

LESSON CLUSTER 3

What is Air?

Activity 3.1: Is the Air in a Cup a Real Substance?

Let's try some activities to find out more about air. Collect some air in a small plastic bag by moving it through the air. Try to answer the following questions:

1. How do you know air is in the bag? _____

Squeeze the plastic bag. Then, answer the following questions:

2. Can you feel the air when you squeeze the bag? _____
3. As you squeeze the bag harder and harder, do you notice any difference? _____
If so, describe the difference.

Try another activity. First, push an upside-down cup into a container of water and mark the level of water inside the cup with a grease pencil. Then, remove the cup, tape one end of a hose inside the cup, and leave the other end so it will be outside the water. Place the cup and hose in the container as shown in the picture. Do you think you can fill up the cup with water, without turning it rightside-up?

Suck the air out of the cup through the hose.



4. Do you notice any change in the surface level of water inside the cup? What happens?

5. Blow air back in the cup through the hose. Do you notice any change in the surface level of water inside the container? What happened?

6. How can you explain this? _____

7. You might have noticed that however hard you pushed the glass into the water, you could not fill up the cup with water. Use what you know about molecules to explain this.

Question Set and Demonstration 3.2: Clean Air and Smells

1. Name the four major gases that make up air. _____

2. My friend said that all molecules in the air are the same. Is my friend right?
Explain why you think so.

3. Your teacher will release a small amount of perfume in the room. What do you think
perfume is made of?

4. How did the perfume travel from where it was released to your nose? Use molecules in
your explanation.

5. Ammonia is another substance that you can smell. Invent a shape for ammonia molecules
and draw a picture of what air in your kitchen might look like with magic eyeglasses shortly
after you opened a bottle of ammonia.

Activity 3.3: Breathing Out and Breathing In

Let's do a simple activity. Breathe on a cool piece of plastic.

1. What do you see?

2. What do you think the fog is made of?

3. Where did the fog come from?

4. What does this tell you about what is in the air that you breathe out?

Now let's try an activity about carbon dioxide in air. Your teacher will give you a straw and a cup full of water mixed with BTB. BTB is a substance that is normally blue, but carbon dioxide gas (CO_2) turns it yellow. The tiny amount of carbon dioxide gas usually present in the air around us is not enough to change the color of BTB from blue to yellow.

5. Use the straw to bubble your breath through the BTB solution. Describe the change in the solution.

6. What does this tell you about the air you breathe out?

7. How does the air you breathe in differ from the air you breathe out?

Question Set 3.3: Cluster Review

1. What kinds of molecules is air made of?

<u>Name</u>	<u>Formula</u>	<u>Picture</u>

2. How does the size of a carbon dioxide molecule compare with the size of a speck of dust?

3. When you smell something, what does that tell you about the molecules in the air?

4. How do smell molecules move through the air and get to your nose?

5. (Fill in the blanks below with the names of gases in the air -- nitrogen, oxygen, carbon dioxide, and water vapor.) Compared to the air you breathe in, the air you

breathe out has more _____ ,
 more _____ , and less _____

