



# EXPERIMENTING WITH ICE CUBES

SCIENCE: STATES OF MATTER

*Every child is different. Do what works best for encouraging each child's exploration of this suggested activity.*

## OBJECTIVE OF THIS INVESTIGATION:

While making ice-markers children will notice how states of matter change.

## VOCABULARY:

- Solid
- Liquid
- Cold
- Warm
- Change
- Melt

## MATERIALS:

- Ice cube tray
- Water
- Small pitchers for pouring
- Food coloring
- Popsicle sticks or other item to stick in the ice cube trays for children to hold on to once the water has frozen (e.g., interlocking blocks, popsicle holders, any plastic toy that is easy to grasp and would fit in a single pocket of an ice cube tray).
- Optional: Foil to cover ice cube tray and poke popsicle sticks through if they are very long. This will hold the popsicle sticks in place until they freeze.
- Note: Complete this activity outside or on a waterproof mat if mess is a concern.

## PROGRESSION STEPS (SCIENCE: STATES OF MATTER):

Visit [STEMIE Learning Trajectories](#) for details

- Energy Observer

## THIS INVESTIGATION:

### Day 1:

- Gather children together around the materials.  
**"Today we're going to make some homemade ice-markers with this water and food coloring."**
- Show children the pitcher of water.  
**"Is water a liquid, solid, or gas? How do you know?"**
- Ask follow up questions, such as: **"Does water change its shape when it's in different containers? Let's try it out!"**
- Narrate how the water takes the shape of the ice cube tray when poured in.  
**"The water has the shape of the pitcher, but when we pour it out, the shape changes. Now the water has the shape of the ice tray. Liquids change their shape depending on the container that holds them."**

## ADAPTATIONS:

See [A Guide to Adaptations](#) for general ideas and strategies

### Environment:

- Provide adaptive seating so all children are comfortable and able to access the materials.
- Set up a boundary around the coloring area to help children know where to color.





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## THIS INVESTIGATION (CONTINUED):

### Day 1 (Continued):

- Allow children to add water to the ice cube trays.
- Next allow children to add a few drops of food coloring to different pockets in the ice cube tray.
- After the trays are full ask: **"Hmmm. Can we hold on to the water right now like a marker or crayon? No! Because it's a liquid. What could we do to the water so that we can hold it in our hands like a marker or crayon?"**
- If children need more scaffolding, ask: **"How can we change this water into ice? Ice is solid! We can hold that!"**
- Place the ice cube tray in the freezer and tell children you will check on it the next day.

### Day 2:

- Remove the ice cube tray from the freezer right before the activity but cover it with a dishtowel or put it somewhere so children can't see it.
- Gather children together and remind them about the ice-markers you started making yesterday.  
**"I put our tray of water in the freezer. What do you think happened to all the water? Why?"**
- Show children the tray of frozen water. **"You're right! The water froze into ice."**
- Remove ice from tray and allow children to use the colored ice to draw on paper.
- As children draw, observe if they notice the ice start to melt. If not, prompt them to take note: **"What's happening to the ice as we color? Is it getting bigger or smaller? It's melting! Why do you think the ice is melting/turning back into water?"**

## HOW TO CONTINUE THIS INVESTIGATION:

- Discuss changes in states of matter throughout the day:
  - Notice ice cream melting on a hot day.
  - Narrate what happens to water when you boil it.

## ADAPTATIONS (CONTINUED)

### Materials

- Provide smaller, easier to hold pitchers or cups for children to use to pour water.
- Ensure the material used as a handle for ice-markers is easily graspable by all children.
- Use dark and highly contrasting colors to help children differentiate the colors.
- Provide gloves for children who might not want to touch cold or have color on their hands.

### Instruction

- Provide visuals of solid and liquid.
- Use visuals that demonstrate the steps to making the coloring tools (pouring, mixing, sticking the handle in, etc).
- Break task down into small steps

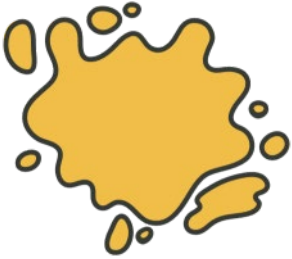


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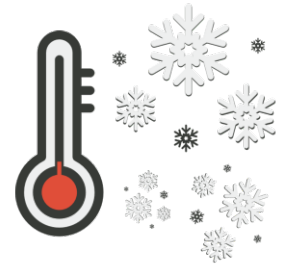
## SUPPORT MATERIALS:



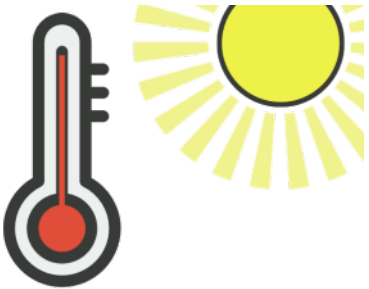
**Solid**



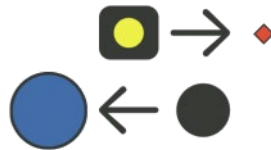
**Liquid**



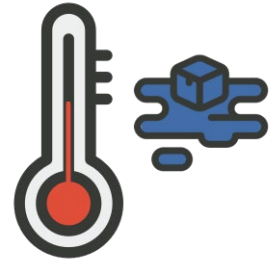
**Cold**



**Warm**



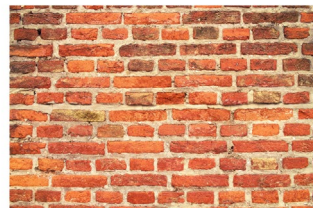
**Change**



**Melt**



**Water (example of a liquid)**



**Bricks (example of a solid)**



**Steam (example of a gas)**