Preserve a Snowflake

A Winter Student Activity

Introduction

Preserve and save a snowflake for decades! Create a lasting cast of nature's perfect crystals with a drop of chilled superglue.

Concepts

- Snowflakes
- Polymers
- Preservation

Background

Ever wanted to catch a snowflake and keep it forever? Now you can! Preserve a snowflake in a drop of superglue! The "super" in this thin, runny adhesive are small molecules called cyanoacrylate monomers that penetrate and interlock anything they touch. The glue hardens when the monomers link together, or polymerize, head-to-tail into long chains called polymers. This process is triggered by a minute trace of water or water vapor and progresses very quickly. This is why superglue hardens more rapidly on moist things, such as fingers, than on dry objects.

The tendencies of superglue to seep into the tiniest nooks and crannies, harden on contact with water, and solidify rapidly make it perfect for taking an impression of something that is very small and made of water—such as a snowflake!

Materials

Coverslip, glass
Freezer access
Microscope slide
Stereoscope
Superglue, thin and runny
Thermometer
Tweezers

Safety Precautions

Use superglue wisely. Vapors from superglue are caustic and breathing the vapors should be avoided. Be sure superglue does not come in contact with skin. Follow the precautions on the Superglue tube and observe all normal classroom guidelines.

Procedure

1. Set a microscope slide, coverslip, tweezers, and superglue outside when it is 20 °F or colder to chill.
2. Catch a snowflake on a slide or pick one up with cold tweezers and place it on the microscope slide.
3. Quickly place a drop of superglue on the snowflake. *Note:* Gel superglue does not work. Use a brand that is thin and runny.
4. Drop a coverslip over the drop of superglue. Do not press down hard or the flake could tear or melt from the heat of your finger.
5. Immediately place the prepared slide into a freezer.
6. Leave the slide in a freezer for one or two weeks. Do not touch the slide with warm hands. The glue must completely harden before the snowflake melts.

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Tips

- No two snowflakes are the same. Encourage students to use stereoscopes to compare and contrast their snowflake to others in the classroom.
- Photograph the preserved snowflakes using a digital microscope camera with a compound microscope on low power.
- After the superglue has chilled and hardened, allow students to take their preserved snowflakes home.
- Classroom or individual student snowflake collections may be set up as well.
- Thin and runny superglue works best in this activity. Flinn Scientific sells superglue that works very well (Catalog No. AP7095).

NGSS Alignment

This laboratory activity relates to the following Next Generation Science Standards (2013):

Disciplinary Core Ideas: Middle School
MS-PS1 Matter and Its Interactions
PS1.A: Structure and Properties of Matter
Disciplinary Core Ideas: High School
HS-PS1 Matter and Its Interactions
PS1.A: Structure and Properties of Matter

Science and Engineering Practices
Developing and using models
Planning and carrying out investigations

Crosscutting Concepts
Patterns
Structure and function

Reference

Save a Snowflake for Decades, http://www.popsci.com/popsci/diy/article/2006-02/save-snowflake-decades (Accessed January 2010).

Materials for *Preserve a Snowflake—A Winter Student Activity* are available from Flinn Scientific, Inc.

Catalog No.	Description
ML1381	Microscope slides, glass
ML1382	Cover slips, glass
AP7095	Superglue

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.