

Bernoulli Obstacle Course

Best for Ages

Workspace

Is electricity required?

6+

Flat indoor surface or table top

Yes

Description

Use a hair dryer to guide a ping pong ball through an obstacle course that you build!

Materials

- Hair dryer(s) and extension cords to increase mobility
- Ping pong balls
- Paper towel rolls/toilet paper tubes, chenille sticks, tape, cookie cutters, plastic cups, popsicle sticks, tin cans, plastic containers, and anything else you have around your house to make an obstacle course.

Concept Explored

• Bernoulli's Principle

What to Do

- 1. With an adult's permission, plug in an extension cord and a hair dryer.
- 2. Turn the hair dryer on (cool) and hold the hair dryer vertically so that the air is blowing upwards. Drop a ping pong ball above the air stream and watch it float.
- 3. Spend time practicing balancing the ball in the air stream. Try moving and changing the direction of the air slowly and quickly.
- 4. Find a flat floor or table top surface to build your obstacle course.
- 5. Use your materials to build hoops, tunnels, and pathways for your ping pong ball. Make sure there is enough space underneath the obstacles for you to hold the hair dryer and float the ball through them.
- Keep tinkering with your obstacles and practicing! Challenge someone else to try it.











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Troubleshooting Tips

- Test each obstacle by floating the ball through it before adding it to your course.
- For tricky spots in your course, try modifying by using different materials and heights.
- Add a funnel or smaller cup to your hair dryer to concentrate the air stream on the ball.
- Use the cool setting on the hair dryer to prevent hot surfaces.



What happens when you push the ball out of the air stream with one finger?

Can you float other balls with the hair dryer? What happens if you use multiple hairdryers at once?

What is Happening?

- What you are seeing is an example of what's called **Bernoulli's Principle**.
 Daniel Bernoulli was a Swiss mathematician and physicist who wanted to find out how objects that are heavier than air could fly.
- Bernoulli discovered that faster air slips past the surface of an object, creating an area of **lower pressure** around the object.
- When you place the ball in the stream of air created by the hair dryer, you force the air to flow around the ball. The still air surrounding the air stream has more pressure and pushes the ball to keep it snuggled in the stream.

Taking it Forward

- You can create a larger version of this activity by using a leaf blower, beach ball, and hula hoops!
- Learn more: check out this book at a local library:
 - The Boy who Harnessed the Wind by William Kamkwamba and Bryan Mealer
- If you like this activity, you'll also like
 - <u>Chain Reactions</u>
 - Paper Airplanes
 - Build a Bridge



