

MILK PLASTIC



THE ADVENTURE:

How much plastic waste does your Troop produce?
Explore recyclable materials and use milk and vinegar
to make a biodegradable material.



PLAN:

- Do you want to do this adventure during a meeting or at camp?
- How much plastic waste does your Troop produce during camp? How much waste do you produce at home?
- What plastics are recyclable in your area?
- How will you heat up your milk solution?
- How will you form groups of two or three?

DO:

Activity#1: How Much Plastic?

- Collect the plastic waste produced by your Troop, either during a camp or over the course of a week. Make sure all plastic waste is clean and dry.
- Weigh the plastic waste produced. At this rate, how much plastic waste would you produce in a year?
- Which plastics can be replaced by reusable items? Eliminated all together? Which plastics are not recyclable? Take those ones out of the mix and measure the weight again. What difference does it make in your yearly waste production?
- Do you know what plastic is made of? What are bioplastics?

Activity #2: Creating the plastic

- Each group needs a glass jar and hotplate or camp stove.
- Slowly heat 200 mL of milk in a pot until it is hot but not boiling.
- While the milk is heating, put 20 mL of vinegar in the glass container.
- Once the milk is hot, take it off the hot plate and pour it into the glass jar.

- Clumps should be forming in the milk. Stir the mixture gently for about two minutes or until clumps stop forming.
- Use a strainer to strain the vinegar and milk mixture into a plastic cup.
- Squeeze out the excess fluid from the solid left on top of the strainer.
- Knead this solid material into any shape you like. The thicker the form, the stronger it will be.
- If the solid is left in the sunlight, it will turn hard and become plastic.
- Let the plastic dry out over a weekend or a week. What causes the solution to become solid?

Extension:

- Does the amount of vinegar affect the yield of casein (plastic)?
- Does the type of milk affect the yield of casein (plastic)?
- Does the type of acid (lemon juice, orange juice, pop, other types of vinegar) affect the yield of casein (plastic)?
- Does the temperature of the mixture affect the yield of casein (plastic)?



REVIEW:

- What do you know now that you did not know before?
- What happens to plastic when it is recycled? When it is not?
- How can you reduce your plastic waste?
- Do bioplastics solve the problems caused by traditional plastics?
- Would this be a useful plastic in your daily life? In your community? Why or why not?
- What can you make out of your milk plastic?
- What did you like about this adventure? What did you not like about this adventure?
- How would you do this adventure differently?

ONLINE RESOURCES:

- Milk Plastic
- Green Plastics
- Bioplastics
- How do I recycle....

MATERIALS:

For each Scout:

- 200 mL skim milk or enough milk powder for 200 mL milk
- 500 mL glass container
- 20 mL vinegar
- Spoon
- Scrap of cloth (to strain)

For each group of 2 or 3:

- Hot plate or camp stove
- Pot
- Oven mitts
- Measuring cup
- Glass jar

For the Troop:

- Scale
- Optional: Other acids, such as lemon juice or pop

