

Lesson Plan #: Soap Making at the Community Level**1h20-2h hours total****Lesson Description**

In this lesson, participants will learn how to create a soap recipe, how to handle lye safely and participants will make a batch of soap.

Learning Outcomes

At the end of this session participants will be able to:

1. List the ingredients in soap.
2. Create a soap recipe.
3. Make soap.
4. Identify factors influencing soap making at a community level.

Materials

- Tools: see list at the end of this lesson
- Ingredients: see list at the end of this lesson
- Soaps samples to display and for the introduction
- A few computers connected to the internet (optional)
- A computer and projector (optional)

Preparation

- Review topic in the Soap Making Fact Sheet
- Write learning outcomes on flipchart paper
- Write basic soap recipe(s) on flipchart paper (see end of lesson for examples)
- Open the Soap Calc website page on your computer and have the projector ready: <http://www.soapcalc.net/calc/SoapCalcWP.asp> (optional)
- Print *Cold Process Soap Making Instructions* handouts for the participants (see end of lesson)
- Print the handouts *International Chemical Safety Card for Potassium Hydroxide*, one per participant – available at <http://www.cdc.gov/niosh/ipcsneng/neng0357.html>
- Write the title *Soap Uses* on flipchart paper
- Optional: print *Soap Making Case Study* handouts
- Write the title *Factors for Soap Making* on flipchart paper

Introduction**10 minutes**

1. Pair participants and give each group one piece of soap (some can have a box or label with the ingredients list).
2. Ask them to discuss what kinds of soap they use at home and why they choose those particular types.
3. Encourage volunteers to share what they discussed with the bigger group.
4. With their pair, ask them to try to identify what the piece of soap they have is made of.
5. Encourage volunteers to share what they discussed with the bigger group.
6. Present the learning expectations.

Soap making**40-60 minutes**

1. Explain to participants that there are 3 processes used for making soap: cold, hot and boiling. In this lesson only the cold process will be explained, as it is the easiest and cheapest one (Note: different processes are used to make liquid soap).
2. Tell the participants that soap is made of 3 main ingredients:
 - Oil or fat—such as beeswax, aloe butter, coconut oil, coffee bean oil, moringa oil, animal fat, palm oil, shea butter
 - Lye—Sodium Hydroxide (NaOH) or Potassium Hydroxide (KOH)
 - Water—distilled, bottled or filtered water

Many other things can be added to these three main ingredients for color, odor and/or texture.
3. Show the participants examples of oils, fats, the lye and things that can be added to soap.

Lye – What it is and how to handle it safely

1. Ask the participants what lye is and where it comes from: Lye is a caustic, alkaline chemical.
 - a.) Caustic—able to burn or corrode organic tissue by chemical action
 - b.) Alkaline—a base that dissolves in water

Sodium hydroxide is created using a chemical reaction between soda, or sodium carbonate, and calcium hydroxide, or lime. Potassium Hydroxide is made from ash.

2. Remind participants that lye is really corrosive and that it should always be manipulated with care, using every safety precaution. Long sleeves and safety glasses should be worn when handling lye.



3. Distribute *International Chemical Safety Card for Potassium Hydroxide* handouts to

participants (optional) and talk about the safety measures when using lye and sodium hydroxide.

Soap making

Option 1 – Design your soap recipe (cold process)



1. Show the participant example(s) of soap recipe on the flipchart paper.
2. If there is an internet connection and a few computers are available, you can have participants create (in groups of 4) their own soap recipe to make 500gr of soap using the Calc Soap website: <http://www.soapcalc.net/calc/SoapCalcWP.asp>.
3. Show them the ingredients available and tell them to try creating a recipe and see if it is going to make a good soap. Quickly explain the different properties to look for on the website (hardness, cleansing, condition, bubbly, creamy, iodine and INS). They will also need to find the amount of lye and water to add to their soap recipe.
4. Once they have created their recipe, ask them to write it down.



5. Distribute the *Cold Process Soap Making Instructions* handouts to the participants.
6. Read the instructions on the *Cold Process Soap Making Instructions* handouts and ask if they have any question.
7. Ask the participants to make their soap following the instructions after reminding them about the safety measures when using lye.

Option 2 – Make soap using an existing recipe



4. Show the participants the soap recipe they are going to make on the flipchart paper.



Remember to give them the amount of lye and water to add to their recipe, as they won't be able to calculate it themselves.

5. Distribute the *Cold Process Soap Making Instructions* handouts to the participants.
6. Read the instructions on the *Cold Process Soap Making Instructions* handouts and ask if they have any question.
7. Ask the participants to make their soap following the instructions after reminding them about the safety measures when using lye.

Factors influencing soap making at the community level

20 - 40 minutes



1. Ask participants to think about soap use in their community (or the community they are working with).
2. Encourage volunteers to share their experience with the bigger group and write down their answers on the *Soap Uses* flipchart paper.

3. Ask participants to think about all the factors that should be considered for soap making by their community (or the community they are working with).
 4. Encourage volunteers to share their experience with the bigger group and write down their answers on *Factors for Soap Making* on flipchart paper.
 5. Add a few ideas if not mentioned: *availability of materials, local knowledge of soap making, demand and use for soap, price of imported soap versus making soap.*
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Tell participants that soap can also be used as a tool for hygiene promotion or as incentive for Community Health Promoters.

6. In pairs, ask participants to share something mentioned on the flipchart paper they have not considered before or something that is really important to consider with their community.

Case study – Soap Making at School in Bolivia (optional)

20 minutes

1. Distribute the Case Study handouts to the participants.
 2. Ask the participants to read the case study.
 3. Ask the participants to discuss how Fundación SODIS implemented their soap project in schools.
 4. Ask the participants what they would have done differently to improve the use of soap in the school and community.
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Review

10 minutes



1. Ask the participants to share with the group one thing they learned from the session and if they are planning to make soap again.
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Reflections on Lesson

Tools list

- Plastic or glass (Pyrex) bowls
- Plastic or glass containers (more or less 2 cups capacity)
- Thermometer
- Coffee grinder or a mortar and pestle (optional)
- Scale
- Immersion blender (optional)
- Soap molds: plastic or wood or cardboard lined with plastic
- Stirrer for soap: plastic spatula, plastic spoon or stainless steel whisk—do not use anything made with aluminum or wood
- Stirrer for lye: plastic spatula, plastic spoon or stainless steel whisk—do not use anything made with aluminum or wood
- Board scrapper or chopper
- Old towels or rags

Safety protection material

- Plastic gloves
- Goggles
- Long-sleeve shirt
- Closed-toed shoes
- Face mask

Ingredients list

- Liquid oils, solid oils, butters and/or fats: olive oil, palm oil, coconut oil, shea butter, and animal fat...
- Distilled water (or the purest water available: bottle water or filtered water)
- Sodium hydroxide (lye) or Potash
- Additives for scents, color and texture such as: essential oils, clay, milk, spices, dry flowers or objects like loofah...

Examples of soap recipes (ingredients)

Always ensure exact measurements as possible when making soap.

Basic Soap (in grams)

- 130 gr coconut oil
- 170 gr olive pomace
- 175 gr palm
- 20 gr shea butter
- 5 gr castor oil
- 71 gr lye NaOH
- 190 gr water

Avocado Soap (in grams)

- 200 gr coconut oil
- 130 gr palm oil
- 200 gr shea butter
- 1 mashed avocado (at trace—the thickening of the mixture)
- 77 gr lye NaOH
- 200 gr water

Marseille Soap (in grams)

- 860 gr olive oil
- 240 gr coconut oil
- 100 gr shea butter
- 24 gr honey (at trace)
- 6 tsp clay (at trace)
- 24 gr honey fragrance (at trace)
- 24 gr of eucalyptus essential oil (at trace)
- 165 gr lye NaOH
- 456 gr water

Basic vegetable based soap (in cups, TB and tsp) – 1lb of soap

- 1/3 cup and 1.5 TB coconut oil
- 1/2 cup and 1.25 tsp olive oil
- 1/2 cup and 1.25 tsp palm oil
- 1 TB shea butter
- 3 TB Sodium Hydroxide
- 2/3 cup less 1 TB cold water (distilled or filtered)
- 2 TB castor oil (at trace)

Option:

- 1/2 tsp grapefruit seed extract or vitamin E
- 1.5 to 2 tsp fragrance or essential oils (at trace)

Cold Process Soap Making Instructions

1. Find or create a cold process soap recipe.
2. Wear rubber gloves and eye protective wear.
3. Measure all ingredients needed and put aside. All the oils used before trace can be put in the same container. Prepare and keep aside any other ingredients to be added at trace (essential oils, clay, extracts...).
4. Oil your molds with any vegetable oil (always prepare extra molds in case you have extra soap to pour).
5. In plastic, glass (Pyrex) or stainless steel container, pour the lye into the water.



NEVER POUR WATER OVER LYE!

Always add your lye (sodium hydroxide or potassium hydroxide) to the liquids. If the liquids were added to the solid lye, a violent reaction could result.

In case of an accident, use a blend of equal part vinegar and water and immediately apply to the skin.

6. Never use aluminum pots or utensils, Teflon-coated or cast iron, as the lye will react with the metal. Mix the lye mixture until the lye crystals are fully dissolved. Stand away as the fumes are toxic.
7. The lye solution will become hot. Put it aside and let it cool down. We want it to reach a temperature between 85 and 110 degrees Fahrenheit (or between 29.5 and 43 degrees Celsius).
8. Melt all oils and fats together in a pan or a microwave. We want them to reach a temperature between 85 and 110 degrees Fahrenheit (or between 29.5 and 43 degrees Celsius).
9. Pour the lye solution into your oils and fats and blend or stir until well mixed without whipping air into the mixture. Be careful during this step to make sure no soap mixture splatters out of the container, as it is very corrosive. Without a blender this could take from 30 to 60 minutes until the mixture thickens (known as trace). Using an electric hand blender reduces the mixing time significantly. When stirring by hand, stir briskly throughout the entire soap making process and scrap the sides often.
10. With either method, you will know you have reached “trace” when a small amount of soap drizzled across the mixture’s surface leaves a faint pattern before sinking back into the mass.

11. Now you can add anything else you want in your soap: color, herbs, essential oils... and stir. Essential oils and fragrance oils can be added with the initial soaping oils but solid additives such as botanicals, herbs, and oatmeal are added at a light trace, just as the mixture starts to thicken.
12. Immediately pour the mixture in your molds and cover your molds with towels or blankets. We want to keep the mixture warm as long as possible.
13. Let it dry for 6 to 24 hours (depending on soap size) before de-molding and/or cutting.
14. Store your soaps in a dry and cool place and let them cure for about 4 to 6 weeks before using or selling them.
Remember that until your soap is completely cured, it is still corrosive.