

# MATERIALS... MADE TO LAST?



**CFE 3270V**

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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."
  - a. Boil water and prepare gelatin in a glass bowl. Refrigerate.
  - 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.

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### **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)<br>Here's Amber on her tractor.               | She's using<br>lots of metal tools.                                   |
| She's got a set of tools<br>to fix it.                        | What do you think<br>this one will do?                                |
| What do you think<br>they're made from?                       | Metal can be used for <i>piercing</i> ,<br>or making holes in things. |
| Amber's tools are made<br>from plastic.                       | What other metal tools<br>is Amber's mom using?                       |
| So is the tractor.  | [machine whirring]  |
| The plastic tractor and tools<br>are light in weight          | What do you think<br>she's making?                                    |
| and safe for Amber<br>to play with.                           | This is<br>Amber's sister Rachel.                                     |
| Would Amber's plastic hammer<br>be any use for driving nails? | She's also using metal<br>for cutting.                                |
| This hammer head is made<br>from metal.                       | The blades of the scissors<br>are metal.                              |
| Amber's dad is using it<br>to mend the fence.                 | She's making a card<br>for a special occasion.                        |
| It's much heavier and harder<br>than Amber's hammer           | "Happy birthday,<br>Grandma."   |
| and can strike hard blows<br>to drive in nails.               | Metal is often used<br>for cutting,                                   |
| Nails are also made<br>from metal.                            | hammering,<br>and piercing.   |
| Look at how this metal saw<br>cuts through wood.              | Amber got a plastic rocker<br>for Christmas.                          |
| Amber's mom is using it<br>at her woodwork class.             | She often plays on it<br>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]  
z-z-z-z-z  
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  
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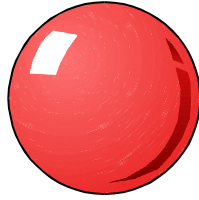
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# CFE 3270 V MATERIALS . . . MADE TO LAST

**DIRECTIONS:** Write sentences to compare these and other materials in the classroom. Include the material's function.

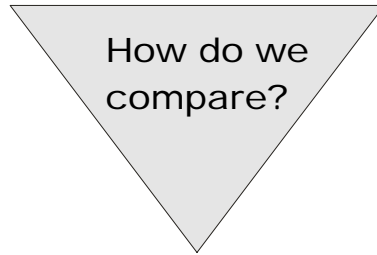
## MATERIALS . . . MADE TO LAST



This ball is made of plastic.

### QUALITIES:

- Light
- Heavy
- Transparent
- Waterproof
- Durable
- Hard
- \_\_\_\_\_
- \_\_\_\_\_



This vase is made of clay.  
Write to compare:

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This hammer is made of metal.

### USES:

- For cutting
- For piercing
- For carrying
- For hollow things
- For hammering
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_