EXPERIMENT MANUAL

IGNITION SERIES

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

THAMES & KOSMOS

Contents

- Clay
- Blowing straw
- Ball
- 2 Syringes
- Wooden stick
- 5 Marbles in net bag
- Hose
- Measuring cup
- Dish with lid
- 3 Mounting stands
- Die-cut film sheet

1st Edition 2012

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General Instructions

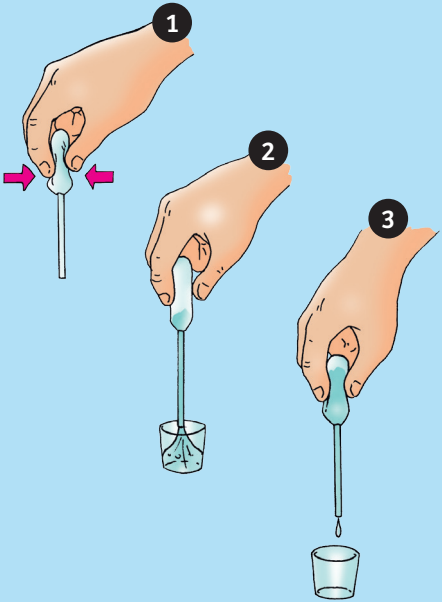
DEAR PARENTS! It's time to turn the bathtub into an experiment lab! You'll be astonished at all the discoveries waiting to be made in and around water. Be ready to offer assistance to your child when he or she needs it. Remove all materials from the bathtub before emptying it, then wash them all off with water and leave them on a towel to dry. We wish you and your child a lot of fun with the experiments!

CAUTION! Use only in calm water under adult supervision.

Not suitable for children under 3 years of age. There is a risk of choking due to small parts that can be swallowed or inhaled. Save the packaging and instructions, which contain important information.

The Pipette

How to use it:



A Mountain of Water

EXPERIMENT 1

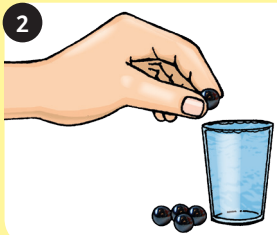
Important! For Experiments 1 and 2, all materials must be clean and free of any soap residues.

Completely fill the cup with clear water.

1

Carefully drop 4 marbles into the cup.

2



A mountain of water!

Rub soap on the last marble. Drop it into the cup.

3

WHY ?

Clear water has a thin skin that holds the mountain together. This is known as "surface tension." Soap breaks the skin and the water overflows.

Mysterious Spin

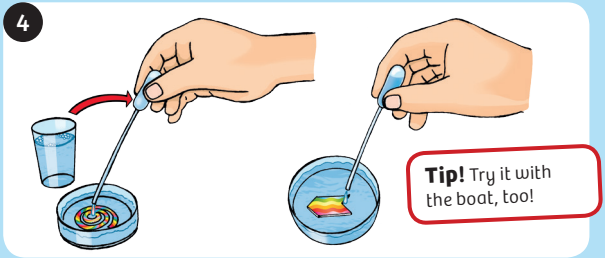
EXPERIMENT 2

Fill the dish with clear water.

Place the spiral on the water.

Add water and soap to the measuring cup and stir.

Drip soapy water into the center of the spiral.

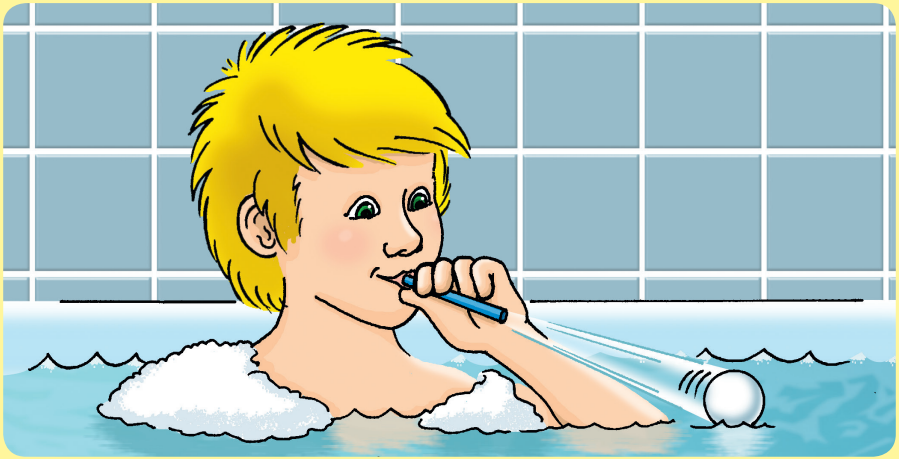


Tip! Try it with the boat, too!

WHY ? The spiral is lying on top of the water's thin skin. The soapy water makes the skin tear along the lines of the spiral shape. That creates a flow of water with the spiral rotating in it.

Blow the Ball Across the Water!

EXPERIMENT 3



WHY Air is composed of lots of tiny particles. When you blow, it pushes the air particles along. They in turn move to the ball and push it forward.

Make Your Waterwheel Turn!

EXPERIMENT 4

Bend all the flaps into position. Insert the wooden stick through the center.

1

Take the waterwheel loosely between your thumb and forefinger and hold it under the stream of water.

2

WHY Flowing water has power! It is powering your waterwheel. Waterwheels have existed for over 2,000 years. They used to be commonly used for grinding grain into flour.

Taking Aim with the Water Syringe

EXPERIMENT 5

Insert the targets into their stands.

1

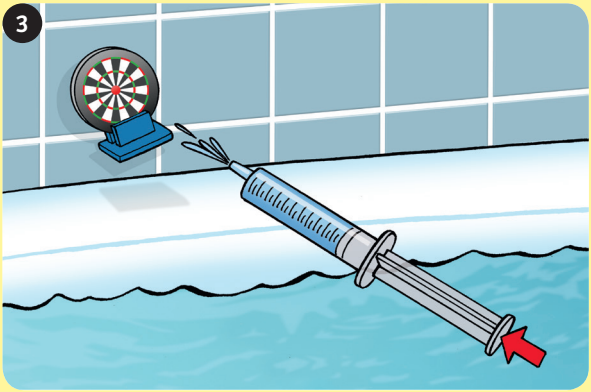
Fill the syringe with water.

2

Note! Find a place where you can easily wipe away the water spray. Keep a rag handy for this purpose.

Push the plunger in forcefully.

3

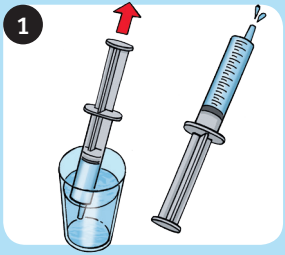


WHY ? The water shoots out in a high arch. Did you hit the colorful targets?

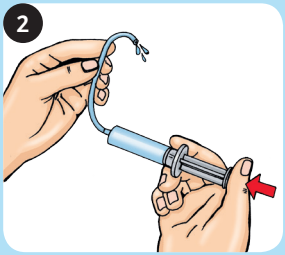
The Secret of Hydraulics

EXPERIMENT 6

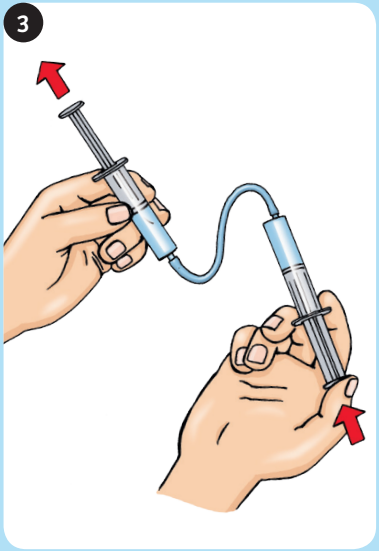
Fill both syringes almost all the way with water.



Fill the hose.



Insert the second syringe. Push on one plunger.



Tip! Push slowly and carefully!

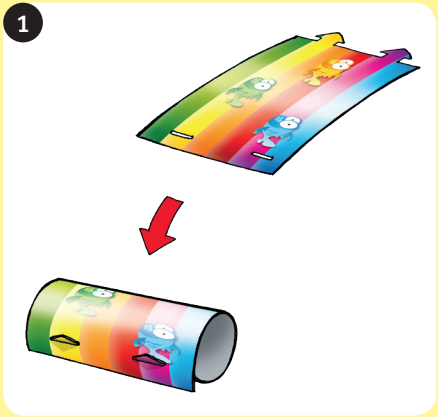
WHY

When all the pieces are assembled, the water can't escape. Since you also can't compress the water, it pushes away and moves the plunger at the opposite end.

Water Flowing Around the Corner

EXPERIMENT 7

Make a tube.



Hold the tube under the stream of water.

WHY The stream of water "sticks" to the tube. It flows around the round shape and is deflected to the side.

The Bend in the Straw

EXPERIMENT 8

Take a look at the straw in the empty cup.

1

Fill the cup with water. Place the straw in it.

2

Tip! Also try holding the straw behind the cup!

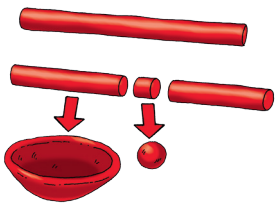
WHY Rays of light "apply the brakes" at the border between air and water, because light travels more slowly in water than in the air. That makes the light change direction, too. That's why things that stick out of the water look like they are bent.

Diving Without Getting Wet

EXPERIMENT 9

Form a boat and a ball out of clay.

1

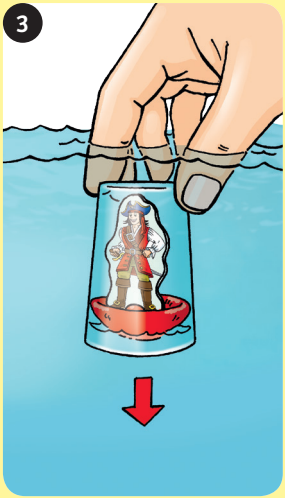


Put the pirate in the boat.

2

Set the boat on the water and place the cup over it. Push the cup straight down toward the bottom.

3



WHY The cup isn't empty — there's air inside. The air can't escape, and the water can't get in. So the pirate stays completely dry!