

Ice Explorations

Concepts Explored

- Observations
- Questioning
- States of matter
- Properties of water
- Properties of light
- Temperature
- Chemical reactions
- Erosion
- Energy
- Hydrosphere

Materials:

1. Balloons, filled with water and frozen
2. Trays
3. Food coloring or liquid watercolor
4. Pipettes
5. Rock salt, table salt, sugar
6. Magnifying glasses
7. Cups, beakers
8. Thermometer
9. LED Flashlights
10. Metal and wood objects (toothpicks, craft sticks, paper clips, etc.)
11. Large, clear tubs filled with water



Skills Applied

Focus and Self Control

Perspective Taking

Communication

Making Connections

Taking on Challenges

Pursuing Ongoing Learning

Standard Connections

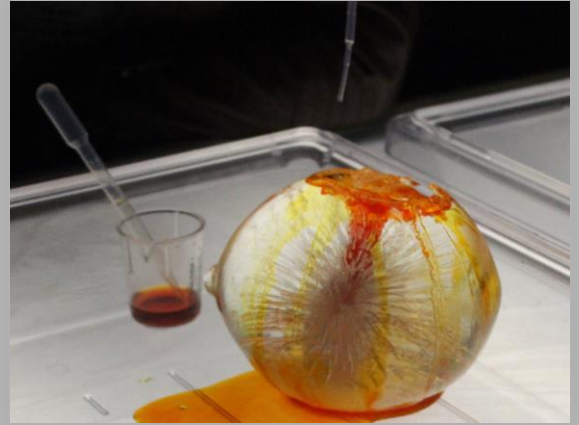
Kindergarten	K-PS3-1, K-ESS2-1, K-ESS2-2, K-ESS3-1, K-ESS3-2, K-ESS3-3
1st Grade	1-PS4-3
2nd Grade	2-PS1-1, 2-PS1-2, 2-PS1-3, 2-PS1-4
3rd Grade	3-LS4-3, 3-LS4-4, 3-ESS2-2, 3-ESS3-1
4th Grade	4-PS3-2, 4-ESS1-1, 4-ESS2-1, 4-ESS3-2
5th Grade	5-PS1-1, 5-PS1-2, 5-PS1-3, 5-PS1-4, 5-ESS2-2, 5-ESS3-1
6th Grade	6-PS3-3, 6-PS3-4, 6-ESS3-3, 6-ESS3-4, 6-ESS2-6, 6-ESS3-5
7th Grade	7-PS1-2, 7-PS1-4, 7-PS1-5, 7-PS1-6, 7-ESS2-1, 7-ESS3-1, 7-ESS2-2, 7-ESS2-3

Preparation:

1. Fill normal balloons with water. They can be any size you want to explore.
2. Freeze them for **at least 24 hours**.
3. Set them on trays for students to begin observations.
4. Gather materials for students to use during inquiry.

What to do:

1. Set ice with balloon already taken off on separate trays (one for each group of students).
2. Prepare materials/tools for inquiry of choice:
 - a. Magnifying glasses for close observation
 - b. LED flashlights
 - c. Cups or beakers of liquid watercolor or food coloring with pipettes
 - d. Rock salt, table salt, and/or sugar in small cups with spoons
 - e. Conductive (paperclips) and non-conductive (toothpicks) objects
 - f. Infrared thermometer temperature gun or other thermometer
 - g. Large tubs filled with water
3. Introduce new tools/materials one at a time and encourage students to write down and share their observations and questions.
4. Use tools/materials that lead students to focus on your specific content: properties of light-turn out the lights and use flashlights, temperature-thermometers, thermal energy-conductive materials, etc.



Facilitation Tips and Ideas:



1. Encourage students to make **observations** first. Have them take record their observations in a journal or do this as a class.

2. Next, guide students to only ask **questions** or say, "I wonder...." Don't allow any answers!

3. Use tools/materials that lead students to focus on your specific content: properties of light-turn out the lights and use flashlights, temperature-thermometers, thermal energy-conductive materials, etc.

4. Generate questions and guide further inquiry or experiments that students are curious about still and connect it other content areas.
5. Let your students lead other grade levels or peers through this activity after they have experienced it.
6. **Less is more!** The more you let your students lead, the better. They will come up with observations and questions that you have never considered.

Resources

- [Science behind ice and inquiry process](#) from Fort Worth Museum of Science and History
- [Ice Balloons Activity Guide](#) from Exploratorium
- [Rubik's Cube video](#) about questioning

