



# Ice Cream Comet Investigation

Grab an adult and a friend to create edible comets as you explore what real comets are made of. Instead of a tool to identify different materials that make up a comet, you'll use your senses to identify what your model comet is made of! You can see what materials are represented by different foods below.

## Materials

*For experiment:*

Pencil or pen

Piece of paper

1 small cup per participant

1 spoon per participant

Black or brown cookies to be crushed ("*space dust*")

Coconut flakes or marshmallows ("*carbon dioxide*")

Peanuts, or nuts ("*rocks*")

Crushed candies such as toffee, peppermint, or sprinkles (to *represent "new discoveries" in your comet*)

Ice cream (a plain flavor like vanilla) OR

*For ice cream:*

$\frac{2}{3}$  cup whole milk (2% or other reduced fat will not work)

$\frac{1}{3}$  cup evaporated milk

5 tbsp sugar

$\frac{1}{4}$  tsp vanilla extract

Salt

1 sandwich-size resealable plastic or reusable bag

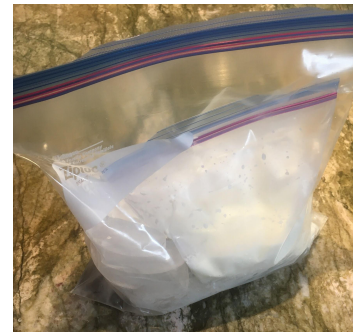
1 gallon-size resealable plastic or reusable bag

Pair of rubber kitchen gloves or oven mitts

Ice (enough to fill a gallon size bag  $\frac{1}{2}$  full) or fresh snow

## Directions

1. **Make** the ice cream that will serve as your comet.  
*If you are using pre-made ice cream, skip to step #8.*
2. **Mix** the following ingredients into the *sandwich* size bag.  
**Helpful hint:** One person can hold the bag while another adds ingredients.  
**Squeeze** the bag to mix ingredients and then to remove as much air out of the bag as much as possible:
  - a. 1/3 cup evaporated milk (or cream)
  - b. 2/3 cup whole milk
  - c. 5 tablespoons of sugar
  - d. Less than 1/4 teaspoon of vanilla
3. **Put** approximately 10 heaping spoonfuls of salt into the *gallon* size bag. **Place** the sandwich size bag into the gallon size bag (checking again that the sandwich bag is sealed tight).
4. **Fill** the gallon bag at least 1/3 full of ice. Close the bag tightly and remove as much air as possible. Be sure to check for leaks.
5. **Gently shake and roll** the bag, keeping it in constant motion for approximately 6-10 minutes or until half the bag has turned to water. You can start with bare hands to feel the temperature change, but switch to gloves when the bag becomes very cold.
6. **Gently feel** the sandwich bag through the icy mixture. When the milk/sugar mixture in the sandwich bag has hardened into soft ice cream, open the gallon bag and remove the sandwich bag.
7. **Rinse** the outside of the sandwich bag briefly to remove the salt/ice mixture (*the ice cream will carry the taste without rinsing*)
8. **Scoop** the ice cream into one cup per member of your tasting/identifying team. You can decide on some cups for tasting only and some for touching only.



9. Add in your choice of amounts of “rock,” “dust,” “carbon dioxide,” and “new discovery” pieces in your individual cups of ice cream to make a unique comet for others to investigate.

10. Sample your “comet”

- a. With a real comet, scientists use a tool called a spectrometer to identify what the comet is made of. With your model comet, your spectrometer is YOU and your many senses!
- b. Pretend that your eyes, hands, and taste buds are filters on a spectrometer taking data from your “comet.”



11. Record the following data on your piece of paper:

- a. Look at the “comet” and see what you can observe **visually**. Record what you notice on your data sheet.
- b. Take the cup you’ve decided is just for touching and **feel** the “comet” with your fingers. Record anything you notice that was different from just looking.
- c. **Smell** the “comet” and record any additional data.
- d. **Taste** the “comet” and record anything else you notice!

12. Compare notes. Share what data you recorded with your fellow scientists!

Did you notice anything that surprised you in your comet?