

FUNdamental Experiments 

Air



by Ellen Lawrence

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Contents

Let's Investigate Air	4
Does air have weight?	6
Does air push against things?	8
Can air slow down a falling object?	10
Does hot air act differently from cold air?.....	12
What's in air?	14
Is there water in air?	16
Can smells travel through air?	18
Discovery Time	20
Air in Your World.....	22
Science Words.....	23
Index.....	24
Read More.....	24
Learn More Online	24
About the Author	24



Let's Investigate Air

Air is all around you, and you breathe it in day and night. You usually can't see air, but you can often feel or see it in action—for example, when windy weather blows your hair around. What exactly is air, though? It is a substance made up of tiny, invisible **molecules** of **gases** that people, plants, and animals need to survive. Now it's time to study air like a scientist. Inside this book are lots of fun experiments and cool facts about air. So grab a notebook, and let's investigate!



Check It Out!

You usually can't see air, but you can prove it's around you. Let's check it out!

1. Blow on a pinwheel and see how it spins.

▶ **What is making the pinwheel move?**

2. Wave a book up and down or from side to side in front of your face, like a fan. You will feel a breeze.

▶ **What do you think is happening?**



3. Blow into a balloon and watch as it grows bigger.

▶ **What makes the balloon swell up?**

(The answers are on page 24.)



Does air have weight?

If you hold out your hands and make them into a bowl shape, they will be filled with air. You can't see the air or feel that it's there, though. So does air have weight? Let's investigate!

You will need:

- Three pieces of string each measuring 18 inches (46 cm) long
- A ruler
- An adult helper
- Two balloons
- A pin
- A notebook and pencil



1 Tie one piece of string around the center of a ruler.



2 Ask an adult helper to blow up a balloon and tie the end with a knot. Have the adult blow up the second balloon so it's the same size as the first, and knot the end.



3 Tie a piece of string around the knot of each balloon. Then tie the balloons' strings to the ruler 1 inch (2.5 cm) from the ends.



4

Hold the string in the center of the ruler and let the balloons hang down. The ruler will be **level** because the two balloons weigh the same.

- ▶ What do you think will happen to the ruler if you pop one of the balloons?

Write your **predictions** in your notebook.

In your notebook, record everything you observed.

- ▶ What happened to the ruler?
- ▶ Do you think the balloons still weigh the same?
- ▶ Do you think air has weight? Why or why not?



- 5 Ask your adult helper to pop one balloon with a pin.



(To learn more about this investigation and find the answers to the questions, see pages 20–21.)

Index

air pressure 8, 20
breathing 4–5, 22
gases 4, 14, 16, 18, 21, 22
gravity 10, 20

hot and cold air 12–13, 21
molecules 4, 12, 14, 18, 21, 22
smells 18–19, 21, 22
solid particles (in air) 16, 21, 22

water 16–17, 21, 22
weight (of air) 6–7, 20
wind 4

Read More

Cooper, Sharon Katz.
Using Air (Exploring Earth's Resources). Chicago: Heinemann (2007).

Green, Jen. *The Air We Breathe (Our Earth)*. New York: PowerKids Press (2008).

Lawrence, Ellen. *Dirty Air (Green World, Clean World)*. New York: Bearport (2014).

Learn More Online

To learn more about air, visit
www.bearportpublishing.com/FundamentalExperiments

About the Author

Ellen Lawrence lives in the United Kingdom. Her favorite books to write are those about nature and animals. In fact, the first book Ellen bought for herself, when she was six years old, was the story of a gorilla named Patty Cake that was born in New York's Central Park Zoo.

Answers for Page 5

1. You are creating moving air by blowing. This air moves the pinwheel.
2. The movement of the book is making the air move. You feel this moving air as a breeze.
3. You are blowing air into the balloon. This causes the balloon to stretch and expand.



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Air



You see its effects when the wind rustles leaves or carries your hat away. You use it to fill a balloon or blow out birthday candles. What is it? Air! You breathe in air all day. In fact, you couldn't survive without it. Now it's time to take a closer look. Inside this book are lots of fun experiments. So grab a notebook and start investigating the cool world of air!

Air **Color** **Dirt** **Light** **Liquids and Solids**

Magnets **Motion** **Rocks and Minerals** **Sound** **Water**