



MAKING SOAP FROM OIL AND LYE

HOMESCHOOL SCIENCE EXPERIMENT

ADULT SUPERVISION REQUIRED

Name: _____

Date: _____

Experiment #: _____

WHAT YOU WILL LEARN

You will observe a chemical reaction called saponification, where oil and lye react to form soap and glycerin.



BIG IDEA

Chemicals can change into new substances with different properties.

MATERIALS

- Olive oil or other vegetable oil – 500 g (about 2 cups)
- Distilled water – 170 g (about 3/4 cup)
- Sodium hydroxide (lye) – 64 g (about 1/4 cup)*
- Digital scale
- Heat-safe mixing container (stainless steel or plastic)
- Heat-safe pouring container
- Stick blender (immersion blender)
- Silicone spatula
- Soap mold (silicone or lined box mold)
- Thermometer
- Safety goggles
- Nitrile or rubber gloves
- Long sleeves or apron
- pH test strips (optional)
- Essential oils or color (optional)

*Do not substitute. Use 100% sodium hydroxide lye.



PROCEDURE

1. Prepare Your Work Area

Clear your workspace and gather all materials. Put on safety gear (goggles, gloves, long sleeves).

2. Measure the Water

Pour distilled water into a heat-safe container.

3. Add Lye to Water

Slowly add the lye to the water while gently stirring. The mixture will get very hot and may release fumes. Stir until the lye is fully dissolved. Set aside to cool to about 100–110°F (38–43°C).

4. Warm the Oil

Measure the oil and warm it to about 100–110°F (38–43°C).

5. Combine Oil and Lye Solution

Pour the lye solution into the oil.

6. Blend

Use a stick blender to mix. Blend until the mixture reaches “trace” (it thickens and leaves a momentary trail on the surface when drizzled).

7. Add Extras (Optional)

Add essential oils or color and mix gently.

8. Pour into Mold

Pour the soap into the mold and smooth the top.

9. Insulate and Rest

Cover the mold with a towel or blanket. Let it sit for 24–48 hours.

10. Unmold and Cut

Remove from mold and cut into bars. Allow bars to cure for 4–6 weeks in a dry, airy place before using.

SAFETY FIRST



Lye is highly caustic and can cause severe burns. **Adult supervision is required at all times.**



Always wear safety goggles, gloves, and protective clothing.



Work in a well-ventilated area. Never breathe lye fumes.



Always add lye to water, never water to lye. It can splatter and cause burns.



Keep children and pets away from the work area.



If lye contacts skin or eyes, rinse immediately with plenty of cool water for 15 minutes and seek medical attention.

TAKE YOUR TIME. BE CAREFUL. HAVE FUN!

OBSERVATIONS

What did you notice as the lye dissolved in water?

What happened as you blended the mixture?

How did the mixture change over time?

Record the temperature at trace: _____

THINK & DISCUSS

- What evidence shows that a chemical reaction occurred?
- Why is it important to add lye to water and not water to lye?
- What are some properties of the soap you made?
- How long do you think the soap needs to cure, and why?

REMEMBER: This experiment uses dangerous chemicals. Always follow safety rules and have adult supervision.