



Quick View

What Everyday Items Do We Create When We Combine Metal and Glass?

These activities draw upon two previously explored materials, metal and glass, to discover how those separate materials are combined to create useful new items we see every day.

Materials

Glass measuring cup, glass baking pan, metal measuring cup, metal baking pan, light bulb, metal picture frame, 8 glass jars the same size, water, food coloring, drumstick, baby food jars, small figure to fit in baby food jar, glue, glitter, glycerin, individual pictures of your students.

A more detailed list can be found on Page 2.

Standards

NCECDTL, ELOF: Goal IT-ALT 3, 4, 5, 6,7,8,9; Goal P-ATL 6, 7, 8, 9, 10, 11, 12, 13; Goal P-LC 1, 2, 3, 4, 5, 6, 7; Goal P-LIT 4, 5; Goal IT-C 1, 2, 3, 5, 6, 7, 9, 10, 12, Goal P-MATH 7, 8, 10; Goal P-SCI 1, 2, 4, 5, 6; Goal IT-PMP 1, 2, 3, 4, 5, 6, 7, 8; Goal P-PMP 2, 3; **MI Standards** SS 1, 3.

Model i Innovation Learning Framework

Throughout this lesson, there will be opportunities to bring in Model i's Habits of an Innovator and Actions of Innovation.

More information on Model i can be found at:

thf.org/education/teaching-innovation/modeli

STEAM ELA/LIT SS/HST Inspiring Artifact of Explore Discover Create **Review & Extend Stories** the Day Ask what students Explore around the Make a water Read stories related Lamy's Diner. Ask students specific remember about how classroom for items xylophone. to the learning: All in and open-ended Explain that before we get metals and made when you a Jam by Rebecca questions Make baby food jar fast-food restaurants glass. combine metal and Bielawski and Pete snow globes. like McDonalds, diner **Family Connection** alass. the Cat's Groovy Bake Explore everyday cars like Lamy's were worksheet to send Sale by James Dean. Make baby food jar Identify items objects that are made where customers could home. picture frames. of both metal and from their homes Near Christmas, read stop to get a quick Coloring sheet to send glass. and around their The Night the Lights meal. home or work on in neighborhood. Went Out on Christmas Show and talk about class by Ellis Paul. the similarities and differences of metal and glass measuring cups and baking pans. Desian Stay Curious, Stay Curious, Stay Curious, Collaborate, Uncover Be Empathetic Collaborate Be Empathetic. Learn from Failure Stav Curious Collaborate, Uncover

Lesson Overview





Materials

Explore

Activity — Touch Exploration

- Glass baking pan
- Metal baking pan
- Glass measuring cup
- Metal measuring cup
- Teachers should provide as many examples of metal and glass objects as possible for touch exploration.

Create

Project Two — Baby Food Jar Snow Globe

- Baby food jars (or other similar size glass jar with lid)
- Small pine cone or other decorative figure that fits inside jar
- Water
- Glitter
- Glycerin (optional, available in a cake decorating section or drugstore)
- Confetti (plastic or metallic)
- Glue (hot glue gun optional)

Create

Project One — Water Xylophone

- 8 Mason jars with lids
- Water
- 8 different colors of liquid food coloring
- Pencils (chopsticks or drumsticks are other options)

Create

Project Three — Baby Food Jar Picture Frame

- Baby food jars, larger size
- Self-sealing laminating sheets (optional: laminate pictures with laminating machine)
- Water
- Glitter
- Glycerin (optional, available in a cake decorating section or drugstore)
- Confetti (plastic or metallic)
- 2 copies of each student's photo, 1/4- to 1/2inch smaller than jar opening





Lesson Guide

Explore



Stay Curious, Collaborate, Uncover How Are Metal and Glass Used? Page 4 Activity: Touch Exploration Page 4

Inspiring Stories



Be Empathetic, Learn from Failure Read Stories to Inspire Your StudentsPage 12

Discover



Stay Curious, Collaborate, Uncover Activity: What Can You Make with Metal and Glass? Page 5

Review & Extend



Stay Curious, Collaborate		
Ask Students Specific and		
Open-Ended Questions	Page 13	
Family Connection	Page 14	
Coloring Sheet	Page 15	

Artifact of the Day

Design



Stay Curious, Be Empathetic Lamy's Diner Page 6 Links & Photos Pages 7-8

Create



What Can We Make with Metal and Glass? Project 1: Water Xylophone Page 9 Project 2: Baby Food Jar Snow Globes Page 10 Project 3: Baby Food Jar Picture Frames Page 11





How Are Metal and Glass Used?

Teachers can ask students what they remember about how we get metals (from the ground) and glass (from sand). What other characteristics of each do they remember?

Students can explore everyday objects that are made of both metal and glass. Then discover what bright ideas are made by combining both materials.

Activity

Touch Exploration

Teachers can show and talk about the similarities and differences of metal and glass objects such as measuring cups and baking pans:

- Which is heavier?
- Why would one work better for the task over the other?

Glass baking pan	Metal baking pan
Does the job	Does the job
Heavier	Lighter
Thicker- longer baking time	Thinner- shorter baking time

Glass measuring cup	Metal measuring cup
Measures ingredients	Measures ingredients
Breakable	Durable
See-through	Lighter

Model i Innovation Learning Framework

Stay Curious, Collaborate, Uncover

- Ask questions like what, why, how.
- Talk about helping, working together.
- What do you see (characteristics, properties)?
 What problems does this material help us solve?







Discover

Activity

What Can You Make with Metal and Glass?

Students can discover what innovative objects can be made when you combine metal and glass by exploring around the classroom.

Students might note windows, doors, light bulbs, computer screens, picture frames, etc.

Students may be able to identify items from their homes that are made with metal and glass, such as tables, dishes, picture frames, measuring cups and baking pans, etc.

Ask students about their neighborhood. Do they have metal and glass objects like traffic lights, storefronts, cars, trucks and buses.

Model i Innovation Learning Framework

Stay Curious, Collaborate, Uncover

- Ask questions like what, why, how.
- Talk about helping, working together.
- What do you see (characteristics, properties)? What problems does this material help us solve?







Artifact of the Day

What Is Lamy's Diner?

Teachers can show the pictures of **Lamy's Diner** and explain to students: Before fast-food restaurants like McDonalds, diner cars like Lamy's were where customers could stop to get a quick meal.

Built in 1946 and made of metal and glass, this entire diner could be lifted onto rollers and moved like a mobile home. What a cool innovative improvement over the earlier horse-drawn lunch wagons!

Links and photos for this section are on Pages 7-8.

Model i Innovation Learning Framework

Stay Curious, Be Empathetic

- Ask questions like what, why, how.
- How might people have felt eating at a diner car, like Lamy's, for the first time?







Lamy's Diner, 1946

thf.org/collections-and-research/digital-collections/artifact/188375#slide=gs-200328







Lamy's Diner, 1946

thf.org/collections-and-research/digital-collections/artifact/188375#slide=gs-195717







Create — What Can We Make with Metal and Glass?

Project 1: Water Xylophone

Materials

- 8 Mason jars with lids
- Water
- 8 different colors of liquid food coloring
- Pencils (chopsticks or drumsticks are other options)

Instructions

- 1. Add water to jars in graduating amounts.
- 2. Add a drop of a different food coloring liquid to each jar. Screw jar lids on firmly.
- 3. Use pencils (chopsticks, drumsticks) to tap side of each jar to create different tones.

Model i Innovation **Learning Framework**

Design

• Make, build and create.









Create — What Can We Make with Metal and Glass?

Project 2: Baby Food Jar Snow Globes

Materials

- Baby food jars (or other similar-size glass jar with lid)
- Small pine cone or a decorative figure that fits inside jar
- Water
- Glitter
- Glycerin (optional, available in a cake decorating section or drugstore)
- Confetti (plastic or metallic)
- Glue (hot glue gun optional)

Instructions

- 1. Glue small pine cone or decorative figure to inside of jar lid. Let dry.
- 2. Fill jar with water.
- Add glitter and confetti to water. (Optional: Add a drop of glycerin to prevent glitter from falling too quickly.)
- 4. Screw lid on firmly.
- 5. Turn upside down.

Model i Innovation Learning Framework

Design

• Make, build and create.









Create — What Can We Make with Metal and Glass?

Project 3: Baby Food Jar Picture Frames

Materials

- Baby food jars, larger size
- Self-sealing laminating sheets (optional: laminate the pictures with laminating machine)
- Water
- Glitter
- Glycerin (optional, available in a cake decorating section or drugstore)
- Confetti (plastic or metallic)
- 2 copies of each student's photo, 1/4- to 1/2inch smaller than jar opening

Instructions

- 1. Laminate students' photos back to back with self-sealing laminating sheets or laminating machine. Rub out any bubbles and be certain edges of photo are sealed.
- 2. Cut excess lamination, leaving about 1/4 inch around edge.
- 3. Fill jar with water.
- 4. Add glitter and confetti. Adding a drop of glycerin will prevent glitter from falling too quickly.
- 5. Place sealed photo in jar.
- 6. Tighten lid firmly and turn jar upside down.

Model i Innovation Learning Framework

Design

• Make, build and create.









Inspiring Stories

Read Stories to Inspire Your Students



All in a Jam by Rebecca Bielawski



Pete the Cat's Groovy Bake Sale by James Dean

If completing lesson near Christmas, teachers may also want to read:



The Night the Lights Went Out on Christmas by Ellis Paul

Model i Innovation Learning Framework

Be Empathetic, Learn from Failure

- How did the characters in the stories feel? How might the stories make others feel?
- Talk about "trying again," what's another way to...







Ask Students Specific and Open-Ended Questions

- Tell me what happened in the stories we read.
- What would you make using metal and glass?
- What did you like the most about the activities we did today?

Family Connection

Send the worksheet on Page 14 home with students to be completed at the end of the lesson.

Coloring Sheet

Have students color the picture on Page 15 as a part of the lesson, or send it home to be colored.

Model i Innovation Learning Framework

Stay Curious, Collaborate

- Ask questions like what, why, how.
- Talk about helping, working together.







We are learning about how metal and glass are combined to make many items we use every day.

Please take your student on an **"I Spy" adventure** through your home and neighborhood to see what metal and glass items you can find. What are some of these things? Have them draw what they find.

You might continue the adventure on a shopping trip to see how many buildings and items you find that combine metal and glass.

These are some of the stories related to our learning. You might enjoy reading them with your student.



Elphie and Dad Go on an Epic Adventure by Hagit R. Oron



Practice Makes Perfect: Robert Can Learn to Do Anything by D.J. Eva



the Henry Ford

Lamy's Diner

