

Viscosity of Snow Globes

Supplies

- * 2 - 3 Clear empty jars with well sealing lids
- * A water proof glue
- * A miniature or two
- * A ruler
- * A Sharpie or other marker that will write on glass
- * Water
- * Vegetable glycerin or baby oil
- * Glitter
- * Towel

Skills used

- * Fine motor skills
- * Measuring
- * Fractions and ratios
- * Logic and hypothesis
- * Fluid dynamics (advanced physics)



Vocabulary needed

Viscosity - Quality of a fluid that relates to it's viciousness or ability to flow and stickiness. The more sticky and resistant to flow, the more viscous the fluid is. This means it has a "high viscosity."

Explore: Pour a few drops of water into a container and move it around. Now do the same with the glycerin or baby oil. What do you observe? Touch them. How do they feel?

Ratios - A relationship between two quantities, normally expressed as the quotient of one divided by the other; for example, the ratio of 7 to 4 can be written 7:4 or 7/4. A ratio can often also be expressed as a decimal or percentage.

Explore: Take a pile of candy and have your child divide the number for each person in the house. Each person has a part of the whole.

Directions

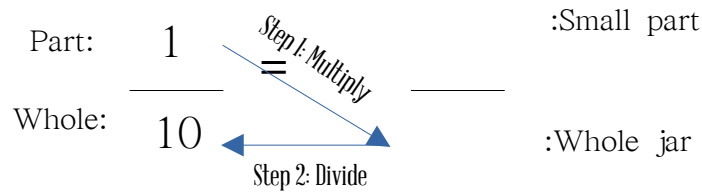
First, we are going to figure out how to make your ideal snow flurries. You can make them go faster or slower with the right **ratio** of glycerin to water. Then, once you have the **viscosity** you like, you'll make your snow globe.

So, grab a jar, your ruler, and your marker to start.

Ratios:

Measure the height of your first jar. Calculate 1/10th of the height and make a small mark on the side of the jar. Now, with your second jar, do the same thing and calculate 1/8th of the jar. If you have more jars, feel free to make your own ratios to play with the viscosity of the snow globe.

Here's the equation to plug it into:



Example if you have a jar that is 8 inches tall:

Step 1: $1 \times 8 = 8$

Step 2: $8 \div 10 = 0.8$

The mark would go at 0.8 inches up the side of the jar.

❄️ Testing Viscosity ❄️

Fill the jar to the line with glycerin or baby oil. Fill the jar almost to the top with water, then add just a little glitter.

Remember this isn't the final globe so don't go crazy with glitter yet!

Screw the cap on tightly. Shake it like you would a snow globe and set it down. What do you see? How do the two jars move? How similar or different are they?

Which one do you like more? That's the one you'll use to make your first snow globe!

❄️ Making a snow globe ❄️

Grab your trinkets and glue, let's go!

Remove the lid and dry it off. Carefully arrange and glue your miniatures onto the lid and allow it to dry. If you need to let it dry over night, do so.

Add a little more glitter to your globe.

Now, keeping the jar over the towel, carefully put the lid back on. It may overflow if you filled it too much earlier. That's OK. The globes actually look better when it's absolutely full.

Note to parents: If you want to make this a permanent snow globe that you can keep year after year, seal the lid to the jar with either the same glue or other waterproof sealant.



Ideas to build on this lab



Math:

- Ratios along the different heights of the jars
- Ratios by volume instead of height

Science:

- Different ratios and different viscosity
- Optics with light or a drop of food colouring in the water.

Literature:

- Create a story to go with the snow globe
- Create a snow globe to go with a favourite story

History:

- Discovery and invention of the glue you used
- An aspect of the history of fluid mechanics, like looking up Archimedes

Jot ideas for future fun here

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