



boats guidebook

Do you like boats? Do you know why they float and how they move through the water? Are you curious about them? Then come along! Let's do the experiments in this kit together to learn all about boats!

In this guidebook, you will see a lot of things that you already recognize. The pictures will guide us in doing our experiments and projects. And whenever you see a Try It box, you will see more ideas for other exciting experiments.

Inside the kit, you will also find a colored Knowledge Wheel. You can quiz yourself with it to see if you remember the things that you discovered while doing your experiments.

And now, let's begin!



**little
labs™**

General Instructions for Parents and Children

Caution! Certain parts of this kit have pointed or sharp corners or edges related to their functions. There is danger of injury! We reserve the right to make technical changes. Keep the experiment kit out of the reach of small children.

Dear Parents,

This experiment kit is designed for children ages 5 and up. For each experiment, first ask your child the question at the beginning of the experiment. Then present the various pictures to him or her as possible answers. In this way, your child can start to develop ideas about how to explain everyday experiences. Next, your child can follow the pictures to do the experiment mostly by him or herself, to test his or her ideas. That will let your child discover firsthand the answer to the question posed at the beginning. Finally, read your child the answer summary at the end of the experiment to confirm or correct his or her own conclusions.

Because the curiosity and powers of comprehension of children at this age are often more fully developed than their manual skills, your assistance will sometimes be needed. Support your little researchers when they need it. If an experiment doesn't work correctly, encourage your child to try it again.

+ Please be sure to provide the children with any extra materials not contained in the box. These are designated with a red plus sign.

Have fun experimenting!

Knowledge Wheel Instructions:

Please place the three rotating disks on top of each other (with the largest on the bottom, etc.) and fasten them with the enclosed 2-pronged fastener. Match the image on the inner wheel to the image on the middle wheel, and then to the image on the outer wheel. Rotate the wheel so the matching pictures align and check them with the answer dot. When all of the dots are the same color, the answer is correct. Here's an example of a solution:



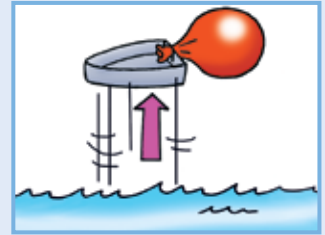
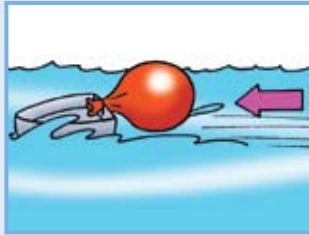
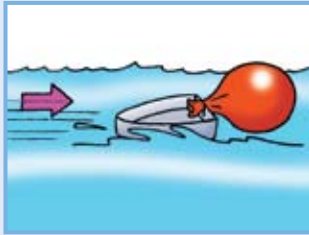
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Experiment 8: Which way does a balloon-powered boat move?



Or do you have other ideas?

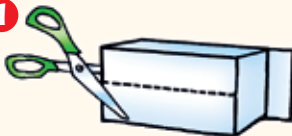
Use it to find out!



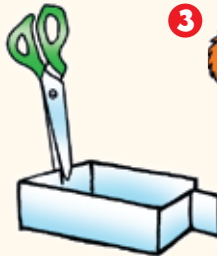
Milk carton

Bathtub or wading pool

1



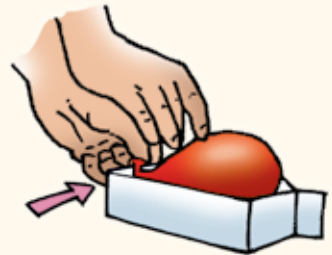
2



3



4



Caution!

Have an adult help you with cutting the milk carton.



Answer:

In the inflated balloon, there is equal pressure pushing on all sides. As soon as the opening of the balloon is released, the air escapes at high speeds from the opening and pushes the balloon in the opposite direction. This is referred to as the recoil principle. This is similar to how rockets and jet engines work too.



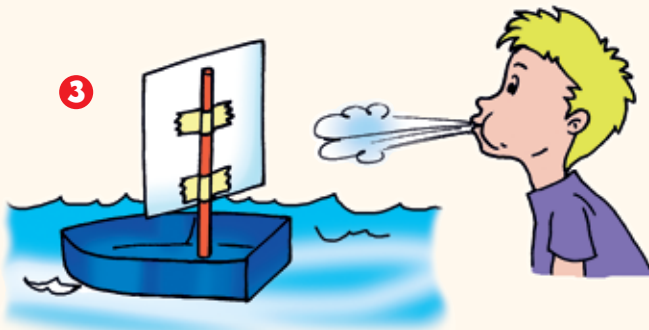
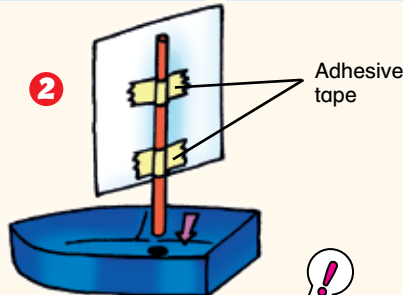
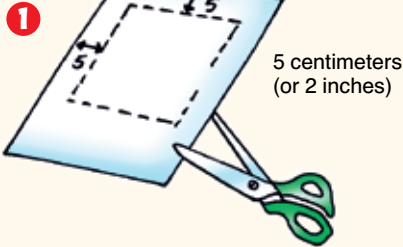


Experiment 9: How do boats sail?



Or do you have other ideas?

Use it to find out!



Answer:

The sail uses the wind to move a boat forward. When the wind hits the sail, the force of the wind is transferred via the mast to the boat's hull. The sailboat glides forward. Before the invention of steam- and motor-powered ships, ships moved around with sails. Large ships had several masts and many sails in different sizes.