AGES
8+

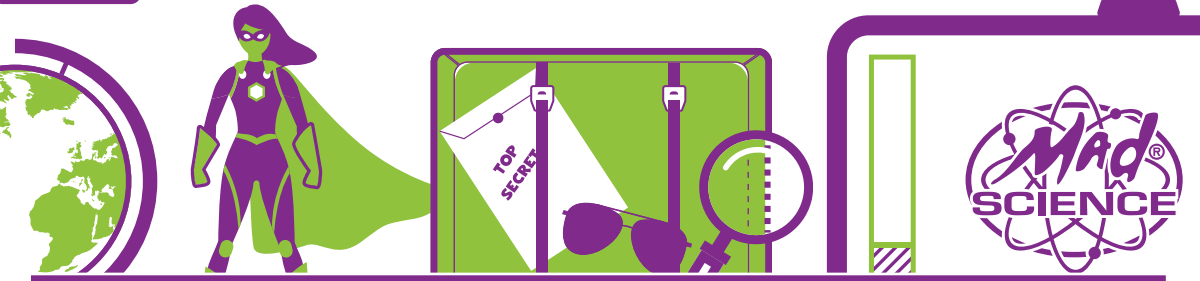
# GROSS SCIENCE

## EXPERIMENT INSTRUCTIONS


**⚠ WARNING:**

CHOKING HAZARD - Small Parts. Not for children under 3 years old. Children under 8 years old can choke or suffocate on uninflated or broken balloons. Adult supervision is required. Keep uninflated balloons away from children. Discard broken balloons at once. Made of natural rubber latex. Children should wear safety glasses and the protective latex-free gloves provided. This set contains chemicals that may be harmful if misused. Make sure to read through all the instructions and safety rules carefully before doing each experiment. Retain the box and booklet for future reference.

# Welcome to your




## Customer Care

Have a question? We're here to help!

We are committed to providing you with the best in customer service! If you are not completely satisfied with your experience, please let us know. You can reach us by e-mail or by phone between the hours of 9:00 AM and 5:00 PM EDT, Monday to Friday.

1-844-623-8697
help@shopmadscience.com
@LoopLabBox
#STEMatHome

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# MESSAGE FOR ADULTS

Dear Parents and Guardians,

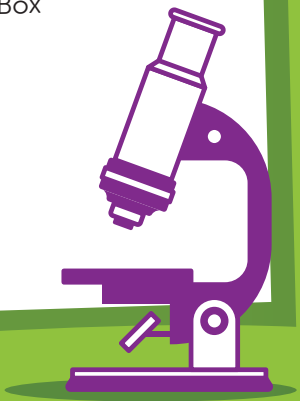
We are here to give your child an immersive STEM experience and to make sure that learning about science is as fun as it is educational. With each Mad Science® Loop Lab™ box that your child receives, they will increase their science knowledge and curiosity about the way things work and learn about the scientific explanations behind everyday life experiences.

Our experiments are safe and kid-tested. Plus, everything needed to complete each experiment is right here, so you can start experimenting right away. We're trying to do our part for the environment by limiting the amount of packaging in each box and ensuring that certain components can be re-used and saved for future experimenting. Plus, our boxes are the perfect storage bins for all sorts of stuff so we encourage you to hang on to them.

Each box is designed to instill confidence and foster the development of important skill sets, like problem-solving and critical thinking. In addition, we've found that children often want to discuss what they've learned and show-off their completed projects, which makes for a great opportunity to get in some quality time. We'd love to come along for the ride and be a part of your child's scientific exploration each month.

We can't wait to see your photos and unboxing videos. Share them on Facebook and Instagram and be sure to tag us! @LoopLabBox
#STEMatHome

The Mad Science Team



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# SAFETY RULES & INFORMATION

**MAKE SURE TO READ THROUGH ALL THE INSTRUCTIONS AND WARNINGS CAREFULLY WITH THE CHILD BEFORE DOING EACH EXPERIMENT.**

1. Adult supervision is required for all experiments.
2. This product is intended for children 8 years old and over. Keep younger children and animals away from the activity area.
3. Wear safety glasses and protective latex-free gloves when the instructions tell you they are necessary.
4. Be careful not to touch your eyes or mouth while wearing gloves.
5. Do not taste or eat any components of these experiments.
6. Do not use the yeast or corn starch provided in your box for any cooking or food-related activities.
7. Do not replace food products in original packaging, dispose of them immediately according to instructions.
8. Keep the area surrounding your experiment clear of any obstructions.
9. Keep the contents of the experiments away from food or food storage areas.
10. Your workspace should be well-lit, ventilated and close to water.
11. Store this product away from high temperatures, humidity and direct sunlight.
12. When wearing the safety glasses, do not look directly into sunlight.
13. Incorrect use of materials can cause injury.
14. Do not use any equipment which has not been supplied with the set or recommended in the instructions for use.
14. Keep the Loop Lab box and instruction booklet for future reference.

## SPECIFIC CHEMICALS

| | |
|---|---|
| **WARNING** | Hydrogen Peroxide (3%) |
|  | Causes skin irritation<br>Causes serious eye damage |
| **PREVENTION** | Wear protective gloves and safety glasses<br>Adult supervision is required |
| **FIRST AID INFORMATION** | **Prevention:** Wear protective gloves and safety glasses.<br>**In case of eye contact:** Rinse eyes continuously with water for 15 minutes. Seek medical attention if irritations persists.<br>**If swallowed:** Rinse mouth with water. Do NOT induce vomiting and seek immediate medical attention.<br>**In case of inhalation:** Remove to fresh air. Seek medical attention if symptoms occur.<br>**In case of skin contact:** Wash affected area with soap and water. Rinse thoroughly.<br>Seek medical attention if irritation occurs. |

## WARNINGS

CHOKING HAZARD – Small parts. Not for children under 3 years old.

WARNING – Children under 8 years old can choke or suffocate on uninflated or broken balloons. Adult supervision is required. Keep uninflated balloons away from children. Discard broken balloons at once. Made of natural rubber latex.

Conforms to the safety requirements of ASTM F-963.

## SAFE DISPOSAL OF EXPERIMENTS AND CLEAN UP

Please follow the instructions at the end of each experiment on how to dispose of your experiment materials.
You will find the instructions next to the following icons:


Think Green!


Safe Disposal


Clean-up

# MISSION: GROSS SCIENCE

## Hello Junior Scientists,

Welcome to your limited-edition Mad Science Loop Lab. Your mission, should you choose to accept it, is to complete all three experiments in this box. You'll be experimenting with all kinds of oozey, gooey and gross textures. Squeeze, squish, and play to your hearts content.

## Get ready to make:

**Foaming Fountain**

**DIY Ooze Ball**

**Ghost Goo**

Remember to read the "How does it work?" and "Did you know?" facts that go along with each experiment.

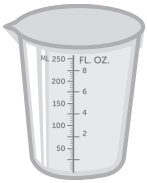
This instruction booklet will guide you as you dive into the wonderful and fun world of science!

Make sure to keep your Mad Science Loop Lab box! When you finish all three experiments, there will be more fun to find inside of it!

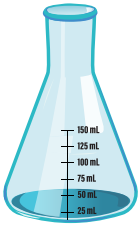
# WHAT'S INSIDE YOUR LOOP LAB BOX

Safety Glasses

Latex-Free Gloves




Beaker




Flask

Funnel

Balloon
(Color may vary)


White Glue

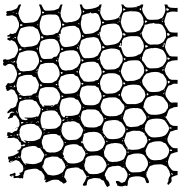

3% Hydrogen Peroxide


Corn Starch


Yeast

Elastic Band

Stir Stick



Mesh Fabric

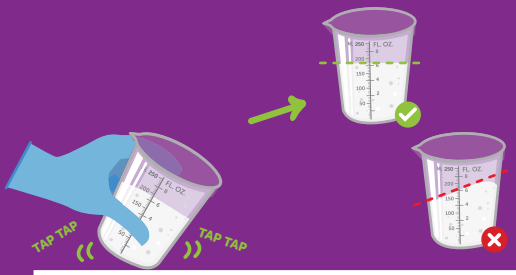


*Color of components may vary

# HOW TO USE YOUR COMPONENTS

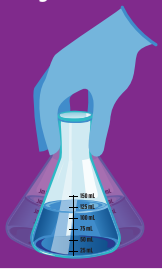
## HOW TO MEASURE CORN STARCH USING YOUR BEAKER

After adding each scoop of corn starch to the beaker, tilt the beaker slightly and gently tap it against your work surface. This will help settle the corn starch so the surface is flat. This will give you a more accurate measurement.




## HOW TO SWIRL YOUR FLASK

Swirling can be used to mix the contents of a flask (usually liquids). Hold your flask upright at the narrow part, near the top. Keep the flask pointing upwards and gently move the bottom of the flask in circles so that the contents inside starts to move in a circle as well. Try and keep the action smooth and constant to avoid letting any of the liquid inside splash against the flask walls.



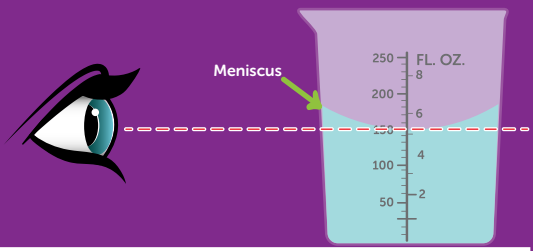
## HOW TO MEASURE LIQUIDS

To measure liquids accurately, you must find the meniscus. The meniscus is the curved shape that forms at the top of a liquid when it is poured into a container. It usually looks like an upside-down dome, curving down from the sides. A meniscus forms because the liquid molecules are attracted to the container walls.

Follow these steps when measuring liquids:

1. Crouch down until you are looking at the meniscus at eye level.

2. Line up the bottom of the meniscus curve with the closest measurement marking on the container. This is the volume measurement you should use!




## HOW TO PREPARE YOUR WORKSPACE

Find a clear area to work on. Lay out a sheet of newspaper or wax paper to protect your work surface. Now you are ready to begin experimenting!

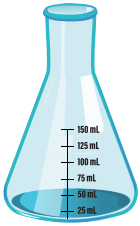
# EXPERIMENT #1: Foaming Fountain


Put on your safety glasses and latex-free gloves before getting started!

## MESS FACTOR:

## WHAT YOU HAVE IN YOUR BOX


Beaker




Flask


3% Hydrogen Peroxide


Yeast

## WHAT YOU NEED TO GET


Liquid Dish Soap

Tablespoon

Water (Warm)



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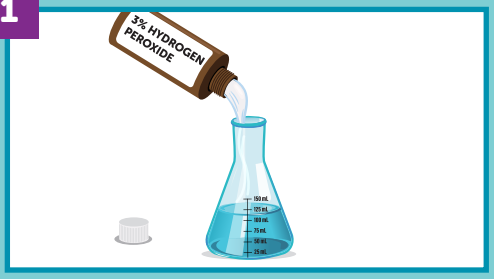
**1**




Ask an adult to help you pour the entire bottle of hydrogen peroxide into the flask.

Optional (if you have food coloring at home): Add 8 drops of food coloring to the hydrogen peroxide in the flask.

**2**

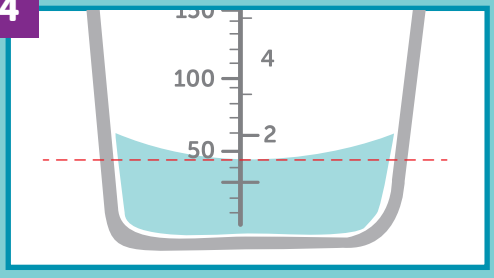

Add 1 tablespoon of liquid dish soap to the flask. Rinse the tablespoon so you can use it again later.

**3**


Swirl the flask gently for 30 seconds to mix everything together, then set the flask aside.

Refer to page 6 of your booklet for a tip on **"How to swirl your flask"**.

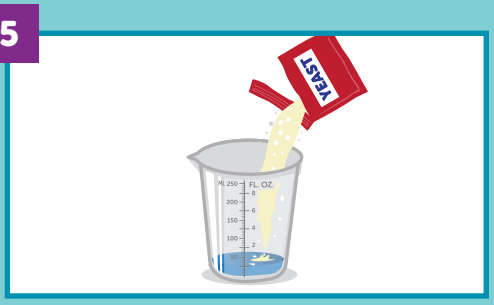
**4**




Use the markings on the side of the beaker to measure 45 mL of warm water.

Refer to page 6 of your booklet for a tip on **"How to measure liquids"**.

**5**




Add the entire package of yeast to the water in the beaker.

**6**


Use the tablespoon to stir the yeast into the water for 30 seconds. Stir until there are no big clumps of yeast left. Remember to scrape down the sides of the beaker while stirring!

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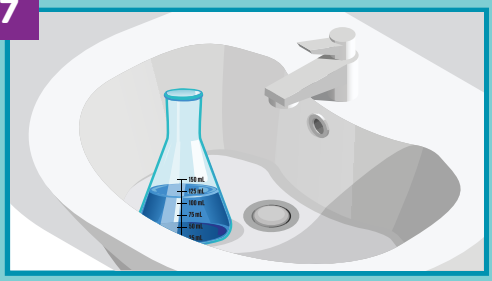
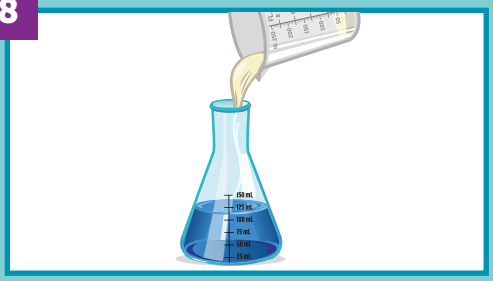
**7**



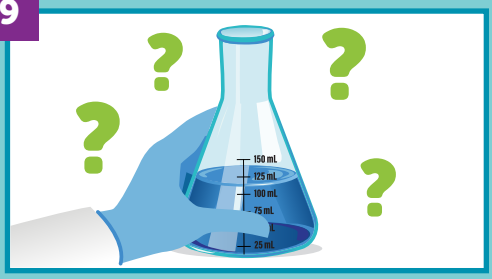
Place the flask inside an empty sink or bathtub. Get ready to observe a speedy chemical reaction... this may get messy!

**8**



Carefully pour the yeast mixture from the beaker into the flask.

**9**




Observe the foaming masterpiece you have created! Touch the outside of the flask. Is it hot or cold?

Think Green! Do you have access to a compost or recycling bin? Check with an adult to see which materials from your experiment can be recycled or composted instead of thrown in the garbage.

Safe Disposal: After you have finished admiring the Foaming Flask, ask an adult to help you pour the foam and the remaining liquid in the flask down the sink.

Clean-Up: Use soap and water to wash the spoon, flask and the beaker. Use a damp cloth to wipe up any mess around your work station. Now you are ready for the next experiment!



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# HOW DOES IT WORK?

You have just created a chemical reaction! The yeast in this experiment acts as a **catalyst**. A **catalyst** is a substance that helps speed up a chemical reaction. The yeast helps remove oxygen from the hydrogen peroxide, then the dish soap traps this oxygen to form lots of oxygen-filled bubbles (this is the foam you see). Does the outside of your flask feel warm to you? That is because this chemical reaction is **exothermic** – this reaction created heat!

## DID YOU KNOW?

Yeast also acts as a **catalyst** in the baking process! In this type of reaction, a gas called carbon dioxide is produced, which causes bread to rise.

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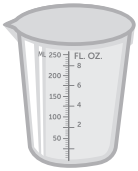
# EXPERIMENT #2: DIY Ooze Ball


Put on your safety glasses and latex-free gloves before getting started!

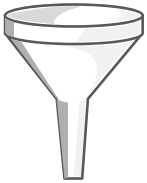
## MESS FACTOR:

**CAUTION:** The DIY Ooze Ball is not a resistant stress ball and can break easily when manipulated strongly. If the DIY Ooze Ball bursts and comes in contact with skin, nose or eyes wash immediately with water. The contents inside the DIY Ooze Ball are made with corn starch and glue which are non-toxic. Product may stain clothing and carpets. Please refer to the Pro Tip on page 13 for ways to avoid breakage.

## WHAT YOU HAVE IN YOUR BOX




Beaker



Funnel

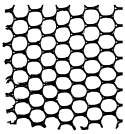

White Glue


Corn Starch

Balloon
(Color may vary)

Elastic Band

Stir Stick



Mesh Fabric

## WHAT YOU NEED TO GET

Medium-Sized Bowl
(Preferably Metal)

Tablespoon

Water (Room Temperature)



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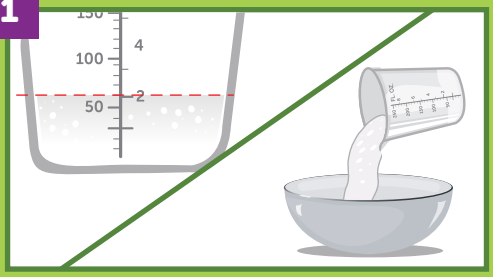
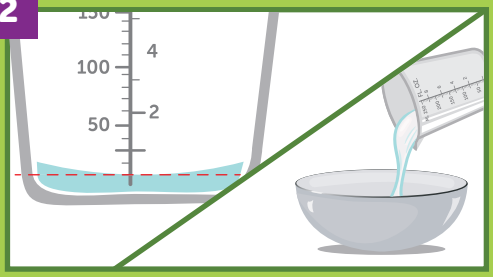
**1**




Use a tablespoon to scoop corn starch into the beaker up until the 60 mL measurement line. Pour the corn starch you measured into the bowl.

Refer to page 6 of your booklet for a tip on **"How to measure corn starch using your beaker".**

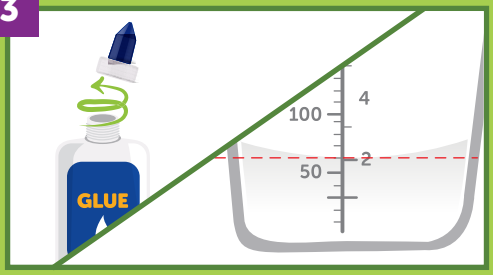
**2**




Use the beaker to measure 10 mL of water and add it to the bowl.

Refer to page 6 of your booklet for a tip on **"How to measure liquids".**

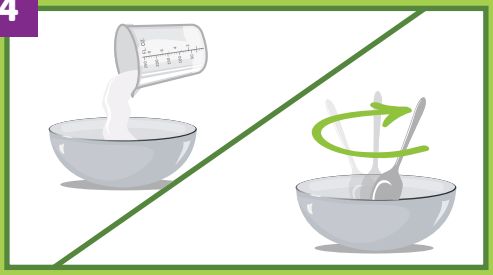
**3**




Unscrew the lid from the glue bottle. Use the beaker to measure 60 mL of glue.

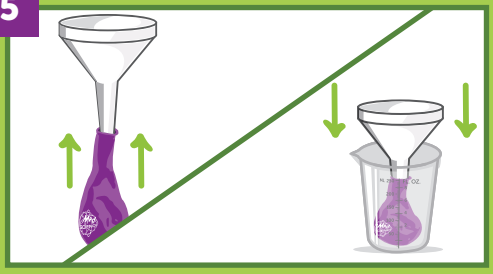
Refer to page 6 of your booklet for a tip on **"How to measure liquids".**

**4**



Pour the glue from the beaker into the bowl. Stir everything using your tablespoon for about 2-3 minutes until you see all the ingredients are mixed together well.

**5**



Position the opening of the balloon around the narrow opening of the funnel. Place the funnel and the balloon inside the beaker so that you can use both hands for the next step.

**6**

Carefully pour the corn starch mixture into the wide opening of the funnel and allow it to drip slowly into your balloon. You may need to use the tablespoon to scrape any remaining corn starch mixture from the bowl into the funnel.

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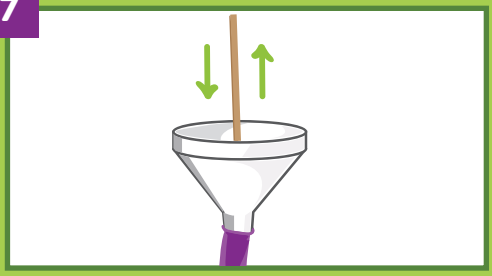
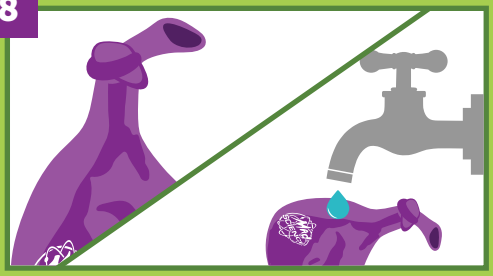
**7**



Lift the funnel and balloon out of the beaker. Use the stir stick to gently push the rest of the mixture into the balloon. Keep the tip of the stick away from the balloon's sides – you don't want to poke a hole in it!

**8**

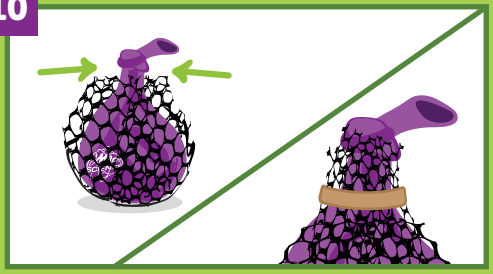


Seal the mixture inside the balloon by tying a knot at the top of the balloon (ask an adult to help, if needed). Rinse any bits of mixture off the outside of the balloon. Dry the outside of the balloon with a cloth before continuing.

**9**

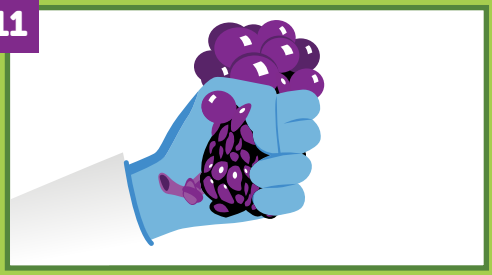
Position the filled balloon in the center of your mesh fabric square.

**10**



Bunch up the mesh around the balloon and gather all the fabric ends at the top (where the balloon knot is). Use the provided elastic band to secure the mesh fabric around the balloon. Loop the elastic band around the balloon and the fabric ends until the elastic band is too tight to be looped around again (ask an adult to help, if needed).

**11**



Squeeze your ooze ball and watch as the filled balloon pops in and out through the holes in the mesh fabric!

Pro Tip: To keep your balloon from bursting, rotate the ooze ball in your hand after every squeeze. This will help prevent sections of the balloon from wearing out and bursting after being squeezed in exactly the same place repeatedly.

Think Green! Do you have access to a compost or recycling bin? Check with an adult to see which materials from your experiment can be recycled or composted instead of thrown in the garbage.

Safe Disposal: If your ooze ball bursts while playing with it, dispose of the entire ball in the garbage. Pouring the corn starch-glue mixture down the drain may cause blockages.

Clean Up: Rinse the funnel, beaker, bowl and spoon well with soap and water. Use a damp cloth to wipe up any mess around your work station. Now you are ready for the next experiment!



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# HOW DOES IT WORK?

You may have noticed that the mixture of corn starch and glue flowed very s-l-o-w-l-y through the funnel and into the balloon. Liquids that flow very slowly have high **viscosity**. **Viscosity** is a measure of how fast or slowly liquids flow. Thick liquids (like honey or syrup) flow slowly and have a high **viscosity**, while thin liquids (like water) flow quickly and have a low **viscosity**. A mixture of corn starch and glue is a very thick liquid which oozes slowly, making it the perfect filling for a DIY Ooze Ball! Can you think of an example of other liquids with a high **viscosity**?

## DID YOU KNOW?

The **viscosity** of lava from a volcano affects how the shape and size of the volcano changes over time. If lava oozing from a volcano has very high **viscosity**, this can also be a sign that a big, explosive eruption could happen!



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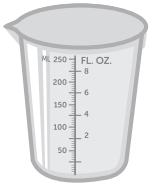
# EXPERIMENT #3: Ghost Goo


Put on your safety glasses and latex-free gloves before getting started!

## MESS FACTOR:

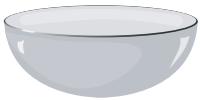
## WHAT YOU HAVE IN YOUR BOX




Beaker


Corn Starch

## WHAT YOU NEED TO GET



Medium-Sized Bowl
(Preferably Metal)

Tablespoon

Water (Room Temperature)



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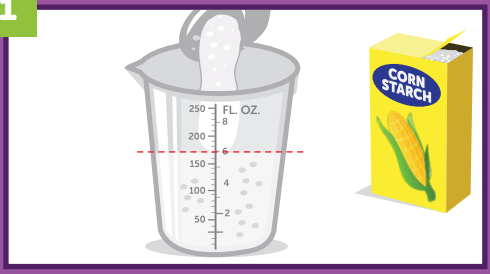
**1**



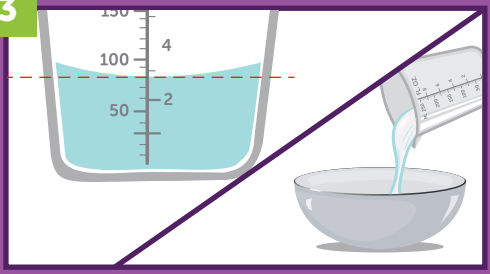

Use the tablespoon to scoop corn starch into the beaker up until the 170 mL measurement line.

Refer to page 6 of your booklet for a tip on **"How to measure corn starch using your beaker".**

**2**

Pour the corn starch you measured into the bowl.

**3**




Use the beaker to measure 80 mL of water. Add this water to the bowl.

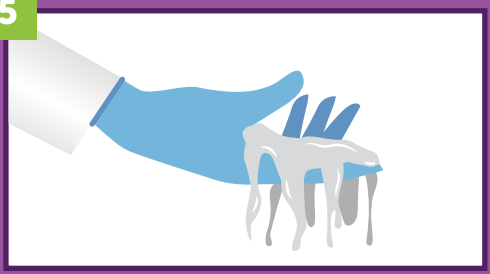
Refer to page 6 of your booklet for a tip on **"How to measure liquids".**

**4**

Use your hands to mix the corn starch and water together until no big clumps of corn starch remain. You have just created Ghost Goo!

Optional (if you have food coloring at home): Add 3 drops of food coloring to the bowl.

**5**



Pick up a blob of Ghost Goo and squeeze it inside your fist. Then, relax your hand and let the goo slide back into the bowl. The goo should run back into the bowl like honey. If it is flowing too slowly, use the beaker to measure 10 more mL of water and add that to your bowl.

**6**

Ghost Goo is safe to touch with your hands! If you want to discover what Ghost Goo feels like without gloves, you can remove your gloves and continue to experiment with it.

Take Note: How does the Ghost Goo feel when you leave your finger on its surface? Does the Ghost Goo flow differently from the corn starch and glue mixture in the DIY Ooze Ball experiment?

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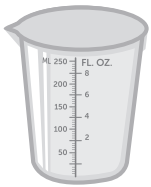
# BONUS EXPERIMENT

## GHOST GOO CRASH PAD

Put on your safety glasses and latex-free gloves before getting started!

**MESS FACTOR:**

## WHAT YOU HAVE IN YOUR BOX




Beaker

Ghost Goo from Experiment #3

## WHAT YOU NEED TO GET

Resealable Bag
(Sandwich-sized)

Tablespoon



Egg*

*For a vegan alternative to the egg, try using a very ripe soft fruit (for example, a plum), or a filled water balloon.



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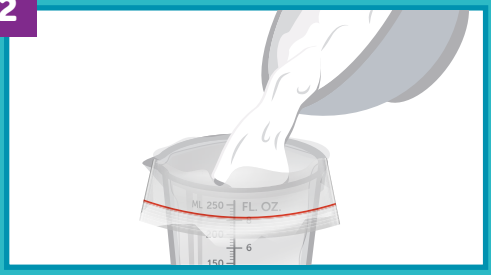
**1**

Now it's time to build a Ghost Goo crash pad! Open an empty resealable bag and position it inside the beaker.

**2**

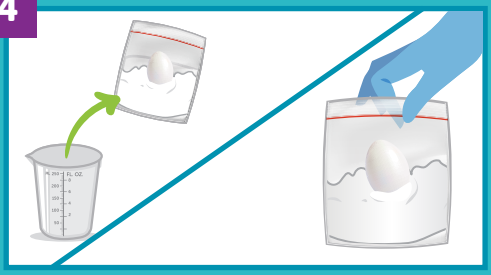


Pour the Ghost Goo you created in Experiment 3 into the resealable bag. Use a tablespoon to scoop out any remaining goo from the bowl into the bag.

**3**

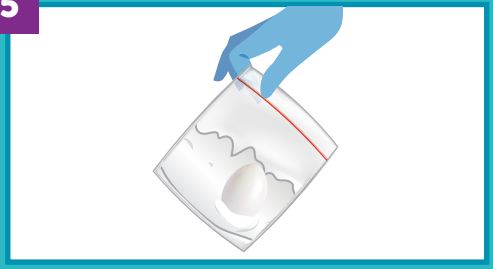
Carefully place the egg (or alternate object) inside the bag.

**4**



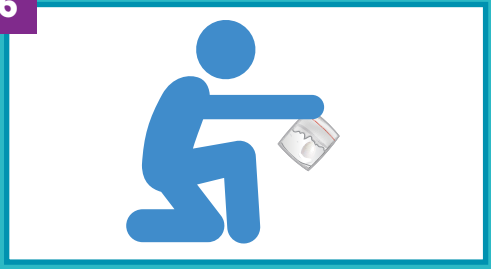
VERY IMPORTANT: Carefully remove the resealable bag from the beaker and tightly seal the bag! You don't want any leaks!

**5**



Ready to test your crash pad? Tilt the bag so that all of the Ghost Goo gathers in one corner. Make sure that the egg is also positioned in that corner.

**6**



Start by kneeling on the floor. Hold the top of the bag and stretch your arm out in front of you. The crash test object should be on top of the pile of Ghost Goo inside the bag.

Countdown: 3...2...1...release the bag so that it drops to the floor, corner first.

Pick up the bag and gently feel the crash test object for any cracks or breaks. Was your crash pad successful?

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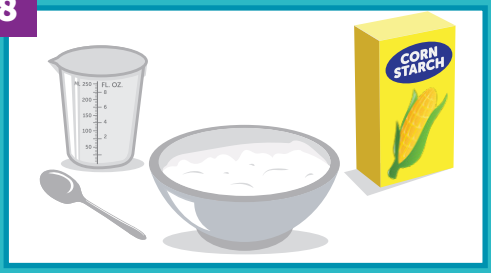
**7**

Now stand up and repeat this experiment, but this time drop the bag from the height of your shoulders (hold the bag straight out in front of you).

If you want to experiment more, try dropping the bag from a taller height. For even further experimentation, test whether your crash test object will survive being dropped by a taller person!

**8**




If you have extra corn starch, you can create more Ghost Goo and add it to your crash pad (follow steps in Experiment 3). Can the crash test object be dropped from greater heights if the crash pad has more Ghost Goo?

Think Green! Do you have access to a compost or recycling bin? Check with an adult to see which materials from your experiment can be recycled or composted instead of thrown in the garbage.

Safe Disposal: After experimenting, dispose of the bag and all its contents in a garbage, along with any remaining Ghost Goo. Pouring it down the drain may cause blockages.

Clean Up: Rinse the spoon, bowl and beaker with soap and water and clean your work station. Make sure to keep all of your plastic tools (beaker, funnel etc.) safe in your box – you may need them for your next Loop Lab box!



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# HOW DOES IT WORK?

A mixture of corn starch and water forms something called a **non-Newtonian fluid**. The flow of **non-Newtonian fluids** changes depending on how much pressure is applied to them. This means that they can behave like a liquid and flow freely when no direct pressure is applied, but they can also behave like a solid as soon as you press or squeeze them.

When an egg is coated in Ghost Goo and dropped to the ground, the goo behaves like a solid and absorbs the impact of the collision with the ground. This helps protect the egg and prevent it from breaking.

## DID YOU KNOW?

Custard (a jiggly pudding) is another example of a **non-Newtonian fluid**. It behaves like a soft, wobbly pudding when left sitting in a bowl, but it will act like a solid when a sudden force is applied. Some brave scientists have even tried filling an entire swimming pool with custard and walking across the top of it!

BONUS EXPERIMENT

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# VOCABULARY

## CATALYST

Acts as a 'helping hand' for molecules in a chemical reaction. A catalyst doesn't get used up in a chemical reaction, but it helps other molecules interact with each other to speed up the reaction. Without catalysts, some reactions would occur very slowly!

## NON-NEWTONIAN FLUID

Fluids which can change how quickly or slowly they flow depending on how much pressure is applied to them. Non-Newtonian fluids can act like liquids when no direct pressure is applied to them, but act like solids when pressed or squeezed.

## EXOTHERMIC

Chemical reactions which produce heat. Lighting a candle is one example of an exothermic reaction (this reaction produces both heat and light).

## VISCOSITY

Describes how slowly liquids flow. Thick liquids (like honey or tar) tend to have high viscosity and flow slowly. Thin liquids (like water) usually have a low viscosity and flow quickly.

# HIDDEN OBJECTS

Can you find all 6 items on your Loop Lab box?



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