6th Grade Science 3/9/20

EQ: How can our model apply to everyday life?

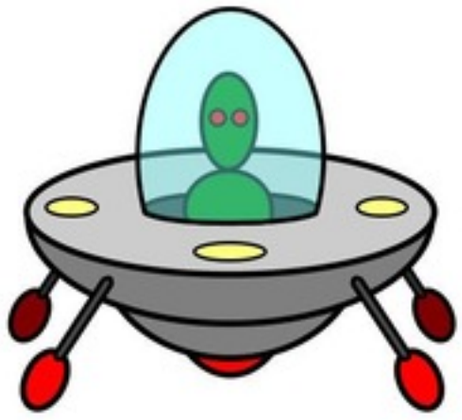
CW: Lesson 16

HW: No HW

Agenda

1) Question of the Day
2) Review Phases of Matter Models
3) Reading 15.4
4) Time to Climb
5) Intro to Final Project

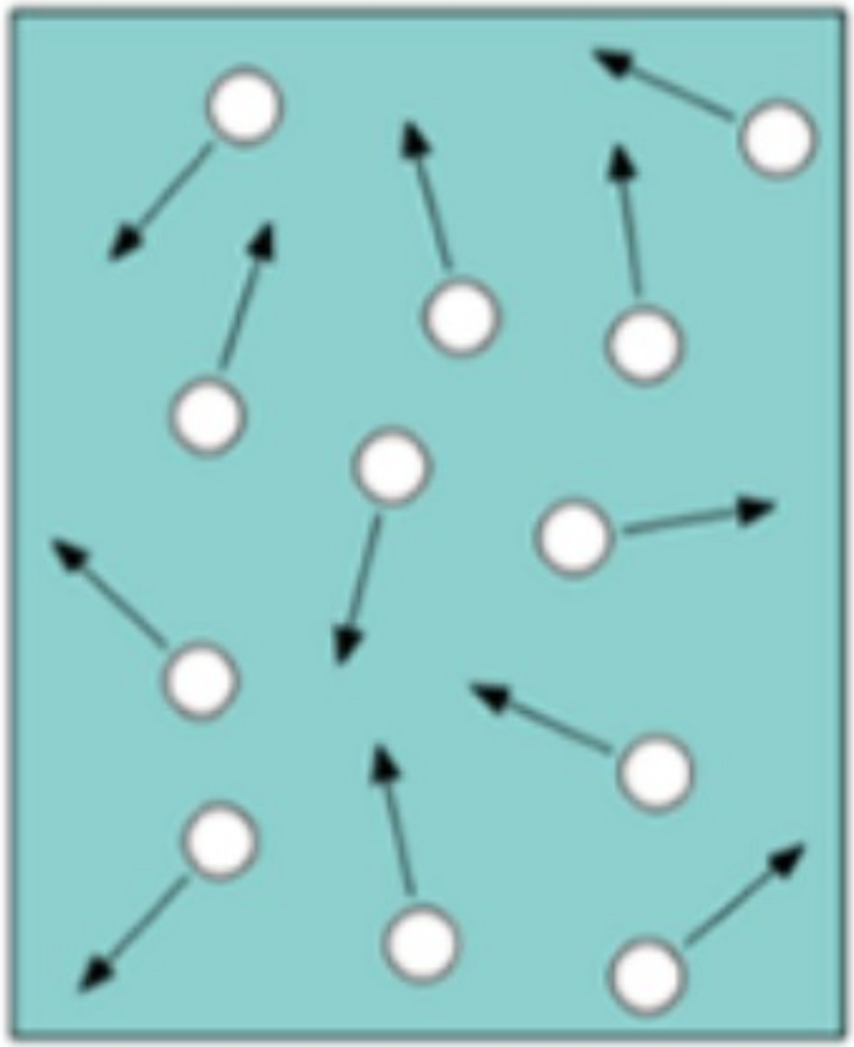
Open Ended Question



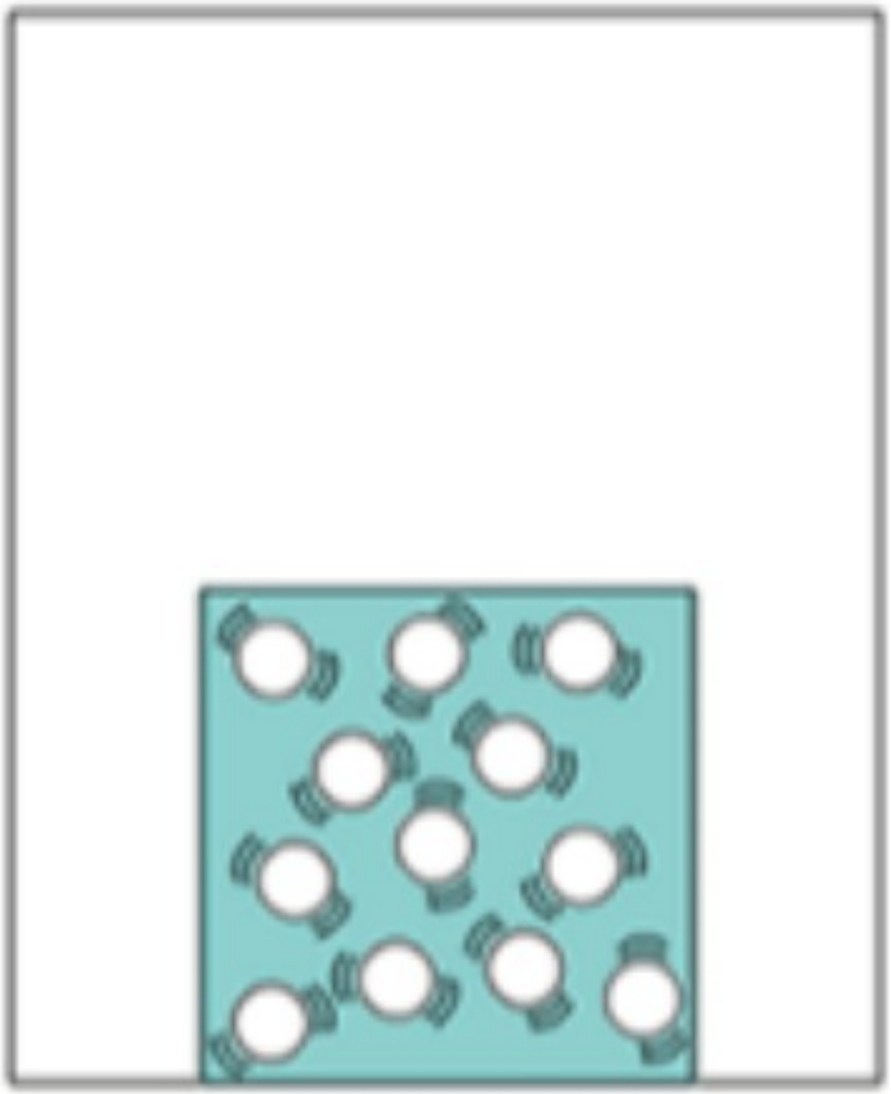
Write silently for 2 minutes. If you could send a message out into space, what is the one thing you would want to tell an advanced alien species?

Please enter your answer here.

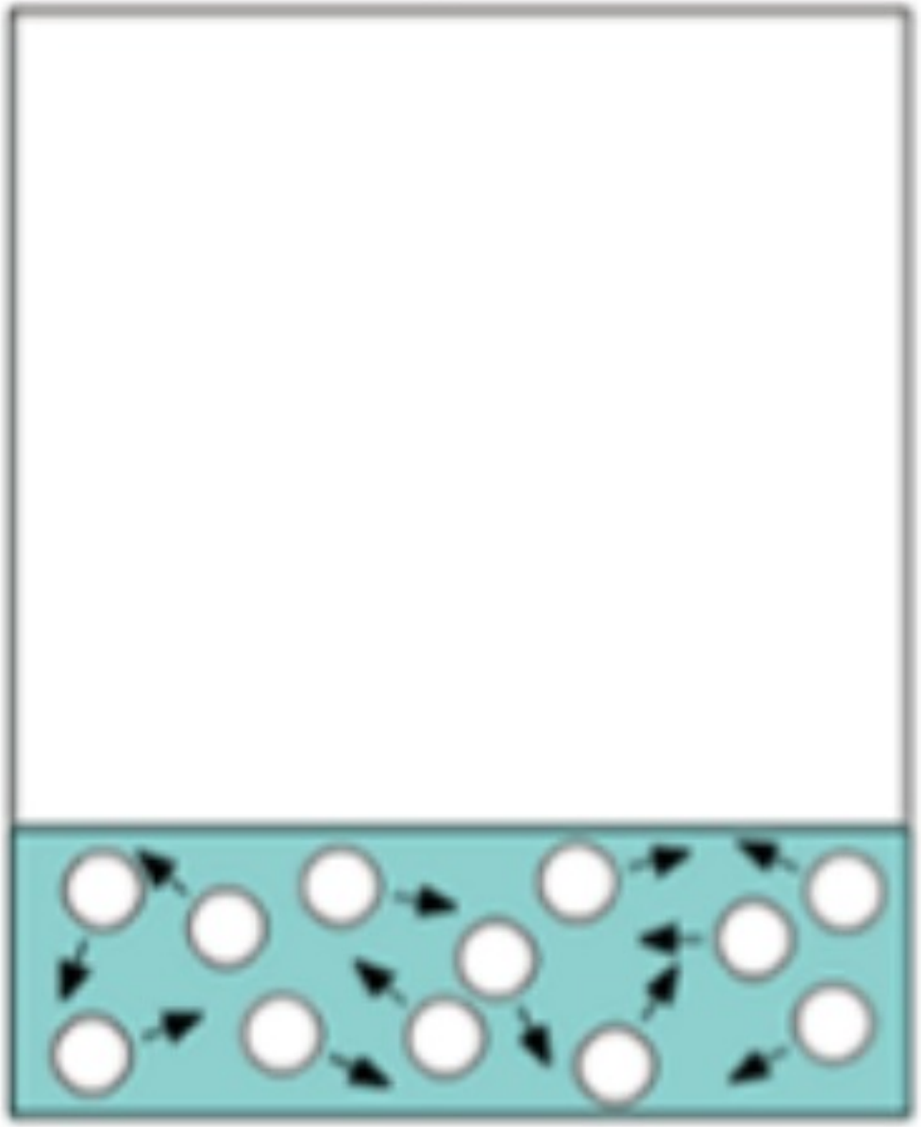
Solid, Liquid, or Gas?

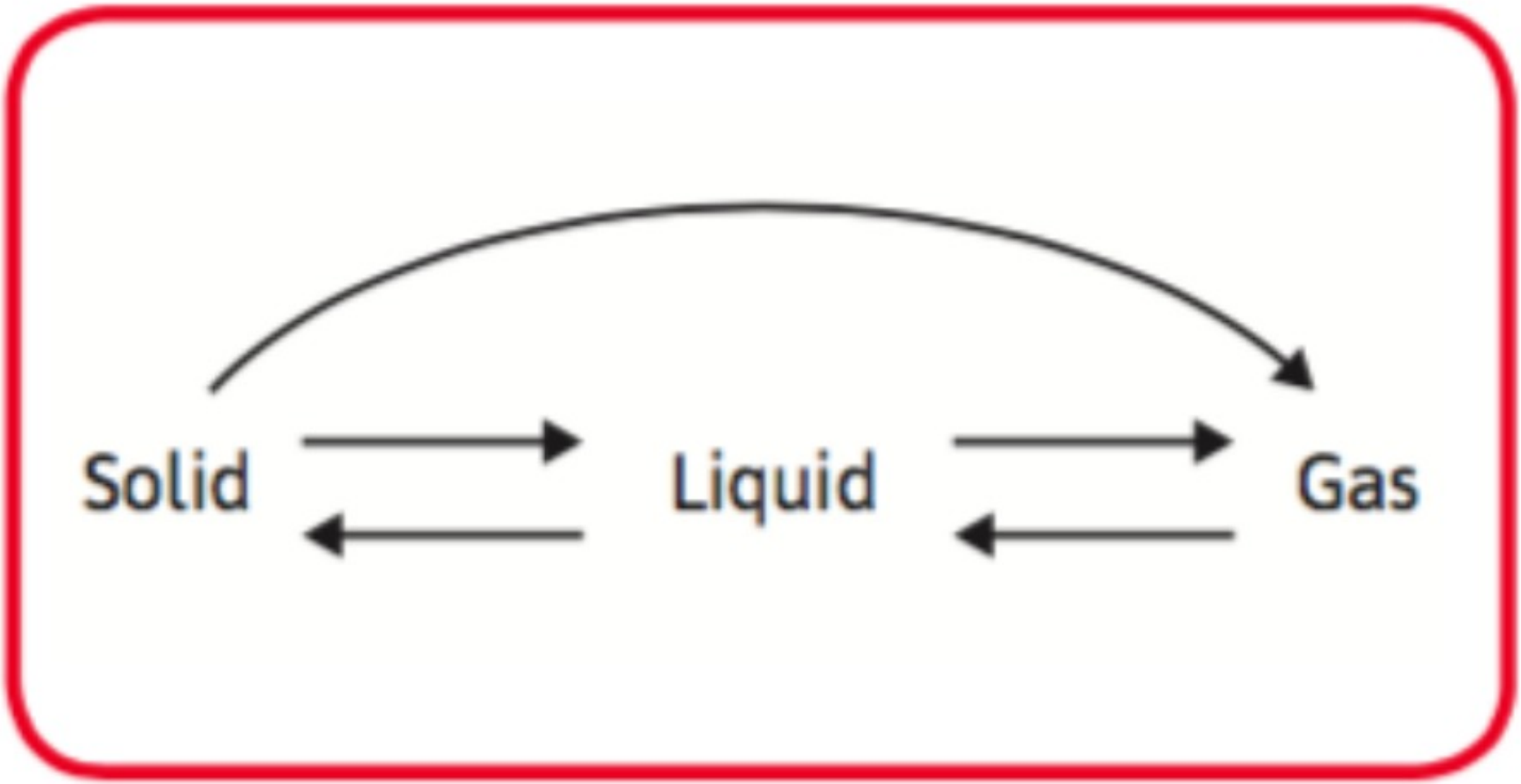


Solid, Liquid, or Gas?



Solid, Liquid, or Gas?




Solid
Liquid
Gas

Review Phases of Matter Models

General Feedback

1) Show the particles!

2) Include a key

3) Show movement (different size arrows/brackets for vibrating particles)

4) Include a detailed explanation of the diagram and how the particles are moving

5) Good creativity!

📖 Reading 15.2 – How Can I Smell Something that Is Solid?

Getting Ready

In class you observed menthol. Menthol is a white solid with a strong odor. Another white solid with a strong odor is a mothball. People use mothballs to keep moths from chewing on their wool clothes. The odor of mothballs keeps moths away.

For humans to smell a material, some of the material has to be in the gaseous state. When you hold solid mothballs, you can smell them. How do mothball molecules in the solid state get into the air? In the space below, describe what you think could be happening to the mothball molecules in the solid state so that humans can smell them.

Open Ended Question

Describe what you think could be happening to the mothball molecules in the solid state so that humans can smell them.

Please enter your answer here.

How Can Mothball Molecules Go into the Air from the Solid State?

One explanation of how you can smell a solid substance is that the solid melts into a liquid, and then the molecules evaporate into the air. Mothballs do not melt at room temperature. Instead, mothball molecules can go from the solid state right to the gaseous state. They skip the liquid state. You know that melting happens when all of the particles of a substance move fast enough to slide past each other. The molecules of mothballs are unique. They can move fast enough so that they go right into the gaseous phase before the substance melts. When a substance skips the melting phase, and changes from the solid state right into the gaseous state, scientists say it sublimes. The process is called sublimation. Remember when molecules change state, they remain the same. They move faster, but they do not change.

In class you observed another substance that sublimes. You saw carbon dioxide go from the solid state to the gaseous state. Carbon dioxide has to be very cold to be in the solid

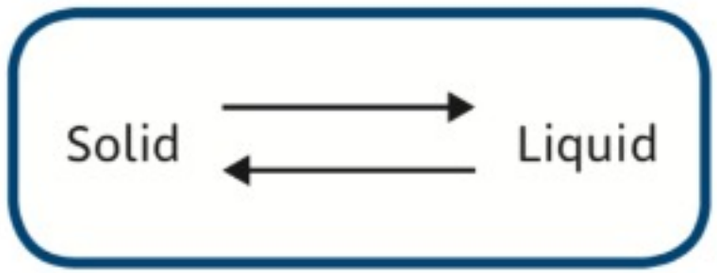
state. Some people call carbon dioxide dry ice because in the solid state it is very cold and looks like ice. In fact, it is even colder than ice. When solid carbon dioxide gets warm, it does not melt like ice melts. Instead, it turns into a gas at room temperature. When carbon dioxide sublimes, no liquid carbon dioxide remains in the spot where the solid was. The spot is dry. So when carbon dioxide sublimes, no liquid carbon dioxide forms.

How Many Ways Can a Substance Change Phases?

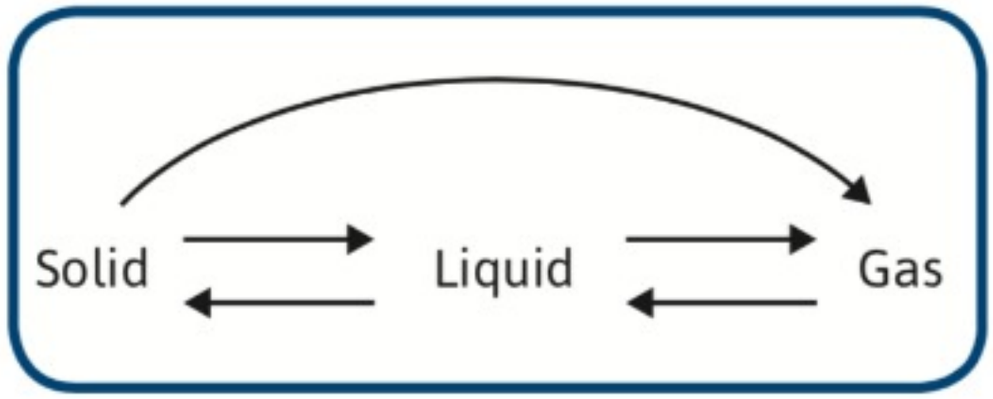
So far you learned a substance can change phases

from a solid to a liquid—and—from a liquid to a solid.

from a liquid to a gas—and—from a gas to a liquid.



Now you know a substance may be able to change into the gas state without first melting. You can show this by grouping the states of matter together and then using another arrow to show that solids can go directly to the gaseous state.



How Does a Snowflake Form?

You have learned some ideas that can help you understand how a snowflake forms. First, remember that one component of air is gaseous water. Water particles get into the air, as a gas, when water evaporates from oceans, lakes, and rivers. Plants also give off water. It is humid in tropical areas because of the gaseous water that plants add to the air. And, every time an animal exhales, water particles go into the atmosphere in its breath. A snowflake begins with all of these gaseous water particles in the air.

As the air begins to cool, so do the water particles. In general, the particles begin to slow down. They condense, forming very tiny clusters of water. When this process happens near the ground, the particles condense on grass or other surfaces as dew. In the atmosphere high above the ground, the water particles condense onto dust particles that are in the air. Each tiny drop contains at least one dust particle. When you see a cloud, you are looking at a huge collection of liquid water and dust droplets suspended in air.

In the winter, when the temperature is below freezing, clouds are still mostly made of liquid water droplets. Although water typically freezes at 0°C (32°F), it can become super-cooled. Super-cooled water is still in a liquid state below its freezing point. When it gets even colder, around –10°C (14°F), the water and dust droplets begin to freeze. This is the start

of a snowflake. As the droplet freezes, it becomes a tiny piece of ice surrounded by liquid water. As more of the liquid freezes on the surface of the ice piece, the ice grows to form a snowflake. At a certain point, the snowflake becomes heavy enough to fall.

Once on the ground, the snow melts, the water evaporates, and the process starts over.

Look at how the ideas you have learned can help you explain how a snowflake forms. Liquid water evaporates into the air because of fast-moving water particles. The water particles then condense as they cool and move more slowly. As water particles condense, they grow into snowflakes. There the process starts over as the water that makes up a melted snowflake evaporates back into the air. This is the value of science! Science explains everyday events in the world around you.

Time To Climb

IC1 Final Project

You will use your consensus models and everything you have learned to explain a real-life situation that we did not study in class.

You will be given a scenario of a problem related to a substance. You must either:

1) Create a solution to the problem
or
2) Describe a different way the substance could be used

Be Creative!

Final Project Steps

1) You will be randomly assigned a partner.

2) Choose a scenario and read it with your partner.

3) Complete the questions on the Final Project Planning Guide

4) Create a poster, brochure, slides, advertisement, video, or commercial (other ideas are welcome with approval)

DUE: Wednesday, March 11th!!

Final Project Rubric

The final project must include:

(a) clearly state the problem

(b) offer a solution or describe additional uses of the substance

(c) include a visual representation of how the substance works/ travels (molecule model)

(d) include information about temperature such as how the product would work or be affected by cooler or warmer weather.

Scenarios

Scenario 1: How can I keep mosquitoes from biting me?

Scenario 2: Peanut Allergies

Scenario 3: How can a skunk smell be helpful?

Scenario 4: Can I stop garbage from smelling so bad?

Final Project Partners

We will be in groups of 2.

Find the person with the same card as you!

Final Project Work Time

Begin working on your Planning Guide!