THAMES & KOSMOS

Ooze Labs

Big Bucket of Slime Activities

Experiment Manual



WARNING. Not suitable for children under 6 years. For use under adult supervision. Contains some chemicals which present a hazard to health. Read the instructions before use, follow them and keep them for reference. Do not allow chemicals to come into contact with the mouth and eyes. Keep small children and animals away from experiments. Keep the experimental set out of reach of children under 6 years old.

WARNING – Chemistry Set. This set contains chemicals and parts that may be harmful if misused. Read cautions on individual containers and in manual carefully. Not to be used by children except under adult supervision.

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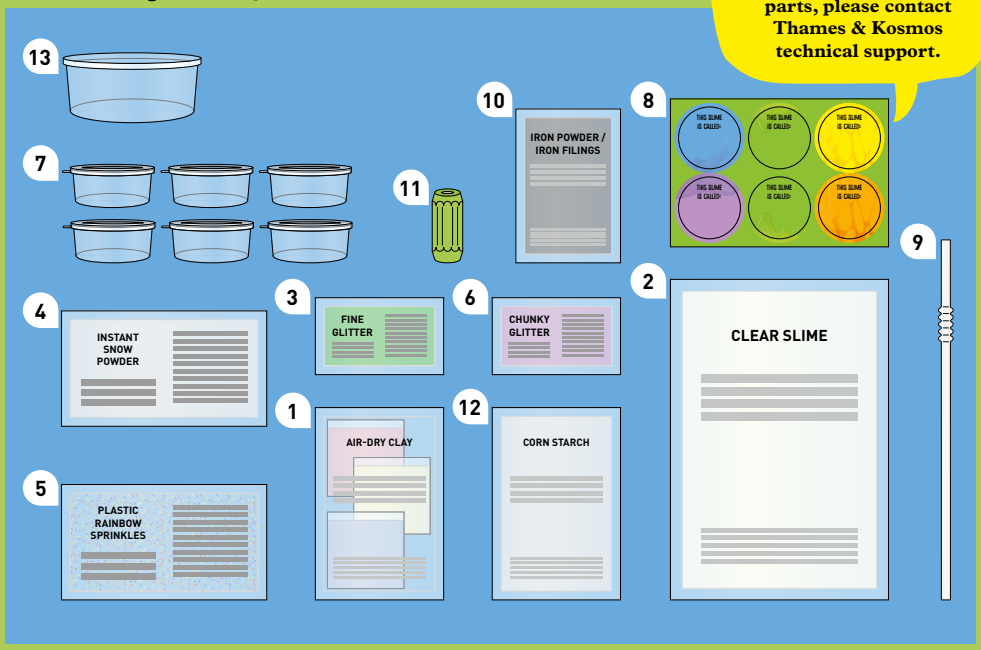
KIT CONTENTS

What's in your experiment kit:



Good to know!

If you are missing any parts, please contact Thames & Kosmos technical support.

Before starting

Please check all of the parts in the kit to make sure that nothing is missing.

Checklist:

✓	No.	Description	Quantity	Part No.
○	1	Air-dry clay (set of 3) (red, yellow, and blue; 6 g each)	1	121-P01
○	2	Clear slime (700 g)	1	121-P02
○	3	Fine glitter (1 g)	1	121-P03
○	4	Instant snow powder (7 g)	1	121-P04
○	5	Plastic rainbow sprinkles (10 g)	1	121-P05
○	6	Chunky glitter	1	121-P06

✓	No.	Description	Quantity	Part No.
○	7	Container with lid	6	121-P07
○	8	Sticker sheet	1	121-P08
○	9	Bendy straw	1	121-P09
○	10	Iron powder (10 g)	1	121-P10
○	11	Magnet	1	121-P11
○	12	Corn starch (35 g)	1	121-P12
○	13	Mixing bowl	1	121-P13

YOU WILL ALSO NEED:

Scissors, water, paper towels, teaspoon, tablespoon, table salt, glass marble, cups

The parts not included in the kit are marked in *italics* in the YOU WILL NEED lists.

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TIP

YOU CAN FIND ADDITIONAL INFORMATION IN THE CHECK IT OUT SECTIONS ON PAGE 6 AND THE INSIDE BACK COVER.



Poison Control Centers (United States)

In case of emergency, your nearest poison control center can be reached everywhere in the United States by dialing the number:

1-800-222-1222

This experimental kit is intended only for children *over 6 years* of age.

Dear Parents and Adults,

Children want to explore, understand, and create new things.
They want to try things and do it by themselves. They want to gain knowledge!
They can do all of this with Thames & Kosmos experiment kits.
With every single experiment, they grow smarter and more knowledgeable.

This set enables your child to learn the basic process of scientific experimentation. Each experiment's steps are explained in detail.

As in a real laboratory and in all chemical experiments, safety plays an important role here.

Please read through this manual and pay specific attention to the safety rules and the first aid information on pages 2 and 3.

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First Aid Information

Please observe this advice should any of the following situations occur.

1. In case of eye contact: Wash out eye with plenty of water, holding eye open if necessary. Seek immediate medical advice.
2. If swallowed: Wash out mouth with water, drink some fresh water. Do not induce vomiting. Seek immediate medical advice.
3. In case of doubt, seek medical advice without delay. Take the chemical and its container with you. For household substances, take the retail packaging with you.
4. In case of injury always seek medical advice.

Advice for Supervising Adults

As required by regulations for chemistry toys

→ Read and follow these instructions, the safety rules and the first aid information, and keep them for reference.
→ The incorrect use of chemicals can cause injury and damage to health. Only carry out those experiments which are listed in the instructions.
→ This experimental set is for use only by children over 6 years. For use under adult supervision.
→ Because children's abilities vary so much, even within age groups, supervising adults should exercise discretion as to which experiments are suitable and safe for them. The instructions should enable supervisors to assess any experiment to establish its suitability for a particular child.
→ The supervising adult should discuss the warnings and safety information with the child or children before commencing the experiments. Particular attention should be paid to the safe handling of hot solutions and chemicals.
→ The area surrounding the experiment should be kept clear of any obstructions and away from the storage of food. It should be well lit and ventilated and close to a water supply. A solid table with a heat resistant top should be provided.
→ The child or children should wear old clothes (or an old smock) when experimenting. After completing the experiments they must pick up and clean the work area and thoroughly wash their hands.
→ Substances in non-reclosable packaging (premade slime, iron filings powder, cornstarch) should be used up as soon as possible after opening the package. In between experiments, store them in the bucket with the lid shut tightly, kept in a cool, dry place.
→ The supervising adult should emphasize to the child or children the importance of following all instructions and warnings, and the importance of carrying out only those experiments that are described in this manual.

SAFETY INFORMATION

Dear Slime Researcher,

Stop! Read this before you start!

Read the following rules and instructions carefully. This way, you can avoid potential risks.

General rules for safe experimenting (safety rules)

- → Read these instructions before use, follow them and keep them for reference.
- → Keep young children and animals away from the experimental area.
- → Store this activity kit and the final slime creations out of reach of children under 6 years of age.
- → Clean all equipment after use.
- → Ensure that all empty containers and non-reclosable packaging are disposed of well.
- → Wash hands after carrying out experiments.
- → Do not eat or drink in the experimental area.
- → Do not allow chemicals to come into contact with the eyes or mouth.
- → Do not apply any substances or solutions to the body.
- → Do not perform slime activities where food or drink is handled or in bedrooms.
- → Do not use any equipment which has not been supplied with the set or recommended in the instructions for use.
- → Take care while handling hot water and hot solutions.
- → Do not replace foodstuffs in original container. Dispose of immediately.
- → Do not allow the premade slime or final slime creations to come into contact with the eyes or mouth.
- → Carefully prepare your work area for the experiments. Clear off the table and gather everything you will need.
- → Always leave your work area in clean condition. Always pay attention to proper disposal of any residues.
- → Do not allow the premade slime or final slime creations to come into contact with the eyes or mouth.

How to Use This Manual

KEEP THE PACKAGING AND INSTRUCTIONS AS THEY CONTAIN IMPORTANT INFORMATION.

- → Many of the kit contents are used for multiple experiments. If a part or material is not destroyed or consumed in an experiment, you should **save it** for later experiments.
- → The "**Make a prediction!**" bubbles encourage you to think ahead and guess what might happen next, based on what you've learned so far. **Keep a notepad and pen handy** for this purpose.
- → The "**Make an observation!**" bubbles remind you to write down what you see happening at that step of the experiment. You can jot these down in the same notepad, too.
- → The "**What's Happening?**" and "**Check It Out!**" sections in the manual are full of fun and fascinating information about the science behind each experiment. Take your time to read them after experimenting.

Make a PREDICTION!

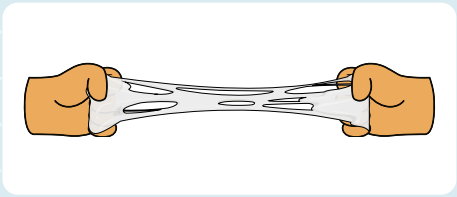
Make an OBSERVATION!

WHAT'S HAPPENING?

CHECK IT OUT

EXPERIMENT 1

Slime stretch test



You will need

– Clear slime

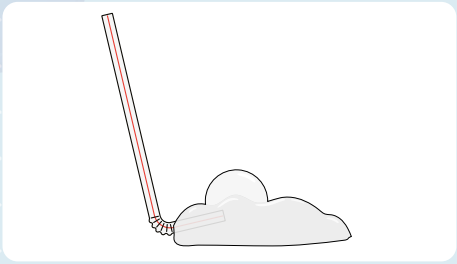
Here's how

1. Place a golf ball-sized piece of slime on a clean, flat surface.
2. Holding one edge with one hand, slowly pull with the other. Observe how far it stretches after 5, 10, and 20 seconds.
3. Take another golf ball-sized piece of slime and this time experiment with pulling quickly, at different speeds. What do you observe?

Make an OBSERVATION!

EXPERIMENT 2

Slime bubbles



You will need

– Clear slime
– Bendy straw

Here's how

1. Flatten a small piece of slime into a disk.
2. Bend the straw, and place the short end of the straw gently into the center to make a seal. Blow slowly to create a bubble.
3. How big does the bubble get? For how long does it hold shape? Does it pop elastically (snap back) or slowly collapse?
4. Compare blowing bubbles in slime to blowing them in soap film. What do you observe?

Make an OBSERVATION!

WHAT'S HAPPENING?

In experiment 1, you observed the **viscoelastic** property of slime that exhibits both viscous (fluid-like) and elastic (solid-like) behavior when subjected to stress or strain. When the slime is pulled slowly, polymer chains flow past one another, so the slime stretches a lot. When pulled quickly, the chains don't have time to rearrange, so the slime behaves more like an elastic solid and snaps. In experiment 2, blowing a bubble stretches the slime's polymer network into a thin film, and its **elastic forces** help the bubble hold its shape briefly.

EXPERIMENT 3

Salty slime



You will need

– Clear slime
– Table salt

Here's how

1. Place a golf ball-sized piece of slime on a clean, flat, waterproof surface.
2. Sprinkle a small pinch of salt on it and observe for 3–5 minutes.
3. Try poking the slime surface with a finger in areas with and without the sprinkled salt crystals. How does it feel to touch?
4. Knead the sprinkled salt into the slime and stretch the slime in different ways. What changed?
5. Try sprinkling different amounts of salt on multiple pieces of slime. What do you think will happen?

Make a PREDICTION!

EXPERIMENT 4

Slime temperature test

You will need

– Clear slime
– A cup of hot water
– A cup of ice water

Here's how

1. Place small pieces of slime of equal size into the cups with hot water and ice water for 30 seconds. ! CAREFUL: HOT WATER!
2. Remove the pieces of slime and observe their texture, stretch, and tackiness.
3. Repeat with longer exposure times (3–5 minutes) and compare.

WHAT'S HAPPENING?

In the spots where it interacts with the slime surface, the salt draws water out of the slime through a process called **osmosis**, causing it to dehydrate. As a result of the dehydration, the physical properties of the slime change, making it feel firmer to stretch, wet in some spots or giving it a grainy texture.

Just like salt, temperature changes have an effect on slime's physical properties, too — they affect the movement of polymer chains in the slime.

Heat increases polymer chain mobility — making the slime softer and more fluid-like. **Cold reduces mobility** — making the slime stiffer and more solid-like.

NEWTONIAN or NON-NEWTONIAN?

In liquids and gases, **viscosity** is a property that tells us how much resistance a substance has to flowing or changing its shape. **Newton's law of viscosity** describes fluids that tend to maintain their viscosity, no matter how fast you stir, push, or squeeze them. Many common fluids such as water exhibit this behavior and are thus called Newtonian fluids.

The fluid you are experimenting with in this kit, **slime, is a non-Newtonian fluid** because its viscosity changes depending on the stress you put on it; in particular when it is subjected to force. Ketchup, for example, becomes runnier when shaken and is thus a non-Newtonian fluid. Many commonly found substances such as custard, toothpaste, starch suspensions, paint, blood, melted butter, and shampoo are non-Newtonian fluids.



KETCHUP: A NON-NEWTONIAN FLUID



Honey, a **highly viscous fluid**



A **heterogenous mixture** of cocoa powder and sugar

MIXTURES & SUSPENSIONS



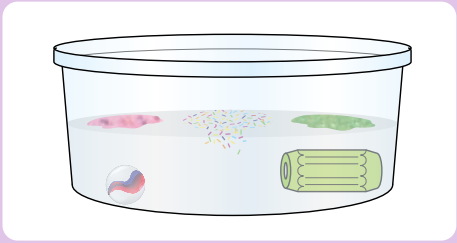
A **suspension** of mud in water

In science, a mixture is made when **two or more substances are physically combined** — but the mixture doesn't change what they are! Each part keeps its own properties, even though the final mixture might look or feel different or behave differently. Some mixtures are **homogeneous**, where everything looks the same, or uniform (like salt water). Others are **heterogeneous**, where you can easily identify the different parts that make up the mixture (like sand in water).

A **suspension** is a special kind of heterogeneous mixture where **tiny solid pieces float around freely in a fluid**. The most common example of a suspension is muddy water where soil, clay, or silt particles are suspended in water. In the next experiment, you'll make your own suspension by mixing different solids into slime!

EXPERIMENT 5

Float, sink or suspend?



You will need

- **Clear slime**
- **Fine glitter**
- **Chunky glitter**
- **Plastic rainbow sprinkles**
- **Magnet**
- **Mixing bowl**
- **Container with lid**
- **Sticker sheet**
- *Glass marble*

Here's how

1. Fill the mixing bowl halfway with clear slime.
2. Separating each material from another, sprinkle some of the fine glitter, chunky glitter and rainbow sprinkles on the surface of the slime. Gently place the glass marble and magnet on the surface so they're not overlapping with the other materials.

Make a PREDICTION!

3. Make a prediction for each material: what will float? What will sink? What will become suspended?

Make an OBSERVATION!

4. Wait for 15–20 minutes, then record the results.
5. Now knead the slime so all the materials get mixed into it. Which ones stay suspended and which ones sink to the bottom?
6. What would happen if you repeated the same experiment with water instead of slime? Try it out!

Make sure you clean the mixing bowl after every experiment.

WHAT'S HAPPENING?

Whether an object floats or sinks in slime depends on its **density compared to the slime** and on how it interacts with the slime's sticky surface. Low-density objects like glitter tend to stay on top, while denser ones like glass marbles usually sink or become embedded. The same objects behave very differently in water, showing how the **viscosity** and **stickiness** of slime strongly affect how materials move and settle within it.

WOW!

You've created a suspension of glitter and rainbow sprinkles in the slime! Adjust the amount of glitter or sprinkles to get your ideal look. Then store your slime in a **container** and use a label from the **sticker sheet** to give it a fun name.

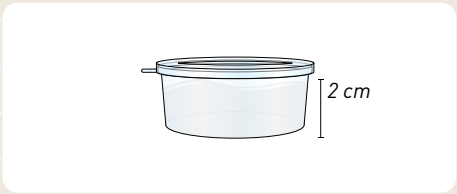


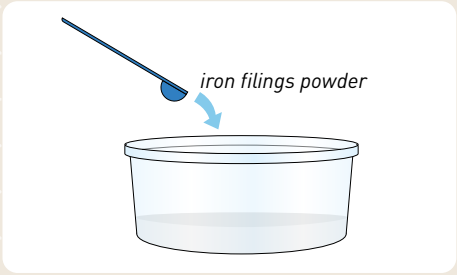
EXPERIMENT 6

Magnetic slime

You will need

- **Clear slime**
- **Iron powder**
- **Container with lid**
- **Magnet**
- **Mixing bowl**
- **Sticker sheet**
- *1/2 Teaspoon*





Here's how

1. Fill a container with clear slime up to 2 cm. Then, transfer the slime to the mixing bowl.
2. Measure half a teaspoon of iron powder and sprinkle it over the slime.
3. Knead the iron powder into the slime until they are evenly combined.
4. Hold the magnet close to the slime, but don't let it touch. What do you observe?
5. Can you separate some specks of iron powder from the slime using the magnet?
6. When you're done experimenting, store the magnetic slime in the container and give it a label from the sticker sheet.

Make an OBSERVATION!



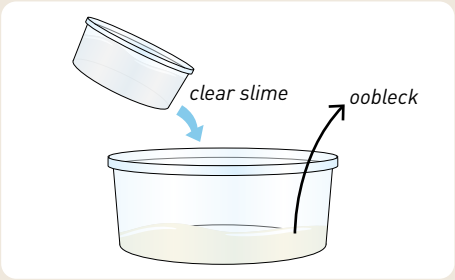
Iron powder tends to rust if it gets wet or is exposed to air for long periods. To reduce the chances of rusting: dry the powder on a paper towel before mixing, keep the slime in a sealed container, and do not store long-term.

WHAT'S HAPPENING?

You've made a suspension of iron particles in slime! Because it's a mixture, both the slime and iron keep their own properties. Iron is **ferromagnetic**, so it reacts to magnetic fields. When you bring a magnet close, it pulls on the iron particles inside the slime, making the whole blob move or form cool patterns. With a strong enough magnet, the iron filings can even be pulled out, separating them from the slime.

EXPERIMENT 7

Non-Newtonian Buddies: Slime & Oobleck



You will need

- **Clear slime**
- **Corn starch**
- **Mixing bowl**
- **Container with lid**
- *Tablespoon*
- *Water*
- *Stirring stick (optional)*

Here's how

1. Mix a tablespoon of corn starch with half a tablespoon of water in the mixing bowl. Use the spoon or a stirring stick to combine them well. Did you notice anything while stirring them together?
2. You've made Oobleck, a Non-newtonian fluid. Test its properties by tapping it quickly and very slowly. What do you observe?
3. Now fill a container with clear slime up to 2 cm. Then, transfer the slime to the mixing bowl.
4. Knead the slime and Oobleck together.
5. How do you think the resulting mixture will behave?

Make a PREDICTION!

6. Now try mixing Oobleck and slime together in equal parts. Compare the properties of the clear slime and the two Oobleck slimes you just made. What is the difference in their textures, thickness, fluidity and stretch?

Make an OBSERVATION!

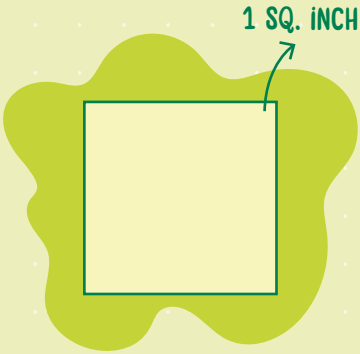
WHAT'S HAPPENING?

On page 6 you learned about non-Newtonian fluids. **Oobleck** is another example of a non-Newtonian fluid — it hardens when you hit or squeeze it quickly, but flows when you move it slowly. When you mix Oobleck and slime, the Oobleck particles get trapped inside the slime's stretchy polymer network, creating a thick, milky, and sometimes rubbery slime, depending on the ratio of Oobleck to slime.
What you've created is a non-Newtonian hybrid — a material that behaves in surprising ways depending on how you poke, pull, or squish it!


Oobleck

EXPERIMENT 8

Glitter slime



You will need

– Clear slime
– Chunky glitter
– Mixing bowl
– 1/2 Teaspoon

Here's how

1. Place a golf ball-sized piece of slime in the mixing bowl.
2. Measure half a teaspoon of the chunky glitter and sprinkle it over the slime. Knead the slime and glitter together until they're evenly mixed.
3. Now spread the slime as thinly as you can without breaking it and place it over the one-inch square on this page. Make sure the thin slime film covers the entire square.
4. Count the number of glitter particles you can see inside the square and note it in the table below.
5. This is the approximate concentration of the glitter per square inch of your slime sample. We say "approximate" because the distribution of the glitter particles is not the same in every part of the slime. Test it for yourself!
6. Slowly and carefully peel the slime off the paper.
7. Experiment with mixing different quantities of chunky glitter (or even plastic rainbow sprinkles) in the same quantity of slime and record the different concentration values in the table.

Make an OBSERVATION!

Amount of glitter	Approximate concentration per sq. inch of slime
1/2 teaspoon of glitter	
1 teaspoon of glitter	

WHAT'S HAPPENING?

Concentration is a way to describe how much of one substance is present in a mixture or solution. It tells us how crowded the particles of that substance are in the space they occupy.
Scientists use concentration to compare mixtures — like how much sugar is dissolved in water, how salty ocean water is, or how many particles are packed into a sample.

If you like your batch of glitter slime, don't forget to store it in a container.

EXPERIMENT 9

Butter slime

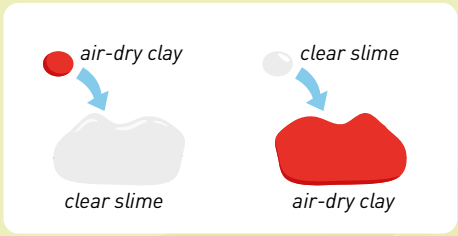
You will need

- **Clear slime**
- **Air-dry clay**
- **Mixing bowl**
- **Container with lid**

Here's how

1. Take golf ball-sized pieces of the clear slime and air-dry clay (in any color of your choice).
2. Compare how the two materials look, feel, stretch, and bounce to see how different they really are.
3. Add a pea-sized piece of clay to the piece of slime, and knead them together.
4. Add a pea-sized piece of slime to the piece of clay, and knead them together.
5. Make predictions about the two new materials you've made. How will they feel, stretch, bounce and look?

Make a PREDICTION!



6. Try this: make three different colors of butter slime and store them together in a container (you can stack them next to or on top of each other) and leave it undisturbed. After about 8 hours, you'll come back to a beautiful marbled butter slime!

Make an OBSERVATION!



WOW!

Make your perfect batch of "butter slime" by mixing different colors of clay. Store it in a container and use a label from the sticker sheet to give it a fun name!



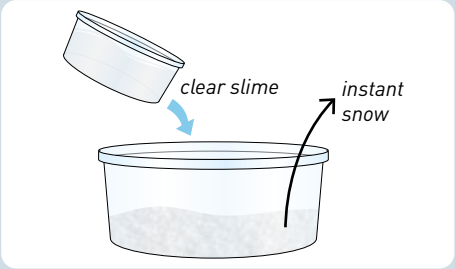
WHAT'S HAPPENING?

The clear slime in your kit is made of a lot of different things, including a little bit of water — you may have noticed that it feels slightly wet to touch.

When you mix the air-dry clay with the slime, the clay's fine, dry particles absorb some of the water in the slime. At the same time, the clay's structure mixes with the slime's long, stretchy polymer network. These two effects work together: the slime becomes thicker and smoother while the clay becomes more flexible, and the mixture turns into a soft, spreadable "butter slime."

EXPERIMENT 10

Snow Slime



You will need

- **Clear slime**
- **Instant snow powder**
- **Container with lid**
- **Mixing bowl**
- *Water*
- *Teaspoon*

Here's how

1. Measure a teaspoon of instant snow powder and pour it into the mixing bowl.
2. Add water to the instant snow powder, a few drops at a time, and observe the changes. How much water can you add until the powder stops absorbing it?

Make an OBSERVATION!

3. Now fill a container with clear slime up to 2 cm. Then, transfer the slime to the mixing bowl.
4. Knead the slime and instant snow together.
5. How do you think the resulting mixture will behave?

Make a PREDICTION!



WHAT'S HAPPENING?

What is this instant snow powder, after all!? The powder, made of **sodium polyacrylate**, is a polymer (just like the slime you've been playing with!) with super water-absorbing properties. In fact, it **can soak up a LOT of water** — up to 100 times its own weight! Can you think of any place where it might be helpful to soak up large amounts of liquid quickly? You guessed it — these polymers, in another form, are also commonly found in diapers!

When you mix the hydrated instant snow powder into your clear slime, the tiny particles settle into the slime's polymer network and change some of its physical properties. As a result, the slime becomes grainy, fluffy, less stretchy, and less transparent, making it look like a ball of snow!

Sodium polyacrylate is also what **hydrogel beads** are made of — those super water-absorbing beads you might've seen in vases, plant pots, or even sensory play bins!

CHECK IT OUT

What exactly is "SLIME"?

Throughout this manual, you've probably come across the word **"polymer"** many times. But what exactly is it? A polymer is any substance — natural or human-made — made of **long, bendy chains of tiny repeating building blocks** called **monomers**. You can imagine these chains like a string of beads, all linked together. The way these monomers connect gives the entire chain special properties, allowing it to move, stretch, and slide around. These properties determine how the polymer behaves when you touch it, squish it, pull it, or mix it with other materials.

The slime you typically find in craft kits contains glue mixed with a special substance called an activator. The **glue** in the clear slime is a **great example of a polymer** and its building block, or monomer, is a compound called vinyl acetate. Many of these monomers link together to form long, simple chains that can easily slide past each other. That's why glue flows smoothly and can be poured from a bottle.

When we add the **activator** to glue, something new happens: the activator helps the polymer chains in the glue connect to each other in many places.

This connecting is called **cross-linking**. Once cross-linking begins, the chains can no longer slide freely — they start sticking together to form a stretchy, squishy network that we recognize as slime! Since slime is made of glue polymer chains linked together in a new way, slime is also considered a polymer. "Slime" is a general name for this kind of material, and different slimes can have different formulas, and behave in different ways.

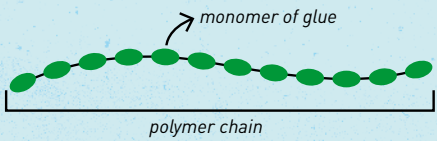


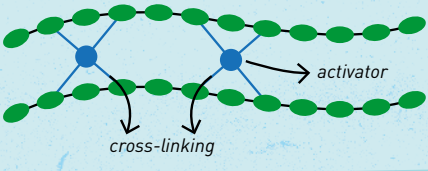
You can **make your own slime** by mixing white glue, baking soda, and an activator (such as contact lens solution containing boric acid).

1. Pour an 8-ounce bottle of white craft glue into a large mixing bowl.
2. Measure one tablespoon of baking soda, add it to the bowl, and stir well.
3. Next, measure one and a half tablespoons of activator, add it in, and mix until everything is fully combined.

If you want your slime to be thicker, add a little more activator. If you want it to be softer and stretchier, mix in a bit of water during the process.

Because slime can be made in so many different ways, it often behaves differently even when used in the same experiments. Try repeating the activities in this book with a batch of slime you made yourself, or with a store-bought slime from another brand. Do you notice any changes in how the slime behaves? What differences can you discover?





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