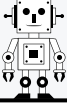
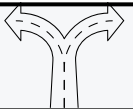


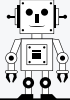
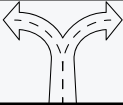
Affects of Heating and Cooling Menu

Directions: Take a look at the different ways you can explore **how materials are affected by heating and cooling** on the choice board. Choose the ONE activity that you think will best help you show what you've learned and that you will enjoy working on!

Ask and Investigate 	Model It! 	Be a Data Detective 
Come up with a question about how heating or cooling affects a material. Plan a simple way to investigate.	Create a model to show how heating or cooling can change the state of a material. Explain your model.	Observe what happens to different materials when they are heated or cooled. Record your observations and share what you notice.
Math Connections! 	Explain It! 	Solve a Problem! 
Use measurements to describe how heating or cooling affects a material. Explain your measurements.	Describe in your own words how heating and cooling can cause materials to change state. Use specific examples in your explanation.	Imagine you need to keep something hot or cold for a long time. What materials would you use for insulation and why?
Tell a Story! 	Create a Visual! 	Be the Teacher! 
Write a short story about a material that goes through different temperature changes and how it affects the material.	Create a diagram or chart that visually shows the different states of matter and how heating and cooling can cause changes between them.	Explain to someone how heating and cooling can affect the properties of different materials. Use real-world examples.

Hot & Cold Ideas: Exploring Heating & Cooling!

Explore the core concepts of the effects of heating and cooling with these starting points. Remember, you can always come up with your own amazing projects too!

Ask and Investigate 	Model It! 	Be a Data Detective 
1. Does heating different solids change them the same way? 2. Does cooling different liquids change them the same way? 3. Can you make a gas turn back into a liquid?	1. Show what happens to water when it gets very cold. 2. Show what happens to butter when it gets warm. 3. Show how a thermometer works with heating and cooling.	1. Observe ice melting. What do you see? 2. Observe what happens to a balloon in a warm place and a cold place. 3. Watch water boil. What changes do you notice?
Math Connections! 	Explain It! 	Solve a Problem! 
1. Measure the size of a marshmallow before and after heating it. 2. Time how long it takes ice cubes of different sizes to melt. 3. Compare the starting and ending temperatures of water being heated.	1. Why does a metal spoon in hot soup get hot? 2. Why does butter get soft when it's left out on the counter? 3. Why does a balloon get smaller in the cold?	1. How can you keep ice from melting quickly? 2. How can you warm up a cold drink quickly? 3. What materials would be best for oven mitts? Why?
Tell a Story! 	Create a Visual! 	Be the Teacher! 
1. A snowflake's journey from a cloud to the ground. 2. A piece of chocolate left in the sun. 3. Water turning into steam and back again.	1. Show how a thermos or a cooler works to keep things at a certain temperature. 2. Show how heat moves from one thing to another when they are at different temperatures. 3. Show materials that are good insulators.	1. Describe how heating and cooling might affect a bridge. 2. Demonstrate how a cooler works to keep things cold. 3. Help someone understand why sidewalks have cracks in them.