

Freeze and Thaw		Grade 1 - Earth and Space Science
<b>Lesson Plan</b>	<b>Safety Notes</b>	Ask for help when using the microwave.
		If you have a latex allergy, do not eat the chocolate shell after this experiment!
<b>Description</b>		
Students will explore the seasonal process of freezing and melting (thawing) water.		
<b>Materials</b>		
<ul style="list-style-type: none"> <li>● Chocolate chips</li> <li>● A microwave-safe bowl</li> <li>● A microwave</li> <li>● A balloon or water balloon.</li> <li>● Water</li> <li>● A plate</li> <li>● A freezer</li> </ul>		
<b>Science Background</b>		
In fall, it gets cold enough for water to freeze. In the spring, it melts again. (Most years, it freezes and melts many, many times in between!) When water freezes, it expands. Believe it or not, ice expands with enough pressure to break solid rock, or in this experiment, chocolate.		
<b>Activity Procedure</b>		
<ol style="list-style-type: none"> <li>1. Put your chocolate chips into a microwave-safe bowl. Microwave for 30 seconds at a time (stopping to stir every 30 seconds) until the chips are melted. Set aside to cool.</li> <li>2. Fill your balloon partway with water. Be careful not to overfill and burst the balloon! (A water balloon will be less likely to break, but you can use a regular balloon.)</li> <li>3. The chocolate should be cool enough to touch, but still semi-liquid. Dip the balloon into the semi-molten chocolate and roll it around to get a good coating. You can experiment with the thickness of the chocolate coating.</li> <li>4. Put the chocolate-coated balloon on a plate, and stick it in a freezer overnight.</li> <li>5. The next morning, record your observations on the handout.</li> </ol>		
<b>Debrief</b>		
When the water freezes, it expands inside the water balloon. If the balloon isn't totally full, it can stretch with the expanding water-- but chocolate can't, so the chocolate shell should crack. Rocks aren't stretchy, either, so they can be cracked and broken down by water freezing in cracks. The same thing happens to our roads.		

## Handout

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Draw what you think will happen to the chocolate on the balloon:

Draw what actually happened. Refer to the lesson plan to learn why this happened: