

LESSON CLUSTER 8

Explaining Evaporation and Smells

Question Set 8.1: Explaining Evaporation

1. How many situations can you think of where water evaporates? List as many as you can in the space below.

2. Pick one of the situations above and explain what is happening. Be sure that your explanation discusses both substances and molecules.

3. Will a towel dry out faster in humid air or in dry air? _____ Explain why.

4. If you want your towel to dry out quickly after you have used it, should you leave the bathroom door open or closed? _____ Why? _____

5. (BONUS) a) Evaporation occurs when fast-moving water molecules escape from liquid water and leave the slower-moving molecules behind. What do you think happens to the temperature of the liquid water?

Why?

b) Why does your get cold if you go outside without drying your hair?

Question Set 8.2: Where Does the Water in the Air Come From?

Look back to Activity 3.3. Do you remember seeing the moisture when you breathed on the glass? Try explaining how that moisture got there in more detail.

1. Where did the water molecules in the air that you breathed out come from?

2. How did they get into the air?

3. Why can't you usually see water in the air that you breathe out?

4. Every day billion of gallons of water flow into the oceans from rivers all over the world, but the amount of water in the ocean stays about the same. That means that billions of gallons of water must also be getting out of the oceans every day. How is this happening?

5. Explain what is happening to the water at the surface of the ocean. Talk about both substances and molecules in your explanation.

Substances: _____

Molecules: _____

6. Identify each of the changes in substances below as: expansion, contraction, dissolving, melting, solidifying, or evaporating.

a. _____: melted candle wax drips down and turns hard

b. _____: a puddle dries up

c. _____: a balloon blows up on top of a bottle when the bottle is warmed

d. _____: the level of the liquid goes down in a thermometer

e. _____: dew on the grass dries up when the sun shines on it

f. _____: iron is heated in a furnace until it turns into a liquid

g. _____: sugar is stirred in a glass of water until all the solid pieces are gone

Activity 8.3: Alcohol Evaporation Race

1. Your teacher will give you two ml of alcohol, which evaporates more quickly than water. See how fast you can evaporate it completely. Time yourself.

Starting time: _____ : _____ minutes and _____ seconds

Finishing time: _____ : _____ minutes and _____ seconds

Time to evaporate: _____ : _____ minutes and _____ seconds

2. Describe what you did to make the alcohol evaporate faster.

3. The molecules of alcohol are different from water molecules (see Lesson Cluster 2 for a picture of an alcohol molecule). But the process of evaporation is essentially the same. Try explaining how the alcohol evaporates.

4. Can you think of another way to change the liquid alcohol into alcohol gas that would be even faster? If you can, describe how you would do it.

Question Set 8.4: Lesson Cluster Review

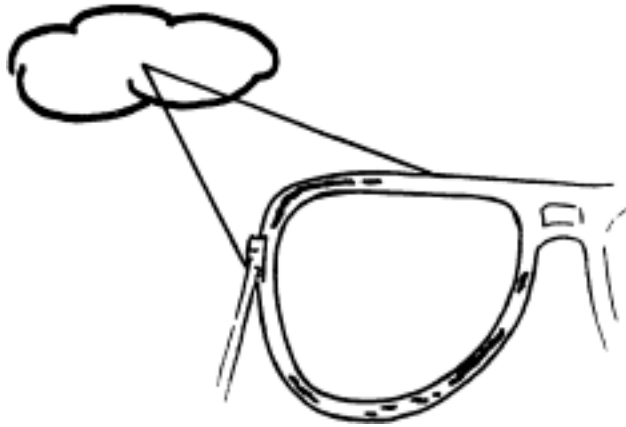
- I. The story "Bartholomew and the Oobleck," by Dr. Seuss, tells how King Derwin of Didd got his magician to make millions of tons of a sticky green substance called Oobleck. Everyone in the kingdom is stuck until the king says, "I'm sorry." Then,

"The sun began to shine and fight its way through the storm.., all the oobleck that was stuck on all the people and on the animals of the Kingdom of Didd just simply, quietly, melted away."

(a) What would be a more scientifically accurate word than "melted" to describe what happened to the oobleck? _____

(b) What must have happened to the molecules of the oobleck?

(c) Show what the air of the Kingdom of Didd might have looked like through magic eyeglasses after the oobleck "melted away." (You can invent your own shape for oobleck molecules.)



2. Sometimes we say that morning fog is "burned off" by the sun when the sun rises. The fog is made of tiny drops of water. Explain what actually happens to the water molecules in these drops when the sun heats the drops up by shining on them.

3. What is the difference between evaporation and boiling?

4. Explain how you can smell an open bottle of vinegar even though you are across the room.

(a) What is actually reaching your nose? _____

(b) How did the vinegar molecules get into the air?

(c) How did the vinegar molecules reach your nose?
