



8+

VOLCANO SCIENCE KIT

STARTER SERIES

ONLINE BONUS MANUAL



This kit
comes with 50+
Exciting Experiments

25 + **26**
EXPERIMENTS
MAIN MANUAL EXPERIMENTS
ONLINE MANUAL

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Experiment #1

MULTI-LAYERED LIQUID

5
MINS

EQUIPMENT

- Conical Flask
- Stirring Stick
- Measuring Cylinder

MATERIALS FROM KIT

- Colours

MATERIALS FROM HOME

- Water
- Baby Oil/Cooking Oil
- Honey

INSTRUCTIONS

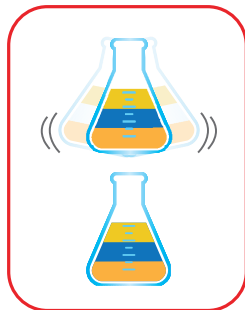
- 1 Take the conical flask. Add 25 mL honey.
- 2 Add 20 mL water and a few drops of any colour. Mix well.
- 3 Add 15 mL oil to the solution.
- 4 Shake the conical flask. Then wait for the liquids to settle.

DID YOU SEE?

After 2 minutes, did you see three clearly separated layers of honey, water and oil in the conical flask?

SCIENCE BEHIND THIS

Different kinds of liquids taken in same quantity have different weight, this is also known as density. Honey being the heaviest settles at the bottom and oil being the lightest floats on the top.



Experiment #2

JUMPING RAISIN

5
MINS

EQUIPMENT

- Spatula

MATERIALS FROM KIT

- Baking Soda
- Citric Acid

MATERIALS FROM HOME

- Raisins
- Water
- Glass Tumbler

INSTRUCTIONS

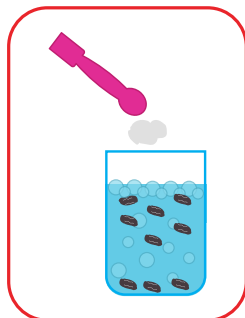
- 1 Fill 3/4th of the glass tumbler with water and add 2 scoops of baking soda. Mix well.
- 2 Add few raisins into the glass tumbler.
- 3 Add 2 scoops of citric acid and observe.

DID YOU SEE?

After a bit of time, raisin goes up and down in the water.

SCIENCE BEHIND THIS

The air bubbles made by the chemical reaction stick to the raisin and make its density lighter than water. But when the bubbles pop at the surface, the raisin drops down again.



Experiment #3

JET PROPELLED BOAT

5
MINS

EQUIPMENT

- Spatula
- Measuring Cylinder

MATERIALS FROM KIT

- Citric Acid
- Baking Soda

MATERIALS FROM HOME

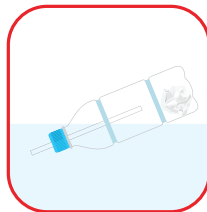
- Clay
- Water
- Tub/Bucket
- Plastic Bottle
- Straw
- Tissue

INSTRUCTIONS

- 1 Punch a hole in the cap of the plastic bottle. Put a straw through it. Affix clay on both sides until the straw can't move.
- 2 Fill 1/3rd of the bottle with water and add 1 scoop of citric acid in it.
- 3 Take a wide bucket or use a bath tub. Fill it with water. Ensure the bottle can float in it.
- 4 Take 4 scoops of baking soda and wrap it in a tissue. Put it in the bottle and close the cap. Then place the bottle in the tub/bucket in the same way as shown.

DID YOU SEE?

A jet of bubbles shoot out of the straw and the bottle is pushed ahead through the water like a boat.



SCIENCE BEHIND THIS

The reaction between baking soda and citric acid releases carbon dioxide gas. This gas is pushed out of the straw because there is no space inside the bottle. The resulting force pushes the bottle ahead.

Experiment #4

FLUFFY SLIME

10
MINS

EQUIPMENT

- Spatula

MATERIALS FROM KIT

- Colours

MATERIALS FROM HOME

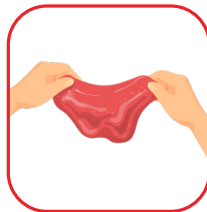
- Bowl
- Shampoo
- Cornstarch

INSTRUCTIONS

- 1 Add 6 scoops of cornstarch and 3 scoops of shampoo in a bowl.
- 2 Add 6-7 drops of colour and use spatula to mix.
- 3 Keep mixing and kneading till the slime gets formed.
- 4 Add more cornstarch if the slime is too watery.

DID YOU SEE?

Did you see the slime being made?



SCIENCE BEHIND THIS

This mixture is not actually slime, but a thick liquid-solid suspension, which behaves like slime.

Experiment #5

SOAP BOAT

5
MINS

EQUIPMENT

- Cup
- Stirring Stick

MATERIALS FROM KIT

MATERIALS FROM HOME

- Soap
- Paper
- Water
- Shallow Bowl
- Scissors

INSTRUCTIONS

- 1 Create soap solution by mixing soap in a cup of water.
- 2 Add water to a shallow bowl (or use the experiment tray). Cut out a simple triangle of paper and have it float on the water.
- 3 Dip a stirring stick into the soap solution and insert it right behind the triangle inside the water.

DID YOU SEE?

Did the paper triangle move ahead?



SCIENCE BEHIND THIS

Surface tension is the force that holds water together. When soap is added, it reduces the surface tensions behind the boat. Since surface tension is higher in front of the boat, this surface tension pulls the boat ahead.

Experiment #6

ANTI GRAVITY WATER

10
MINS

EQUIPMENT

MATERIALS FROM KIT

MATERIALS FROM HOME

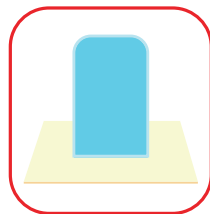
- Water
- Thick Paper
- Small Glass Tumbler

INSTRUCTIONS

- 1 Fill the glass tumbler completely with water. Place the thick paper on top of the glass tumbler.
- 2 There should be no space between the water and the paper on top.
- 3 Gently place your hand on the paper and flip the glass tumbler over.
- 4 Remove your hand from the paper and see what happens to the upside down glass tumbler.

DID YOU SEE?

The paper sticks to the glass tumbler and the water does not fall down.



SCIENCE BEHIND THIS

Air pressure forces the paper upwards, against the glass. The pressure is strong enough to stop the weight of the water pushing the paper away.

Experiment #7

POWER OF HEAT

5
MINS

EQUIPMENT

- Measuring Cylinder

MATERIALS FROM KIT

- Colours

MATERIALS FROM HOME

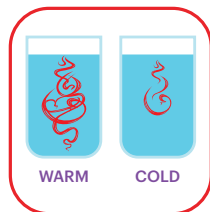
- Water
- 2 Transparent Glasses

INSTRUCTIONS

- 1 Fill the first glass with cold water.
- 2 Ask an adult to heat some water. Pour the warm water in the second glass.
- 3 Add 1-2 drops of any colour to each glass.
- 4 Observe how the colour spreads. Is it the same in both glasses?

DID YOU SEE?

Did the colour spread faster in the glass containing warm water?



SCIENCE BEHIND THIS

Warm water molecules have more energy and are moving faster than the molecules of cold water. This makes it easier for the colours to get mixed throughout the hot water.

Experiment #8

BENDING WATER

5
MINS

EQUIPMENT

MATERIALS FROM KIT

MATERIALS FROM HOME

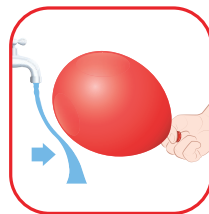
- Balloon
- Woollen Sweater

INSTRUCTIONS

- 1 Blow up the balloon and tie a knot so the air stays inside.
- 2 Rub the balloon on a woollen cloth like a sweater. You can also rub the balloon on your hair.
- 3 Bring the balloon near water flowing from a tap. Keep the water flow slow.

DID YOU SEE?

The flow of water bends towards the balloon.



SCIENCE BEHIND THIS

When we rub the balloon on wool or hair, it gains static electricity. This type of electricity can attract objects to it, like water.

Experiment #9

TESTING CAPILLARITY

10
MINS

EQUIPMENT

- Measuring Cylinder

MATERIALS FROM KIT

- Blue Colour

MATERIALS FROM HOME

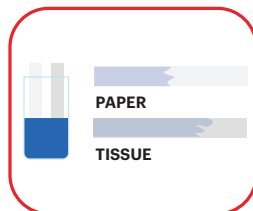
- Water
- Transparent Glass

INSTRUCTIONS

- 1 Take a glass and fill it halfway with water. Add 2 drops of blue colour.
- 2 Cut a long rectangular strip (1 inch wide & 6 inch long) from notepad paper and tissue paper.
- 3 Put the notepad strip on one side of the glass and the tissue strip on the other side.
- 4 Wait for a minute, then take out both strips of paper.

DID YOU SEE?

The tissue paper is more wet than the paper sheet strip. The colour also has travelled faster in the tissue paper.



SCIENCE BEHIND THIS

We are seeing capillary action of water. Tissue paper has more space in them for water to travel faster. This is the reason that tissues are used for drying.

Experiment #10

CHROMA ILLUSION

5
MINS

EQUIPMENT

- Measuring cylinder
- Stirring Stick
- Cup

MATERIALS FROM KIT

- Blue Colour
- Red Colour
- Yellow Colour

MATERIALS FROM HOME

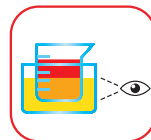
- Water

INSTRUCTIONS

- 1 Fill the measuring cylinder with 25 mL of water.
- 2 Add 1 drop of blue colour. Mix well.
- 3 Fill half a cup with water. Add 4 drops of yellow colour and mix well.
- 4 Dip the measuring cylinder vertically into the cup. Observe the lower part of the measuring cylinder through the yellow colour of the cup.
- 5 Now try the same above steps with 4 drops of red colour in the measuring cylinder.

DID YOU SEE?

Did you see the colour of the measuring cylinder change when looking through the filled part of the cup? What colours did you see?



SCIENCE BEHIND THIS

In your line of sight, both colours appear mixed, creating what is known as a Chroma Illusion. This shows how our eyes and brain blend colours, creating surprising effects. Different colour arrangements can trick our brain into seeing things differently.

Experiment #11

CUSTOM AIR PURIFIER

3
HRS

EQUIPMENT

- Spatula

MATERIALS FROM KIT

- Baking Soda

MATERIALS FROM HOME

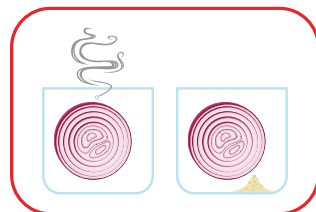
- Onions
- 2 Air Tight Containers

INSTRUCTIONS

- 1 Take the 2 containers and keep a couple of onion slices in both of them.
- 2 Sprinkle 2-3 scoops of baking soda in the corner of one container.
- 3 Close the lids of both containers.
- 4 Wait for 3 hours and open the containers. Do they smell the same?

DID YOU SEE?

The container without the baking soda has a strong smell of onion as compared to the other one.



SCIENCE BEHIND THIS

The odor of onion is acidic. Baking soda is a base which reacts with the acidic smell and causes the odor to vanish.

Experiment #12

GLOWING NAMEPLATE

15
MINS

EQUIPMENT

- Cup
- Spatula
- Stirring Stick

MATERIALS FROM KIT

- Glow Powder

MATERIALS FROM HOME

- Glue
- White Paper

INSTRUCTIONS

- 1 Add 1 scoop of glow powder to the cup.
- 2 Add 5 mL glue to the cup and mix.
- 3 Dip the stirring stick into the mixture and use it to write your name on a piece of paper. Let the paper dry for 1 hour.
- 4 Turn off the lights (ensure absolute darkness) to see your name glow! slime is too watery.

DID YOU SEE?

When you turn off the lights, your name will glow.



SCIENCE BEHIND THIS

When the glow powder comes in contact with any light form, it absorbs the light and later emits it in the dark. This property of the glow powder is called phosphorescence.

Experiment #13

MAKE YOUR OWN COMPASS

10
MINS

EQUIPMENT

MATERIALS FROM KIT

MATERIALS FROM HOME

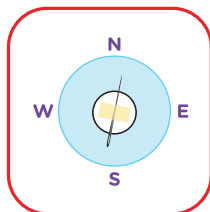
- Shallow Dish
- Card Paper
- Adhesive Tape
- Sewing Needle
- Scissors
- Magnet
- Water

INSTRUCTIONS

- 1 Cut a circle out of card paper. It should be approximately 2 cm in diameter.
- 2 Stick the sewing needle to the middle of the circle using adhesive tape.
- 3 Take the shallow dish and fill it with water.
- 4 Rub the magnet along the length of the needle in the same direction for about 20 times. Now, place the paper on the water in the dish.

DID YOU SEE?

The circular paper begins to spin. Eventually it will stop when the needle is pointing in the north direction, just like a compass.



SCIENCE BEHIND THIS

Rubbing the magnet on the needle gives the needle the properties of the magnet for a short time. The needle interacts with the Earth's magnetic field and aligns with the north and south poles. Placing the needle in water is important because it allows the needle to move freely.

Experiment #14

BALLON JET

10
MINS

EQUIPMENT

- Stirring stick

MATERIALS FROM KIT

MATERIALS FROM HOME

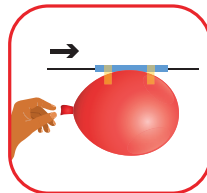
- Long length of thread
- Adhesive tape
- Balloon

INSTRUCTIONS

- 1 Pass the thread through the stirring stick. Attach both ends of the thread across the length of a room.
- 2 Attach pieces of adhesive tape to the top and bottom of the stirring stick.
- 3 Blow up the balloon. While still holding the neck, attach the balloon to the stirring stick using the free ends of the adhesive tape stuck on it.
- 4 Bring the balloon and stirring stick to one end of the thread and let go of your hand. What happens next?

DID YOU SEE?

The balloon and stirring stick zoom across the room along the thread at a high speed.



SCIENCE BEHIND THIS

The buildup of air is released from the back of the balloon. This pushes the balloon ahead. Since it is attached to the stirring stick, it can only go straight.

Experiment #15

MAKE THEM JUMP

20
MINS

EQUIPMENT

MATERIALS FROM KIT

MATERIALS FROM HOME

- Scissors
- Card Paper
- Woollen Cloth
- Balloon

INSTRUCTIONS

- 1 Cut out some paper figures from the card paper. They can be any shape.
- 2 Place all your paper figures on a flat surface.
- 3 Blow up the balloon and ask an adult to tie a knot on its neck.
- 4 Rub the balloon on the woollen cloth and bring it close to the paper figures. What happens next?

DID YOU SEE?

The paper figures will jump up and attach to the balloon. Then they fall back down.



SCIENCE BEHIND THIS

Rubbing the balloon on wool gives it static electricity. Static electricity can both attract and repel objects. This is the reason the paper figures fall back down after getting attached to the balloon first.

Experiment #16

SECRET MESSAGE

10
MINS

EQUIPMENT

MATERIALS FROM KIT

MATERIALS FROM HOME

- Bowl
- Lemon Juice
- Earbud
- Candle
- Paper Sheet

INSTRUCTIONS

- 1 Pour some lemon juice in a bowl.
- 2 Dip an earbud into the lemon juice and write a word on the sheet of paper. Let the sheet dry completely.
- 3 Ask an adult to light a candle.
- 4 Hold the sheet over the burning candle to warm it for a minute

DID YOU SEE?

Message appears when paper is heated above candle flame.



SCIENCE BEHIND THIS

Lemon juice is acidic in nature. The acid remains in the paper even after the lemon juice has dried. The acid undergoes oxidation and turns brown when heat is applied.

Experiment #17

LIFT A BALL WITHOUT TOUCHING

10
MINS

EQUIPMENT

MATERIALS FROM KIT

MATERIALS FROM HOME

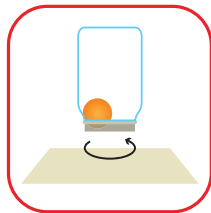
- Small Ball (Ping Pong or Bouncy Ball)
- Jar With a Bigger Mouth

INSTRUCTIONS

- 1 Place the ball on a flat surface like a table. Place the jar upside down over the ball.
- 2 Start to move the jar in circular motions. You will see the ball moving along the rim of the jar.
- 3 When this happens, move the jar faster.
- 4 Now slowly lift the jar. What do you see?

DID YOU SEE?

The ball lifts up along with the jar.



SCIENCE BEHIND THIS

When the jar moves, it creates a force that makes the ball move in circles as well. This force is called centripetal force. When we move the jar faster, this force becomes greater than the force of gravity. This allows the ball to be lifted along with the jar without you ever having to touch it.

Experiment #18

EGG IN A BOTTLE

15
MINS

EQUIPMENT

MATERIALS FROM KIT

MATERIALS FROM HOME

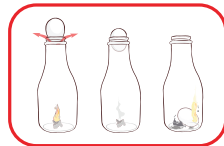
- Boiled Egg
- Newspaper
- Glass Bottle
- Matchsticks

INSTRUCTIONS

- 1 Take an empty glass bottle and a boiled egg. Ensure the mouth of the bottle is just big enough for an egg to comfortably be placed atop it.
- 2 Crush a small piece of newspaper and put it inside the bottle. Ask an adult to drop a burning matchstick inside the bottle to set the newspaper on fire.
- 3 When the paper starts burning, place a boiled egg on the mouth of the bottle.
- 4 Wait for the paper to burn completely. What do you see?

DID YOU SEE?

The egg pops inside the bottle.



SCIENCE BEHIND THIS

When the newspaper uses all the air inside the bottle for combustion, it creates a vacuum and the paper tries to use the air available outside. The resulting air pressure takes the egg along inside the bottle.

Experiment #19

CRYSTAL MELTING

5
MINS

EQUIPMENT

- Cup
- Spatula
- Stirring Stick

MATERIALS FROM KIT

- Colours
- Crystal Powder

MATERIALS FROM HOME

- Salt
- Water

INSTRUCTIONS

- 1 Create crystals by adding few drops of colour and a scoop of crystal powder to 20 mL of water in a cup.
- 2 Take 2 scoops of common salt in the spatula. Add them to the crystals.
- 3 Mix well using the stirring stick. What do you see?

DID YOU SEE?

The crystals have now turned back to liquid.



SCIENCE BEHIND THIS

Salt breaks the bonds between the crystals and water. This results in melting of the crystals back to water.

Experiment #20

MELTING RATES

1
HOUR

EQUIPMENT

MATERIALS FROM KIT

MATERIALS FROM HOME

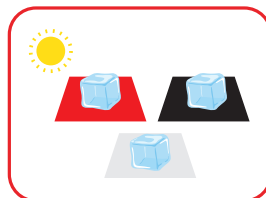
- Ice Cubes
- Coloured Paper Sheets

INSTRUCTIONS

- 1 Take 3 paper sheets of black, white and red colour respectively.
- 2 Place all 3 sheets in the sunlight.
- 3 Keep one ice cube above each of them.
- 4 Observe which cube melts first.

DID YOU SEE?

Ice cube on the black sheet melts first.



SCIENCE BEHIND THIS

Black colour absorbs the sunlight more and results in the cube to melt quickly.

Experiment #21

FINDING RAIN LEVEL

12
HRS

EQUIPMENT

- Funnel
- Measuring Cylinder

MATERIALS FROM KIT

MATERIALS FROM HOME

- Water
- Marker Pen
- Small Clear Plastic Bottle

INSTRUCTIONS

- 1 Add 25 mL water to the measuring cylinder and pour it inside the plastic bottle. Mark the water level in the bottle.
- 2 Repeat the above steps till you have 5-6 marks on the bottle. Then empty the bottle.
- 3 Place the funnel over the mouth of the bottle. Then keep the bottle outside at a place where it can catch raindrops.
- 4 After the rain is over, bring the bottle back in and check the water level.

DID YOU SEE?

The water level in the bottle tells us the day's rainfall level.



SCIENCE BEHIND THIS

There are scientists who study water levels during rains to predict the weather. They are called meteorologists. Do you want to become a meteorologist when you grow up?

Experiment #22

MAKE A SUBMARINE

10
MINS

EQUIPMENT

- Funnel

MATERIALS FROM KIT

MATERIALS FROM HOME

- Clay
- Water
- Glass Tumbler
- Pen Cap
- Think Bottle Plastic with Cap

INSTRUCTIONS

- 1 Attach a small piece of clay to the handle of the pen cap. If there is a hole in the tip, seal it with clay.
- 2 Fill the glass tumbler with water and drop the pen cap in it. Add or remove the attached clay till the pen cap is floating on the surface.
- 3 Use funnel to fill the plastic bottle with water. Leave a little space at the top.
- 4 Put the pen cap inside the bottle and screw in the cap. Take the bottle with both hands and squeeze it from the sides. Observe.

DID YOU SEE?

The pen cap sinks when the bottle is squeezed. It floats back up when you stop squeezing.

SCIENCE BEHIND THIS

The bubble of air trapped in the pen cap allows it to float. But when the bottle is squeezed, water enters the pen cap and the bubble becomes smaller. This forces the pen cap to sink. This method of adding and releasing water to float or sink is used by submarines to travel underwater.



Experiment #23

WATCH HEAT MOVE

10
MINS

EQUIPMENT

MATERIALS FROM KIT

- Colours

MATERIALS FROM HOME

- 2 Blocks
- Cooking Oil
- Tealight Candle
- Heat Resistant Glass Bowl

INSTRUCTIONS

- 1 Put few drops of red colour in the centre of the bowl.
- 2 Fill half of the glass bowl with oil.
- 3 Place the candle between the blocks and ask an adult to light it.
- 4 Place the bowl on the blocks so that the candle is right underneath it. Wait for 5 minutes

DID YOU SEE?

Did the drops of colour rise in the oil?



SCIENCE BEHIND THIS

The heat from the candle causes warm currents to circulate in the oil. These currents carry the colour along with them. Thus, we can see heat moving.

Experiment #24

PATTERN MAKING

15
MINS

EQUIPMENT

- Tray
- Cups
- Measuring Cylinder

MATERIALS FROM KIT

- Colours

MATERIALS FROM HOME

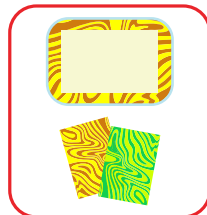
- Water
- Thick Paper
- Painting Brush
- Cooking/Baby Oil

INSTRUCTIONS

- 1 Put 4-5 drops of any one colour in a cup. If you are using more than one colour, use different cups.
- 2 Mix 5 mL of oil with the colours in the cups using the brush.
- 3 Pour water on the tray so that the whole surface of the tray is covered. Then gently pour the cup with the oil and colours to the plate.
- 4 Place the paper over the pattern layer. Then take it out and let it dry on a flat surface.

DID YOU SEE?

Did you see vibrant patterns printed on the paper sheets?



SCIENCE BEHIND THIS

The colours are mixed with oil which prevents them from mixing completely with the water. This allows us to create patterns that float on water.

Experiment #25

GLOWING WAND

20
MINS

EQUIPMENT

- Cup
- Spatula
- Measuring Cylinder

MATERIALS FROM KIT

- Glow Powder

MATERIALS FROM HOME

- Paintbrush
- Cardboard
- White Glue

INSTRUCTIONS

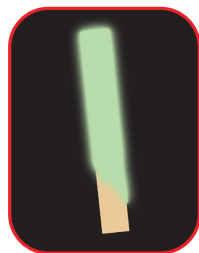
- 1 Take a cup. Mix 1 scoop of glow powder with 5 mL of white glue.
- 2 Ask an adult to cut a thin piece of white cardboard with length 30 cm and breadth 4 cm.
- 3 Apply the mixture from the cup onto the cardboard wand using the paintbrush. Leave a little space at the bottom where you will be holding it.
- 4 Let the mixture dry and stick to the cardboard. Then turn off the lights!

DID YOU SEE?

Did the cardboard wand glow in the dark?

SCIENCE BEHIND THIS

When the glow powder comes in contact with any light form, it absorbs the light and later emits it in the dark. This property of the glow powder is called phosphorescence.



Experiment #26

JUPITER JAR

20
MINS

EQUIPMENT

- Spatula

MATERIALS FROM KIT

- Red Colour
- Yellow Colour

MATERIALS FROM HOME

- Water
- Glitter
- White Shampoo
- Glass Jar with a Lid

INSTRUCTIONS

- 1 Fill 3/4th of the jar with water. Then add 3 scoops of white shampoo.
- 2 Add 8 drops of red colour and 10 drops of yellow colour to the jar. Mix well.
- 3 Add a few scoops of glitter. Then fill the rest of the jar with water.
- 4 Close the bottle tightly with the lid. Twist and move the closed jar in your hands.

DID YOU SEE?

Did you see the orange bands moving in the jar similar to Jupiter's surface?

SCIENCE BEHIND THIS

The pearlescent white shampoo is a rheoscopic fluid. Rheoscopic fluids are known as current showing fluids, that is, they can show you all of the tiny directional movements of water in a jar. Because they are a bit sparkly and look out of this world, a lot of people think bottles of rheoscopic fluid look like Jupiter in a jar.

