$\qquad$ Period $\qquad$ Date $\qquad$

## Lesson 11: How Can I Turn Fat into Soap?

## Activity 11.1

## Purpose

Over the coarse of this unit, you have established that soap and fat are different substances. Through a chemical reaction you can turn fat into soap. We will do this in class.

## Chemical Reaction

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## Safety

Sodium hydroxide can burn your skin. You need to wear safety goggles, gloves, and an apron. If you get sodium hydroxide on your skin, rinse your skin with cool water, and tell you teacher immediately. Also you are using a hot plate so be careful of burns and spilling hot liquids.

## Procedure

1. Check you have all your supplies:

- Goggles, apron, gloves, Sharpie marker, 1 clear plastic cup, graduated cylinder, glass stirring rod, 1 glass beaker, 1 bottle of rubbing alcohol, and 1 hot plate.
- Nearby there should be a digital scale and salt. Cups of fat should be at the supply counter.

2. Put on your safety goggles.
3. Use the Sharpie to label one clear plastic cup with your groups' names and class period.
4. Take a plastic cup to the digital balance. Place the cup on the balance and zero it by pressing "tare" or "zero". The balance should read 0.00 . Check the units are in grams.
5. Mass $\mathbf{5 0}$ grams of salt into the cup. Take the cup with the salt back to your lab station.
6. Measure $\mathbf{1 5 0} \mathbf{~ m l}$ of water with the graduated cylinder. Pour the water into the clear plastic cup.
7. Carefully pour the $\mathbf{5 0} \mathbf{g}$. of salt into the clear plastic cup. Set the cup that contained the salt back into the lab kit.
8. Stir the water and mixture with the glass stirring rod until the salt is mostly dissolved (about 1-2 minutes). Place the clear plastic cup with the salt water to the side.
9. Take the bottle of rubbing alcohol from the kit.
10. Measure $\mathbf{2 0} \mathbf{~ m l}$ of rubbing alcohol with the graduated cylinder. Pour the $\mathbf{2 0} \mathbf{~ m l}$ of rubbing alcohol into the beaker.
11. Get a cup of fat from the supply counter. The teacher has massed it for you ( 11 g ). Put the $\mathbf{1 1} \mathbf{g}$ of fat into the beaker with the rubbing alcohol.
12. Stir the mixture of fat and rubbing alcohol with the glass stirring rod for about 1 minute. Try to break up the fat and mix it with the rubbing alcohol. Throw out the cup that contained the fat.
13. Turn on your burner on to WARM temperature.
14. Place the beaker on the burner and continue stirring for 2-3 more minutes. The fat will not completely dissolve, but the mixture should turn somewhat cloudy. Take the beaker off the burner. The beaker should be cool enough to move.
15. Have your teacher pour $\mathbf{2 0} \mathbf{~ m l}$ of sodium hydroxide into the beaker.
16. Place the beaker on the burned on WARM temperature. Stir the mixture with the glass stirring rod.
17. Stir the mixture for about 12 minutes. DO NOT let the mixture boil. DO NOT put your face over the beaker. Refer to the progressoin of the chemical reaction below.

The boundary between the layers moves towards the bottom of the beaker and is less distinct.

It is done when the boundary between it layers is gone and blended together.

18. Turn off the burner. After the liquid becomes a single layer, ask your teacher to pour the mixture into the clear plastic cup that contains the salt solution. DO NOT STIR IT.
19. Carefully place the clear plastic cup at its designated location for your class. It will sit overnight.
20. Get a new plastic cup for the next group. Rinse off the stirring rod. Double check the burner is off. Wash your hands.
21. Give your lab partners a high five- you made soap!

