



Activity 5: Is Air Really There?

(Note this activity can be used with Assessment 2-1)
How can we show that air

- takes up space (volume)?
- has mass (weight)?
- exerts pressure?
- can be compressed?

Resources

- balloons
- ruler or long stick or dowel
- string
- tape
- paper
- pin
- tissue paper
- ping-pong ball
- pot
- plastic or glass cup
- PhET simulation

Hypothesis

Read each activity in the "Procedure" and predict what you think might happen.

Activity	Hypothesis
Paper Chase Need a Hint? Which piece of paper will fall faster?	
Balloon Balance Need a Hint? What will happen to the other balloon when you pop one?	
Air Underwater Need a Hint? What will happen to the ping-pong ball and the paper when you put the cup into the water?	



Skill Builder

How to write a hypothesis.

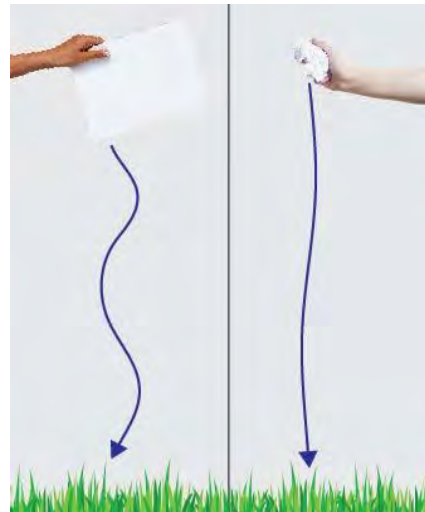
If you need to use this Skill Builder, access it from the online course.

Procedure

- 1 Perform each activity described.
- 2 After each activity, record what happened, and try to explain how the air caused the result you observed.
- 3 For those activities you are unable to do, click the videos to watch what happens.

Activity 1: Paper Chase

- 1 Take one flat sheet of paper and one crumpled up sheet of paper. Hold them both in the air.
- 2 Drop both pieces of paper at the same time from the same height.



Activity 2: Balloon Balance

- 1 Blow up two balloons to approximately the same size.
- 2 Tape each balloon to opposite sides of a ruler or another long stick.
- 3 Tie a string to the middle of your ruler so that the balloons are balanced on either end.
- 4 Now, take a pin and carefully pop one of the balloons.



Activity 3: Air Under Water

- 1 Fill a bowl about halfway with water. Place a ping-pong ball in the water.
- 2 Crumple a piece of tissue paper, and push it into the bottom of a cup.
- 3 Place the cup upside down over the ping-pong ball in the pot of water.
- 4 Notice what happens to the ping-pong ball.
- 5 Remove the cup, and notice what happened to the tissue paper.



Activity 4: PhET Simulation

- 5 Go to the **Gas Properties PhET** website and click **Run Now**.
- 6 Click the handle to pump some gas particles into the container.
- 7 Click and drag the left side of the container to the right to make the container smaller.
- 8 Click and drag to make the container larger.
- 9 Record your observations in the **Observations Table**.

Activity	What Happened?	Can you explain what happened? How was AIR involved?
<u>Paper Chase</u>	Need a Hint? Which piece of paper fell faster?	Need a Hint? Why did the flat sheet of paper fall slower? (Think about air pushing against it as it fell.)
<u>Balloon Balance</u>	Need a Hint? What happened to the other balloon when you popped one?	Need a Hint? Does air weigh anything? How do you know?
<u>Air Underwater</u>	Need a Hint? What will happen to the ping-pong ball and the paper when you put the cup into the water?	Need a Hint? Why did the ping-pong ball get pushed down? Why did the paper stay dry? Level 2: What was inside the cup that kept the paper dry and pushed the ball down?

PhET Simulation Questions	Observations
<p>3 a. What do the gas particles do when you pump them into the container?</p> <p>Need a Hint? Did they move around or stay still?</p>	
<p>4 a. What happens when you make the container smaller?</p> <p>Need a Hint? What did the gas particles do?</p>	
<p>4 b. What happens when you make the container bigger?</p> <p>Need a Hint? What did the gas particles do?</p>	

Using the observations you made during the activities, answer the questions you set out to explore:

1. How can we show that air:

a. takes up space?

b. exerts pressure?

c. can be compressed?

d. has mass (weight)?

2 Air has weight and presses against everything it touches. This is called air _____
_____.

pressure, spread, compressed, poured, around

3 Air can be _____ to fit into a smaller container.

pressure, spread, compressed, poured, around

4 Air can be _____ to fit into a larger container.

pressure, spread, compressed, poured, around