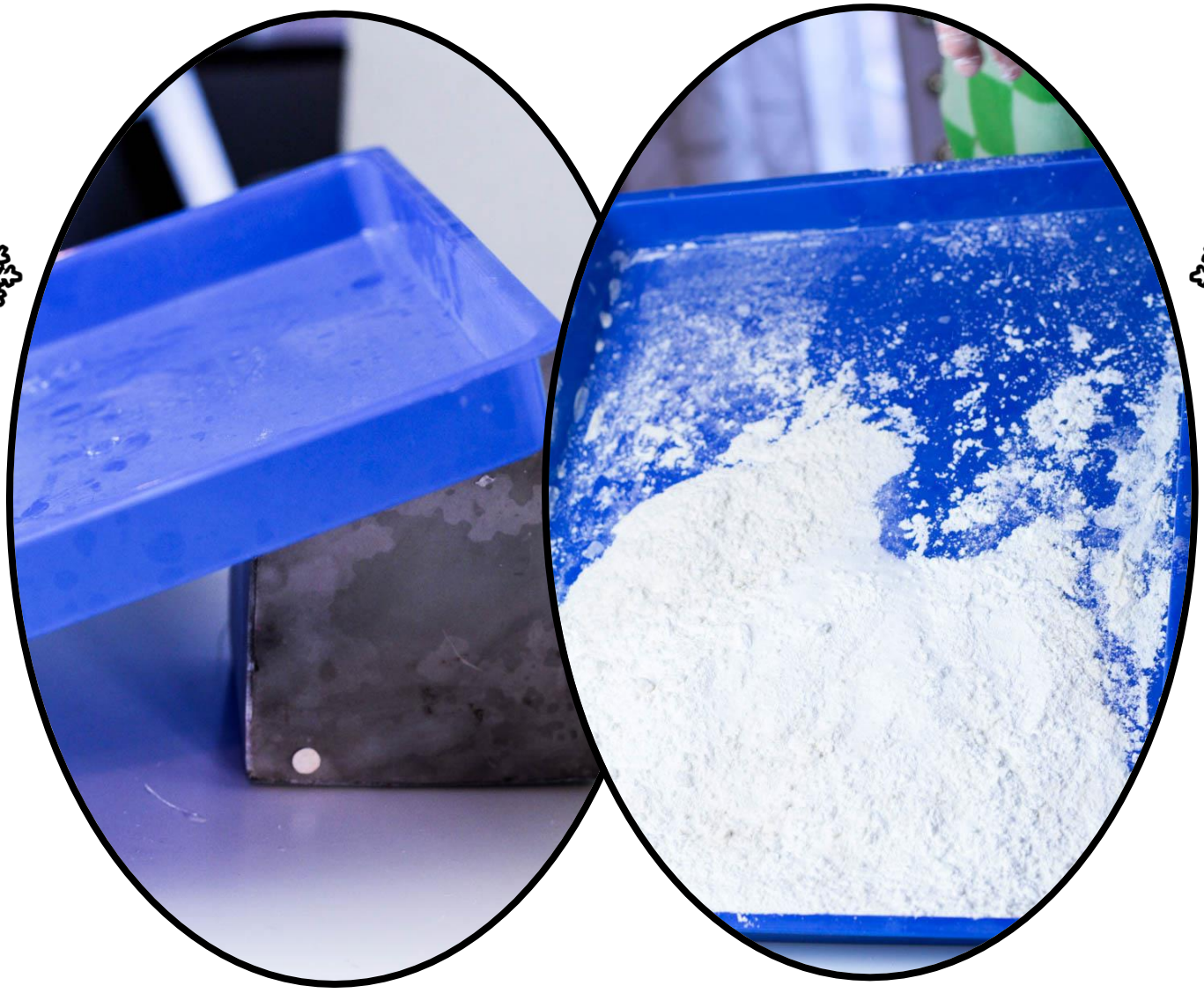
WINTER SCIENCE CREATING AVALANCHES



AVALANCHES

Name: _____ **Date:** _____

Natural disasters are often the result of several factors combining together. It's true of tornadoes, hurricanes, and blizzards, as well as avalanches. Three different factors combine to create an avalanche. You need lots of snow, a steep slope, and a trigger to start the process. Let's take these one by one.

First, the snow part is obvious. Snow is the thing that falls. The more snow there is, the bigger the avalanche.

Now let's look at the slope. You've probably been sledding before. You know that you need a hill. Without a hill, you're not sledding…you're sitting. You've probably noticed that some hills are better sledding hills than others. It is the same with an avalanche. Most avalanches start on mountain slopes with angles between 25 and 60 degrees. If the angle is less than 25 degrees, it's not steep enough to get the snow to start sliding. If it's greater than 60 degrees, the snow is constantly falling off the mountain. An avalanche happens when the snow piles up over time, and then something triggers it to fall.

The trigger is ingredient number three. The trigger can be almost anything. It could be a falling tree or rock, wind, or a loud noise that sends vibrations through the snow. The key is that the snow is ready to fall when the trigger happens. It's ready because there's one or more weak layers in the snow. There are layers that are melting or are just less stable than the firmer layers around them. If the weak layers are in the middle of a huge snow pile and the slope is steep enough, the firm top layer can slide right down the mountain.

Try this as a demonstration. Push your dry palms together very tightly. They are two solid surfaces with nothing between them. Try sliding one hand up while still pushing together. Unless your hands are sweaty, it's hard to move. If something wet or less solid is in there – such as lotion or sand – your hand moves. That's similar to a hard layer of snow falling off of a weak layer. It's a instant avalanche.

AVALANCHES

Name: _____ **Date:** _____

Question: Can we use fake snow materials to build and demonstrate an avalanche?

Materials:

- Fake Snow Layers: (Flour, Salt, Sugar, Cornmeal, Fake Snow)
- Large plastic tray
- Compass
- Rocks or blocks
- Sound system (optional)

Procedures:

1. Use the compass to create an incline on the tray between 25 and 60 degrees.

2. Layer the materials into snow layers, placing the heaviest material (salt) on the bottom to represent packed, icy snow, followed by the lighter materials: sugar, then cornmeal, and then flour. Place the lightest material, fake snow, on top to represent freshly fallen snow.

3. Hit the surface of the tray with a rock or block. Watch what happens to the snow. Optional: Place a speaker near the tray and play music or sounds at varying volumes. Observe whether the vibrations cause an avalanche and compare at which volume levels movement occurs.

Notes:

If an avalanche does not occur, adjust the angle of the incline and see if an avalanche is more likely at certain inclines than others.

Adding additional "snow" may also increase the chances of an avalanche.

AVALANCHES

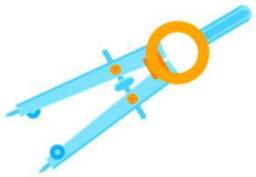
Name: _____ **Date:** _____

Using details from the passage and the demonstration to answer each question.

What three factors cause avalanches to occur?

How did we implement those three factors in our demonstration?

Winter Science : Creating Avalanches

 FLOUR	 SALT	 SUGAR
 CORNMEAL	 PLASTIC TRAY	 FAKE SNOW
 COMPASS	 SPEAKER (OPTIONAL)	 ROCKS

Winter Science : Creating Avalanches

Use the compass to create an incline on the tray between 25 and 60 degrees.

Winter Science : Creating Avalanches

Layer the materials into snow layers, placing the heaviest material (salt) on the bottom to represent packed, icy snow, followed by the lighter materials: sugar, then cornmeal, and then flour. Place the lightest material, fake snow, on top to represent freshly fallen snow.

Winter Science : Creating Avalanches

Hit the surface of the tray with a rock or block. Watch what happens to the snow. If an avalanche does not occur, adjust the angle of the incline and see if an avalanche is more likely at certain inclines than others.

Winter Science : Creating Avalanches

Adding more "snow" may also increase the chances of an avalanche.

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