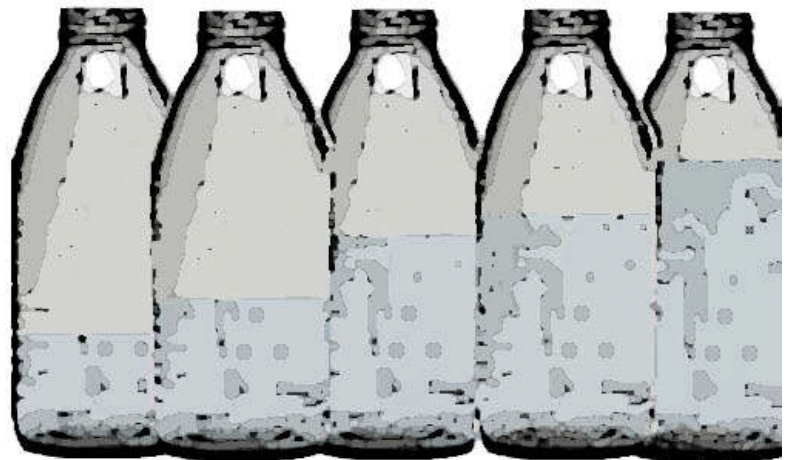
how is it recycled?

Glass bottles can be recycled in most communities. Generally, you need to rinse bottles and jars and remove all metal caps, rings, and lids. Sometimes, your program asks you to separate glass into three colors – brown, clear, and green – or the glass is sorted once it is collected. The glass gets taken to a recycling center where it is crushed and then sent to a glass factory. The crushed glass is called "cullet." At the glass factory, the glass is mixed in with sand and minerals. The mixture is then heated and melted into molten in order to produce new, recycled glass bottles and jars.

what is it made into?

Glass bottles and jars can be recycled into...glass bottles and jars! When a glass container is recycled, then new glass container is just as strong and useful as a container made from raw materials. However, some kinds of glass are made from different ingredients than glass bottles and jars. For instance, window glass, drinking glasses, dishes, and mirrors are all made differently and therefore, cannot be recycled with glass bottles and jars. Recycled glass is also used to make tile and is sometimes used in road paving.

neat musical experiment on back! →



activity

In this activity, students will explore, through observations and measurements, how the amount of water in a glass bottle affects the sound it makes when you hit the bottle with a spoon. Because glass and hot water are involved, adult supervision is recommended.

What You Will Need

- I Four 16-ounce glass soda bottles that are empty and have been cleaned
- I Water at room temperature (enough to fill all four bottles to the very top)
- I One spoon
- I Liquid measuring cup that can measure in milliliters (ml)
- I Paper and pencil on hand for recording your observations!

Procedure

Make a hypothesis (educated guess) before you begin - Do you think the pitch, or sound, you get from tapping the soda bottles with the spoon will go up or down when you take different amounts of water out of the bottles?

Fill the soda bottles to the top with water. With your spoon, gently tap the sides of each of the glass bottles. Listen to the sound that each makes. Are they the same or are they different from each other? Make a recording of your observations.

Using the measuring cup pour out 100 ml of water from the first bottle, 200 ml from the second bottle, 300 ml from the third bottle, and 400 ml from the fourth bottle. Like before, gently tap the side of each glass bottle and listen to the different sound pitches each one makes. Make a record of the sounds that you hear...

I Did the sound pitches get higher or lower than when the bottles were full of water?

I Which bottle had the highest pitch?

I Which one had the lowest pitch?

Now that you have done this experiment, here is away to change the results so you can make some



comparisons. Repeat the steps exactly as you did them before, but this time use hot water. **Be careful when working with hot water. Have an adult help you fill the bottles so you don't get hurt.**

Record your observations of the different sound pitches that you hear. Make note of how they are the same or different from the first experiment.

You may also want to try freezing the water in the bottles after measuring them correctly. **Make sure to leave the tops off the bottles when freezing the water so the bottles won't break.** While the bottles are freezing, think about whether or not the sounds will change from the other experiments. Make a recording of the sound pitches from tapping the bottles with frozen water.

Now look at all of the observations that you have recorded onto paper. Notice the differences in pitch of the water bottles, and how temperature affects the change in sound. A good way to organize your results is to make a graph. Work with your class and teacher to set it up, and make sure you have all of the information in the graph. The purpose of a good graph is to visually show information in a way that can help you understand what that information means.

for more info...

The Glass Packaging Institute, <http://www.gpi.org>

Corning Museum of Glass, <http://www.cmog.org>

The Environmental Protection Agency's "Explorers' Club", <http://www.epa.gov/kids/>

The Earth 911 Handy Kid's Section, <http://www.earth911.org/handy>



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