

METAL MELTS



Contact Information

Athens-Clarke County Recycling Division
Program Education Specialist
706.613.3512
www.acc-recycle.org

Grades

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Objectives

Students will be able to understand that the physical properties of materials will allow them to be recycled into other products.

Method

Students examine the physical property of metals. Students demonstrate the recycling concept of metal by melting cerrobend, a metal that turns into liquid at a low melting point.

Materials

Cerrobend (metal), hot plate, pan, beaker, muffin tin, variety of molds, pot holder

Vocabulary

Waste stream, recycled, bi-metal

Procedure

1. Discuss the percent of metals in the WASTE STREAM. The waste stream refers to the flow of waste from the source of generation (e.g., households, businesses, industries) to its final end use or final disposal. Metals occupy 8.7% of the total waste thrown away in the United States. Metals are a nonrenewable resource which should be conserved and RECYCLED. Metals are recycled into new products. Metals can easily be sorted and collected for recycling.
 2. Discuss the term BI-METAL. Beverage cans and other metal products are referred to as bi-metal when two metals are used in producing the same product. Students can separate bi-metal cans from aluminum cans by understanding that aluminum cans are non-magnetic and the bi-metal cans are magnetic, i.e., they will be attracted to a magnet.
 3. Provide students with a box of aluminum and bi-metal cans. Have students separate the cans using a magnet. Ask the students to describe other physical properties of the two types of cans which helps in sorting.
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4. Explain to students that metals, when heated, will melt so that the liquid can be poured into new molds or in other ways be made into new products. The heating causes the molecular bonds to change forming a liquid. When the metal cools, the bonds change into the solid structure. Most metals melt at temperatures that are too high (400° and above) to produce in the classroom. Cerrobend is a metal that melts at a low temperature. Tell students that the class will demonstrate recycling of metals by using the metal cerrobend in a demonstration.
 5. Cerrobend has a melting point of 158° F. It should not be stored in a warm place nor should it be ingested. Cerrobend is a metal alloy, i.e., it is a blend of a number of different metals. You may purchase a piece of CERROBEND metal from the following address:
CERROBEND METAL PRODUCTS CO.
P.O. BOX 388
BELLEFONTE, PA 16832
 6. Set up the metal recycling demonstration in the front of the class collecting all the materials needed. Have students watch as the teacher demonstrates metal recycling by carefully following these instructions:
 - a) Fill a frying pan with one to two inches of water and place it on the hot plate.
 - b) Place the cerrobend metal into the beaker and put the beaker in the frying pan.
 - c) Turn the hot plate on high. Heat until the metal melts.
 - d) Carefully pour the metal into the mold.
 - e) Place the mold into the container with water for about one minute.
 - f) Remove the hardened metal from the mold.
 - g) Pour any excess molten metal into the muffin pan cup. Cerrobend expands as it cools and could crack the glass beaker.
 7. **Helpful Hints:** Cerrobend should not be ingested (it contains tin, lead, cadmium, and bismuth). Cerrobend should not be stored in a warm place (it melts at 158° F). This process is similar to what occurs in the processing of aluminum cans indicating that aluminum cans can be used and reused many times.
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Source: Waste In Place, 1990 Keep America Beautiful, Inc.