



## Ice Exploration

Excavate frozen objects!

Creativity Skills Developed					
 Imagination & Originality	 Flexibility	 Decision Making	 Motivation		
Topic	Age	Participants	Complexity	Duration	Cost & Resources
<ul style="list-style-type: none"> <li>Making, Building &amp; Tinkering</li> <li>Science</li> <li>Nature</li> </ul>	<ul style="list-style-type: none"> <li>2-5 yrs.</li> <li>6-9 yrs.</li> <li>10-14 yrs.</li> </ul>	<ul style="list-style-type: none"> <li>Individuals</li> <li>Small groups (2-4 participants)</li> <li>Large groups (5+ participants)</li> </ul>	<p><b>Moderate</b></p> <p><i>Guidance needed from an expert peer or an adult</i></p>	<ul style="list-style-type: none"> <li><b>Extended</b> (15 min. - 2 hrs.)</li> </ul>	<p><b>Medium</b></p> <p><i>Need to collect some everyday household objects or easy to find purchase of \$10 or less</i></p>

### Get Ready...

Use your problem solving skills and a variety of tools to get items out of blocks of ice.

### Get Set...

Gather these materials:

- Items to freeze (leaves, shells, sticks, rocks, pennies, etc.)
- Plastic containers of different shapes and sizes to freeze the items in
- Large bowls or flat plastic tubs
- Toothbrushes or nail brushes
- Eyedroppers
- Salt
- Towels
- Flashlights
- Water



## Go!

1. Freeze items in plastic containers filled with water.
2. Once frozen, pop out the ice into a large bowl or flat plastic tub.
3. Take a look at your tools before you start. How will you use each tool? What do you think will happen when you use each tool?
4. Now use the tools to excavate the ice. How can you get the items out of the ice? What other tools could you use? What other things could you try?

## We're Finished! What Now?

- Have an excavation race! Freeze similar items in the same amount of water and see who can get the item out first. Afterwards, have each person talk about what they did to get the item out. What was the fastest method? What was the slowest? What was the most creative?
- Try freezing items in larger plastic containers and excavate even larger pieces of ice. How does this change the activity? Will you use a new method? Will you need new tools?
- Try freezing small items in water balloons instead of plastic containers. Place the item in the balloon, fill it with water and then freeze it. Once it is frozen, cut the balloon off. Excavating objects from a rounded shape is another fun challenge!

## Links to Creativity Research

This activity requires both flexibility and persistence, which are cognitive and affective components of creativity. Participants must remain persistent in the task, but also willing to change their problem-solving tactics if necessary (see Nijstad et al.'s work on the Dual Pathway to Creativity). Both divergent and convergent thinking are essential to successfully complete the excavation: divergent thinking produces a multitude of potential excavation methods, while convergent thinking is utilized to decide on the method that is most likely to be successful. The cycle between divergent and convergent thinking gives birth to the creative thinking process (Cropley, 2006).

Cropley, A. (2006). In Praise of Convergent Thinking. *Creativity Research Journal*, 18(3), 391-404.  
Nijstad, B.A., De Dreu, C.K.W., Rietzschel, E.F., & Baas, M. (2010). The dual pathway to creativity model. *European Review of Social Psychology*, 21, 34 - 77.

## Source

This activity was contributed by the Center for Childhood Creativity at the Bay Area Discovery Museum.  
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