(1). Master Color

Experimental materials: measuring cup (7), dropper, water, stirring rod, pigment.

1. Take three measuring cups, fill 100 ml of water, and drip into the 3 measuring cups of red, yellow, and blue color pigments.

2. Take out the four measuring cups and pour 50 ml of water.

3 Pour red and yellow water into the first glass of clear water. Pour red and blue water into the second cup of clear water, and into the third cup of clear water Pour the yellow and blue water, and finally pour the red, yellow, and blue water into the fourth cup full of water. The children pay attention to the color Variety.

**Scientific principle**: Red, yellow, and blue are the three primary colors of colors. The three primary colors can theoretically be matched with any other color. Children can compare and see who made the new one. More colors!

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(2). Milk animation

Experiment materials: pigment, dropper, pure milk, detergent, white plate.

1. Pour pure milk into the dish (just not at the bottom of the dish

2. Add 5-10 drops of pigment (monochrome or multi-color) to the milk

3. Use a straw to suck up the detergent and drop it into the pigment You can form a spectacular milk animation in the plate.

**Scientific principle**: The detergent contains surfactants, which can destroy the surface tension of the liquid and be driven by the disturbed milk. The pigment rolls and moves to draw beautiful patterns.

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(3). Magic discoloration

Experiment materials: discoloration flower, test tube (4), vinegar, washing powder, boiling water, clean water, stirring rod.

1. Put discoloration flowers in a test tube (a pack of discoloration flowers can be used 2 to 3 times) pour 40ml of warm water and stir evenly.

2. Pour 40 ml of vinegar into a test tube, pour a small amount of detergent and 40 ml of water into the remaining measuring cup and mix well.

3. Pour the color-changing flower solution into vinegar and washing powder liquid and the color will change obviously.

**Scientific principle**: The color-changing flower used in the experiment contains anthocyanin, which is a natural acid-base indicator. It turns red when encountering acidic substances, and blue or green when encountering alkaline substances.

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(4). Volcanic eruption

Experiment materials: effervescent tablets, pigments, edible oil, test tubes, and water.

1. Add one-fifth of water, three-fifths of edible oil and 5-10 drops of coloring to the test tube. 2 Throw half an effervescent tablet into the cup, and a beautiful "volcano molten slurry" gradually emerges from the bottom of the cup.

**Scientific principle**: The effervescent tablet can quickly produce a large amount of carbon dioxide gas when it meets water. When enough carbon monoxide gas is accumulated, the carbon dioxide gas carries the colored water and rushes out of the oil-water layer, reaching the top of the oil: finally overflowing into the air, and then create a spectacular scene exactly like a volcanic eruption.

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(5). Color relay

Experiment materials: pigment measuring cup (6 pieces), paper towels (6 pieces), water, stirring rod.

1. Pour 60 milliliters of water into each measuring cup, drip different colors of pigment and stir evenly.

2. Put an empty measuring cup between the two measuring cups with pigment water. 3. Fold the banknote in half twice, put one end into the dye water and one end into the empty cup, and observe the change of the empty cup after two hours.

**Scientific principle**: Please refer to ʻʻVegetable Dressingʼʼ for the principle.

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(6). Vegetable dressing

Experiment materials: pigments, measuring cups (3), Chinese cabbage, and water.

1. Fill each of the three measuring cups with 50 ml of water and drop 3 different color pigments (10-20 drops).

2. Break off three whole pieces of cabbage and immerse the roots in three cups of pigment water in turn.

3. Observe the changes in cabbage leaves after 1 day.

Note: In addition to cabbage, flowers with branches can also do this experiment.

**Scientific principle**: There are many small ʻʻpipesʼʼ inside the leaves\paper towels. Water is absorbed on the inside of these small pipes. Due to the difference of cohesion and adhesion, the water can slowly transport the pigment water to the leaves/empty cups. This phenomenon is called "capillarity". There are many common capillary phenomena in life, such as: bricks absorb water and towels absorb sweat.

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(7). Liquid layering

Experiment materials: pigment, measuring cup (3), dropper, detergent, edible oil, clean water, test tube.

1. Pour 30 ml of detergent, 30 ml of water, and 30 ml of oil into 3 measuring cups.

2. Drip 10 drops of pigment into the detergent and stir, and 5 drops of pigment in the clean water and stir. The colors of the two pigments should be different.

3. Use a dropper to slowly inject detergent, clean water, and oil into the test tube, and finally liquid layering will appear.

**Scientific principle**: Dishwashing detergent and water oil have different densities. The three liquid detergents have the highest density, followed by water and oil with the lowest density. The denser liquid is heavier and will sink to the bottom, while the less dense liquid Light, floating on top, so as to achieve the effect of layering.

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(8). Rainbow

Experiment materials: pigments, test tubes, measuring cups (3), droppers, sampling spoons, sugar, and water.

1. Take 3 measuring cups numbered A, B, and C, and pour 20 ml of warm water, and then drop 3 different colors of pigment into each cup.

2. Add 1 scoop, 2 scoops, and 4 scoops of sugar to the three measuring cups and stir to dissolve them.

3. Use a dropper to absorb solution C, gently press the dropper, and let the sugar solution slowly flow into the test tube along the inner wall of the test tube, then use the same method to inject the B solution, and finally inject the A solution, and a beautiful rainbow will appear. Children can try to challenge the rainbow of more colors.

**Scientific principle**: Because the same amount of water is added with different sugars, the density of the liquid is different. The density of the water with more sugar is higher, the denser liquid will sink to the bottom, and the lower density will be at the bottom. The upper level uses this scientific principle to create a beautiful rainbow.

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(9) Color fountain

Experiment materials: baking soda, citric acid, pigment, measuring spoon, funnel, detergent, test tube, water.

1. Fill the test tube with three-quarters of water, 3 tablespoons of citric acid (stir well). Squeeze 10 drops of detergent: 10 drops of red pigment.

2. With the help of the funnel, quickly pour 3 spoons of baking soda into the test tube (3 spoons of baking soda is poured in at a time), and the fountain continuously gushes out.

**Scientific principle**: The reaction of baking soda and citric acid produces a large amount of carbon dioxide gas. Dissolve the detergent in a test tube and blow out a large amount of foam. The hand is a colored fountain erupting.

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(10), Water blowing balloon

Experiment materials: baking soda, citric acid, measuring spoon, funnel, balloon, test tube, clean water.

1. Fill the test tube with three-quarters of water and 2-4 spoons of citric acid, and use the funnel to fill the balloon with 24 spoons of baking soda.

2. Put the balloon on the mouth of the bottle and pour the baking soda of the balloon into the test tube. The balloon is slowly blown up on dioxide gas. The more carbon dioxide gathers, the bigger the balloon is.

**Scientific principle**: The alkaline baking soda and acidic citric acid will react acid-base chemically to produce a large amount of gas. The more carbon dioxide gathers, the bigger the balloon is.

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(11) Fire extinguishing in air

Experimental materials: baking soda, white vinegar, measuring cup, measuring spoon, candle.

1. Light the candle.

2. Pour 40 ml of white vinegar into the measuring cup, add baking soda and produce a lot of bubbles.

3. After 5-10 seconds, pick up the measuring cup and slowly tilt it towards the center of the candle, and the candle will turn off.

**Scientific principle**: The carbon dioxide produced by baking soda and vinegar is itself an incombustible substance, and it is heavier than air, so it will temporary stay at the bottom of the cap after the reaction. Due to the characteristic of carbon dioxide that can isolate combustibles from air, the carbon dioxide is poured in the flame, the flame will be extinguished because it is isolated from oxygen.

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(12) Water absorption

Experiment materials: pigments, candles, measuring cups, plates, water.

1. Pour clean water into the bottle (just do not pass the bottom of the pan), add 3 drops of pigment and stir evenly.

2. Put the candle in the center of the plate and light it, put the measuring cup on the candle, and after a while, the water ran into the cup.

**Scientific principle**: When the cup is buckled on a burning candle, the air in the cup becomes hot. According to the principle of thermal expansion and contraction, the air in the cup will expand and part of it will overflow outside the cup. After a few seconds, the oxygen in the cup is exhausted, the candle goes out, the temperature in the cup drops, the air in the cup shrinks, and the air pressure drops. At the same time, the carbon dioxide produced by the combustion dissolves in water, which also causes the air pressure in the cup to drop. Therefore, the air pressure outside the cup is higher than the air pressure inside the cup, so the water outside the cup is squeezed into the cup by the atmospheric pressure.

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(13). Artificial snow (disappearing water)

Experimental materials: water-absorbing resin, measuring cup, measuring spoon, clear water.

1. Pour a teaspoon of resin powder into the measuring cup and add 20 ml of water. After 2.5 seconds, I turned the measuring cup upside down and the water disappeared out of thin air. Replace the measuring cup with an opaque cup to create a magic effect.

2. Add pigments into the water and pour it into a measuring cup filled with resin powder to make colorful snow.

**Scientific principle**: the white powder is the highest water-absorbing resin, which can absorb more than 100 times its own volume of water. The colored snow that children can make can also be used as a rainbow potted plant. Adding a layer of culture soil at the bottom of the potted plant is more conducive to plant.

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(14). Making water spirit

Experiment materials: sodium alginate, calcium lactate, measuring cup, measuring spoon, stirring rod, bowl, basin and boiling water.

1. Put a half of sodium alginate and 240 ml of boiling water in a bowl, stir with a stirring rod for 10 minutes (continuous stirring is possible), leave it for 5 minutes and continue stirring for 5 minutes, let it stand for about an hour to obtain concentrated seaweed Sodium solution.

2. Measure 500 ml of cold water with a measuring cup and pour it into the basin, add 1 and a half of calcium lactate and stir well to obtain a refreshing calcium lactate solution.

3. Take the measuring spoon and put it into the calcium lactate solution to soak it. Slowly pour a little sodium alginate solution into the measuring spoon. Dip the measuring spoon into the calcium lactate solution for 5 seconds and then turn the measuring spoon over. Then the water spirit ball will separate Take out the measuring spoon, the water spirit can be taken out after soaking in calcium lactate solution for 5 minutes. The longer the soaking time, the better the elasticity. Add a small amount of pigment to the sodium alginate solution to get a colorful water spirit.

**Scientific principle**: Sodium alginate is a safe and harmless substance extracted from seaweed. Sodium alginate will quickly exchange ion when it encounters the calcium ions in calcium lactate. Gel jelly also uses similar principles to become beautiful and fun.

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(15). Point water into ice

Experimental materials: sodium acetate supersaturated solution, sodium acetate crystals (1 packet), dropper, bowl.

1. Take a bowl and pour freshly boiled water.

2. Put the frozen sodium acetate supersaturated solution bag into boiling water (install the mouth-it must be sealed, and the water will fail), and shake it slightly to promote dissolution. After all the ice at the bottom of the bag is completely dissolved, turn it over and let the mouth of the bag is blanched in boiling water for tens of seconds, and then taken out and cooled. There are three cooling methods: natural cooling, accelerated cooling in cold water, and refrigerator cooling. It must be cooled to normal temperature or lower than normal temperature before use, otherwise the experimental effect will be poor.

3. This product can be reused. Safety: Sodium acetate is the reactant of edible white vinegar and edible baking soda, please feel free to use it.

**Scientific principle**: The supersaturated sodium acetate solution at room temperature is in a very unstable state. Adding some crystals will cause this state to lose its balance. Excessive solutes crystallize rapidly like water freezes, and the crystals will release heat, so it is also called "hot ice".

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(16). Drip water into a mountain

Experimental material: sodium acetate supersaturated solution, sodium acetate crystal (1 packet) dropper.

1. The first two steps of reference point water to ice.

2. After the dissolving wave is cooled, use a dropper to suck the solution and slowly drop it on the crystal to form a shocking effect of dripping water. Be careful not to touch the crystal and crystallized sodium acetate with the dropper.

**Scientific principle**: For the principle, please refer to "Pointing water into ice".

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(17). Suspended eggs

Experiment materials: raw eggs, long glass cup, clear water, coloring, salt, measuring cup, stirring rod.

1. Fill the glass cup with 150 ml of water, then put the egg into the cup, the egg will sink to the bottom of the cup. How to make the eggs float?

2. Measure 100 ml of water and 50 ml of salt into a glass with a measuring cup, stir until the salt bath has dissolved, and put the eggs in the glass.

3. Fill the measuring cup with 60 ml of water and add 3 drops of pigment and stir evenly.

4. Slowly pour the pigment water into the saltwater cup along the stirring rod. The egg is suspended in the middle of the cup.

**Scientific principle**: The density of the egg is greater than that of clear water, so the egg will sink to the bottom of the cup. However, after adding salt to the clear water to prepare a higher concentration of salt water, the density of the salt water is greater than that of eggs, so the eggs will stay between the clear water and the salt water.

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(18). Rainbow rain

Experimental materials: pigment, edible oil, test tube, measuring cup, stirring rod, water.

1. Pour 10 ml of edible oil into a measuring cup, and add 5 drops of each of the red, yellow, and blue pigments, and mix well.

2. Pour about 40 ml of water into the test tube.

3. Pour all the edible oil mixed with pigment into the test tube, and let it stand for 10 seconds, and then a dreamy rainbow rain will appear in the test tube.

**Scientific principle**: After the edible oil mixed with pigment is poured into clean water, since the density of the edible oil is less than that of water, the edible oil will wrap the pigment and float to the surface. After standing for a period of time, due to the maximum density of the pigment, the pigment begins to sink into the water and dissolve with the water, thus forming a dreamy rainbow rain.

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(19). Making eggs

Experimental materials: raw eggs, pigmented white vinegar, glass cups.

1. Wash the eggs and put them in a glass cup, pour white vinegar, which should exceed the height of the eggs (observe the phenomenon in the cup).

2. Add 8-10 drops of green pigment and stir evenly.

3. After 24 hours, the eggshell disappears and the egg volume becomes larger, and at the same time the egg becomes a cute egg (after the egg is rinsed and then replaced with vinegar and pigment water, the effect is good after 24 hours)

**Scientific principle**: the main ingredient of eggshell It is calcium carbonate, which is alkaline. It can dissolve and react with vinegar (acid) and produce a large amount of carbon dioxide gas. After the eggshell is dissolved, there is a translucent film on the outer layer of the egg. The colored vinegar enters the egg through the translucent film, and the egg is enlarged and discolored. It begins to sink into the water and dissolve with the water, thus forming a dreamy rainbow rain.

(20). Wordless Book of Heaven

Experimental materials: A4 paper, cotton swabs, baking soda, discoloration flowers, measuring cups, paper towels, clean water.

1. Add 10 ml of water and half a spoon of baking soda to a measuring cup and mix well.

2. Dip Write the words you want to write on the white paper with a cotton swab filled with soda water. After you write it, put the paper in a ventilated place to air dry, and the writing disappears.

3. Take a piece of paper, fold it into a rectangle, and dip it in boiling water to change the color Smear the flower lotion on the air-dried paper, and the writing reappears. After the white paper is air-dried, the writing becomes light green.

**Scientific principle**: After the soda water is washed on white paper and air-dried, the handwriting will disappear because the soda water has no color. When the color changing flower solution is applied to the air-dried paper, the handwriting reappears. According to the scientific principle of "Magic Discoloration", the handwriting will become light green after air-drying.

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(21). Pigment diffusion

Experiment materials: select clear glass adjustment cups (2), measuring spoons, clear water, pigment, and salt.

1. Add 30 ml of window salt to a glass cup and fill it with clear water, stir it evenly, and let it stand 30 seconds.

2. Fill another glass with clean water.

3. Put 3 drops of pigment into each of the two cups, observe the diffusion of the pigments in the two cups, and see what is different.

Scientific principle: diffusion is a substance from the high-density area to the low-density area, until the phenomenon of uniform distribution. The density of the pigment is higher than that of clear water. When the pigment is dropped into the clear water, it will diffuse into the lower density water at a faster speed. The density of the salt water is higher than that of the pigment, so the pigment can be suspended on the salt water and slowly diffused after a period of time.

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(22) Naughty paper ball

Experimental materials: 1 bottle, 1 paper towel.

1. Knead the paper ball into two large and small paper balls.

2. Place the bottle flat on the table, and then put the small paper ball on the mouth of the glass bottle.

3. Blow into the paper ball at the mouth of the bottle and observe the movement of the paper ball.

4. Select a large paper ball and place it on the bottle mouth, blow air at the bottle mouth, and observe the movement of the paper ball.

**Scientific principle**: As the bottle is "filled up" with air, add a little bit of air inside, and the air will overflow. The airflow cannot enter the bottle, but a low-pressure area is formed at the mouth of the bottle. According to the Bernoulli effect, the higher the gas velocity, the lower the pressure. The airflow blown by the straw is lower than the pressure of the still air in the bottle, so the paper ball will not be blown into the bottle but will be pushed out by the air in the bottle.

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(23). The magical water bag

Experiment materials: preservation bag, water, pencil.

1. Put a small amount of water into the fresh-keeping bag and tighten the mouth of the bag.
2. Rotate the sharpened pencil and insert it into the water bag (wow! The magic phenomenon has appeared, the water bag is not leaking!).

**Scientific principle**: The surface is regular and smooth, and the fresh-keeping bag is elastic. When the pencil pierces the fresh-keeping bag, the fresh-keeping bag can actually tightly wrap the outer edge of the pencil, so the fresh-keeping bag can still be sealed.

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(24). No mixing of cold and hot water

Experimental materials: plastic bags, pigments, 2 glasses, cold water, and hot water.

1. Fill the left cup with cold water first, drop two drops of pigment in the right cup, and then fill with cold water.

2. Cover the pigmented cup with a plastic bag, and then turn the cup upside down.

3. Push the covered cup upside down on the other cup so that the cup lip is completely overlapped.

4. Slowly remove the middle plastic bag and find that the pigment water and transparent water are slowly mixed together.

5. Fill the cup on the left with cold water first, drop two drops of pigment in the cup on the right and fill it with hot water.

6. Pour the pigmented hot water cup into the cold water on the cup, the mouth of the cup coincides, and the plastic bag in the middle is slowly removed, and it is found that the pigment water and the transparent water are not mixed together.

**Scientific principle**: Due to the movement of molecules, two glasses of cold water are slowly mixed together. The higher the temperature of hot water, the more intense intermolecular movement and the lower the density, so the hot water will float on the cold water. So when the hot water is on, the two cups of water are not mixed together.

(25). Lost direction

Experimental materials: 1 transparent glass, paper, colored pens, and water.

1. Use different colored pens to draw different patterns and text.

2. Fill the glass with clear water, stand up the painted pattern and place it about 10 mm behind the glass.

3. Observe the difference between the image seen from the glass and the original image.

**Scientific principle**: Because light travels at different speeds in two different materials, the direction of propagation changes at the junction of the two media. This is the refraction of light. When light enters the water from the air, the propagation medium changes, so the light Refraction was born. In addition, after the glass is filled with water, the cylindrical water column is equivalent to a convex lens. Within a certain distance interval, the image we see becomes a left-right reverse image.

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(26). Taking water from the air

Experimental materials: bottles, cups, straws, water.

1. Add water to the bottle, insert the straw, and adjust the angle of the straw.

2. Take a deep breath, block the mouth of the bottle with your mouth, hold the straw with one hand and block the gap between the mouth of the bottle with one hand, and blow into the bottle.

3. The straw sprays a jet of water into the glass in front.

**Scientific principle**: When we blow to the mouth of the bottle, the air pressure in the bottle will become higher and higher. Due to the limited space in the bottle, the straw forms an external channel, and the air pressure compresses the water in the bottle and sprays outward through the straw. If you blow in air forcefully, the air pressure in the bottle will increase instantly, and a strong and fast water jet will be sprayed; otherwise, a weak and slow water jet will be sprayed. From water hoses to high-pressure water guns, although their shapes are quite different, they all use the principle of air pressure spraying.

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(27). Needle stick balloon

Experiment materials: balloon, pin.

1. Blow up the balloon (be careful not to blow the big drum) and find the last position of the bottom of the balloon.

2. Insert the needle carefully so that the balloon will not burst.

3. Pull out the pin, the balloon will not burst, the balloon leaks and becomes smaller. Insert the needle back and the balloon stops getting smaller again.

**Scientific principle**: During the process of blowing the balloon, the color of the middle part will gradually become lighter, because the rubber molecules are stretched, and the bottom of the balloon gathers a large number of unstretched rubber molecules, so the color is darker. When a thin needle was gently inserted from the bottom of the balloon, these rubber molecules acted as a cushion, so there was no explosion.

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(28). Decolorized beverage

Experiment materials: masterbatch, Fanta, measuring cup, scissors.

1. Pour 60 ml of Fanta into the measuring cup.

2. Cut the masterbatch from the middle and divide it into two.

3. Dip the-half masterbatch into Fanta and stir.

4. After about 2 minutes, take out the masterbatch.

5. The original orange Fanta has become a colorless "Sprite", it turned out that the color master film absorbed all the orange in Fanta.

**Scientific principle**: Since the color masterbatch has a strong adsorption effect on the pigment, it can easily absorb the pigment in the beverage.

For young children, they are in the stage of growth and development. From the precautionary principle, try to stay away from beverages containing pigments. Don't drink functional drinks, carbonated drinks, etc. as water. Even if the pigment content in the beverage is within the limit, long-term large amounts of drinking will harm your health.

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(29). Control straw

Experiment materials: mineral water bottle (with lid), straw, sweater (hair or other woolen fabrics are fine).

1. Rub the straw with the prepared sweater and rub both ends back and forth about 20 times.

2. Place the straw flat on the mineral water bottle with the screwed cap.

3. Place the palms of both hands on the left and right sides of both ends of the straw (the palm is about 5 cm away from the straw and be careful not to touch the straw).

4. Move your hands slowly, and the straw will follow your hands as if controlled.

**Scientific principle**: When the sweater rubs the straw, it adds an extra negative charge to the straw. When the palm with no static electricity is close to the straw with static electricity, the object without static electricity will accumulate the opposite polarity of the charge carried by the charged object. Because the opposite charges attract each other, it will show the phenomenon of "electrostatic adsorption".

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(30) Pinching balloons in the air

Experiment materials: balloons, mineral water bottles, pins, scissors.

1. Use a pin to drill a small hole near the bottom of the bottle and use scissors to enlarge the small hole a little bit.

2. Put the balloon into the bottle and put the balloon mouth on the bottle mouth.

3. Blow up the balloon and block the small hole at the bottom of the bottle with your finger. At this time, you can find that the balloon will not become smaller. Release your finger and the balloon will become smaller.

**Scientific principle**: This experiment uses atmospheric pressure. When the small hole is blocked, the bottle is sealed. At this time, the atmospheric pressure outside presses the balloon into the bottle to prevent it from getting smaller. After releasing the finger, the bottle communicates with the outside, and the atmosphere inside the bottle is as strong as the

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(31) Balloon Hercules

Experimental materials: wide-mouth glass bottles (yogurt bottles), balloon tissues, and lighters.

1. Blow up the balloon.

2. Take off a piece of paper towel to make a long strip and light it.

3. After a few seconds, when the paper towel burns vigorously, throw the paper towel into a dry bottle (if there is a match, you can throw the match directly into the bottle).

4. Quickly block the mouth of the bottle with a balloon to prevent air from entering.

5. After a while, the balloon was lifted, and the glass bottle was also lifted.

**Scientific principle**: When the burning paper is thrown into the bottle and the balloon blocks the mouth the bottle, the burning paper will deplete the oxygen in the bottle, resulting in atmospheric pressure inside the bottle it is less than the outside atmospheric pressure, so the outside atmospheric pressure is like an invisible hand pushing the balloon into the bottle. Outside of the bottle, so the ball can become smaller again.

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(32). Water flow control table tennis

Experimental materials: water basin, table tennis.

1. Put the ping pong ball in the empty basin.

2. Poured water on the table tennis and found that the table tennis was actually controlled by the current.

**Scientific principle**: According to Bernoulli's principle, the greater the flow rate, the lower the pressure, and the lower the flow rate, the greater the pressure. When the ping pong ball in the water moves away from the center of the water flow in other directions, because the water velocity on the lower side of the rolling direction of the soldier ball is small and the pressure is strong, the water velocity above the water flow is high and the pressure is small, resulting in an upward pressure difference. The ball is pushed up horizontally. The same can be obtained, regardless of No matter how the ping pong ball deviates from the center of the current, it will return to the center of the current due to the old sticky waist.

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(33). Qi management and water

Experimental materials: disposable cups, balloon, hair gauge pins, water.

1. Use a pin to punch a hole at the bottom of the plastic cup near the edge.

2. Blow up the balloon and tie the mouth of the thumb balloon. Use a sweater to go back and forth to the balloon about 20 times.

3. Fill the plastic cup with water and lift it up to form a water column at the hole.

4. Bring the part where the balloon rubbed close to the water column, and the water flow was turned away by the ball. Note: The faucet can replace the secondary cup, but the water flow must be reduced. Sweaters can also be replaced by hair or other fabrics that are easier to generate static electricity.

**Scientific principle**: When the balloon is attached to the sweater and rubbed, it adds an extra negative charge to the ball. At this time, the exposed small water column carries a neutral charge. When the negatively charged balloon approaches the water column, the neutrally charged water column will accumulate charges of opposite polarity to the charge carried by the ball, and the opposite charges attract each other. So, a small water column that is light enough will be turned off by the ball.

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(34). Coin-filled water

Experimental materials: 1 coin, pigment, measuring cup, dropper, water.

1. Add 20 milliliters of water to the measuring cup and add two drops of pigment.

2. Use a dropper to suck the pigment droplets onto the surface of the coin and keep dripping upward.

3. The water droplets on the coin are getting bigger and bigger and dangling.

4. Continue to drip upwards, the droplets finally burst and the water overflows.

**Scientific principle**: Coins can store so much water. In fact, this is not the credit of the coin, but the tension of water. The different density of molecules on the outside and inside of the molecules on the liquid surface results in different forces, which leads to a toward the internal force. That's why the water will be held up and not overflow.

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(35). Bottle swallowing eggs

Experimental materials: wide-mouth glass bottles (yogurt bottles), shelled boiled eggs, paper towels, and lighters.

1. Shell the cooked eggs.

2. Take off a piece of paper to make a long strip and light it.

3. After a few seconds, when the paper towel burns vigorously, throw the paper towel into the dry bottle (if there is a match, you can throw the match directly into the bottle).

4. Quickly block the mouth of the bottle with hot eggs to prevent air from entering.

5. After a while, the egg is slowly swallowed into the bottle.

**Scientific principle**: When the burning paper is thrown into the bottle and the mouth of the bottle is blocked with eggs, the burning paper will exhaust the oxygen in the bottle. As a result, the atmospheric pressure inside the bottle is less than the outside atmospheric pressure. Therefore, the outside atmospheric pressure is like an invisible hand pushing the egg into the center of the bottle.

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(36). Table tennis

Experiment materials: glass bowls, clear water.

‘’There used to be a ping pong ball. It yearned for a free life in the ocean, so its dream since childhood was to be an excellent deep-sea diver. But the ideal is very plump, the reality is very skinny. It is "born with buoyancy every time it wants to sink into the water, but it will automatically float up. It is distressed to ask the kid for help, please help him!’’

1. Use gravity directly with your hands Push the ping pong monarch into the deep-water area and fail!

2. Use a glass cup to buckle the ping pong ball in a boring gourd style, and then press down internally. The successful soldiers finally dived into the water!

**Scientific principle**: when we press directly with our hands Table tennis because the buoyancy of water is much greater than the gravity of a pawn ball. So, every pawn ball will be floated on the water. While pressing the table tennis ball with an empty glass, the air in the cup pushes the water away, and there is no water in the cup. The table tennis was naturally "pressed" to the bottom.

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(37) Water absorption table tennis

Experiment materials: plastic bottles, table tennis water.

1. Put the ping pong ball on the bottle mouth, hold the ping pong with your hand and turn the bottle upside down and release the hand holding the ping pong ball. The ping pong ball will fall.

2. Fill the bottle with clear water (the water should be filled; it is best to overflow).

3. Put the ping pong ball on the mouth of the bottle, press it with your hand and turn the bottle upside down.

4. Loosen the hand that pressed the table tennis ball and found that the table tennis ball is sucked.

**Scientific principle**: This is the effect of atmospheric pressure. The bottle is filled with water, and the pressure is lower than the outside. Pressed against the bottle mouth.

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(38) Table tennis suspended in the air

Experimental materials: hair dryer, table tennis.

1. Turn on the hair dryer with head up.

2. Put the ping pong ball on the tuyere, and then let go. At this time, you can see the ping pong ball floating in the air.

3. Slowly tilt the hair dryer to the left and right, the table tennis ball will also keep on falling.

4. In addition to table tennis balls, there are many things that can be suspended, such as foam balls, the bottom of the bottle cut from the previous experiment, etc. What else can the children try?

**Science principle**: This experiment uses the Bermingley effect. The higher the fluid velocity: the lower the pressure, the higher the air velocity around the ping pong ball, the lower the pressure, so the air pressure makes it difficult for the ping pong ball to move left and right, and the upward blowing force of the hair dryer offsets the weight of the ping pong, so ping pong the ball is suspended in the air!

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(39). Can play acrobatics?

Experiment materials: 1 bottle of canned beverage, water.

1. Place the cans full of beverages on the table diagonally. The cans cannot stand diagonally.
2. Try to put the empty cans on the table diagonally, and the empty cans cannot stand diagonally.

3. Fill the can with about a quarter of water.

4. Try to put the can on the table diagonally again, and now it can stand diagonally on the tabletop successfully.

**Scientific principle**: Cans filled with beverages and empty cans, because of their high center of gravity, and the focus point is difficult to be on the vertical line of the garden, so it is difficult for us to stand diagonally on the table. And when we fill the can with a quarter of the water, the center of gravity of the entire can can be on the same vertical line as the point of force, and the center of gravity is low at this time, so we can easily stand it on the table on. In fact, to keep the object in a relatively stable state, the key is to find the center of gravity. When the center of gravity and the point of force are on the same vertical line, the object will maintain a balance in the vertical direction. However, children should not understand the center of gravity as the center of the object, and the center of gravity of many objects will not be on the object at all.

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(40). Resurrecting caterpillars

Experimental materials: paper-packed straws, crayons, pencils, droppers, and water.

1. Tear off both ends of the straw wrapping paper.

2. Shrink both ends of the straw paper toward the middle, the tighter the better.

3. Pull the shrunk straw paper away from the straw, and the white caterpillar is ready.

4. Use a dropper to suck clean water on the caterpillar. The caterpillar moves like a resurrection.

5. To make colored caterpillars, you only need to paint the straw wrapper with a crayon, use a pencil to cover the eyes and mouth, and then repeat the above steps.

**Scientific principle**: Paper contains a large number of tiny plant fibers. Under the action of capillary, the paper absorbs water, and the water has surface tension. Water drops on the shrinking caterpillar, and the tension of the water slowly expands the caterpillar.

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(41). Rebellious bottle

Experiment materials: plastic bottles, pins, pigment water.

1. Fill the plastic bottle with water (for easy observation, you can add a small amount of pigment for dyeing).

2. Tighten the cap to ensure that the plastic bottle does not leak water.

3. Use a pin to poke a thousand small holes near the bottom of the plastic bottle.

4. When the cap is tightened, the bottle with holes will not leak.

5. Open the cap of the bottle and spray water from the small hole.

**Scientific principle**: Due to the surface tension of water, the small holes are covered with a thin water film, which blocks the water at the small holes. Because the atmospheric pressure inside the bottle is lower than the atmospheric pressure outside the bottle because the cap is tightened. The external atmospheric pressure supports the water at the small hole to prevent it from flowing out. When the bottle body is squeezed hard or the bottle cap is opened, the air pressure in the bottle increases, causing the water film at the small hole to rupture, and the water flows out from the small hole.

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(42). Egg diving

Experiment Materials: eggs (boiled eggs can avoid the risk of breaking), transparent glue in a water cup, 2 pieces of paper.

1. Pour water into the water cup and place a piece of paper in the center on the top of the cup.

2. Take another piece of paper and connect the two ends with transparent glue to make a paper tube.

3. Stand the paper slip in the center of the paper, and then put the egg above the paper tube (the egg and the water cup are on the same vertical line).

4. Push the paper away quickly by hand and observe the situation of the egg falling.

**Scientific principle**: This experiment is due to Newton's first law. Newton said that objects in motion want to stay in motion, and stationary objects want to stay at rest unless an external force is applied to them. Therefore, what the egg wants to do is "do not go". After the paper was removed instantly, the egg lost its load and fell into the cup under the action of gravity.

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(43). Thin cans

Experimental materials: empty cans, boiling water, cold water, basin (used to hold cold water), dishcloth.

1. Pour half a can of boiling water into the empty can.

2. After about 10 seconds, wrap the can with a dish cloth and pour out the boiling water in the can.

3. Then quickly buckle the open can with the opening facing down in a basin containing cold water (ice water is better). The can is squashed.

**Scientific principle**: The water vapor formed by boiling water drives away part of the air in the can, and the remaining air inside is heated. When the can is upside down and stuffed into the water, the internal water vapor condenses into water droplets, and the hot air cools and shrinks. As the bottle mouth is sealed by water, the air pressure inside the can is reduced. At this time, the external atmospheric pressure is stronger than the internal pressure of the can, and the can is squeezed and collapsed due to the pressure difference between the inside and the outside.

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(44). Disappearing flowers

Experimental materials: white paper, scissors, plastic bag watercolor pen, deep-mouth cup, water.

1. Cut the white paper into slightly smaller than plastic bags and draw beautiful flowers on the paper.

2. Put the paper with flowers in a plastic bag.

3. Insert the bag straight into the water, the flower disappeared miraculously.

**Scientific principle**: Light travels in a straight line. When the light passes through the water from the air, the way the light travels changes, so the light confuses our eyes like bending down, so just adjust the angle and put it in the cup. The object seems to be invisible.

(45). Rubber band crossing

Experiment materials: rubber bands, mobile phones.

1. Put the rubber band on your hand, stretch it, and then come from the tiger's mouth

2. Use these two fingers to clamp, after clamping come back and hold the five fingers.

3. Next, put the phone close to the finger side, and at the same time release the thumb, the rubber band will jump to the phone.

**Scientific principle**: use special props, cleverly integrated visual transmission High-intelligence performing arts in different scientific fields such as science, psychology, chemical mathematics, optics, and physical performance. Grasping the characteristics of people's curiosity and knowledge, and creating all kinds of incredible and unpredictable illusions, making it difficult for people to see through the mysteries, so as to achieve the artistic effect of fakes.

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(46). The magic in water purification

Experimental materials: rice water, baking soda alum, and stirring stick.

1. Pour 50ml of rice wash water into two test tubes.

2. Add a teaspoon of baking soda to the measuring cup on the left.

3. Take a small spoon and add a small spoon of alum and pour it into the test tube on the left.

4. Let stand for 1 hour, you can see that the rice-washing water in the measuring cup on the left turns from turbidity to clear.

5. There are a lot of white precipitates at the bottom of the left test tube, and the right test tube is basically unchanged. Pour the three colors of red, yellow, and blue water into the fourth cup full of water. The children pay attention to the changes in the colors.

**Scientific principle**: Alum water purification is a method often used by the people in the past. At first, baking soda was added to neutralize the acidity of alum in the water. Alum can ionize aluminum ions in water, and it is easily hydrolyzed to produce colloidal aluminum hydroxide Al $(OH)_3$. Therefore, alum is a better water purifier. In the real water purification plant, after the processes of "adding coagulant to agglomerate the dirt" and "sand layer filtration", finally chlorine gas is added to disinfect the water, d finally distributed to every household, it is me Tap water from our tap.

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(47). Magic crystal crystallization

Experiment materials: alum, stirring stick, measuring cup, twisting rod, boiling water, thin thread.

1. First divide the torsion bar into three sections.

2. Then use the torsion bar to twist together and break it into a snowflake package and hang it with a thin wire.

3. Pour half a cup of hot water into the test tube, and add alum crystals several times and stir to dissolve

4. Immerse the twisted stick snowflakes in the alum solution and let stand for 3 hours,

**Scientific principle**: Add alum to the hot water to saturate it. When the water cools, the alum will precipitate and attach to a fixed object to crystallize, so that the precipitation over time will give us the crystal shape we want Now The elephant is called "crystal".

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(48). Starch meets iodophor

Experimental materials: test-tube, test-tube rack, iodophor, stirring stick, starch, water.

1. Pour the same amount of water into the two test tubes.

2. Pour an appropriate amount of iodine into the test tube and stir evenly.

3. Pour starch into another glass and stir evenly.

4. Pour the iodine mixture into the starch mixture, and the color of the liquid instantly turns blue.

**Scientific principle**: This experiment fully demonstrates that chemistry is a science of change. Starch is a kind of polysaccharide, which can be divided into amylose and amylopectin. At the microscopic level, the amount of glucose contained in them is different from the molecular structure. After starch is mixed with iodine, a new substance is formed. This new substance changes the light absorption performance of the mixture and changes its color.

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(49). Lemon and iodophor

Experimental materials: test-tube, test-tube rack, dropper, stirring stick, lemon, iodophor, utility knife.

1. Pour purple brown iodophor into the test tube, add water and stir evenly.

2. Squeeze the lemon and squeeze the juice into the test tube.

3. Now we pour the lemon juice into iodophor. Wow! Purple The brown color has become colorless!

**Scientific principle**: Lemon juice contains a large amount of vitamin C. Vitamin C has a strong reducibility, which will reduce the iodine dissolved in iodine to hydroiodic acid. However, hydroiodic acid is colorless in solution, so iodine will fade when it encounters lemon juice.

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(50). VC tablets encounter iodine

Experimental materials: test tubes, test tube racks, iodine, VC tablets, stirring rods.

1. Pour iodophor and water into the test tube.

2. Use a stirring rod to dissolve iodophor with water, and the water will be dyed red.

3. Break the VC slice by hand and put it into the water.

4. The red water is slowly disappearing.

**Scientific principle**: iodophor will oxidize water molecules to produce free radicals, just like an apple will change color when in the air. Vitamin C is a water-soluble antibody. Which is a deadly enemy to free radicals, so it will kill free radicals. Therefore, vitamin C acts as an antibody in the human body and has a magical effect on fighting free radicals and delaying aging.

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(51). Leaf vein gypsum fossil

Experimental materials: gypsum powder, plastic cup, paint, paintbrush, spoon, dropper, stirring rod. plastic film.

1. Add water and gypsum powder in the measuring cup into the plastic cup several times in small amounts.

2. Use a stirring rod to pour the gypsum in the cup on the plastic film and put the prepared leaves on the plaster.

3. Wait for 20 minutes.

4. Gently peel off the leaves and wait for the plaster to harden completely.

5. Paint your favorite color with paint and finish with vein plaster.

**Scientific principle**: This experiment uses the characteristics of gypsum that is easy to solidify but slow to solidify and the texture of leaves is rubbed on the gypsum to simulate the formation of fossils.

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(52). Rainbow race

Experimental materials: dropper, masterbatch, crayons, water.

1. Use colored pencils to draw a few points on the masterbatch.

2. Raise the masterbatch and drip water into the bottom of the masterbatch.

3. Observe the color change on the masterbatch.

**Scientific principle**: Watercolor is easy to dissolve in water, and each color molecule continuously diffuses under capillary action. Due to the difference in molecular weight of each color, the lighter color molecule diffuses quickly, and the phenomenon of chromatography occurs.

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(53). Floating needle

Experiment materials: 1 basin of water, paper towels, sewing needles.

1. Put the needle directly into the water, and the needle sinks to the bottom of the water.

2. Put a small piece of facial tissue into the water and put the embroidery needle on the facial tissue.

3. After the facial tissue sinks into the water, the embroidery needles are still floating on the water.

**Scientific principle**: When the needle is directly put into the water, the needle will sink to the bottom of the water due to its own gravity because the needle is relatively thin and destroys the surface tension of the water. After putting the noodle paper on the surface of the water, put the embroidery needle on the tissue paper, because the tissue paper will sink slowly after being soaked in water. The water molecules have time to re-form tension. When the tissue completely leaves the embroidery needle and sinks to the bottom, the embroidery needle continues to float on the water due to the surface tension of the water.

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(54). Bouncing bubble

Experiment materials: Cups, straws, detergent, cotton gloves.

1. Add a little detergent to the cup, pour a small amount of water and stir evenly with a straw.

2. First, we try to catch the bubble with our hands, the bubble bursts all at once.

3. Is there any way to make the bubble "live" longer? Share with everyone-an "artifact" that can catch the bubble-a cotton glove! 4. Look, after putting on the glove, we can Bubbles are treated as balloons and won’t break even when tapped gently.

**Scientific principle**: When our hand touches the bubble directly, the surface tension of the bubble is reduced, so the bubble The bubble was punctured. When we wear cotton gloves, because there are a lot of fine hairs on the gloves, they have strong adhesion and elasticity, which will produce a hydrophobic effect, so it is not easy to break the bubbles.

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(55). Small dream droplets

Experimental materials: water cup, dropper, test-tube, test-tube rack, pigment, oil, transparent cup.

1. Take three test tubes, pour appropriate amount of water, and drop them into red, blue, and yellow. Plant the pigment, then stir quickly to make it diluted in water.

2. Take a transparent cup and pour an appropriate amount of oil.

3. Use a dropper to absorb the colored waves in the three test tubes and drop them into a transparent cup containing oil. We will find that they fall into the oil like drops of water.

**Scientific principle**: If the solute and the solvent are similar in structure, then they are mutually soluble in each other. This is the principle of "similar miscibility". In this experiment, the main component of edible oil is mixed glycerides (organic) and water is inorganic. Their molecular structures are quite different and cannot be mutually soluble. Therefore, we will observe that when the pigmented water is dropped into the oil, a spherical colored droplet is formed.

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(56). Lemon fire

Experiment materials: lemon or orange, fruit knife, candle, lighter.

1. Cut a small piece of lemon zest from the fresh lemon.

2. Light the candle.

3. Place the lemon peel close to the candle flame, squeeze the lemon peel with your fingers, make the juice squeezed out of the lemon peel spray toward the flame, and observe the candle flame.

**Scientific principle**: Lemon peel (orange peel) contains natural essential oils and other combustible organics. When the lemon peel (orange peel) is squeezed against the candle flame, the essential oils are also squeezed out. When the essential oil meets the candle flame, it catches fire and emits a bright flashing fire light. Accompanied by a crackling sound.

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(57). Rainbow Ferris wheel

Experimental materials: rainbow candy, plates, water.

1. Take out about 10 to 12 rainbow candies and place them in a circle evenly on the plate.

2, Gently pour about 30ml of clean water at room temperature into the center of the plate, the height of the water is the same as the height of the middle of the rainbow candy.

3. Observe the diffusion of rainbow Sugar pigment in the dish.

**Scientific principle**: After the water contacts the rainbow candy, the pigment begins to dissolve in the water, and the density of the water increases and spreads to the areas of low density without direction. When a certain skittle pigment meets another skittle pigment because the density is similar, the two colors diffuse toward the less dense area in the center of the plate, and finally form a shape similar to a rainbow ferris wheel.

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(58). Sugar water starry sky cup

Experimental materials: sugar cubes, food coloring, warm water.

1. Put the sugar cube into the glass and pour warm water.

2. After the sugar cube is dissolved, we add the pigment to the cup. The pigment floats on the upper layer.

3. Stir the pigment with a wooden stick to diffuse, but it is still on the upper layer, forming a gorgeous

**Scientific principle of the starry sky gradient effect**: sugar cubes are highly soluble in hot water. After a period of time, the temperature decreases and the solubility decreases, and because part of the sugar is not dissolved, the sugar water is deposited on the bottom of the cup. The concentration of the sugar water at the bottom is higher than that of the upper part, and the density of the sugar water in the two parts is different, which will cause stratification. So, when we drop the pigment into the cup, the pigment will float on the upper part of the sugar water, forming a gradual starry sky effect.

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(59). Rainbow bubble dragon

Experiment materials: color master tablets (thin old clothes or old towels), plastic bottles, rubber bands, detergent, bowls or cups, pigments, scissors, stirring rods.

1. Pour 50ml of water and 20ml of detergent into the cup and stir well.

2. Use scissors to cut off the bottom of the plastic bottle.

3. Put the dish cloth on the bottom of the cut bottle and fix it with a rubber band.

4. Drop pigments on the cloth, and more drops of several colors are better.

5. Blow in from the mouth or the bottle, and a rainbow bubble dragon appears.

**Scientific principle**: Every small gap in the dishcloth is like a bubble blowing tube. There are countless small gaps all over every corner of the dish cloth, so it blows out countless neatly Arranged small bubbies. This is mainly due to the existence of the surface tension of the bubbles. coupled with the mutual attraction of the hydrogen atoms in the water molecules, forming the foam that we have seen breaking free from the dishcloth. The pigment of the dishcloth is attached to the bubble, forming a rainbow bubble dragon.

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(60). Angry raisins

Experimental materials: transparent plastic bottles, Sprite, raisins.

1. Pour half a bottle of Sprite into a transparent plastic bottle.

2. Hang the bottle with your hand and flick the bottle wall with one hand to bounce the bubbles attached to the bottle wall.

3. Pour about 10 raisins into the bottle. The raisins swam up and down in the bottle like small fish.

**Scientific principle**: Carbonated beverages contain a lot of carbon dioxide. After opening the cap of the beverage bottle, the carbon dioxide overflows in gaseous form, forming many small bubbles. Some air bubbles are attached to the raisins, causing their buoyancy to be greater than their own gravity, and the raisins float up. As the bubbles gradually burst, the buoyancy is less than gravity, and the raisins sink again. Repeatedly, a wonderful scene similar to an aquarium appeared.

(61). Outsmart egg

Experiment materials: conical flask, vinegar, baking soda, eggs, paper towels, detergent lubricate the left and right sides, you can leave it alone)

1. Put a lighted paper towel in the bottle, put the egg on the bottle mouth the egg is sucked in.

2. Now we pour the baking soda and white vinegar into the conical flask.

3. As long as you shake it the other way round, the egg can get out of the bottle by itself.

**Scientific principle**: In this experiment, baking soda reacts with the white vinegar in the bottle to produce a large amount of carbon dioxide gas. Because the egg is stuck in the mouth of the bottle, the bottle is relatively closed, and more and more large amounts of carbon dioxide gas cannot be discharged, so the egg is pushed out.

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(62). Balloons are being afraid of coins

Experimental materials: coins, glass beads, balloons.

1. Put coins and glass beads into the balloon respectively and put them all at the bottom of the balloon.

2. Use a pump to hit the balloon until you can see the coins and glass beads at the bottom.

3. Then lower the balloon from a high place to observe its phenomenon.

**Scientific principle**: When a full-blown yellow balloon falls from a high place to the ground, the coin in the balloon hits the balloon and knocks out a long hole in the balloon's skin. Because the balloon is full, the skin has elastic tension. The tension between the upper and lower ends of the elongated hole is unbalanced, so it quickly splits and bursts.

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(63). Balloon circle

Experiment materials: scissors, rubber bands, balloons, straws.

1. Cut off the long end of the straw, connect the straw to the balloon, and tie it with a rubber band.

2. Blow the balloon into a bulge, pinch the mouth of the balloon with your hands.

3. Find a smooth tabletop or ground, let go, shoo! The balloon spins.

**Scientific principle**: After loosening the mouth of the balloon, the air in the balloon is ejected from the mouth of the straw. Because the straw is bent, the airflow from the mouth of the straw generates a side recoil, so the balloon can be rotated.

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(64). Two-color flower

Experiment materials: scissors, test tubes, pigments, white roses.

1. Pour the two colors of pigment into the water and stir evenly.

2. Use scissors to cut off the end of the flower stem and then cut the flower stem.

3. Insert the two separated stems of the white rose into a test tube with two pigments dissolved.

4. Let the roses stand still and observe that the white roses gradually change color after different time. Finally, our two-color flower is complete.

**Scientific principle**: The reason why flowers absorb water and change color is related to the capillary phenomenon. The capillary phenomenon refers to the liquid inside the thin tubular object due to the cohesion and adhesion. Difference, the phenomenon of rising by overcoming gravity. There are many water-carrying pipes in the flower stems. We call them pipes. The smaller the radius of the duct, the greater the height of water rise. Therefore, the pigment water can be easily delivered to all parts of the flower. The two-color flower in this experiment is to divide the flower stem into multiple halves and insert them in different colors of water respectively, so that the roots can absorb the pigments, and the multiple colors are evenly presented on the petals. It cannot change genes, it cannot be inherited, and it will be a bicolor flower without seeds. Because of various indeterminate factors such as the pigment in the water, the concentration of the pigment and the degree of absorption of the flower, the two-color flowers made by each person will be different to a certain extent, and they are all unique.

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(65). The eggs are smiling

Experimental materials: candles, eggs, water glasses, white vinegar.

1. First draw a smiley face on the egg with a candle.

2. Put the eggs in the cup and pour. The white vinegar is over the eggs.

3. Take out the egg after the outer shell of the egg has faded.

4. Wash the eggs, you will find the eggs smiling at you at this time.

**Scientific principle**: The main component of eggshell is calcium carbonate which will react with the acetic acid in white vinegar, while the main component of candle is paraffin, which is insoluble in water and vinegar. After coating on the eggshell, it prevents the white vinegar from reacting with the egg shell. Then the smiley face came out.

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(66). Water-filled mesh

Experimental materials: test tube, masterbatch, toothpicks, rubber bands. 1. Pour water into the bottle, be sure to fill it up.

2. Put the masterbatch on the mouth of the test tube.

3. Tie the gauze net with a rubber band.

4. Now we cover the mouth of the bottle with our hands, turn the bottle upside down and let go, but the water does not leak out.

5. Poke in again with a toothpick, the water still doesn't come out.

6. Put the bottle upside down vertically so that the water will not leak. But if you tilt it slightly, the water leaks out immediately.

**Scientific principle**: It turns out that the pressure of the air is very high, and it can fully support the gravity of the water at the mouth of the bottle, so the water will not leak downward. The surface of the water is like a layer of elastic skin. The molecules on this layer of "skin" are attracted by the molecules under the surface of the water, which wraps up the water and prevents the water from running around. So even if the toothpick is cut in, the water in this bottle will not pour out.

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(67). Discolored apple

Experiment materials: citric acid, measuring cup, apple, sampling spoon, plate, fruit knife.

1. Measure 20 ml of water in a measuring cup, add half a spoon of citric acid, stir well, and pour it into the dish.

2. Cut the apple in half, and quickly put half of the apple with the cut side down in the plate and pick it up after 3 seconds. Place the two halves of the apple with the cut upwards and let it stand for half an hour and observe the discoloration of the two halves.

**Scientific principle**: The phenolic substances in apples are oxidized to produce phenolic oxides after encountering oxygen, which causes the apple cut surface to turn black, while citric acid inhibits the activity of phenol oxidase, the vitamin C in lemon has a strong recovery the original nature slows down the apple oxidation process. Therefore, eat more foods with high vitamin content.

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(68). Self-made bubble water

Experiment materials: measuring cup, stirring rod, sugar, detergent, water, straw.

1. Measure out 40 ml of water, 20 ml of sugar and 20 ml of detergent with a measuring cup.
2. Pour 40 ml of water into a measuring cup containing 20 ml of sugar and stir evenly.

3. Pour the stirred sugar water into a measuring cup containing detergent, and stir evenly, the bubble water is ready.

4. Take a straw, put one end into the bubble water, and blow on the other end, wow- a lot of bubbles (please try more games)

**Scientific principle**: bubbles are formed by the surface tension of water. This tension is When the pulling force is applied, there is a mutual traction force on the inside and perpendicular to the contact surface of the two adjacent parts, The mutual attraction between water molecules on the water surface is stronger than the attraction between water molecules and the air. These water molecules are like being stuck together.

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(69). Cotton line ice fishing

Experiment materials: ice cubes, salt, cotton thread, l plate, sampling spoon.

1. Take out a piece of ice cube and place it on the plate, then put the cotton thread on the center of the ice cube and try to make the thin thread close to the ice cube.

2. Sprinkle about a dozen grains of salt evenly along the cotton thread. (Salt should not be too much, otherwise it is easy to fail)

3. After standing for l minute, gently lift the cotton thread, the ice cubes are caught.

**Scientific principle**: Salt can lower the freezing point of water and make ice melt more easily. After sprinkling a small amount of salt around the cotton thread, the melted snow water is affected by the surrounding low temperature and freezes again, so the cotton thread and ice are frozen together.

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(70). Suppressed water

Experiment materials: test tube, clear water.

1. Pour water into the measuring cup.

2. Cover the cup with A5 paper, press the paper, and turn the measuring cup over.

3. The water did not leak out.

**Scientific principle**: The force of atmospheric pressure pushing the water surface in the cup is exactly equal to the weight of the remaining water in the bottle plus the pressure generated by the air in the bottle, so the balance of force is reached, so we can see that the water in the bottle no longer flows out.

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(71). Trapped ice cubes

Experimental materials: glass, coloring, edible oil, water, ice cubes, stirring rod.

1. Pour half a cup of water into the glass, add 2 drops of pigment into the water, and stir evenly.

2. Pour about 80ml of edible oil into the glass, take a piece of ice into the glass gently, and observe the position of the ice.

3. Common sense Use a stirring rod to press the ice cubes into the bottom of the water and observe where the ice cubes are.

**Scientific principle**: Water, oil, and ice have the largest density of water, while oil has the smallest density. Ice is between oil and water. Therefore, water is at the bottom of the cup, oil is at the top, and ice is at the top. It is suspended between water and peanut oil.

(72). Balloon garland

Experimental materials: hair dryer, balloon, double-sided tape,

1. Blow 6 balloons first.

2. Paste the balloon into a wreath with double-sided tape.

3. Put the hair dryer under the ball garland to blow air, and the balloon floats and spins in the air.

**Scientific principle**: Today's experiment uses the Kangda effect, where the fluid (water flow or air current) leaves the original direction of flow force and changes to the tendency to flow with the protruding object surface. When we blow with a hair dryer under the balloon, when the airflow blows to the surface of the balloon, the speed will increase, and the pressure will be lower; while the airflow at the periphery is slow and the pressure is higher.

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(73). Chopsticks to lift rice

Experimental materials: rice, funnel, chopsticks, test tube.

1. Pour rice into the test tube with the help of a funnel and pour it to the mouth of the bottle.

2. Then insert the chopsticks into the rice, as deep as possible, and the direction as vertical as possible.

3. Shake the test tube to compact the rice.

4. The chopsticks successfully lifted a test tube of rice (if the second step is done correctly, the test tube still cannot be lifted, indicating that the rice is not sufficiently pressed, please repeat the third step)

**Scientific principle**: This experiment uses the principle of static friction, when the chopsticks are inserted into the rice, if you try to move the chopsticks, the surface of the chopsticks will have static friction with the rice, and there will be static friction between the rice and the wall of the test tube. The compacted rice exerts a lot of pressure on the chopsticks and the bottle wall. This pressure makes the static friction force become very large, so we can easily lift the whole bottle of rice with the chopsticks.

Give it a try: After the experiment is successful, you can also try to continuously reduce the amount of rice to see what other phenomena will occur?

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(74). Light candles in a separate space

Experimental material: glass cups, lighter candles.

1. Use a lighter to light the candle and wait until the candle burns vigorously to cover it.

2. A puff of green smoke will rise from the candle wick. Use a lighter to get close to the green smoke. A miracle happened, and you will find that the candle is lit again.

**Scientific principle**: After the candle is lit, the paraffin around the candle flame slowly melts to form candle oil. The candle oil rises along the candle wick and vaporizes into combustible gas when heated at the upper end of the candle wick. The combustible gas reaches the ignition point and burns. In fact, after the candle is put out, it follows the smoke trail together. What rises is the vapor of the candle composition. These waxes neatly meet the air and condense into small particles mixed in the smoke trail. The smoke trail becomes the fuse, and then use a lighter Light the small particles in these smoke trails, and the candle will be lit by the way.

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(75). The secret

Experiment materials: two oranges, a glass of water.

1. Put a whole orange into the water and find the orange floating on the water.

2. Take the orange out of the water and remove the orange peel. Put it in the water again and the orange sinks into the bottom of the cup.

3. Put the peeled and unpeeled oranges into the measuring cup respectively. By comparison, the peeled bridge can easily sink into the bottom of the cup.

**Scientific principle**: The unpeeled orange has a soft skin and a lower density than water. In addition, there is air in the center of its interior, so the overall density is lower than water, so it will float on the water. Peeled orange, most of the orange petals It is sugar water, a small part of solid matter, the overall density is slightly higher than water, so it will sink into the water.

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(76). A simple water purification device

Experimental materials: 2 measuring cups, paper towels, and muddy water.

1. Use measuring cup-cup of muddy water.

2. Fold the paper towel into a long strip, put one end into the empty measuring cup and the other end into the muddy water. Observe the phenomenon every half an hour.

3. Only halfa cup of muddy water remained after 2 hours, and half a cup of clear water was obtained in the empty measuring cup.

**Scientific principle**: There are many small "pipes" in the paper. Water is adsorbed inside these small pipes. Due to the difference of cohesion and adsorption, the water can be slowly transported into the empty cup. The sediment and other substances cannot be adsorbed, so that the sediment and water are separated to obtain clean water. This phenomenon is called "capillarity".

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(77). Card suspension technique

Experimental materials: water, measuring cup (disposable cup), playing cards, coins.

1. Fill the disposable cup with water, put a card, half of the card is suspended outside the cup.

2. Put the one-yuan coin on the dangling part of the card. The card has not been pushed by the hard market and stands firmly on the edge of the cup.

3. With the addition of a 5-dime coin, the card still does not fall.

**Scientific principle**: If there is no water in the cup, the two ends of the card are not evenly stressed, let alone coins, the card may not stand firmly on the edge of the cup. However, after being filled with water, the surface tension of the water provides a corresponding pulling force for the paper sheet, which is equal to the gravity of the coin and the two ends of the card are balanced. So even if hanging outside the rim of the cup, the card and the hard market can be well balanced without falling.

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(78). Rotating paper snake

Experiment materials: paper, pencils, candles, bamboo sticks.

1. Cut the paper into the shape of a long snake.

2. Insert a bamboo stick on the candle and fix the "long snake" on the other end.

3. Light the candle and the "long snake' will rotate with it.

**Scientific principle**: The candle burns to generate heat, and then the air rises by heating, pushing the paper snake to make the paper snake spin. In fact, Kongming lanterns and hot air balloons can rise for the same reason. Although the process of this experiment is not complicated, it still makes me feel very interesting and rewarding. It can use my imagination and satisfy my curiosity.

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(79). Flowers in water

Experimental materials: white paper, water basins, and colored pens.

1. Make the white paper into a paper flower shape, and then fold the petals to the middle position to become a flower bud.

2. Put the folded flower buds into the water, after a while, you can see the buds bloom slowly.

**Scientific principle**: Paper is the main experimental material: the ingredient is plant fiber. When water penetrates the fiber in the paper, the fiber will expand. When the petals are folded open. The effect of flowering in water will appear.

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(80). Water table tennis

Experiment materials: table tennis, measuring cup, water.

1. Pour more than half of the water into the vector cup, put the table tennis ball on the water, and observe the phenomenon.

2. Take out the ping pong ball and fill the vector cup with water so that the water surface is higher than the edge of the measuring cup. Put the ping pong ball on the edge of the cup, you can see the ping pong ball moving towards the other side.

**Scientific principle**: There is no measuring cup filled with water. The liquid level in the cup is concave, so it stays still after being put into the water. After the water is filled, the tension causes the water to rise above the mouth of the cup, forming an upward convex liquid surface. Under the action of the tension of the liquid surface of the opposite shape, the ping pong ball has an opposite movement tendency.

---

(81). High above water

Experiment materials: pigments, test tubes, water.

1. Pour the pigment into a basin filled with water.

2. Push the test tube obliquely into the water and let part of the water enter the cup.

3. Then slowly lift the test tube. Wow! The water in the test tube is pulled up! You can even move it left and right!

**Scientific principle**: When the test tube is in water the pressure of the test tube is less than or equal to the pressure outside the test tube, so the test tube water will not flow out. When the test tube is raised. The water in the test tube will be higher than the water in the basin. I don' t know if you have noticed that when we use a straw to drink a drink, the water in the straw will be much higher than the water in the cup. This is because we use our mouth to pump out the air in the straw, the pressure inside the tube will be lower than the pressure outside the tube, and the water will easily reach high places.

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(82). Toothpick speedboat

Experiment materials: toothpicks, detergent, and a basin of water.

1. Prepare a basin of water.

2. Take a toothpick and dip the thick end of the toothpick with a little detergent, then gently put the toothpick into the basin, and the toothpick rushes out like a speedboat.

**Scientific principle**: Dishwashing liquid contains surfactants and is easily soluble in water. Therefore, the toothpicks dipped in detergent can be moved on the surface of the water.

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(83). Water-tight funnel

Experiment materials: funnel, glass bottle, measuring cup, balloon, scissors, pigment, pin.

1. Get a cup of water in the water glass and drop two full amounts of pigment into the water glass.

2. Cut the head and tail of the balloon in half, leaving only the lower part of the balloon, and poke a hole at the bottom of the balloon with a needle cone.

3. Pick up funnel, insert the bottom of the funnel into the small hole at the bottom of the balloon, and insert the balloon and funnel into the glass bottle.

4. Pour the water in the water cup into the glass bottle. We can see that only a small amount of water enters the glass bottle, and the remaining water is left. In the funnel.

**Scientific principle in the closed state of the bottle mouth**: water poured into the bottle and the air in the bottle is squeezed. As the water flow continues to enter the bottle, the air pressure increases to block the inflow of water; therefore, the air cannot go out and the water cannot enter. Coming phenomenon.

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(84). The escaped pepper

Experiment materials: dish soap, water, pepper.

1. Sprinkle a layer of pepper on the surface of the water. The peppers stand in rows on the surface of the water.

2. We apply detergent on our hands!

3. Put the fingers with detergent into the water, wow! The pepper layer is punctured by the detergent!

**Scientific principle**: the reason why pepper can float on the water. Because the surface of the water has surface tension, forming a water film. The surface of the pepper is hydrophobic and light, so it stays on this layer of water. The detergent contains surfactants, which can destroy the surface tension of the water and destroy the water film, so that the pepper cannot be carried by the water film, so it will be dispersed.

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(85). Beautiful siphon phenomenon

Experimental materials: pigment, glue, utility knife, cup, straw, scissors.

1. Drill a small hole in the cup with a screwdriver.

2. Insert the short end of the straw into the small hole of the cup.

3. Cut off a straw so that the length of the straw is slightly longer than the bottom of the cup.

4. Seal the interface with glue and wait for the glue to dry. A total of 3 such cups will be made.

5. Stack with other cups, so that the cups with straws are at different heights.

6. Drop the pigment into the cup and add water that does not exceed the height of the straw.

7. Add water to the highest cup, you can see the highest cup the water is sucked into the next cup by the straw.

**Scientific principle**: Siphon is the phenomenon of using the force of the difference in liquid level. Place the high open end in a container filled with liquid. The liquid in the container will continue to flow out from the opening at a lower position through the siphon.

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(86). Non-wet paper

Experimental materials: measuring cup, paper, water.

1. Fold the A4 paper and put it on the bottom of the measuring cup.

2. The measuring cup is pressed into the water forcefully by the inverted buckle, not past the bottom of the cup.

3. Take the measuring cup out of the water, the water in the measuring cup is not even wet.

**Scientific principle**: There is air in the glass. When the mouth of the glass is placed in the water, the air in the glass separates the paper towel from the water, and the paper towel will not be soaked.

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(87). Bags that cannot be burned

Experimental materials: preservation bags, water, and lighters.

1. Fill the fresh-keeping bag with water.

2. Use a lighter to burn under the bag without breaking the bag.

3. Pour out the water and use it. The lighter will burn under the bag, and the bag will be burnt.

Scientific principle: Why can't plastic be burned when it is filled with water, and it

will burn at a point when it is not filled with water? Because the combustion needs to reach a certain temperature. When the fire is burned in plastic bags and water, the water absorbs more heat. The plastic bags transfer the heat to the water. The plastic bags cannot reach the ignition point, so they will not burn.

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(88) Toothpicks and five-pointed star

Experimental materials: plates, toothpicks, water, dropper.

1. Take 5 toothpicks and bend them from the middle position.

2. Bend the two sections into a V shape, being careful not to break them.

3. Put 5 toothpicks on the plate and place them neatly.

4. Take water with a dropper and drop it in the middle of the toothpick.

5. You can see the toothpicks slowly open.

6. It becomes a united five-pointed star shape!

**Scientific principle**: After dripping water on a toothpick, its broken part will play in the water, and a half-broken toothpick will tend to straighten again. And due to the surface tension of the water, the water-stained part near the center the toothpicks will move away from each other, and the toothpicks will slowly become a five-pointed star. Children should also pay attention, do not add too much water, too much water will increase resistance and may cause the experiment to fail.

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(89) Water flow separation and combination

Experiment materials: thumbtacks, pigments, plastic bottles.

1. Drop the pigment into the bottle and shake it gently.

2. Tighten the cap of the water bottle and make a small hole in the lower part of the water bottle not too far away,

3. Unscrew the cap, the water flows out. Wipe the water flow horizontally by hand, and then the water flow from fusion to fusion, and then wipe the water flow vertically by hand.

**Scientific principle**: In the experiment, the water is wiped horizontally by hand. The surface tension of the water reduces the surface area of the water, turning it into a stream of water and wiping it vertically, destroying the tension of the water, and the water flow is redistributed.

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(90). Obedient four-pointed star

Experimental materials: paper, scissors, candles, toothpicks, straws.

1. Fold the paper in half twice and cut a cut along the folded edges to cut out a four-pointed star.

2. Insert the toothpick on the candle and place the four-pointed star lightly on the other end of the toothpick.

3. Rub the straw 20 times with a rag, close to the four-pointed star.

**Scientific principle**: When positive charges gather on an object, positive static electricity is formed, and when negative charges gather on an object, negative static electricity is formed. The straw rubs against the linen cloth, the straw is negatively charged, and the cloth is positively charged.

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(91). Cola Fountain

Experimental materials: Coke (Sprite), plates, chalk (mint candy can also be used).

1. Put the Coke on the plate, unscrew the cap of the Coke bottle, break the chalk into several pieces and put it in.

**Scientific principle**: Thousands of small pits in the chalk are ideal places to form carbon dioxide foam, so that carbon dichloride is attached to the small pits and released quickly, so chalk + cola = a fountain that can make people crazy and happy. (Using mints can also achieve this effect, such as Mentos).

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(92). Table Tennis Diving

Experimental materials: table tennis, disposable cups, clean water.

1. Let the table tennis ball fall freely from a height of 60cm from the tabletop to observe the rebound height of the table tennis ball.

2. Put the same ping pong ball into a water cup with a small half cup of clean water (you can add a drop of pigment for experimental observation).

3. Let the water cup fall freely from a height of 60cm from the tabletop and observe the rebound height of the table tennis ball. Through experiments, you will find that: the first table tennis ball is a free-falling table tennis ball, and the maximum rebound height is about the second table tennis ball placed in the water cup has a maximum rebound height of 10cm, much higher than the first table tennis ball. Why is there such a situation?

**Scientific principle**: Because now when the water cup collided with the tabletop, the water in the cup was splashed high and the ping pong ball was bounced up. From this point of view, we can preliminarily conclude that the reason why table tennis can rebound higher is largely due to the thrust generated by the splash.

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(93). Toothpicks tied balloon

Experimental materials: 1 toothpick, multiple toothpicks, balloons.

1. Prepare two balloons that are blown up.

2. Use a toothpick to tie the balloon.

3. Take the lottery, arrange the lottery first, and then go to tie the balloon.

**Scientific principle**: This experiment uses the principle of pressure and pressure. The toothpicks tied into a bundle seem to be many. In fact, they increase the force area of the balloon and the toothpicks, but the pressure applied to the balloon is the same every time. Pressure formula: pressure x force area = pressure, the pressure does not change, the force area increases, and the pressure decreases. Therefore, the pressure of each toothpick on the pressure point of the balloon becomes smaller, so the deformation of the contact point between the balloon and the sign It's not big, but the balloon is not easy to puncture.

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(94). Detect starch in food

Experimental materials: various foods (such as bread, biscuits, apples, hawthorn, etc.), iodophors, plates.

1. Take small pieces of common food such as bread, biscuits, apples, hawthorn, etc., and put them on the plate.

2. Drop iodophor on the food separately and observe the color change.

**Scientific principle**: Starch will turn purple or blue when it meets iodine.

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(95). Water circulation rotating bottle

Experimental materials: Coke bottle or mineral water bottle, funnel, pigment, water, pin, cotton thread.

1. Pierce holes in the same direction around the bottom of the bottle, so that the directions of the holes are in the same direction.

2. Tie the cotton thread to the mouth of the bottle. Put a few drops of pigment into the coke bottle and fill it with water.

3. Pinch the cotton thread and lift the Coke bottle and rotate the bottle in the opposite direction of the water flow.

**Scientific principle**: Because the small holes deviate in the same direction, the water flows out and is affected by the recoil force, which pushes the bottle to rotate.

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(96). Starch secret letter

Experimental materials: paper cup, starch, iodophor, sampling spoon, filter paper, hook line pen, measuring cup.

1. Pour an appropriate amount of starch into the measuring cup, add water, and stir with a stirring rod until it is fully dissolved and becomes viscous.

2. Dip the starch solution with a hook line pen, write on the filter paper, and dry it.

3. Gently dot the filter paper with iodophor.

**Scientific principle**: Starch will turn red or blue when it meets iodine. The sensitivity of these color reactions is very high. It can be used as a quantitative and qualitative method to identify starch, and it can also be used to analyze iodine content. Foods contain starch, such as: apples, eggs, do you know which foods contain starch?

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(97). Coins filled with water

Experimental materials: 1 yuan coin, pigment, measuring cup, dropper, water.

1. Add 20 ml of water to the measuring cup and add 1 drop of pigment.

2. Use a dropper to draw the pigment droplets onto the surface of the coin and keep dripping on top.

3. The water droplets on the coin are getting bigger and bigger and dangling.

4. Continue to drip upwards, the droplets finally burst and the water overflows.

**Scientific principle**: Coins can store so much water. In fact, this is not the credit of the coin, but the tension of the water. The different density of molecules on the outside and inside of the molecules on the liquid surface results in different forces, which results in a force towards the inside. That's why the water will be held up and not overflow.

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(98) Non-Newtonian fluid

Experimental materials: starch, water, stirring stick.

1. Take 15g of starch into the measuring cup (the height of the starch into the measuring cup is 40ML).

2. Drop the pigment into a measuring cup, add a little water to make pigment water.

3. Pour the pigment water into a measuring cup containing starch.4. Adjust starch viscosity.

**Scientific principle**: The liquid that we mix with cornstarch and water in the sudden test today is "non-Newtonian fluid." The jam, eggs, egg whites, chewed gum, and even human blood, oil, et. that we usually eat belong to "Non-Newtonian fluids" are between liquids and solids. When the surface is under pressure, it will start to harden and have certain solid characteristics. When there is no pressure on the surface, it is very soft and liquid-like. According to this characteristic, people make "non-Newtonian fluid" body armor, which is comfortable and bulletproof. The performance is also better. The secret of the "non-Newtonian fluid" in the sudden test is that the water is so hard. The mature corn grains are very hard. When the corn flour and water are mixed with extremely high density, the small corn grains are evenly distributed in the liquid. Medium, the density even exceeds corn kernels, when we hit the "non-Newtonian fluid" hard, the pressure is evenly transmitted to each particle, and it feels like beating a wall.

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(99). Oil-water separation

Experimental materials: test-tube, test-tube rack, dropper, pigment, edible oil, water

1. Use a dropper to drop half of the test tube water into the test tube, then fill in 1 drop of pigment and shake it evenly.

2. Use a dropper to draw edible oil into the test tube, and the test tube is 7 minutes full. 3. Cover the test tube lid and shake the test tube, then put the test tube on the test tube rack and let it stand for 1 to 2 minutes and observe the phenomenon.

**Scientific principle**: Under normal conditions, oil and water have different molecular sizes and different viscosities, so they will not mix, and the density of water is greater than that of oil, so oil will float on water.

(100). Oil and water mixing

Experimental materials: test tubes, test tube racks, droppers, pigments, edible oil, water, detergent.

1. Use a drop to put half of the test tube water into the test tube, then add 1 drop of pigment to the skin, and shake it evenly.

2. Use a dropper to absorb the edible oil into a test tube. The test tube is 7 minutes full, and then two drops of detergent.

3. Cover the test tube and shake the test tube, and then let the test tube stand on the test tube rack for 1 to 2 minutes and observe the phenomenon.

**Scientific principle**: Dishwashing detergent can emulsify oil into small oil droplets, prevent the oil droplets from re-aggregating and make the oil evenly dispersed and suspended on the water, so it looks like oil and water are really mixed together.

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(101). Excess Paper

Experimental materials: white paper, ruler, pencil.

1. Make a mark every third-on one side of the paper.

2. Make a mark on the other half of the paper.

3. Fold the two long sides in half and spread out.

4. Draw a straight line that is straighter than the half line at the three marks.

5. Cut off the three vertical lines, then turn half of the paper over, hey how does the A4 paper look? More!

**Scientific principle**: This experiment uses logical misleading and illusion. There is not much paper. Turn the middle part to stand up, and then keep turning the middle part to both sides to mislead your eyes to think that it is too much-block, wrong Optical illusion, also known as optical illusion, means visual illusion, belongs to physiological illusion, especially geometrical illusion is to be known for its variety. Optical illusion is based on empiricism or improper when people observe objects. With reference to the wrong judgments and perceptions formed, visual error refers to the observer s wrong perception of images that are inconsistent with the objective facts under the interference of objective factors or the control of their own psychological factors, which we encounter in daily life. There are many examples of optical illusions. For example, the ratio of blue, white, and red of the French flag is 30:33:37, but we feel that the areas of the three colors are equal. This is because white gives a feeling of expansion, while blue has a feeling of contraction, which is an optical illusion.

(102). Coin explosion balloon

Experimental materials: 2 balloons, 1 coin, 1 glass bead.

1. Put the glass beads into the balloon, and put the coin into another balloon.

2. Blow up the two balloons and tie them tightly.

3. Let the balloon fall from the same height and pass the real You will find that after the balloon is dropped from the same height, the balloon with the coin will burst, but the balloon with the glass beads does not burst, which is really strange!

**Scientific principle**: The glass beads are spherical, the contact area with the balloon is large when impact occurs, the pressure on the impact point is small, and the damage to the balloon skin is small, and the impact point is round and the force is balanced, so the balloon does not Easy to be torn. In contrast, the coin appears «sharper», the impact point is small, the pressure is high, and the damage to the balloon skin is large, and the elongated impact point is unbalanced. The strong elasticity of the balloon skin is easy to tear from the impact point. crack.

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(103). The hills with beef

Experimental materials: ruler, several coins

1. Place the two coins next to each other on the desktop against the wall and use a ruler to clamp the coin between the wall and the ruler.

2. Take a coin and place it a short distance away from the first two coins, and then bounce it forward to hit the middle 2 coins, and go up (note that the force is appropriate, and the coins do not bounce around) look- look at the middle

How will the coin at the position and the coin at the other end react? Try it: you can add a few more coins to see what is the difference? Try hitting the coin at the middle position with 2 coins at the same time and see A few coins will pop out on the other end.

**Scientific principle**: Today's experiment uses the principle of transferring energy from the movement of objects. How many coins you use to bounce forward, correspondingly how much energy is transferred forward to make the same number of coins pop out in front.

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(104). Sugar Blowing Balloons

Experimental materials: empty bottle, sugar, alcohol mother powder, water, balloon, rubber band, spoon.

1. Pour half a bottle of warm water into the bottle.

2. Add 15 spoons of sugar.

3. Add 3-5 spoons of yeast powder and stir

4. Put the balloon on the bottle mouth and fasten it with a rubber band

**Scientific principle**: Yeast powder is fermented in a warm water environment, and the sugar is broken down into carbon dioxide through respiration. Carbon dioxide is a gas, so the balloon is inflated.

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(105). Manufacturing Plasticine

Experimental materials: flour, salt, edible oil, coloring, measuring cup, bowl, spoon, water.

1. Pour a measuring cup of flour into a bowl, add a spoonful of table salt, adda small amount of cooking oil and a small amount of cold water, and stir evenly (do not add too much water, if it is too dry, add some water, if it is too wet, add appropriate flour), knead the flour into a dough.

2. Add your favorite pigments and knead the dough vigorously until the dough is smooth and delicate without sticking to your hands

**Scientific principle**: Why add salt and oil to the dough? What effect will they have on the dough? It turns out that oil can make the dough not sticky. Increase the plasticity of the dough; adding salt can make the water loss of the dough slower.

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(106). Homemade Thermometer

Experimental materials: transparent bottles, transparent straws, pigments, plasticine, cold water, hot water.

1. Pour one-fifth of the water into the bottle and adda few drops of pigment.

2. Wrap the straw in the center with plasticine, insert the straw into the bottle and let the straw touch the water in the bottle, then use the plasticine to seal the mouth of the bottle so as not to leak. In this way. the thermometer is ready.

**Scientific principle**: When the thermometer is placed in a hot water cup, the air in the bottle will be heated and expanded. press the water into the straw, the water column will rise, take the thermometer out of the hot water, the air in the bottle will shrink when it is cold. The water column in the straw will go down.

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(107). Magical Sand

Experimental materials: magic sand, glass cup, sampling spoon, water, plate, paper towel.

1. Pour half a cup of clear water into the glass pour the magic sand into the water and use the sampling spoon to pick up the sand. The sand is actually dry.

2. How to take out the sand: Pour out the water in the glass until the sand is about to pour out. Stop taking a plate pour the remaining sand and water into the plate, and then use a paper towel to soak up the water in the sand.

**Scientific principle**: Magic sand is to coat ordinary sand with a water-repellent film, so that water molecules will not attach to the surface of the sand grains. When the sand is poured into the water, these sands will gather together and become a similar mass.  It looks like wax, but if you leave the water, the sand will return to its original appearance. Think about it: How can we make these watery sands wet? Is oil, okay? What about detergent?

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(108). Rubber band can sing

Experimental materials: paper cups, rubber bands, toothpicks.

1. Poke a small hole in the center of the bottom of the paper cup with a sign and poke the rubber band into the small hole with a toothpick.

2. Fold the toothpicks short, and fix the toothpicks on the bottom of the cup with rubber bands

3. Pull out the rubber bands to different lengths and flip the rubber bands and sounds of different frequencies can be heard in the paper cup.

**Principle of Kezi**: Sound is produced by vibration. The sharpness and lowness of the sound are related to the vibration frequency. The higher the frequency, the sharper the sound, and vice versa.

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(109). Waterproof layer

Experimental materials: candles, pigment sampling spoons, paper towels.

1. Light the candle, wait for the candle to melt and release the candle oil, take a piece of paper towel, pour the candle oil on the paper towel and scrape the name with a sampling spoon.

2. Take a pigment and drop it on the end of the paper towel that is not coated with candle oil. The pigment spreads quickly, and then drop another drop on the place where the candle oil has been applied. It is found that the pigment forms water droplets on the paper towel.

**Scientific principle**: The main raw material of candles is paraffin, which is easy to melt and has a density less than water, so the contact between water and paper is isolated.

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(110). Flying over the wall

Experimental materials: coins, balloons.

1. Take a balloon, put a coin into the balloon, and blow the balloon full.

2. Pinch the air outlet and gently rotate the balloon coin to fly around the inner wall of the balloon and rotate like a wall.

**Scientific principle**: Because the coin rotates on the inner wall of the balloon and is acted by centripetal force, centripetal force is a kind of pulling force. The direction of a coin in a circular motion changes constantly with the movement of the object on the circular orbit. Therefore, the coin moves along the balloon. When the inner wall makes a circular motion, the coin does not fall.

(111). Vanishing Fog Film

Experimental materials: goggles, detergent, hot water, paper towels

1. Put a cup of hot water in a measuring cup, put the goggles lens close to the top of the hot water, the lens will become foggy.

2. Take detergent and apply it on the lens and wipe it clean with a paper towel.

3. Put the eye protection lens close to the hot water and the lens wiped by the detergent does not fog.

**Scientific principle**: Fogging is when water vapor condenses on the lens to become tiny water droplets. Dishwashing detergent is a surfactant. After wiping, it destroys the surface tension of the water droplets, so that no small water droplets can be seen or not. Form a fog film.

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(112). Sucker blowing paper

Experimental materials: straws, paper, 3M adhesive (double-sided adhesive)

1. Wrap the strip of paper around your fingers.

2. Paste the 3M glue clip on the paper.

3. Stick the straw on the other side with 3M glue.

4. Blow into the straw with your mouth.

**Scientific principle**: In a fluid system, such as airflow and water flow, the faster the flow rate, the lower the pressure produced by the fluid. This is the "Bernoulli theorem" discovered by Daniel Bernoulli, known as the father of fluid force" in 1738". When the airflow quickly flows out of the straw, the pressure at the end of the straw decreases, and the paper strip below will move upward.

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(113). Crystal on eggshell

Experimental materials: eggshell alum (also known as potassium alum), pigment, white latex, disc, jelly cup, beaker (measuring cup), sampling spoon, mixing spoon, cotton swab, white paper.

1. Glue the eggshells with white latex and spread them evenly with a cotton swab.

2. Use the sampling method to take potassium alum and apply it to the eggshell.

3. Dry the eggshell.

4. Add some hot water to the jelly cup.

5. Then add a few drops of pigment and stir to make it even.

6. Add alum to the hot water and stir to make it no longer dissolve and get a cup of saturated alum solution.

7. Put the eggshell filled with alum into the jelly cup.

**Scientific principle**: The saturated solution of alum is easy to form crystals and the alum on the eggshell can be used as a crystallization center. The alum particles in the water will continuously combine with the alum on the eggshell to form crystals, which can form beautiful crystals.

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(114). Sucker suction confetti Experimental materials: straws., paper towels, sweaters, or other woolen fabrics.

1. Take a piece of paper towel and tear it into pieces of paper scraps and sprinkle it on the tabletop.

2. Put the straw into the sweater and rub it back and forth about 20 times, then get close to the scraps of paper on the desktop and observe the phenomenon.

**Scientific principle**: When the sweater rubs the straw, it adds an extra negative charge to the straw. When the straw with static electricity is close to the paper market without static electricity, the objects without static electricity will gather the opposite polarity of the charge carried by the charged objects. The charges of the opposite sex are attracted to each other, it will show the phenomenon of "'electrostatic adsorption".

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(115). Separate pepper and salt

Experimental materials: towel, salt, pepper, plastic spoon (other than that, it can also be achieved with a balloon).

1. Mix salt and pepper evenly.

2. Take out the plastic spoon and rub the towel quickly.

3. Put the towel on top of the mixed powder.

4. You will find that the pepper is sucked onto the towel

**Scientific principle**: friction generates static electricity static electricity can absorb lighter things, pepper is sucked onto the towel and put on it. In addition, we can rub the blown balloon and it can also reach this experiment effect.

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(116). Milk secret letter

Experimental materials: milk, candle, disc, white paper, hook line pen (cotton swab).

1. Dip the milk with a hook line pen and write on white paper.

2. Dry the words on the white paper.

3. Light the candle and put it in the disc water.

4. Put the paper on the flame and put it at 5-10cm to bake. Be careful not to touch the flame to prevent the paper from burning.

**Scientific principle**: The protein is denatured and solidified at about 60 degrees Celsius, and it appears, and the burning point of the paper should reach 130 degrees or more. The above phenomenon.

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(117). Egg stand at attention

Experimental materials: eggs, salt.

1. Try to stand the egg upright on the table directly, the egg cannot stand upright.

2. Sprinkle a little salt on the tabletop, and keep the chicken side in contact with the table salt particles on the table top and adjust constantly At the center of gravity of the egg, the egg actually stood up.

**Scientific principle**: The bottom of the egg and the salt particles forma stable supporting structure on the table, which is equivalent to increasing the contact area between the egg and the table and the entire contact surface is horizontal, at this time, the center of gravity of the egg is on the same vertical line as the fulcrum of the entire supporting structure, so the egg can be erected without falling.

---

(118). Color gyro

Experimental materials: measuring cups, toothpicks, hard low leather or cardboard, double sided tape, colored pens, pencils, plasticine.

1. Use a pencil to make a center point on the cardboard, align the bottom center point of the measuring cup with the center point and draw a circle around the measuring cup.

2. Cut the drawn circle with scissors, color with colored pen, and drill a small hole in the middle of the circle with scissors.

3. Take a toothpick, tear off a small pair and glue it to the middle of the toothpick, then insert the toothpick into the small hole of the round paper

4. Take a small ball of plasticine and stick it on the contact position of the toothpick and the bottom of the paper, The colored top is ready.

**Scientific principle**: After turning the top by hand, the force of each part of the top is in a dynamic balance state in a short time, so the top can keep a balanced rotation for a period of time.

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(119). Making whirlpool

Experimental materials: paper cups, straws, scissors, plasticine, cotton thread, pens.

1. Take out two straws, cut out two oblique openings with scissors, and insert the two straws together.

2. Use a pen to insert two holes at the bottom of the paper cup, symmetrical.

3. Insert a straw into the hole just inserted into the paper cup and block it with plasticine.

4. Use a pen to insert two holes in the upper part of the paper cup.

5. Pass cotton thread through the hole and tie it.6. Pour water into the paper cup.

**Scientific principle**: After the water flows out of the paper Cup, the paper cup begins to rotate because of the force. In mechanics, one of the forces that always exists in pairs is called the acting force. The corresponding forces are equal in magnitude and opposite in direction, The force is called the reaction force. In this experiment, the force generated when the water flows out is the force, and the force received by the paper cup is the reaction force.

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(120). Sucker solo

Experimental materials: elbow straw (the straw on the back of the boxed milk), glass cup, scissors.

1. Cut a small mouth about three-quarters of the depth of the straw.

2. Bend a certain angle at the cut of the straw, as close as possible to a right angle.

3. Fill the water cup with clean water, insert the straw near the incision into the water, and then blow vigorously from the other end. The blowing will continuously change the depth of insertion into the water and pay attention to the changes in the sound.

**Scientific principle**: When the blown airflow passes through the straw incision, the airflow hits the inner wall of the lower straw to generate a vortex that causes resonance and makes a sound. The level of the sound is related to the size of the resonance cavity. When the straw is raised, the resonance cavity increases, and the sound is announced When the straw is pressed down, the resonance cavity becomes smaller, and the sound becomes higher. Therefore, when the depth of the straw is continuously changed, the sound changes.

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(121). Local phone

Experimental materials: measuring cup, thread, tape

1. First tear off two small pieces of tape.

2. Stick both ends of the prepared long wire on the bottom of the two measuring cups with tape.

3. The local phone is ready, how about the effect.

**Scientific principle**: Sound is produced by vibration. There are three ways of sound transmission: solid, liquid, and gas. Sound cannot be transmitted in a vacuum.

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(122). Burning is not broken balloons

Experimental materials: candles, balloons, water.

1. Put the balloon on the tap to catch water.

2. Then put the balloon filled with water on the candle to burn.

**Scientific principle**: The specific heat capacity of water is large, and it will absorb a lot of heat. When a balloon is burned, the water inside plays a role in cooling the air, first absorbs the heat of the flame and reduces the temperature of the balloon so that it does not reach melting point, so the balloon will not burst.

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(123). Sucker whistle

Experimental materials: scissors, straws.

1. Pinch one end of the straw and cut out the triangle mouth with scissors.

2. Blow with a straw, try to shorten the straw and blow again, and keep testing.

**Scientific principle**: The sounding principle of a whistle is that the airflow flows through a relatively narrow gap at a high speed, causing the airflow to be turbulent and sound. The whistle mouth mainly makes the airflow impact against the opening gap of the whistle and bows the vibration of the air in the whistle. When blowing a whistle, the airflow speed flowing through the mouth of the whistle will also affect the sound frequency of the whistle. When the airflow speed is large, the sound frequency is higher than when the airflow speed is small. Not so harsh and changing the size of the outlet can also change the whistle's sound frequency.

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(124). Tea Discoloration

Experimental materials: green tea bag, hot water citric acid, baking soda, sampling spoon, stirring spoon, measuring cup, stirring rod.

1. Put the green tea bag in a hot pot and steep for a few minutes.

2. Pour the brewed green tea into three measuring cups.

3. Add 1 scoop of baking soda to the first and second measuring cups.

4. Put another spoonful of citric acid in the first measuring cup.

**Scientific principle**: The divalent iron ions contained in alkali are easily oxidized in aqueous solution to form trivalent iron salts. Tea water contains tannic acid [rousuan]. Tannic acid and trivalent iron can combine to form black iron tannate. As a result, the color of the tea becomes darker. Citric acid is an organic acid. The reducing citric acid can reduce the iron in iron tannate to divalent iron, so that the black of iron tannate is completely faded and the tea color becomes lighter.

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(125). Air Cannon

Experimental materials: mineral water bottles, scissors, balloons, candles.

1. Cut the mineral water bottle from the middle and cut the balloon from the middle.

2. Use the lower part of the balloon to cover the upper part of the cut mineral water bottle (the half with the mouth).

3. Aim the mouth of the bottle at the lit candle, stretch the balloon by hand and then suddenly let it go, the candle was extinguished by air cannon.

**Scientific principle**: After letting go, the balloon quickly returns to its original shape. At the same time, the extra air is squeezed out of the barrel to form an airflow, blowing out the candles. The "air cannon" is a very fun prank "weapon", hiding behind others. Fire a shot, scared people to jump up, and will not cause any harm. Purely kindly "weapon", tell you a little secret, if you pour a smoke in the "air cannon" first, it will be a smoke ring.

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(126). UFO in water

Experimental materials: 1 dropper, 1 small piece of paper, 1 pencil, I male knife, 1 Yingzi, detergent.

Note: The premise of the experiment is to ensure that the dishes do not contain residual detergent, otherwise the experiment will fail.

1. First draw a spiral pattern on a small piece of paper and cut it along the edge of the spiral to cut out a spiral frisbee like a mosquito coil.

2. Pour half a plate of clear water into the plate, put the spiral flying saucer into the clear water on the plate, and wait for the paper to completely stand still.

3. Put a drop of detergent into the slit in the center of the small piece of paper and observe the movement of the piece of paper. Through the above experiment, we found that the small piece of paper that was originally still on the surface of the water, after dipping into the detergent, the piece of paper began to quickly rotate around its center point.

**Scientific principle**: Water has surface tension and detergent is a surfactant, which can quickly reduce the surface tension of water. After dropping the detergent into the center of the paper, the detergent quickly spreads along the spiral groove, and quickly reduces the surface tension of the water at the groove. Due to the spiral shape of the paper and the difference in surface tension, the paper finally makes the paper The sheet starts to rotate around its center point.

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(127). Intimate Cup

Experimental materials: two measuring cups, facial tissue.

1. Put a set cup upside down

2. Put another measuring cup on the upside-down glass

3., Press down firmly, then lift it up, there is no response.

4. We put the noodle paper on the upside-down measuring cup and pour a little water.

5. Put the measuring cup on the facial tissue and press.

6. Look! The two measuring cups are pasted together.

**Scientific principle**: When we directly touch the bottom surfaces of the two measuring cups, because the bottom surface of the measuring cup is slightly concave and convex, there is a gap between the two surfaces and cannot be pasted. After adding a layer-soaked tissue paper between the bottom surfaces of the two measuring cups. The space between the cups is filled with soaked tissue so air cannot enter. At this time, the two cups are affected by the surrounding air pressure, so they will stick together.

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(128). Flying out of the water

Experimental materials: bottles, beakers, straws.

1. Add water to the glass bottle and insert the straw.

2. Block the gap in the bottle mouth, blow into the glass bottle, and spray a jet of water from the straw, which is injected into the measuring cup in front.

**Scientific principle**: When we blow into the mouth of the bottle. the air pressure in the bottle will become higher and higher. Due to the limited space of the glass bottle, the straw forms an external channel, and the air pressure compresses the water in the bottle and sprays it out through the straw. If you blow in the air forcefully, the air pressure in the bottle will increase instantly, and a strong and fast water jet will be sprayed; otherwise, a weak and slow water jet will be sprayed. From faucets to high-pressure water guns, although their love is very different, they all use the principle of air pressure spraying.

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(129). Eat candy potato

Experimental materials: sugar, fruit knife, potatoes, plates, white water, spoons.

1. Prepare two potatoes, one of which is cooked in a pot.

2. Cut off the two ends of the two potatoes and dig a hole in the middle. Be careful not to dig through.

3. Put two potatoes on the plate and put sugar in each.

4. Pour some water on the plate.

5. It can be found that the white sugar in raw potatoes has been melted, but the white sugar in cooked potatoes has not melted.

**Scientific principle**: Potatoes are composed of many cells. The cells in raw potatoes can permeate and absorb water. The water in the plate is absorbed by it. The sugar is melted up, while the cells in cooked potatoes lose their vitality. Absorbing water can only melt white sugar by its own water. Therefore, the phenomenon of sugar being eaten occurs.

(130). Quick recovery table tennis

Experimental materials: hot water, table tennis, measuring cup.

1. Find a ping pong ball with a thinner side.

2. Put the squashed ping pong ball into the cup.

3. Pour proper amount of hot water into the cup.

4. At this time, I took out the table tennis and found that the table tennis has been verified and restored.

**Scientific principle**: After the squashed ping pong ball is poured with hot water, the ping pong ball will return to a round appearance. This is because the heated water can increase the temperature of the ping pong ball, and the heating of the air will expand the ping pong. The ball puts a relatively large pressure on the inside of the table tennis ball and forces the table tennis ball back to its original spherical shape. If we poke a hole in the flattened table tennis ball, this method will not work! Because the air in the table tennis ball is heated and expanded It flows out from the small hole, so that the pressure inside and outside is the same, and the table tennis ball will not return to its original state.

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(131). PH test

Experimental materials: citric acid, baking soda, disc, measuring cup, dropper, sampling spoon, PH test paper, paper cup.

1. Use a paper cup to pour 30m of water into the three measuring cups.

2. Put a spoonful of citric acid into the first measuring cup.

3. Take a spoonful of baking soda and put it in the second measuring cup.

4. Tear off a piece of test paper, drop it onto the test paper with a dropper, and take the water in the three measuring cups.

5. Compare the colors of the three test papers.

**Scientific principle**: PH test paper is usually used to detect the pH of a solution. Because of its color contrast, it has a very intuitive feature for roughly understanding the pH of a solution. Generally, the smaller the H value, the more acidic the solution. When the PH value is 7, it is neutral, which is close to the pH of water. The higher the PH value, the stronger the alkalinity of the solution.

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(132). Iron tree blossom

Experimental materials: specimen film, cup, copper sulfate, dropper, straw, filter paper, petri dish, zinc flake.

1. Pour copper sulfate particles into a plastic cup.

2. Add water and stir into copper sulfate solution.

3. Cut the zinc flakes into several small pieces with scissors, spread the filter paper in the petri dish, and put the small zinc flakes.

4. Use a dropper to suck the copper sulfate solution onto the filter paper and slowly disperse it.

Note: Do not drop the copper sulfate solution directly on the zinc flakes cover the petri dish lid, carefully observe any changes around the zinc flakes, try to keep it for more than a day.

**Scientific principle**: The filter paper has a pattern like an iron tree. In this experiment, the reaction of zinc and copper sulfate is a substitution reaction. The substitution reaction is a chemical reaction in which elemental substances react with compounds to form other elemental substances and compounds. This is the four largest in chemistry One of the basic reaction types.

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(133). Elephant toothpaste

Experimental materials: detergent, hydrogen peroxide, water, yeast powder, 2 measuring cups.

1. Pour yeast powder and water into the measuring cup and stir evenly.

2. Pour a certain amount of hydrogen peroxide and detergent into another measuring cup and stir evenly.

3. Pour the water mixed with yeast powder into the conical flask.

4. Pour in hydrogen water and detergent, and the foam will gush out.

**Scientific principle**: In this experiment, the yeast powder acts as a catalyst in the chemícal reaction. Yeast powder catalyzes the decomposition of hydrogen peroxide (chemical equation: 2H202 = 2H20 +02 1). The reaction will be violent and produce a large amount of oxygen. Dishwashing liquid will envelop the oxygen in the liquid detergent and produce a lot of bubbles, which will appear like toothpaste.

Note: Heat will be released during this process, 50 children should be careful when doing experiments. It is best not to touch the foam to avoid being burned.

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(134). Chemical traffic light

Experimental materials: empty bottle, glucose, sodium hydroxide, glass rod, water, indigo carmine.

1. Take the indigo carmine with a spoon and pour it into an empty bottle.

2. Add water to make an aqueous solution.

3. Pour water and glucose into the measuring cup, stir until completely dissolved and nixed into the conical flask

4. Pour sodium hydroxide and water into the measuring cup and stir until completely dissolved.

5. Mix and pour into the bottle, The solution will turn green immediately. After a period of static measurement, the green will slowly turn to red, after a static measurement, the red will slowly turn to yellow, pick up the vial and shake it, The yellow solution in it turns red and then green, which looks like a traffic light.

**Scientific principle**: In this experiment, the solution in the Erlenmeyer flask was added with 3 ingredients: sodium hydroxide, D-glucose, and indigo carmine. Indigo carmine is a redox indicator, which can show different colors in different redox states. Under the action of redox reaction and PH value, it can change a variety of colors. The experiment summarizes the specific discoloration state of T.

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(135). Charged balloon

Experimental materials: 2 balloons, 1 string, and 1 piece of cardboard.

1. Inflate the two balloons separately and tie a knot in the mouth.

2. Connect the two balloons with a wire.

3. Use balloons to rub on the hair (or woolen sweater).

4. Lift the middle part of the string, and the two balloons separated immediately.

5. Put the cardboard between the two balloons, The electricity on the balloons makes them attracted to the cardboard.

**Scientific principle**: The electricity on one balloon repels the electricity on the other balloon. There is a cardboard in the middle. The electricity on the two balloons makes them attracted to the cardboard.

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(136). Perforated paper holding water

Experimental materials: one bottle, one pin, one piece of paper, pigment.

1. Fill an empty bottle with water, and then add a few drops of pigment.

2. Punch many holes in the white paper with a pin.

3. Cover the mouth of the bottle with a piece of paper with holes.

4. Press the piece of paper with your hand and turn the bottle upside down so that the mouth of the bottle faces down.

5. Remove your hand gently, cover the mouth of the botte with a piece of paper motionless, and the water does not flow out of the hole.

**Scientific principle**: Thin paper can hold up the water in the bottle because the atmospheric pressure acts on the paper, which produces an upward supporting force. The small holes will not leak water because the water has surface tension, and the water forms a water film on the surface of the paper, so that the water will not leak out. This is like an umbrella made of cloth. Although the cloth has many small holes, it will not leak rain.

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(137) The candle does not go out

Experimental materials: candles, small funnels.

1. Light the candle.

2. Make the wide mouth of the funnel face the flame of the candle and blow vigorously into the flame from the small mouth of the funnel.

3. Make the small mouth of the funnel face the flame of the candle and blow forcefully against the flame from the wide mouth of the funnel.

**Scientific principle**: When blowing in this way, the flame will obliquely reach the wide end of the funnel, and it is not easy to blow out. If you blow from the wide end of the funnel, the candle will be easily extinguished. When the blown gas goes from a narrow mouth to a wide mouth, it gradually evacuates, and the air pressure weakens. At this time, the gas around the wide mouth of the funnel will rush into the wide mouth of the funnel due to the strong pressure. Therefore, the flame of the candle will also rush to the wide mouth of the funnel. Attention: Pay attention to safety when the candle is burning.

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(138). Bottle deflated

Experimental materials: warm water cup, 1 mineral water bottle.

1. Pour warm boiled water into the bottle and mold the bottle by hand to see if it feels hot.

2. Pour out the warm water in the bottle and quickly close the bottle tightly.

3. Observe the bottle slowly deflating.

**Scientific principle**: Heat the air in the bottle to reduce its pressure. Since the air outside the bottle is more pressured than the air in the bottle, the bottle is squashed.

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(139). Non-wet paper

Experimental materials: a newspaper, an empty glass and a vat filled with water.

1. Knead the newspaper into a ball and stuff it into the cup. (Remember to be full).

2. Quickly put the cup filled with newspaper with the mouth down and put it into a large bucket filled with water.

3. After one minute, take out the cup (do not tilt) and touch the newspaper in the glass. What I found: The newspaper is not wet! It is still dry! Why!

**Scientific principle**: It turns out that newspapers occupy the space in the cup, so the space in the cup is small, and there is no space when water enters. And because the cup is fast, it will not get wet when inserted vertically into the bucket.

(140). Hidden ice cream

Experimental materials: water, transparent container, plastic bag, marker pen, blank paper.

1. Cut the white paper out of the size of the plastic bag and draw on the ice cream slip.

2. Draw ice cream on the surface of the plastic bag with a marker.

3. Put the white paper into the plastic bag and seal it.

Experimental phenomenon: Fill the transparent container with water and put the plastic bag into the water along the side of the container. See what happened? When the paper is placed vertically in the water, you can see the pattern drawn on the plastic bag, and when you take out the paper, you can see all the patterns.

**Scientific principles**: This applies the principles of total reflection and refraction. When the incident angle is less than the critical angle, the naked eye can see the light refracted from the water, so the ice cream cone can be seen. When the incident angle is gradually greater than the critical angle, the refracted light disappears completely and the ice cream cone cannot be seen with the naked eye, and there will be an illusion of disappearance. This phenomenon is called total reflection.

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(141). Floating boat

Experimental material: white porcelain plate with white board pen, water.

First use a whiteboard marker to draw a boat pattern on the surface of the white porcelain plate, pour clean water into the container, and blow it lightly, and you will find the boat floating on the water.

**Scientific principle**: The ink of the whiteboard marker contains a peeling agent, a substance that can reduce adhesion. These peeling agents are mixed in the ink and will prevent the combination of the handwriting and the surface, Therefore, when the handwriting is washed or erased by water, it is very easy to fall off.

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(142). Beautiful rainbow

Experimental materials: two plastic water bottles, a compass, awl, water, and thumbtacks.

1. Use thumbtacks to pierce about twenty or so small holes in the plastic bottle cap, fill the plastic bottle with water and close the cap tightly, hold the bottle with your back facing the sun, and gently squeeze it to spray out the water. I saw the rainbow.

2. Use an awl to make a hole in the other bottle cap and repeat the above test. This time, the rainbow cannot be seen in the light rain sprayed from the bottle cap.

**Scientific principle**: The rainbow is caused by the dispersion and reflection of small water droplets that are nearly spherical in the air. When sunlight enters the water droplets, it will be incident at different angles at the same time. and it will also be reflected at different angles in the water droplets. Among them, reflections at 40 to 42 degrees are the strongest, causing the rainbow we see. But the water column is too large to form small water droplets and cannot be refracted.

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(143). Soda making

Experimental materials: fresh lemon, water, baking soda, measuring cup, sampling spoon.

1. Put the lemon and squeeze the lemon juice into the measuring cup, add an appropriate amount of water.

2. Pour a spoonful of baking soda.

3. Shake gently to fully dissolve the baking soda.

**Scientific principle**: When baking soda and lemon juice are mixed, they react to produce carbon dioxide. Bubbles in sodas sold in supermarkets are also formed by carbon dioxide, which is added with high pressure.

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(144). Magic candle that will burn

Experimental materials: banana, potato chips, measuring cup.

1. Use a knife to cut off the two ends of the banana to cut flat points.

2. Put the cut bananas into the measuring cup. Don't cut the bananas too short. The height should be higher than the measuring cup.

3. Carefully break out a long strip of potato chips, the candle "wick" is just fine.

4. Insert the "candle wick" on the banana and light it.

**Scientific principle**: Potato chips are made from potatoes, the main ingredient is starch, and edible oil is added during the processing process. Both things are combustible, so it's just a little bit.

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(145). Underwater World

Experimental materials: pigment, sampling spoon, measuring cup, funnel, bottle, edible salt, edible oil, water.

1. First fill the bottle with 140ml water, then add 20ml edible oil and then drop 34 drops of pigment, observe the phenomenon.

2. Take half a teaspoon of edible salt and pour it into the bottle, and observe the phenomenon: At this time, we can see that the pigment begins to sink, like a mysterious blue underwater world. Continue to put a few more tablespoons of salt. The "underwater world" seems to be boiling!

**Scientific principle**: First-the pigment will float in the interlayer between oil and water, after adding salt, part of the salt is dissolved in the pigment, the density of the pigment increases, and it quickly sinks into the water to dissolve; after continuing to add salt, the salt quickly dissolves and diffuses in the water, driving the movement of the pigment, and it looks like sea water is surging., Forming a beautiful "underwater world" in the cup.

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(146). Besieged ice

Experimental materials: coloring, edible oil, stirring rod, 1 glass, water, ice cubes.

1. Pour 140ml clear water into the glass, then add 1 drop of pigment (to increase the degree of experimental recognition) and stir evenly.

2. Pour 30ml of cooking oil into the glass, then take the ice cubes and gently put them into the glass and observe the position of the ice cubes.

3. Press the ice cube into the water with a stirring rod and release it, and then observe the ice cube change.

**Scientific principle**: Since the density of water is the largest among the three substances, and the density of oil is the smallest, ice is between oil and water, so water is at the bottom of the cup, oil is at the top, and ice is suspended between water and oil.

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(147). 0ld currency for new

Experimental materials: stirring rod, measuring cup, sampling spoon, salt, white vinegar, old 50 cents coins (2 pieces).

1. Pour 80m of white vinegar into the measuring cup, pour a sentence of salt into the vinegar and stir to fully dissolve the salt.

2. Take an old 5 dime coin into the solution and knead it gently for 2 minutes. Take it out and dry it and compare it with other coins. It is found that the coin after being put in the solution and kneaded looks like a new dress.

**Scientific principle**: Penta coins are copper-plated, and the copper-plated surface in the air for a long time will be oxidized into copper oxide and become dull. Vinegar contains acetic acid, which can react with the copper oxide on the coin to dissolve the dirt on the surface of the coin. The crystal structure of salt enhances the decontamination effect of the coin.

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(148). Suppressed water

Experimental materials: measuring cup, bottle, dropper, clear water.

1. Fill the bottle with water first, cover it with a measuring cup and place it upside down on the table.

2. Slowly lift the water bottle one by one, observe the water level in the cup and the bottle, stop lifting and keep it every 20ml rise, and observe the water level status in the bottle and the measuring cup. The children think carefully: Why does the water in the bottle stand still and not flow down?

3. Continue to lift until the water in the measuring cup is about to overflow, stop and hold, then use a dropper to continuously suck out water from the measuring cup, and then observe carefully that the water level in the bottle is falling, and the water level in the measuring cup remains unchanged.

**Scientific principle**: The force of atmospheric pressure pushing the water surface in the cup is exactly equal to the weight of the remaining water in the bottle plus the pressure generated by the air in the bottle, so the balance of force is reached, so you can see that the water level in the measuring cup remains unchanged. Water no longer flows out. In daily life, this principle is often applied to water feeding devices for birds and chickens.

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(149) A balloon that can't swim

Experimental materials; balloons, water cups, hot water (above 80 degrees), clear water.

1. Pour 25ml of water into the 2 balloons, tie them tightly and subtract the excess.

2. Pour half a cup of water and hot water into the two glasses respectively.

3. Put the balloons filled with water into the water cups and observe the floating and sinking conditions. Swap the positions of the two balloons again and observe the ups and downs of the balloons.

**Scientific principle**: Under normal circumstances, the higher the temperature, the greater the molecular distance and the lower the density. The order of density of the three substances is: clear water > hot water balloon. A balloon filled with clear water has an overall density smaller than clear water and greater than hot water, so it will sink in the hot water and float in the clear water.

Note: Between 4 degrees and 100 degrees, the density of cold water is greater than that of hot water. Between 0 and 4 degrees, the lower the temperature, the lower the density. At 4 degrees Celsius, the density of water is highest.

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(150). Can't pull book of

Experimental materials: two books

1. Stack the pages of the two books in a staggered manner, and separate pages from each other.

2. Then lit one of the books and observe whether the other book will slip off.

3. Hold one of the books with your hands, and then pull it out to see if you can pull it apart and find that the two books are tightly attached and cannot be separated.

**Scientific principle**: When objects contact and have relative movement tendency, friction will be generated. When the pulling force is greater than the frictional force or the contact surface is smooth, two objects can be separated, there is friction when two papers are stacked together, but it is not enough to make us aware. As the number of papers increases, the friction between the papers increases and exceeds our puling. force, so we cannot separate the two Book.