WARNING: This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.

This is THE supreme slime lab! Make some of the strangest, most anomalous slime you’ve ever encountered. Weird slime that changes color with the heat of your hands. Magnetic slime that slithers towards magnets. Even slime that glows eerily in the dark. Learn the science behind these amazing hydrophilic polymers while mixing up gobs and gobs of slime. Now that’s out of this world!

Read Carefully Before you Begin!
1. Adult supervision is required for the activities in this kit.
2. The individual chemicals in this kit can cause eye burns and skin irritation before they are mixed together to make slime. Keep all chemicals and other ingredients from this kit away from eyes and wash hands with soap and water after touching them. Do not swallow or put anything from this kit in your mouth.
3. Keep small children away from the chemicals and other materials in this kit.
4. Read the instructions carefully before doing any of the activities in this kit.
5. An adult should closely supervise the activities that require boiling water.
6. Reseal all the ingredients after using them, and clean your cups, spoons, bowls, and other equipment after each activity.

What’s included in your kit
- Sodium Tetraborate (STB) 1 oz (28 g)
- Zinc Sulfide 0.25 oz (7 g)
- Magnetite 3 oz (85 g)
- Guar Gum 0.5 oz (14 g)
- Thermochromic pigment 0.1 fl oz (3mL)
- Polyvinyl alcohol 2 fl oz (59 mL)
- Glue solution 2 fl oz (59 mL)
- Red Coloring 0.07 oz (1.9 g)
- Yellow Coloring 0.07 oz (1.9 g)
- Blue Coloring 0.07 oz (1.9 g)
- 1 pipette
- 2 stir sticks

What you’ll need to get
- medium sized cup or bowl
- large mixing bowl
- measuring cup and spoon
- mixing spoons
- disposable cups and tall clear glass
- jars or storage containers
- magnet
- rubbing alcohol (optional)
- small saucepan or microwave safe bowl

How to use this science guide
First follow the steps in the next two sections for making STB solution and guar gum solution. Then you’ll be ready to make slime using the recipes that follow.
Make STB Solution

All the Sci-Fi Slime recipes call for sodium tetraborate solution. It's easiest if you make it now and store it for later use. Here's what you do.

What you need from your kit
- sodium tetraborate
- stir stick

What you need to get
- warm water
- medium sized cup or bowl
- measuring cup
- measuring spoon
- jar or other storage container

1. Add 1 cup of warm water to a medium sized cup or bowl. Measure 1 teaspoon of sodium tetraborate (STB) and add it to the cup.
2. Stir to dissolve all the STB powder. This may take several minutes.
3. Pour the STB solution into a jar or other storage container with a lid. Label it "STB solution". You'll be using this solution for all the slime recipes.

Make Guar Gum Solution

Some of the Sci-Fi Slime recipes call for guar gum solution. There are three different methods for making guar gum solution. Feel free to choose the method that works best for you!

Method 1

What you need
- guar gum (from this kit)
- warm water
- large mixing bowl
- measuring cup
- measuring spoon
- mixing spoon
- jar or other storage container
- patience

1. Measure 2 cups of warm water and add it to a large mixing bowl.
2. Measure 1 level teaspoon of guar gum powder.
3. Guar gum clumps up very easily. So while stirring rapidly, gradually sprinkle in the guar gum powder. It takes a bit of patience and several minutes to mix in all the powder.
4. Pour the solution into a jar or other storage container and label it "guar gum solution". Guar gum solution is perishable, so store it in the refrigerator.
5. If the solution is really lumpy, let it sit overnight before using it. The next day, stir it and the lumps should dissolve.

Method 2

What you need
- guar gum (from this kit)
- rubbing alcohol
- warm water
- large mixing bowl
- measuring cup
- measuring spoon
- mixing spoon
- jar or other storage container

1. Measure 1 level teaspoon of guar gum and add it to the bowl.
2. Measure 2 teaspoons rubbing alcohol and add it to the bowl.
3. Stir until it becomes a uniform soupy mixture. If some of the rubbing alcohol evaporates and the mixture becomes stiff, add a little more alcohol so that the mixture is soupy.
4. Measure 1 3/4 cups of warm water and add it the bowl. Stir in the guar gum.
5. Let it sit for about 20 minutes. It will thicken into a perfectly smooth solution without lumps.
6. Pour the solution into a jar or other storage container and label it "guar gum solution". Guar gum solution is perishable, so store it in the refrigerator.

Method 3

What you need
- guar gum (from this kit)
- water
- microwave safe bowl or small saucepan
- measuring cup
- measuring spoon
- mixing spoon
- jar or other storage container

1. Using a microwave oven or a stove top, bring 1 ¼ cup water to a boil and remove it from the heat.
2. While stirring quickly, sprinkle in ½ teaspoon of guar gum. Try to stir out all the lumps. (If the mixture is still really lumpy, let it sit overnight before using it. The next day, stir it and the lumps should dissolve.)
3. Let the solution cool. Then pour it into a jar or other storage container and label it "guar gum solution". Guar gum solution is perishable, so store it in the refrigerator.

Slime Care Tips
- Keep all of your slimes stored in sealed storage containers or zipper lock bags. That way they won't dry out.
- Wash your hands before handling your slimes. Keep dirt and dust out of the slime.
- If your slime starts to dry out, put it in a zipper lock bag, add a little bit of water, seal the bag, and massage the water into the slime. Let it sit overnight for the water to fully infuse the slime.
- The slime recipes that use guar gum solution will last longer if kept in the refrigerator.

Proto-Plasmic Slime
Slime that looks alive

What you need from your kit
- guar gum solution
- STB solution
- pipette
- stir stick

What you need to get
- cup or glass

1. Stir the guar gum solution. Then pour about ¼ to ½ cup of it into a cup or glass. What is the consistency of the solution?
2. Using the pipette, add 5 to 10 drops of STB solution to the cup and stir it for 5 seconds. What is its consistency now? How has it changed?
3. Repeat step 2 until it gels into a single blob of slime.

Play with it
1. Shake the cup back and forth. The slime jiggles and vibrates strangely. What kind of out-of-this-world sounds does it make?
2. Reach into the cup and grab the slime from the center. Can you pick up the entire blob without it breaking?
3. Try to see how far Proto-Plasmic Slime will stretch before it breaks.
4. Try pouring the slime from one cup to another. Watch how it moves. Doesn't it look like it's alive? Maybe it's an alien life form!
Thermo-Chromic Slime
Heat-sensitive, color-changing slime

What you need from your kit
• guar gum solution
• STB solution
• blue thermochromic pigment
• red food coloring packet
• pipette
• stir stick

What you need to get
• cup or glass
• refrigerator

1. Put the vial of blue thermochromic pigment in the refrigerator for about 5 minutes. (If you’ve just made the guar gum solution, put the solution in the refrigerator until it is cold to the touch.)
2. Stir the guar gum solution. Then pour 1/3 cup of it into a cup or glass.
3. Remove the vial of blue pigment from the refrigerator. Make sure the lid is on tight and shake the vial vigorously for at least 30 seconds to mix the thermochromic pigment. Carefully unscrew the lid to open the vial.
4. Using the pipette, add about 10 drops of the pigment to the guar gum solution and stir it in. Screw the lid back on the vial.
5. If you haven’t already done so, snip off the corner of the red food coloring packet. Add one drop of red coloring to the solution and stir it in. Be careful – it is very concentrated. It should be a good solid purple color. If it’s not, you can add a little bit more red coloring and stir it in.
6. Reseal the packet of food coloring with a piece of tape. Keep it in a zipper lock bag for later.
7. Rinse out the pipette with cold water to remove all the blue pigment.
8. What is the consistency of the solution? Add 5 to 10 drops of STB solution to the cup and stir it for 5 seconds. What is its consistency now? How has it changed?
9. Repeat step 8 until the mixture gels into a single blob of purple slime.

Play with it
1. Make sure your hands are dry. Then touch the Thermo-Chromic Slime with your fingers. Does it change color?
2. Pick up the slime and warm it in the palm of your hands. What color does it change to?
3. Put it back in the cup and let it sit. Does the color change back? What happens if you put the slime in the refrigerator?
4. If your climate is very warm, you may need to cool the slime in the refrigerator before playing with it.

Going Further – Color Changing Paper
Tighten the lid, then shake the vial of thermochromic pigment vigorously for at least 30 seconds to make sure the liquid is well mixed. Carefully unscrew the lid to open the vial. Using the pipette, add one drop of the liquid to a sheet of paper. Use a paintbrush or cotton swab to smear the drop around and draw pictures or write messages. After the paper dries, give it a waft of cold air from the refrigerator or freezer. Does anything happen? Touch the dried pigment with your fingers. Wow – it disappears!

How it works
The blue pigment you added to the slime is called thermochromic pigment. That means it changes color with heat. When the temperature is below 72° F (22° C) the pigment is blue. When the temperature goes above 72° F, it changes to colorless.

So why did you add red coloring to the slime? That’s right – blue mixed with red makes purple. This means that below 72° F, the slime is purple. But if you warm it above 72° F, the thermochromic blue pigment turns clear, leaving the red color. It changes from purple to red!
Magneto-Slime
Slime that slithers towards magnets

What you need from your kit
- guar gum solution
- STB solution
- magnetite powder
- pipette
- stir stick

What you need to get
- disposable cup
- magnet

Caution: Magnetite is a dark colored powder and it may stain. Keep magnetite powder, magnetic slime, and magnetic liquid away from carpet, clothes, other fabrics and porous surfaces. Wash it off your skin with soap and water.

1. Stir the guar gum solution. Then pour 1/3 of it into a disposable cup. (We recommend using a disposable cup because magnetite powder may scratch the cup.)
2. Measure 1 1/2 teaspoon of magnetite powder and gradually stir it into the guar gum solution. Continue stirring until it is a uniform mixture.
3. What is the consistency of the solution? With a clean pipette, add 5 to 10 drops of STB solution to the cup and stir it for 5 seconds. What is its consistency now? How has it changed?
4. Repeat step 3 until the mixture gels into a single blob of black slime.

Play with it
1. Pull out a blob of slime and hold it in your palm. Hold a magnet very near the blob. Does it move towards the magnet? If you have a stronger magnet, try it. What difference does it make?
2. Break off a very small blob of slime. Try to pick it up with the magnet. How big a blob will the magnet hold? Do you think it depends on the strength of the magnet?

Going Further
Try to pick up a paper clip with the bag of magnetite. Does it work? Now pick up a paper clip with a magnet. Can you pick up the bag of magnetite with the magnet? Move the magnet across the bag of magnetite and watch how the powder is attracted by it. Try making another batch of Magneto-Slime and adding more magnetite this time.

Magnetic Liquid!? 
Now that you've made magnetic slime, how about making magnetic liquid? Let's try it! Add equal volumes of magnetite powder and vegetable oil to a disposable cup. With a disposable spoon, stir the mixture until it becomes a smooth, black liquid.

Hold a magnet up to the side of the cup and watch what happens to the liquid. How far up the side can you make the liquid climb? Stir the liquid and notice how smooth it is. Hold the cup in your hand and stick the magnet to the bottom of the cup. Now stir the liquid again. See how thick it becomes. You can even form sculptures with it as the liquid aligns with the magnetic field!

How it works
Magnetite is a natural mineral that can be found in the earth. Magnetite is special because it is ferromagnetic, which means it is attracted to magnets. Adding magnetite to the slime makes it magnetic too!

In the powdered form, magnetite doesn't have a magnetic field of its own, which means it won't attract metal. But in its original rock form, magnetite does have a magnetic field, so metal will stick to it. The earliest form of the compass was made from a magnetite rock floating on a piece of cork in a bowl of water. The magnetite would align with the earth's magnetic field and point north.
Atomic Slime
Slime that glows eerily in the dark

What you need from your kit
- guar gum solution
- STB solution
- zinc sulfide
- pipette
- stir stick

What else you need
- disposable cup

1. Stir the guar gum solution. Then pour 1/3 cup of it into a disposable cup. (We recommend using a disposable cup because zinc sulfide powder may scratch the cup.)
2. Gradually stir all of your zinc sulfide into the guar gum solution. Continue stirring until it is a uniform mixture.
3. What is the consistency of the solution? With a clean pipette, add 5 to 10 drops of STB solution to the cup and stir it in for 5 seconds. What is its consistency now? How has it changed?
4. Repeat step 3 until the mixture gels into a single blob of bright yellow slime.

Play with it!
1. Hold the slime close to a bright light source. Let it soak up the rays for 20 seconds.
2. Turn off the lights or go into a dark room. The slime glows in the dark! Pick up your stretchy glowing blob and play with it.

How it works
It all boils down to atoms, the tiny building blocks that make up everything in the universe. Every atom is like a tiny solar system – negatively charged electrons orbit around a positively charged nucleus.

Zinc sulfide is phosphorescent. That means when light falls onto its atoms, the electrons get excited and jump to higher energy orbits. (You’d jump with excitement too.) After a little while, the electrons calm down, settle back into their normal orbit, and give off visible light. So your zinc sulfide loaded slime continues to glow even after the lights are turned off!

Moon-Snail Slime

What you need from your kit
- STB solution
- polyvinyl alcohol solution
- yellow food coloring
- blue food coloring
- pipette

What you need to get
- disposable cup

1. Pour all of the polyvinyl alcohol solution into a disposable cup.
2. If you haven’t already done so, snip off the corner of the yellow food coloring packet. Add one drop of yellow coloring to the solution. Be careful – it is very concentrated. Stir it to mix in the color.
3. If you haven’t already done so, snip off the corner of the blue food coloring packet. Add one drop of blue coloring to the solution. Be careful – it is very concentrated. Stir to mix in the color. It should turn green.
4. Reseal the food coloring packets with a piece of tape. Keep them in a zipper lock bag for later.
5. Draw up a pipette full of STB solution. While stirring the PVA solution, slowly squirt the STB solution into the cup. Continue stirring.
6. Repeat step 5 until the mixture gels into a thick, slimy mass that is hard to stir.
7. The slime will probably be very sticky at first. If you wait for a few hours before playing with the slime, it will become less sticky.
Play with it
1. Shake the cup back and forth. Does Moon-Snail Slime jiggle like Proto-Plasmic Slime?
2. How far can you stretch the slime before it breaks? Can you stretch it into a sheet?
3. Try rolling it into a ball. Does Moon-Snail Slime bounce?
4. How is Moon-Snail Slime different from the other slimes?

Saturn Mud

What you need from your kit
• STB solution
• glue solution
• food coloring of your choice
• pipette

What you need to get
• disposable cup

1. Shake the glue solution for at least 10 seconds to make sure it is well mixed. Pour all of the glue solution into a disposable cup.
2. Pick a color from the three that came with your kit. You can also mix colors.
3. If you haven’t already done so, snip off the corner of the food coloring packet. Add one drop of coloring to the glue solution. Be careful – it is very concentrated. Stir it to mix in the color.
4. Reseal the food coloring packet with a piece of tape. Keep it in a zipper lock bag for later.
5. Draw up a pipette full of STB solution. While stirring the glue solution, slowly squirt the STB solution into the cup. Continue stirring.
6. Repeat step 5 until the mixture gels into a thick, rubbery mass that is hard to stir.
7. The slime will probably be very sticky at first. If you wait for a few hours before playing with the slime, it will become less sticky.

Play with it.
1. How far can you stretch Saturn Mud before it breaks? Can you stretch it into a sheet?
2. Try rolling the slime into a ball. Does it bounce?
3. How is Saturn Mud different from Moon-Snail Slime? How is it similar to Moon-Snail Slime?

Slimy Rainbow

What you need from your kit
• guar gum solution
• STB solution
• red, yellow, and blue food coloring
• pipette

What you need to get
• 3 cups or glasses
• tall clear glass
• 3 spoons for mixing

1. Stir the guar gum solution. Then pour 1/3 cup of it into each of the 3 cups.
2. If you haven’t already done so, snip off the corners of each of the food coloring packets. Add one drop of red coloring to the first cup, yellow to the second, and blue to the third cup. Be careful – the colors are very concentrated. Stir each cup to mix in the colors.
3. Reseal the packets of food coloring with a piece of tape. Keep them in a zipper lock bag for later.
4. Add 5 to 10 drops of STB solution to each of the cups and stir for 5 seconds.
5. Repeat step 4 until the mixtures gel into single blobs of red, yellow, and blue slime.
6. Pour the blue slime into a tall clear glass. Make sure the blob is level. Then pour the yellow slime on top of the blue. Make sure the yellow is level. Then pour the red on top of the yellow.
7. Hey! How did the green slime get in between the blue and the yellow? And there’s orange slime between the yellow and the red. Watch what happens over the next few hours as the colors gradually blend together into a full rainbow.
How it works
Slime is made of mostly water. When slime of one color touches slime of another color, the colored water in them slowly mixes and creates new colors.

Science Fiction or Science Fact?
Are these slimes actually from another planet? No, not really. But they’re pretty cool! Guar gum comes from the guar plant, and polyvinyl alcohol and glue are both man-made. They all belong to a group of chemicals called polymers, which is another name for plastic. Polymers are made of super-long molecules – thousands (maybe millions!) of atoms joined together in long chains. But these are no ordinary plastics – they are hydrophilic, which means they like to soak up water and become all gooey and slimy.

Remember what the slime solutions were like before you added STB solution? Their long molecules slip and slide over each other very easily, making the solution runny and easy to pour. But when you add STB solution, little bridges connect the long molecules together, making a big stretchy web of molecules. This turns the solution into a blob of slime – thick, elastic, jiggly slime!

These bridges (called crosslinks) are fairly weak, so they break easily when the slime is stretched. Leave a ball of slime on a flat surface, and it slowly flattens out as the crosslinks repeatedly break and reform.