

SLOW MO SNOW EXPERIMENT



Want to experience the wonder of snowfall at home? Create your own winter wonderland inside of a jar! Experiment with glue, glitter, and hot water to find out which mixture creates the perfect, slow motion, snow globe effect. Then, personalize and save it as a calming sensory tool.

PROCEDURE

In a location that can be easily cleaned, lay out 3 jars of similar size and the rest of the materials needed for this experiment.

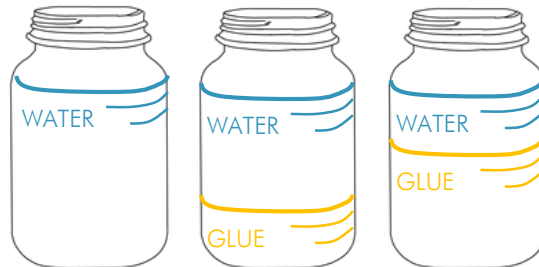
Fill each of the jars with the following amounts of glue and water:

Jar 1: No glue, fill with hot water only.

Jar 2: 1/3 with glue, 2/3 with hot water.

Jar 3: 2/3 with glue, 1/3 with hot water.

Keep in mind that hot water will melt plastic. If you are using plastic bottles for this experiment, mix the glue and hot water in a glass container first. Allow it some time to cool before pouring it into your bottle.



Add a few sprinkles of glitter in each to act as snow, and mix with a spoon until combined. While you mix, make predictions: Which mixture do you think will create the fastest snowfall? Which do you think will create the slowest snowfall? Why?

Give each jar one final stir. Then, side-by-side, observe the glitter as it falls to the bottom of the three jars. Take note of which falls the fastest, slowest, and in between? Do these results match what you predicted? Is there a way you can measure each jar's snowfall speed? What tools might you need? Discuss your results and try to explain why you think each of the three mixtures created different snowfall speeds.

PERSONALIZE AND SAVE

Once you've finished experimenting, turn them into calming sensory jars for later! Determine which snowfall speed you liked best. Adjust the mixtures by adding more glue or starting over with less.

Add more glitter, food coloring, or a figurine inside! To add a figurine, start by finding one small enough to fit inside your jar. It can match the winter wonderland theme, or be whatever you choose! Then, hot glue it to the inside of the jar lid and let it dry.

Last, seal it all together. Place a ring of hot glue around the inside edge of the jar's lid. Then, tightly screw it onto your jar and double check for leaks before finishing!

The Learning Launchpad



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MATERIALS

- 3 jars or bottles of similar size (with lids)
- 2 to 4 bottles of clear glue
- Glitter
- Hot water
- Glue gun
- Spoon
- Food coloring (optional)
- Glitter glue (optional)
- Small toys or figurines (optional)

MORE EXPERIMENTS TO TRY

Compare how different shapes and sizes of glitter fall.

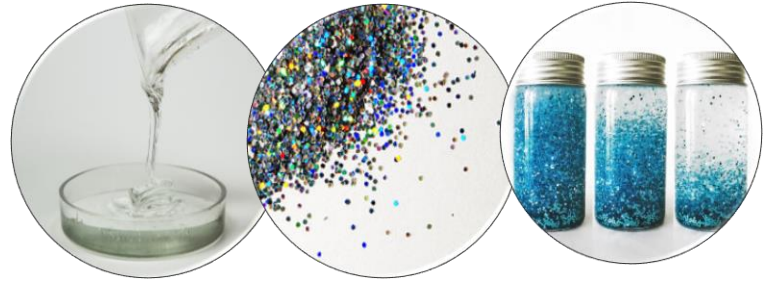
Experiment with other materials in your mixture, like water beads, glitter glue, soap, oil, or corn syrup.

Create a super-slow mixture with lots of glue. Add in loose toys, like small blocks, beads, or magnets. Predict how they'll move, then watch!

BACKGROUND INFORMATION

WHY DOES GLUE SLOW THINGS DOWN?

During the experiment, you may have noticed that the more glue added, the slower the glitter falls. Which makes sense if you're familiar with glue. It's sticky, dense, oozy, and gooey. If you were to imagine running through a pool full of glue, it would be difficult. That is because glue is denser and more viscous than water!



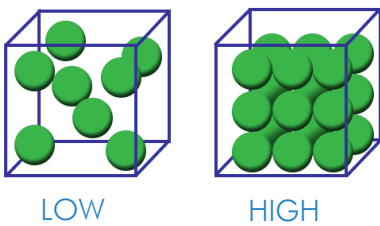
DENSITY

Density is the amount of matter (mass) packed into a set amount of a substance (volume). Glue has a density of about 1.19 g/cm³ (grams per centimeter cubed), while water has a density of 1 g/cm³. That means there is about 0.19 more matter packed into every cubic centimeter of glue than there is in the same amount of water. The more glue added, the more matter there is for the glitter to move through, which increases the viscosity of the solution.

VISCOSITY

Viscosity is how sticky, thick, and semifluid a substance's consistency is due to internal friction. When glue, which has a higher density than water, is mixed with water, the two combine. This increases the viscosity of the water, which has much less resistance to glitter on its own. It also decreases the viscosity of the glue, which has much more resistance to glitter on its own. The result is a semifluid, flowing mixture with a viscosity somewhere in the middle! Glitter can still flow and move easily through this mixture, but it does so at speeds slower than it would in plain water. This creates the slow motion movement that mimics the weightless dance of snow as it falls in the winter.

DENSITY



VISCOSITY



WHY USE HOT WATER?

Hot water is an essential part of mixing the glue and water together because it helps dissolve the glue faster. As explained above, glue and water have different densities which makes it difficult to mix them together at cold or room temperatures. That doesn't mean they can't mix, it just takes some effort.

Adding a bit of hot water adds energy to the mix. The energy from the hot water increases the motion of the molecules in the glue, causing them to break apart more easily. This increases the speed of the glue's breakdown, dissolving it into the water faster and creating a thoroughly mixed solution in the end.

Using hot water to dissolve viscous materials quickly is a common science used in our everyday lives. Hot tea dissolves sugar and honey much faster than cold tea. Hot water in the bath quickly dissolves Epsom salts or bath bombs. It even helps dissolve cocoa powder in a mug of hot chocolate faster!

DRAW YOUR WINTER WONDERLAND

Use the templates below to draw up your own winter wonderland in a jar! Use your imagination or the following prompts to get some inspiration for space-inspired wonderlands:

What do you think winter looks like on the other planets in our solar system?
How do you think astronauts celebrate winter holidays on the International Space Station?
How do you think we would celebrate winter if we lived on planet Mars?
What do you think a winter wonderland in the year 2070 would look like?

Draw it out and share it with us on social media by tagging @chabotspace on Instagram, Facebook, or Twitter!

