MATERIALS... MADE TO LAST?

CFE 3270V

OPEN CAPTIONED
ATLSCHUL GROUP
CORPORATION
1994
Grade Levels: PS-5
15 minutes
1 Instructional Graphic Enclosed
DESCRIPTION
How is plastic made? Where does clay come from? What do metal tools do? Learn about everyday items made from plastic, clay, and metal. Each has special characteristics that meet specific needs. Visit a potter making a piggy bank and a factory making a plastic rocker. Shows some of the many uses of plastic.

INSTRUCTIONAL GOALS
• To study and compare the qualities of plastic, metal, and clay.
• To illustrate the processes, from start to finish, used to produce a plastic rocker and a clay piggy bank.
• To examine the use of the most appropriate materials for specific products.
• To depict both hand-crafted and factory-produced objects.

BEFORE SHOWING
1. Read the CAPTION SCRIPT to determine unfamiliar vocabulary and language concepts.
2. Provide a collection of objects made from plastic, metal, and clay for hands-on exploration.
3. Draw a three-column chart on the board.
   a. Entitle the chart: “What’s it Made of?”
   b. Select items one at a time. Discuss the object’s characteristics and uses.
   c. Add the object’s name under the correct chart heading.

DURING SHOWING
1. View the video more than once, with one showing uninterrupted.
2. Review the segment showing the metal drum that functions as the mold for the plastic rocker. Provide a musical drum. Compare the two drums.
3. Pause as Father hangs clothes, and the caption reads, “If you look around, you’ll see lots of things made from plastic.”
   a. Note items in the classroom
   b. Repeat with clay and metal objects
4. Review the scenes that show clay being collected from the ground and then later molded at the potter’s wheel. Share personal experiences with using clay.
5. Pause at the frame showing mealtime at the Edmondsons’. Pick out which items are made from plastic and which from metal. List the advantages discussed.

AFTER SHOWING

Discussion Items and Questions

1. Plastic is lightweight and safe to use for play. Explain why this is a good material for children’s toys, compared to Dad’s hammer and nails.
2. Describe the tools Mom uses to cut, pierce, and hammer. Explain why she wears gloves and eye protection. Contrast with the bare hands used in hammering a nail or tightening the screw.
3. Why is metal a good material to make the mold for the drum? What materials would not be strong enough for the task at hand?
4. Why is it important for the drum operator to sound the alarm when the drum begins to move? What kinds of safety devices could people who are deaf or hard of hearing use?
5. Explain why the versatile nature of plastic makes it such a wonderful material. Discuss how this affects disposing of plastic.
6. How do plastic, clay, and metal compare? (See INSTRUCTIONAL GRAPHICS.)
7. Where might the potter have learned her craft?
8. Why is heat such an important part of processing? How do synthetic and natural materials compare?
9. What is meant when products are described as made to last?
10. Why aren’t glass plates or cups recommended for children to use?

Applications and Activities

1. Provide plastic children’s tools and their real metal counterparts. Try on safety gloves and goggles. Demonstrate making simple cuts in wood.
2. Teach the children’s hand game Rock, Paper, Scissors. Compare the qualities of plastic, metal, and clay. (See INSTRUCTIONAL GRAPHICS.)
3. Review the segment of the video which begins, “Inside the drum, heat turns the powder into a liquid.”
   b. Later, observe the solid consistency.
   c. Compare the process of making gelatin to the process of making the plastic chair.
   d. Fill a large coffee can with water, cover with a lid, and freeze. Repeat the comparison dialogue.
   e. Write descriptive paragraphs.
4. Prepare sugar cookie dough and provide pig-shaped cookie cutters. Make cookies. Compare the process of baking cookies to the process of firing clay inside a kiln.
5. Invite a guest or ask the art teacher to demonstrate the use of a potter’s wheel and firing clay.
6. Provide clay for self-sculptures. Paint and fire. Write biographies on each artist, and train docents to provide museum tours and comment on each sculpture.
7. Compare a variety of balls that are made of plastic. Put them through a series of scientific investigations, and log the results in observation journals.
8. Visit a local craft store to purchase molds for making candy, desk weights, or candles. Follow the packaged directions to produce an item using a mold.
9. Visit a woodshop or a tool and die business. Observe the metal tools and their uses. Observe safety
issues portrayed through signs, equipment, and clothing.

10. Visit or write to local factories. Ask questions about manufacturing, job training, or job prerequisites.
11. Research the Reduce, Reuse, Recycle theme. Discuss the importance of recycling plastic and how difficult it is to dispose of such a durable product. Visit the local recycling center.

INSTRUCTIONAL GRAPHICS

One instructional graphic is included with this lesson guide. It may be enlarged and used to create transparencies or copies.

- MATERIALS . . . MADE TO LAST

WEBSITES

Explore the Internet to discover sites related to this topic. Check the CFV website for related information (http://www.cfv.org).
CAPTION SCRIPT

Following are the captions as they appear on the video. Teachers are encouraged to read the script prior to viewing the video for pertinent vocabulary, to discover language patterns within the captions, or to determine content for introduction or review. Enlarged copies may be given to students as a language exercise.

(male narrator) Here's Amber on her tractor.

She's got a set of tools to fix it.

What do you think they're made from?

Amber's tools are made from plastic.

So is the tractor.

The plastic tractor and tools are light in weight and safe for Amber to play with.

Would Amber's plastic hammer be any use for driving nails?

This hammer head is made from metal.

Amber's dad is using it to mend the fence.

It's much heavier and harder than Amber's hammer and can strike hard blows to drive in nails.

Nails are also made from metal.

Look at how this metal saw cuts through wood.

Amber's mom is using it at her woodwork class.

She's using lots of metal tools.

What do you think this one will do?

Metal can be used for piercing, or making holes in things.

What other metal tools is Amber's mom using?

[machine whirring] This is Amber's sister Rachel.

She's also using metal for cutting.

The blades of the scissors are metal.

She's making a card for a special occasion.

"Happy birthday, Grandma."

Metal is often used for cutting, hammering, and piercing.

Amber got a plastic rocker for Christmas.

She often plays on it with Rachel.
[girls chattering]

It was made here, in this large plastics factory.
The plastic rocker was made inside this huge metal drum.

You can see some of the finished rockers being taken out.

At the start of the process, powdered plastic is poured into rocker-shaped molds.

The drum is then closed up.

[hand tool clicking] d-d-d-d-d-d
[alarm beeping] beep, beep, beep

The warning signal tells everyone that the drums are ready to move into the heating chamber.

Inside the chamber, heat turns the powder into a liquid.

As the drum spins around, the liquid plastic is spread out and covers the inside of the mold.

After 20 minutes in the heating chamber, the drums move to a cooling chamber, still spinning to keep the molten plastic coating the inside of the mold.

The drum spends 20 minutes cooling inside the cold chamber.

What do you think will have happened?

The powder that was poured into the mold has been changed into a plastic rocker by rotating, heating, and cooling.

Let's look again at how it happened.

Plastic is made from oil.

Oil is pumped up from under the ground.

To make plastic, oil is changed into a kind of powder.

This powdered plastic is mixed with color.

It's then poured into a mold.

The mold is heated, and the powder turns into a liquid.

As the mold rotates, the molten plastic is spread out, covering the inside.

When the mold is cooled, the molten plastic sets and becomes solid.

And that's how the rocker is made.

Amber has found a different way of playing with her rocker.

[Amber chattering]
If you look around, you'll see lots of things made from plastic.

Plastic can be made into shapes that roll.

It can be light.

Plastic can be transparent— you can see through it.

It can be waterproof.

Plastic can be bouncy...

and sharp enough to cut.

[mower buzzing]

It can be a thin sheet.

Soft and squeezable.

[tapping]

Hard and protective.

Plastic can be flexible, and it can be hollow.

[coins clicking]

[coin clunks]

Here's a piggy bank made from a different material: clay.

Clay is dug from out of the ground.

This is what it's like when it reaches the potter.

After she's taken off as much as she needs, the potter has to shape the clay with her hands.

She loves the soft feel of the clay as she forms it into the shape she wants.

Look at how she's pulling the clay up and changing its shape.

When she's molded it into the right shape for the body of the pig, she has to close the top.

Watch how she makes this shape into a pig.

Once the pig has all its parts, it's put into a kiln, a large, very hot oven.

The heat inside the kiln bakes the clay hard.

When it comes out, the pig is decorated: coated with a liquid glaze and painted.

It then goes back inside the kiln.

Look at the difference when it is finally taken out. The heat has turned the glaze into a shiny coating which is very hard— but easy to clean.

It's mealtime at the Edmondsons'.

Pick out which objects on the table are made from plastic,
which from pottery or clay, and which from metal.

Each material has certain advantages and certain drawbacks.

Some items on the table could be made from any of the materials--plastic, clay, or metal.

But each utensil has its own requirements--either hard or strong or sharp or lightweight or flexible.

Have the very best materials been used to make each utensil?

Oops!

Would a different material last longer?

Look around your classroom.

Have different things been made from plastic, clay, or metal?

Have they been made to last?

Funding for purchase and captioning of this video was provided by the U.S. Department of Education:

PH: 1-800-572-5580 (V).
This ball is made of plastic.

This vase is made of clay.

This hammer is made of metal.

How do we compare?

QUALITIES:
- Light
- Heavy
- Transparent
- Waterproof
- Durable
- Hard

USES:
- For cutting
- For piercing
- For carrying
- For hollow things
- For hammering

Write to compare:

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