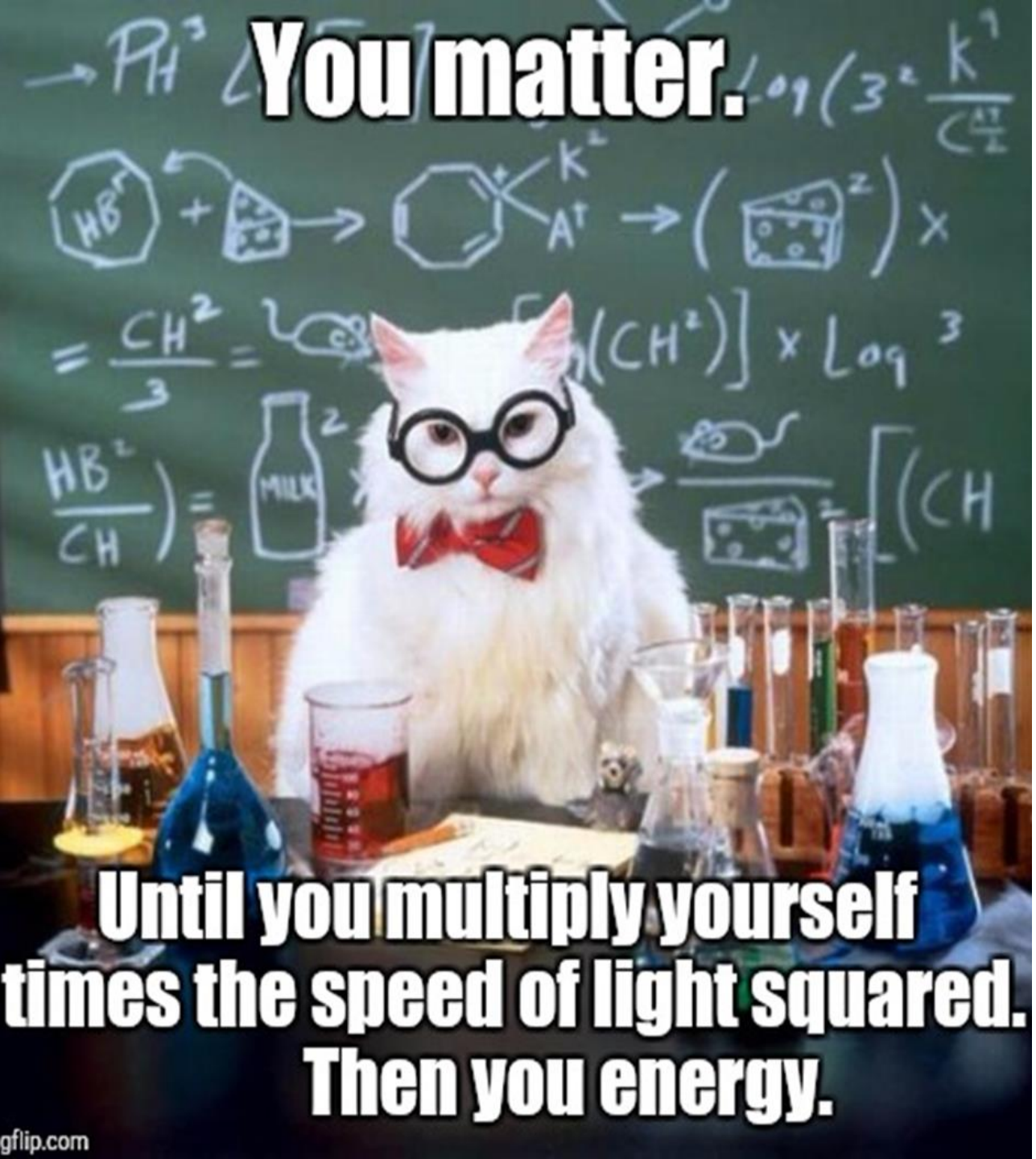


IS2T1 Properties of Matter

Density & Temperature Worksheet A

Directions: All work must be shown for full credit. Answers must show proper significant figures and scientific notation as well as include a unit.

1. A substance boils at 99 °C, what is this temperature in K?

$K = {}^{\circ}C + 273$

$K = 99^{\circ} + 273$

Answer: 372 K ← no degree sign

2. A plastic ball has a mass of 2.34 g and a volume of .32cm³. What is the density?

Work:

$$\frac{2.34\ g}{.32\ cm^3} = 7.3125$$

Answer: 7.3 g/cm³

Will the plastic ball sink or float in a container of ethanol. Ethanol has a density of .800 g/cm³. Answer: sink

3. If the density of a diamond is 3.5 g/cm³, what would be the mass of a diamond whose volume is .5 cm³?

Work:

$$\frac{3.5\ g}{cm^3} = \frac{x}{.5\ cm^3}$$

$$\left(3.5\ \frac{g}{cm^3}\right)(.5\ cm^3) = x$$

$$1.75 = x$$

Answer: 2 g

Now, you finish the worksheet

4. A copper cylinder is placed in a 50 mL graduated cylinder filled with 25.0 mL of water. Use the data below to answer the following question.

Mass of copper cylinder	Volume before	Volume after
23.75 g	25.0 mL	33.6 mL

Calculate the final volume.

Work: 33.6 − 25.0 Answer: 8.6 mL

Then, calculate the density of the cylinder using the final volume.

Work:

$$\frac{23.75\ g}{8.6\ mL} = 2.7616$$

Answer: 2.8 g/mL

5 If the density of a substance is 4.0 g/mL and the volume is 25.4 mL, what is the mass?

Work:

$4.0 = \frac{x}{25.4}$ $(4.0\ g/mL)(25.4\ mL) = x$ $x = 101.6$

Answer: $1.0 \times 10^2\ g$

6. If the mass of a substance is 32.4g and the density is 8.2 g/mL, what is the volume?

Work:

$8.2 = \frac{32.4}{x}$ $\frac{8.2(x)}{8.2} = \frac{32.4}{8.2}$ $= 3.95121$

Answer: 4.0 mL

7. A can of Coca-Cola classic at 34° C has an internal pressure of 380 kPa. Calculate the temperature in Kelvin.

Work:

$K = °C + 273$

$K = 34 + 273$

Answer: $K = 307$

8. At room temperature, about 293 K, a can of soda contains approximately 250 kPa (kilopascals).

Convert the temperature from Kelvin to Celsius.

Work:

$K = °C + 273$

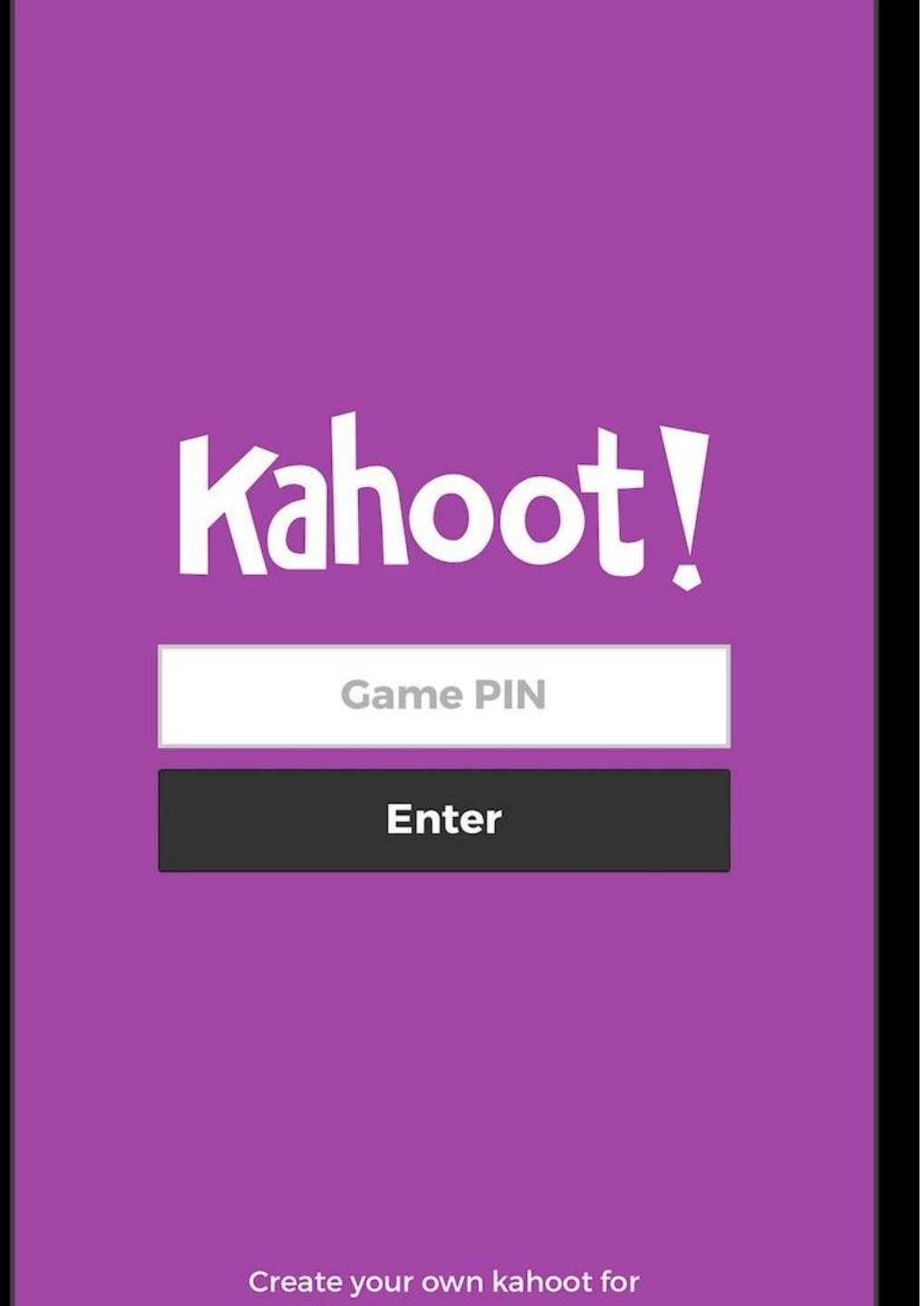
$293 = °C + 273$

$293 - 273 = °C$

Answer: $20°C$

Late work week 6

- All late work for week 6 is due this **Friday, 9-25** by 8:00 a.m. All work not turned in will stay as a **“missing/zero”** in infinite campus and cannot be submitted in google classroom.



Make sure you have downloaded the Kahoot app onto your phone or another device for today's game. Top five students win extra credit.

Virtual Expectations

BE ON TIME

Wake up early enough to get ready

Eat breakfast

Log on a few minutes early

Use your real name on the screen

BE PREPARED

Be in a

Technology shou

No distractions includin phones
(unless you are using your phone to meet)

MUTE YOURSELF

Keep your mic on MUTE unless you have been called on

Use headphones if you have them

BE PRESENTABLE

Wear appropriate clothing

Be sure your camera is on

Sit up straight and be in camera view for attendance

CHAT RESPONSIBLY

Raise your hand to speak

Type your question in the chat box

Stay on topic (no side conversation)

PARTICIPATE

Stay focused

Ask and answer questions

Listen and show respect to peers

Particle Motion Rotation Activities

Guiding Question: *How is particle motion related to temperature?*

- **<u>Activity #1: Pinwheel by Candlelight</u>**
- **Materials:** aluminum foil, 4 candles, pencil, lighter, play-doh

Pinwheel by Candlelight directions

- Four candles are placed under a pinwheel that is secured to the table as shown in the picture above.
- The demonstration will begin by lighting the candles one by one.
- **Give a prediction** of what you think will happen:_____

https://www.youtube.com/watch?v=yz6NeHrcfWg

Data Table

# of Candles lit	What changes do you observe?
One candle	
Two candles	
3rd and 4th candle	

Draw It Out: (Pg. 4)

Using the boxes below…

1) Draw in air particles before and after the candles were lit. *(Are they evenly spread out? Are they concentrated in one area? Is there a difference in the number of particles in a given space before/after the candles are lit?)*

2) Using a colored pencil show the direction of heat movement from the candle in the second box.
(Does it only go in one direction? Is it concentrated or spread out?)

Before:	**After:**
	

Draw It Out: Answer

Using the boxes below…

1) Draw in air particles before and after the candles were lit. *(Are they evenly spread out? Are they concentrated in one area? Is there a difference in the number of particles in a given space before/after the candles are lit?)*

2) Using a colored pencil show the direction of heat movement from the candle in the second box.
(Does it only go in one direction? Is it concentrated or spread out?)

Before:

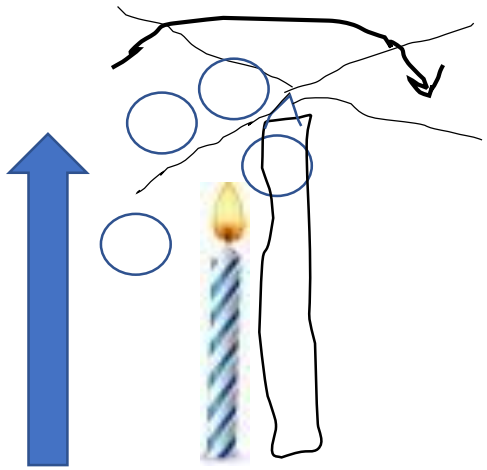
Reactants

gases

After:

Products

Pinwheel is spinning



Heat is rising (energy)

Complete the statement: The air particles are moving **faster** because the pinwheel is spinning faster.

Think It Out:

1. Name all of the components of this "system?" _____
2. What types of "particles" are present? *solid* *liquid* *gas*
3. What is the candle adding to your "system" when lit? **Heat energy**
4. What is happening to the air particles near the candle when lit? **Moving around faster**

5. How are the air particles near the lit candle different in temperature compared to the air particles near the pinwheel? **Warm air rises, cool air sinks**
   What is your evidence? **Spins faster as you light more candles**
6. How are the air particles near the lit candle different in placement/concentration (e.g., are there more or less particles) compared to the air particles near the pinwheel? **more**

7. As more candles are lit, how is that changing the components of your system (the heat/energy/motion)?

More energy, more heat, more motion (kinetic energy)

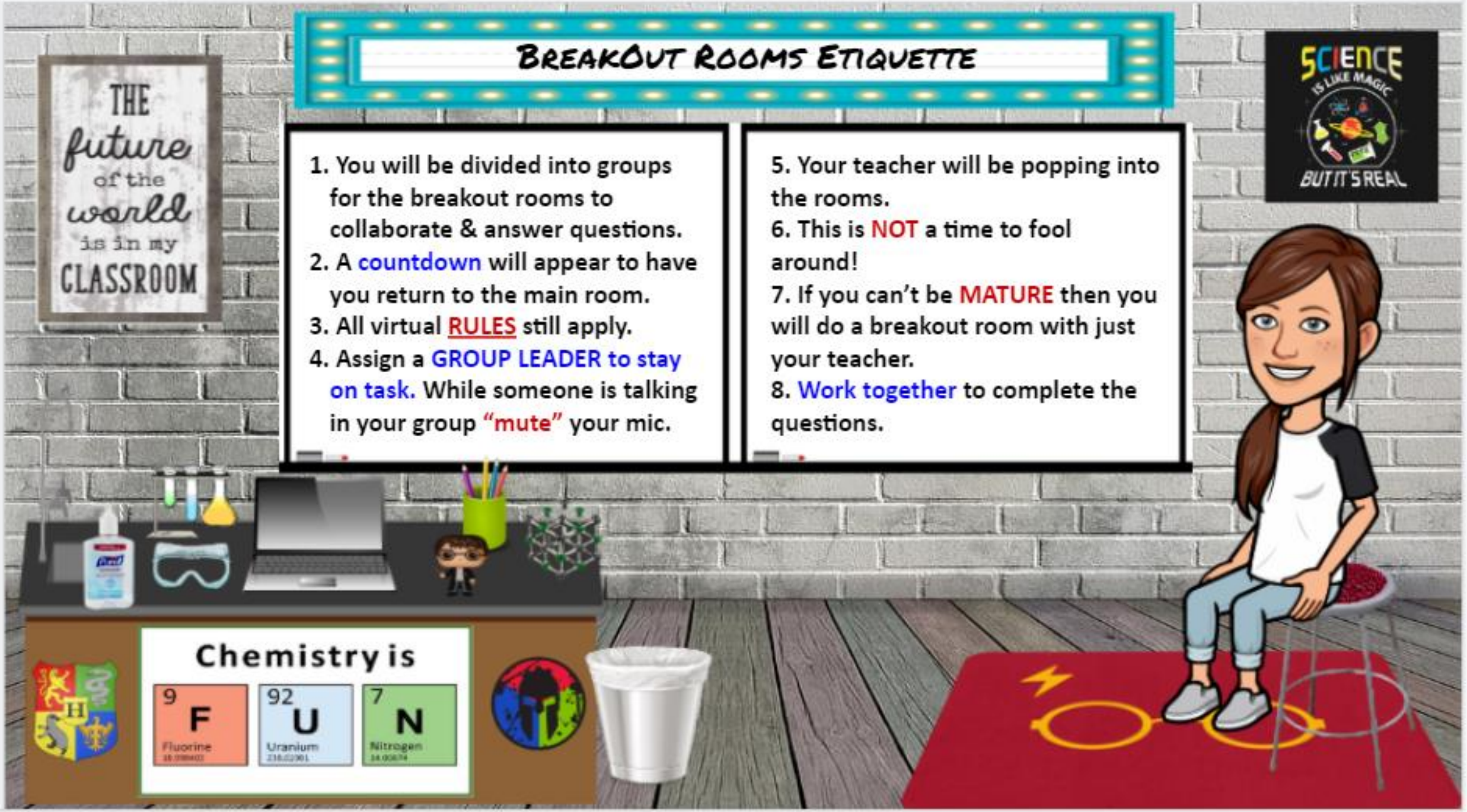
8. Do you think the number of particles in a given area change when more heat is added? **Yes**

9. Why or why not? Explain.

Note: As the particles are heated they spread out.

10. Would you consider the components in this activity (pinwheel/candle set up) to be a part of an "open system" or a "closed system?" Explain.

Open system not in a closed container

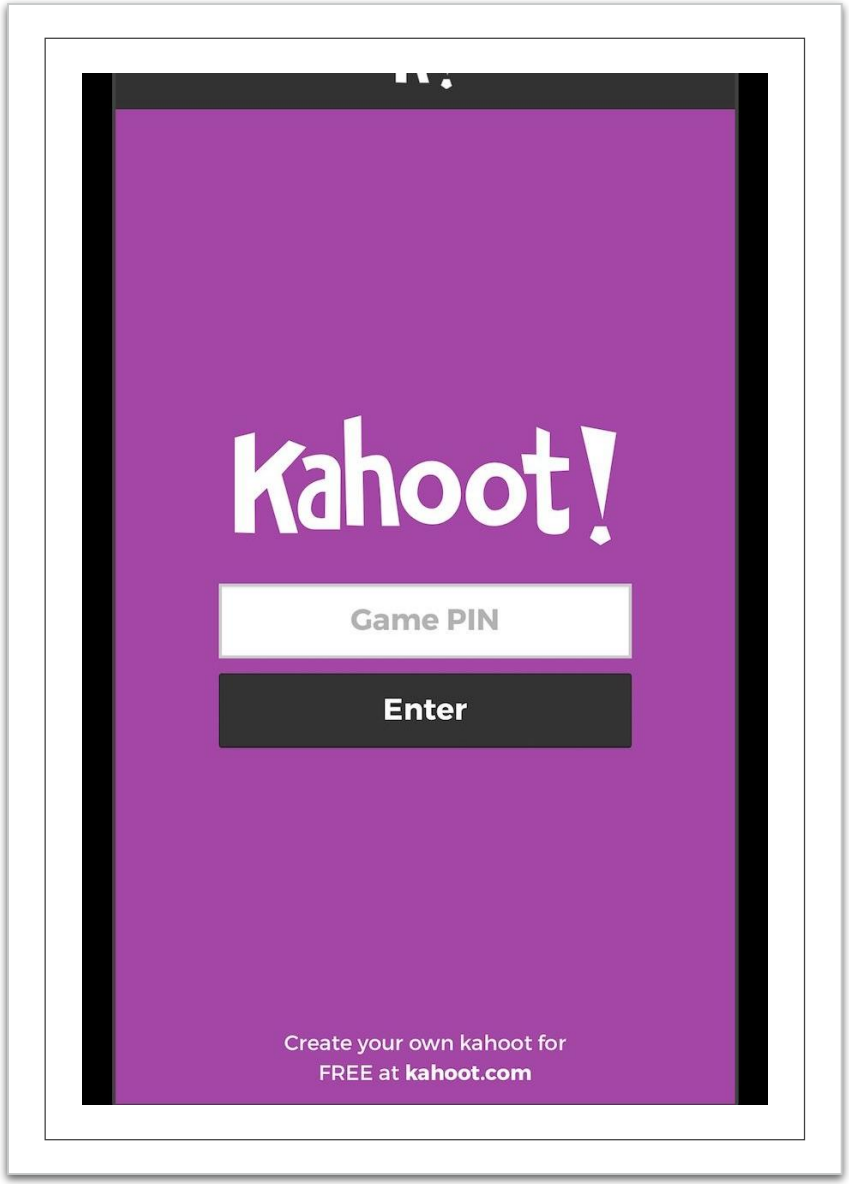

BreakOut Rooms Etiquette
1. You will be divided into groups for the breakout rooms to collaborate & answer questions.
2. A countdown will appear to have you return to the main room.
3. All virtual RULES still apply.
4. Assign a GROUP LEADER to stay on task. While someone is talking in your group "mute" your mic.
5. Your teacher will be popping into the rooms.
6. This is NOT a time to fool around!
7. If you can't be MATURE then you will do a breakout room with just your teacher.
8. Work together to complete the questions.
THE future of the world is in my CLASSROOM
SCIENCE IS LIKE MAGIC BUT IT'S REAL
Chemistry is
9 F Fluorine
92 U Uranium
7 N Nitrogen

What did you learn?

Choose the correct words to complete the following statement. Not all words will be used.

heated, faster, flow, air, temperature, rises, wind, cooled, kinetic, slower, sinks

- Changes in **temperature** will create changes in the speed of particles as evidenced through the pinwheel spinning **faster** when the **air** particles are **heated** by the candle. Less dense air (warmer air) **rises** and more dense air (cooler air) **sinks**, therefore, creating a **flow** of air particles = **wind** that propels the pinwheel to spin. Particles that are moving are increasing in **Kinetic** energy.



Go to Kahoot.it or find the app on your device. You need to enter in your first name and last initial. This is review for your QUIZZIZ on Thursday-Friday.

Now, complete the pHET states of matter/density for HW