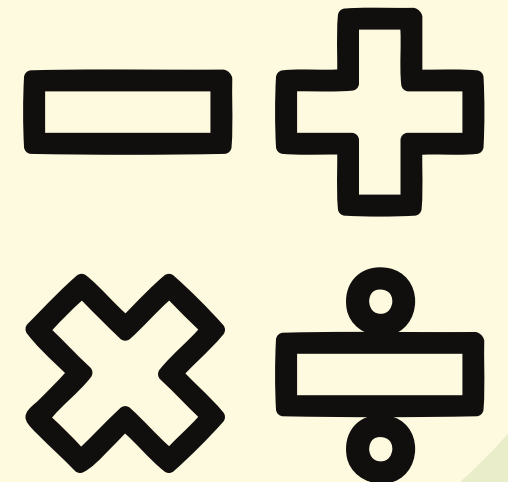
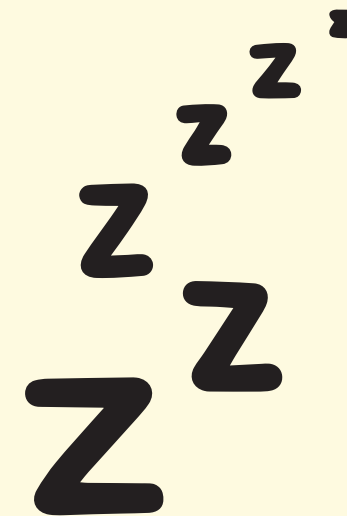
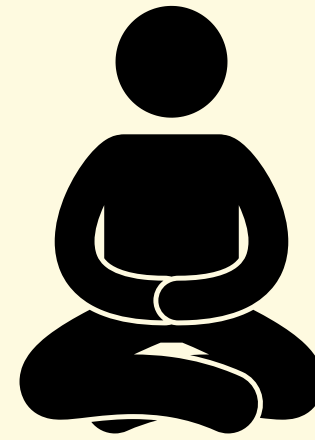


Exploring Hot Peppers

KBAR

- Read
- Practice math
- Nap
- Meditate
- Draw.

NO PHONES!

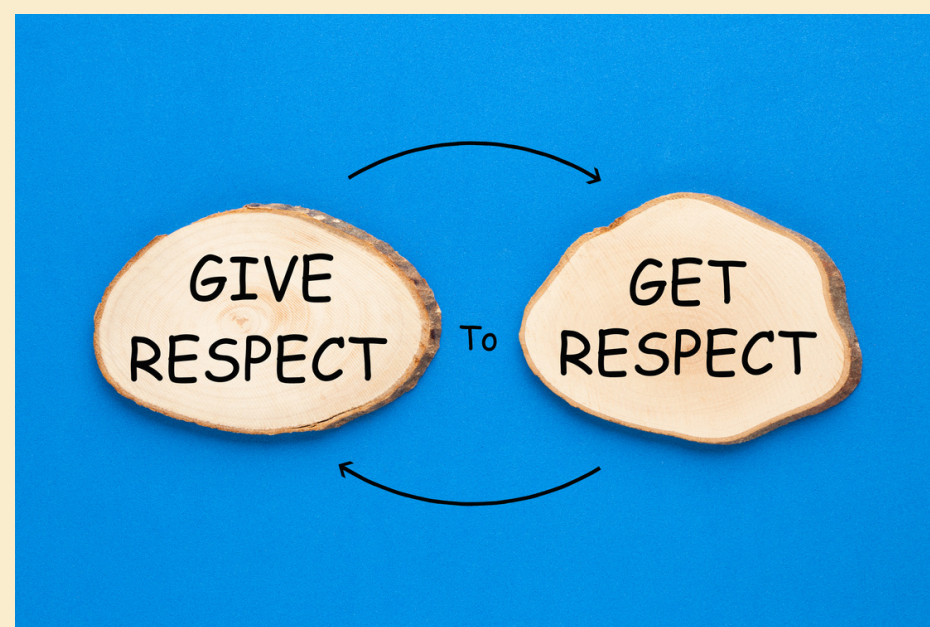
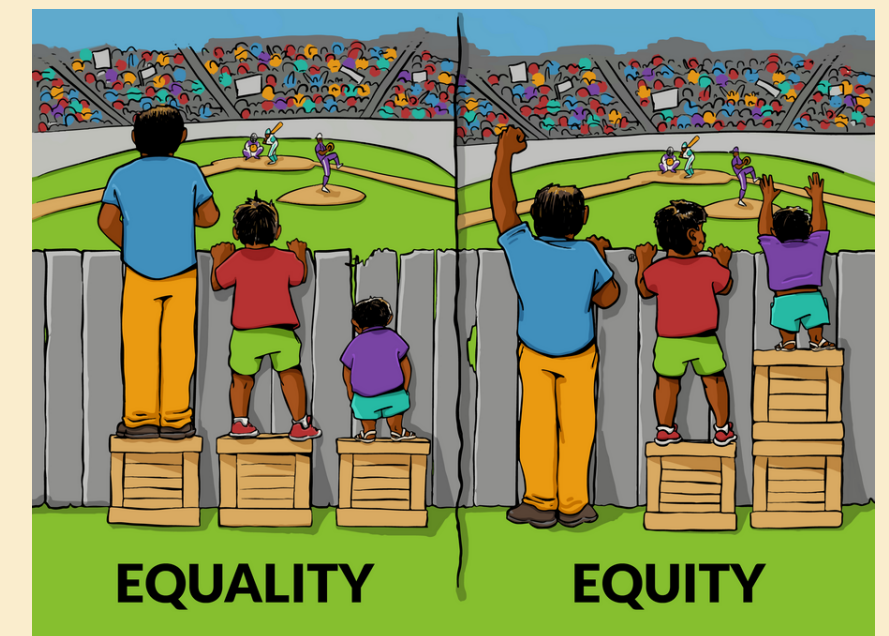


Creating Norms for a Science Classroom



How do we stay accountable to science and classmate

How do we make an equitable classroom?



How do we respect one another

Our Classroom Norms

Accountability to Science and class

Be Prepared to Listen

Focused and on-topic Conversations

Keep your Classmates in Check

Make Safe and Smart Decisions

Respect for Each Other

**Respect our Disagreements/
Respond Politely to Comments**

Respect Classroom Materials

Equity.

Be Mindful of our Words

Make Sure Everyone Feels Included

Making Observations



CATCH-UP DAY!

- MAP TESTING/Make-up
- Finish Math Poster
- Linear Models Worksheet
- Art Project

SCIENCE WARMUP - MONDAY 5/2

One of your classmates claims that the size of a hot pepper determines how spicy it will be.

Do you agree or not?

How would you test or prove whether they're right or not?

Our Classroom Norms

Accountability to Science and Class

Be Prepared to Listen

Focused and on-topic Conversations

Keep your Classmates in Check

Make Safe and Smart Decisions

Respect for Each Other

Respect our Disagreements

Respond Politely to Comments

Respect Classroom Materials

Share the Air (Allow others to speak)

Equity

Help Classmates in Need

Be Mindful of our Words

Make Sure Everyone Feels Included

I Noticed...

- Some people didn't react
- Faces turning bright red
- Some eyes were watering
- Mucous and snot coming from their faces
- One performer was beginning to vomit
- Some performers appeared distracted and couldn't focus on playing the music.
- Some performers touched their faces
- The music changed

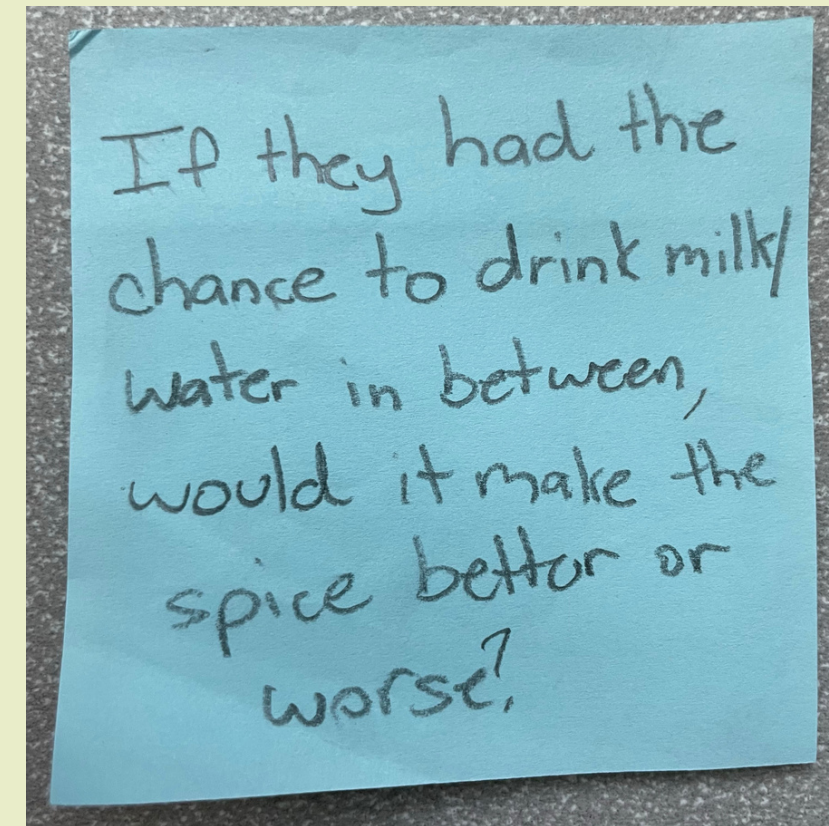
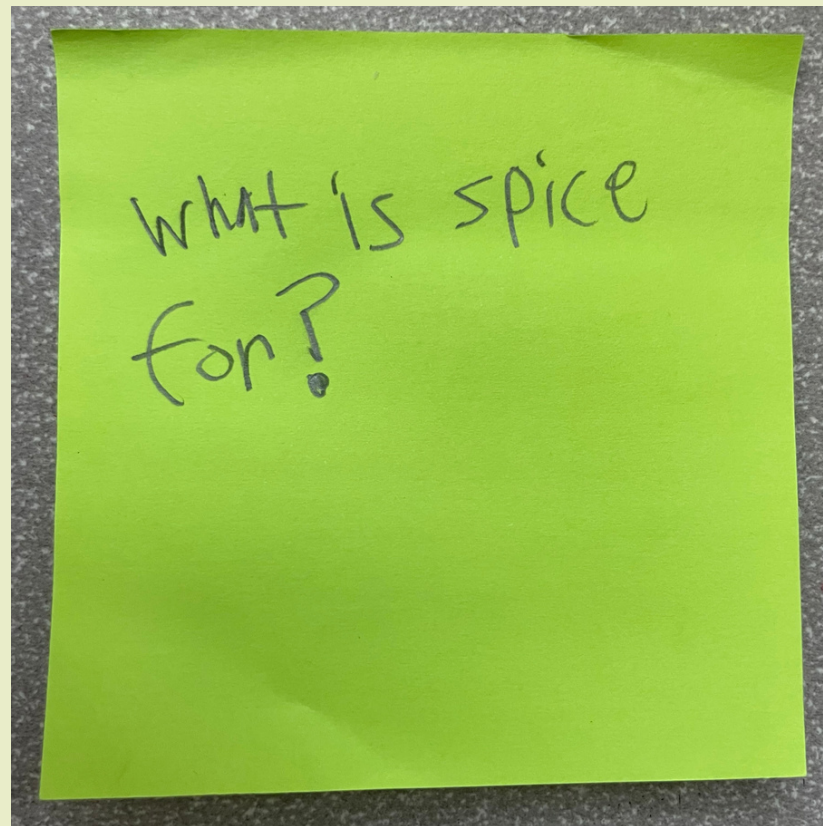
I Noticed...

- Violins, trumpets, bass, mallets, cymbals, flutes, clarinettes
- Performers played faster after eating the chili
- Positions of the orchestra were out of order
- Runny noses, sweating, crying, coughing
- Beginning of the music was calm while the end was faster and more hectic
- Different chilis were consumed
- Number of people running away after the performance.

ASKING THE RIGHT QUESTIONS

"If I had an hour to solve a problem and my life depended on it, I would use the first 55 minutes determining the proper question to ask, for once I know the proper question, I could solve the problem in less than five minutes."

- Einstein



What is an Investigable Question?

An investigable question is a one that can be answered through hands-on investigation

THIS USUALLY REQUIRES THE COLLECTION OF DATA AND EVIDENCE

THREE TYPES OF INVESTIGATION QUESTIONS

Descriptive Questions:

Produce a description of an object, material, or event.

Relational Questions:

These types of questions ask about the relationship between two variables

Cause-Effect Questions:

Seeks to understand how one variable affects another

Good investigation questions are interesting.

Am I interested in finding out the answer to this question?

Good investigation questions are those I do not already know the answers

Do I already know the answer to this question?

Good investigation questions lead to a “plan of action” (a plan for what I need to do to answer the question, including the evidence I need to collect).

Is this question written in a way that clarifies what I need to do (observe, measure, change, etc.) to answer it?

Good investigation questions are those that can be answered with available material.

Will I be able to find the material I need to answer this question?

Good investigation questions are those that can be completed in a reasonable amount of time.

TUESDAY 5/3

Read through each of the group role cards at your table. Switch with people at your table until you have read all 4.

WRITE 2 QUESTIONS YOU HAVE ABOUT GROUP ROLES.



Our Classroom Norms

Accountability to Science and Class

Be Prepared to Listen

Focused and on-topic Conversations

Keep your Classmates in Check

Make Safe and Smart Decisions

Respect for Each Other

Respect our Disagreements

Respond Politely to Comments

Respect Classroom Materials

Share the Air (Allow others to speak)

Equity

Help Classmates in Need

Be Mindful of our Words

Make Sure Everyone Feels Included



TEAM CAPTAIN

Main point of contact with teacher. The only one who should be asking the teacher questions.



SKEPTIC

Challenges each group member to explain their thinking.



ACCOUNTABILITY MANAGER

Makes sure members stay on task. That they can answer teacher's questions and that they know what is going on.



COACH

Asks every member to share their ideas and thinking. Ensures everyone is listened to and heard. Invites others to make suggestions on what to do next.

Designing Investigations

QUESTION

REWRITE YOUR INVESTIGATION QUESTION HERE

HYPOTHESIS

WHAT DO YOU THINK THE ANSWER TO YOUR QUESTION WILL BE AND WHY?

METHOD

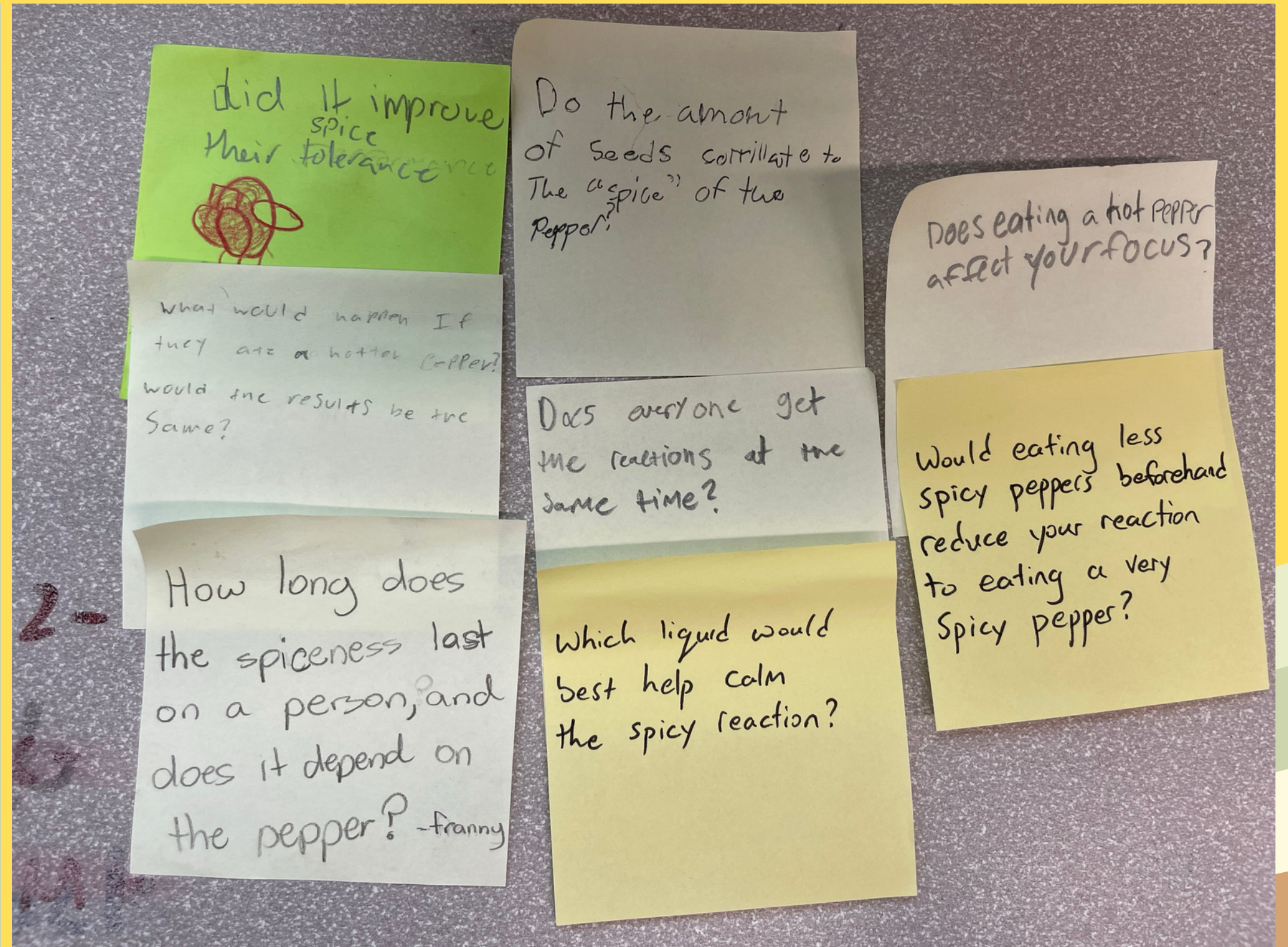
MAKE A DETAILED PLAN TO TEST YOUR HYPOTHESIS

DATA

RECORD YOUR EXPERIMENT RESULTS AND YOUR OBSERVATIONS

CONCLUSION

WHAT DID YOU LEARN FROM YOUR EXPERIMENT?
WAS YOUR HYPOTHESIS CORRECT?



THURSDAY, APRIL 5

Sit at a table with your research group. Look at the roles below and nominate each member for a role until everyone in your group knows their position.



TEAM CAPTAIN

- The group's main point of contact with the teacher when there are questions.
- Can leave the table to gather materials and tools from the teacher.
- Makes sure members are staying on task.



TECHNICIAN

- The only team member allowed to handle dangerous materials.
- The only member allowed to use specialized or hazardous tools.
- Must wear personal protective equipment (PPE) at all times.



SKEPTIC

- Asks team members to clarify their ideas.
- Helps the team consider "How can we do this better?"
- Makes sure all team members are heard and listened to.



DATA ANALYST

- Gathers and writes down experimental data
- Keeps research papers tidy and organized.
- Communicates major findings with other groups.

Understanding Solubility

WARMUP:

**SHARE A MEMORABLE MOMENT DURING
8TH GRADE RETREAT WITH THE PEOPLE
AT YOUR TABLE**

This Week's Question: What exactly is inside hot peppers that makes them so spicy?

Lesson Goal

- Different substances are made from different atoms or molecules, which interact with each other in many ways
- Different substances dissolve in different liquids or solvents.

All physical substances are made of atoms

PERIODIC TABLE OF ELEMENTS

PubChem

1 H Hydrogen Nonmetal																	2 He Helium Noble Gas															
3 Li Lithium Alkali Metal	4 Be Beryllium Alkaline Earth Metal																	5 B Boron Metalloid	6 C Carbon Nonmetal	7 N Nitrogen Nonmetal	8 O Oxygen Nonmetal	9 F Fluorine Halogen	10 Ne Neon Noble Gas									
11 Na Sodium Alkali Metal	12 Mg Magnesium Alkaline Earth Metal																	13 Al Aluminum Post-Transition Metal	14 Si Silicon Metalloid	15 P Phosphorus Nonmetal	16 S Sulfur Nonmetal	17 Cl Chlorine Halogen	18 Ar Argon Noble Gas									
19 K Potassium Alkali Metal	20 Ca Calcium Alkaline Earth Metal	21 Sc Scandium Transition Metal	22 Ti Titanium Transition Metal	23 V Vanadium Transition Metal	24 Cr Chromium Transition Metal	25 Mn Manganese Transition Metal	26 Fe Iron Transition Metal	27 Co Cobalt Transition Metal	28 Ni Nickel Transition Metal	29 Cu Copper Transition Metal	30 Zn Zinc Transition Metal	31 Ga Gallium Post-Transition Metal	32 Ge Germanium Metalloid	33 As Arsenic Metalloid	34 Se Selenium Nonmetal	35 Br Bromine Halogen	36 Kr Krypton Noble Gas															
37 Rb Rubidium Alkali Metal	38 Sr Strontium Alkaline Earth Metal	39 Y Yttrium Transition Metal	40 Zr Zirconium Transition Metal	41 Nb Niobium Transition Metal	42 Mo Molybdenum Transition Metal	43 Tc Technetium Transition Metal	44 Ru Ruthenium Transition Metal	45 Rh Rhodium Transition Metal	46 Pd Palladium Transition Metal	47 Ag Silver Transition Metal	48 Cd Cadmium Transition Metal	49 In Indium Post-Transition Metal	50 Sn Tin Post-Transition Metal	51 Sb Antimony Metalloid	52 Te Tellurium Metalloid	53 I Iodine Halogen	54 Xe Xenon Noble Gas															
55 Cs Cesium Alkali Metal	56 Ba Barium Alkaline Earth Metal																	72 Hf Hafnium Transition Metal	73 Ta Tantalum Transition Metal	74 W Tungsten Transition Metal	75 Re Rhenium Transition Metal	76 Os Osmium Transition Metal	77 Ir Iridium Transition Metal	78 Pt Platinum Transition Metal	79 Au Gold Transition Metal	80 Hg Mercury Transition Metal	81 Tl Thallium Post-Transition Metal	82 Pb Lead Post-Transition Metal	83 Bi Bismuth Post-Transition Metal	84 Po Polonium Metalloid	85 At Astatine Halogen	86 Rn Radon Noble Gas
87 Fr Francium Alkali Metal	88 Ra Radium Alkaline Earth Metal																	104 Rf Rutherfordium Transition Metal	105 Db Dubnium Transition Metal	106 Sg Seaborgium Transition Metal	107 Bh Bohrium Transition Metal	108 Hs Hassium Transition Metal	109 Mt Meitnerium Transition Metal	110 Ds Darmstadtium Transition Metal	111 Rg Roentgenium Transition Metal	112 Cn Copernicium Transition Metal	113 Nh Nihonium Post-Transition Metal	114 Fl Flerovium Post-Transition Metal	115 Mc Moscovium Post-Transition Metal	116 Lv Livermorium Post-Transition Metal	117 Ts Tennessine Halogen	118 Og Oganesson Noble Gas
																		57 La Lanthanum Lanthanide	58 Ce Cerium Lanthanide	59 Pr Praseodymium Lanthanide	60 Nd Neodymium Lanthanide	61 Pm Promethium Lanthanide	62 Sm Samarium Lanthanide	63 Eu Europium Lanthanide	64 Gd Gadolinium Lanthanide	65 Tb Terbium Lanthanide	66 Dy Dysprosium Lanthanide	67 Ho Holmium Lanthanide	68 Er Erbium Lanthanide	69 Tm Thulium Lanthanide	70 Yb Ytterbium Lanthanide	71 Lu Lutetium Lanthanide
																		89 Ac Actinium Actinide	90 Th Thorium Actinide	91 Pa Protactinium Actinide	92 U Uranium Actinide	93 Np Neptunium Actinide	94 Pu Plutonium Actinide	95 Am Americium Actinide	96 Cm Curium Actinide	97 Bk Berkelium Actinide	98 Cf Californium Actinide	99 Es Einsteinium Actinide	100 Fm Fermium Actinide	101 Md Mendelevium Actinide	102 No Nobelium Actinide	103 Lr Lawrencium Actinide

1
H
Hydrogen
Nonmetal

Atomic Number

S

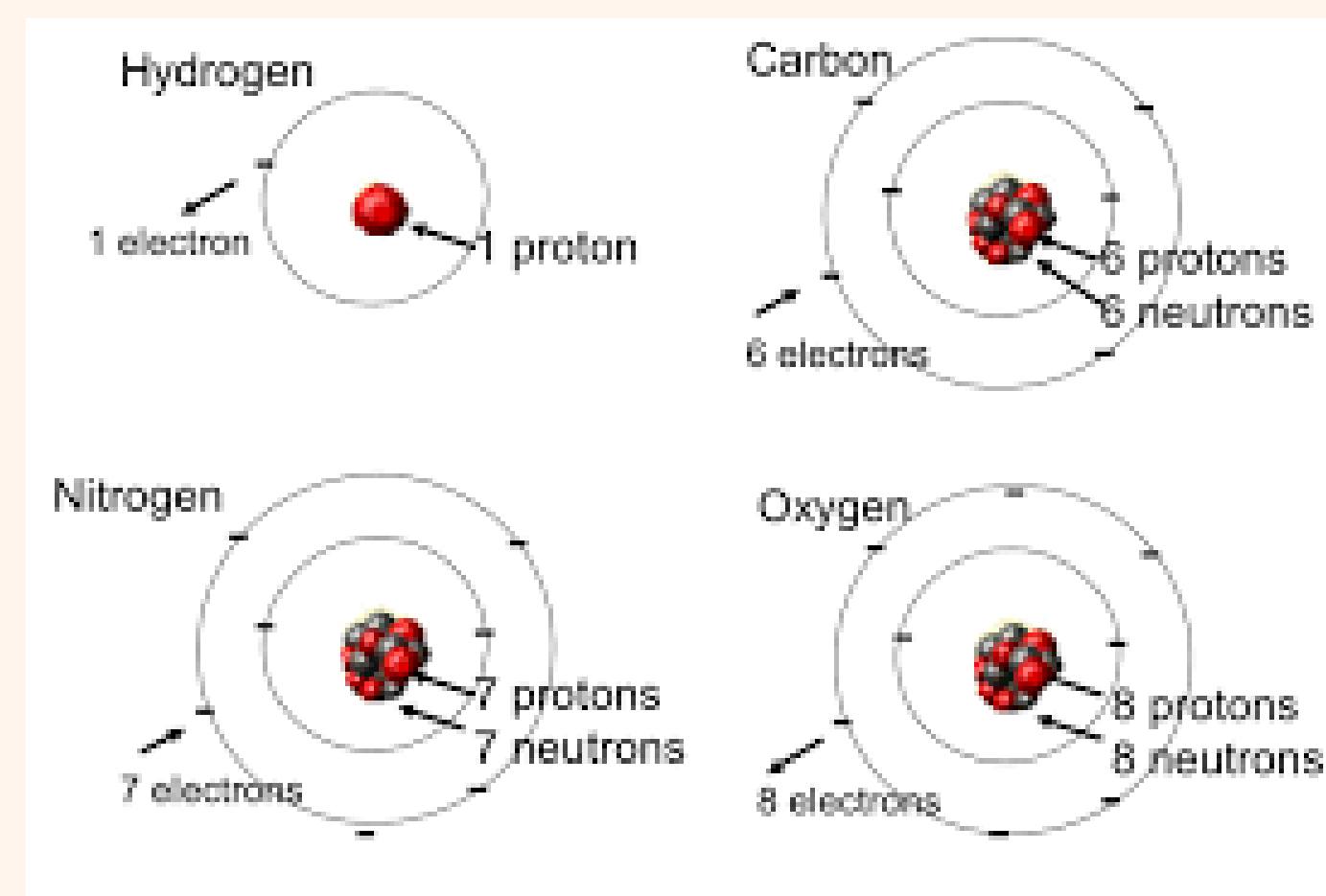
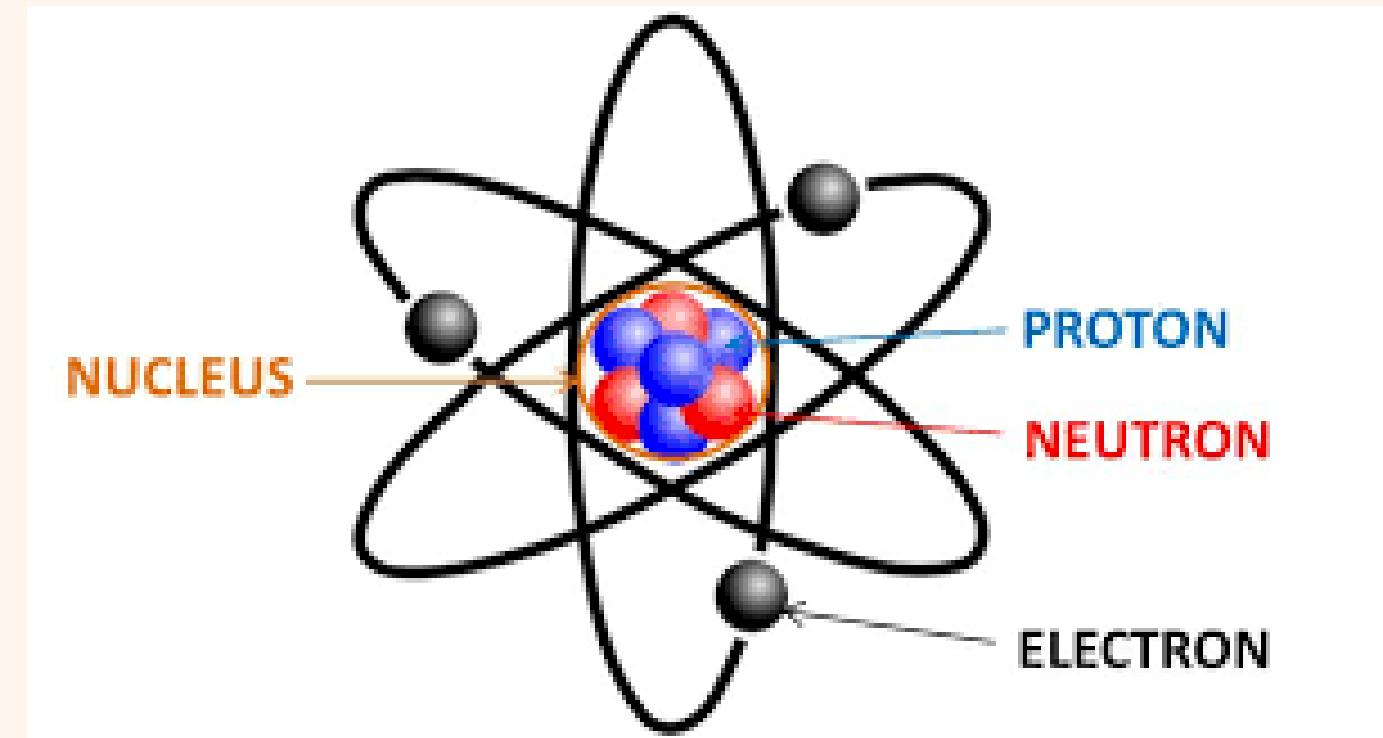
Group Block

An atom is made of 3 primary components

Protons - In the center of the nucleus. Has a positive electrical charge

Neutrons - In the nucleus of the atom. Has no charge

Electrons - Negative electrical charge Same number of electrons as protons. Exists as a "cloud" around the nucleus



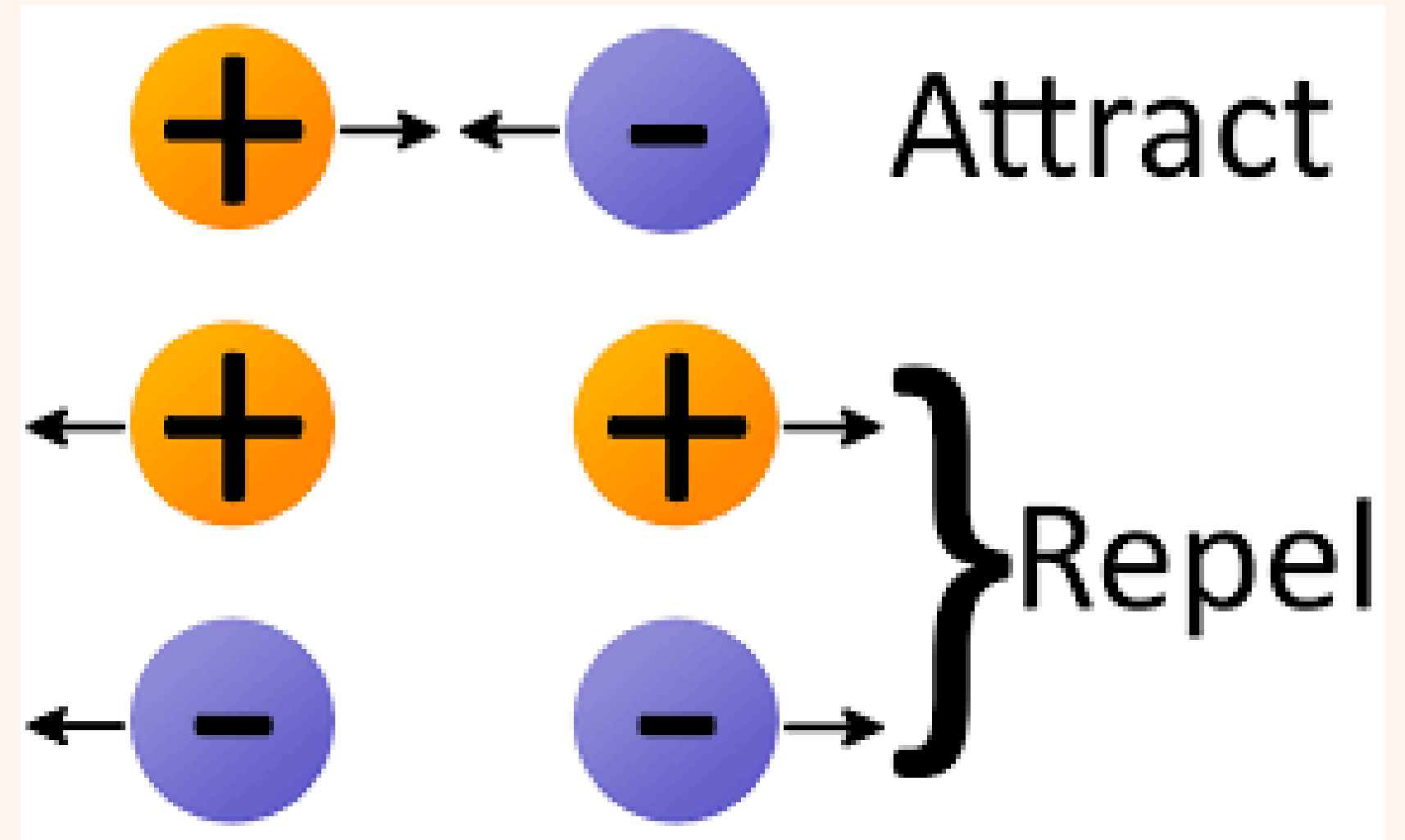
Opposites Attract!

Positive protons repel other protons

Negative electrons repel electrons

BUT

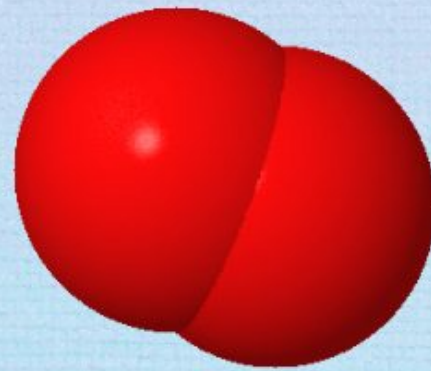
Protons and electrons attract each other



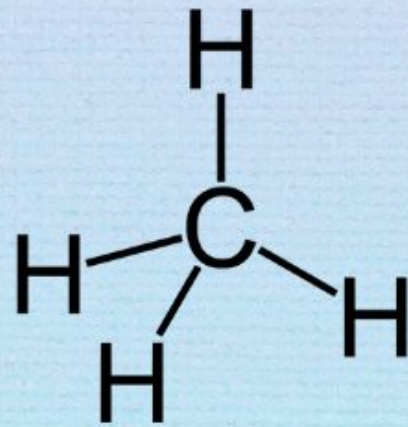
The electrical charge of atoms can pull them together to make a molecule

What Is a Molecule?

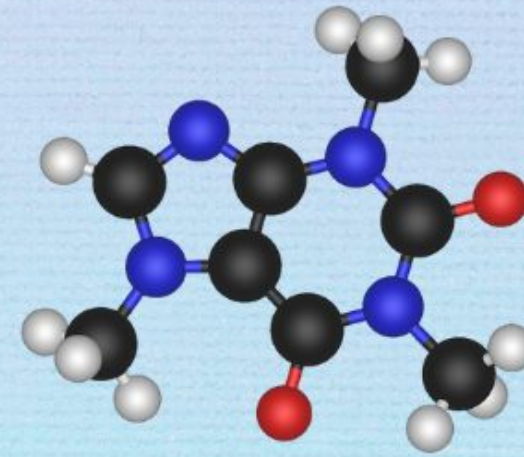
A MOLECULE IS AN ELECTRICALLY NEUTRAL GROUP OF ATOMS JOINED TOGETHER BY CHEMICAL BONDS



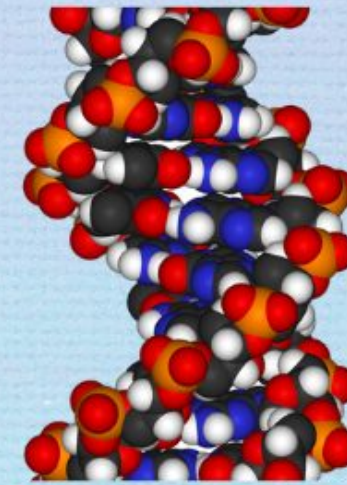
Oxygen



Methane



Caffeine



DNA

A molecule may consist of two atoms of the same element or many atoms of different elements.

RECIPROCAL READING!

Tuesday, May 24

Sit with your research group and take out yesterday's What is Solubility article.

Everyone should also have today's Solubility Lab Worksheet

Read the article to define the following terms:

1. Solubility
2. Dissolve
3. Like-Dissolves-Like
4. Polar Molecule
5. Non-polar Molecule

ASSEMBLE INTO GROUP ROLES!

Sit at a table with your research group. Look at the roles below and nominate each member for a role until everyone in your group knows their position.



TEAM CAPTAIN

- The group's main point of contact with the teacher when there are questions.
- Can leave the table to gather materials and tools from the teacher.
- Makes sure members are staying on task.



TECHNICIAN

- The only team member allowed to handle dangerous materials.
- The only member allowed to use specialized or hazardous tools.
- Must wear personal protective equipment (PPE) at all times.



REPORTER

- Asks team members to clarify their ideas.
- Collects ideas and observations from each group member
- Reports findings and team conclusions at the end of class.



DATA ANALYST

- Gathers and writes down experimental data
- Keeps research papers tidy and organized.
- Communicates major findings with other groups.

Beating the Heat!

What makes hot chili peppers so spicy?

Yesterday's lesson goal: We learned that substances made of different atoms or molecules can interact with each other differently.

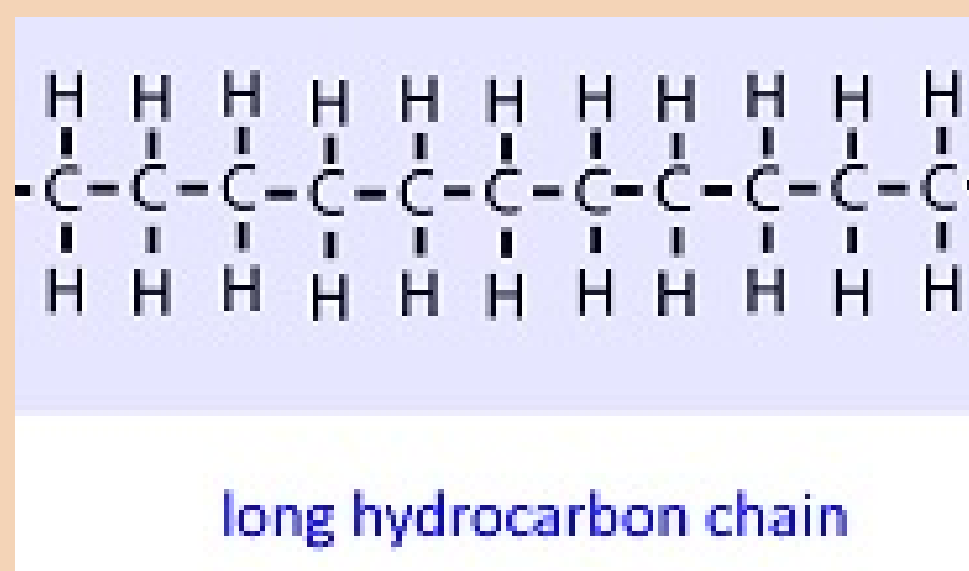
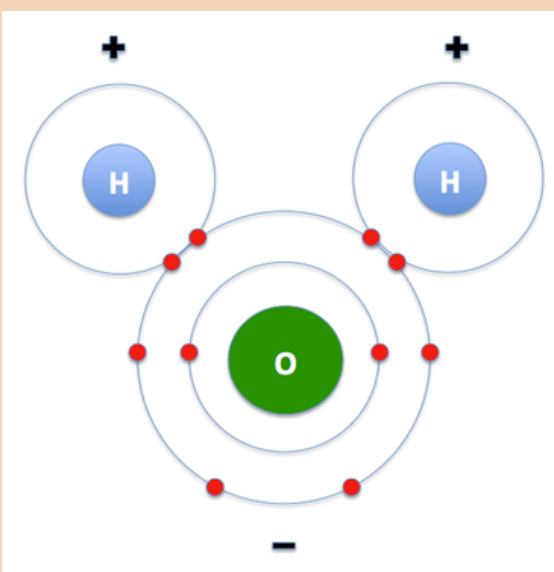
By the end of class, we'll be able to decide what liquid we should use to separate spice from chili peppers

FRIDAY, MAY 27: WARMUP

Polarity is the uneven sharing of electrons on a molecule which results in a positive charge on one side and a negative charge on the other.

A **non-polar molecule** evenly distributes its electrons so there is no strong charge on one end or another.

Decide which image below represents a polar or non-polar molecule



2-2-Q DISCUSSION

THANK YOU FOR YOUR FEEDBACK!

Concerns

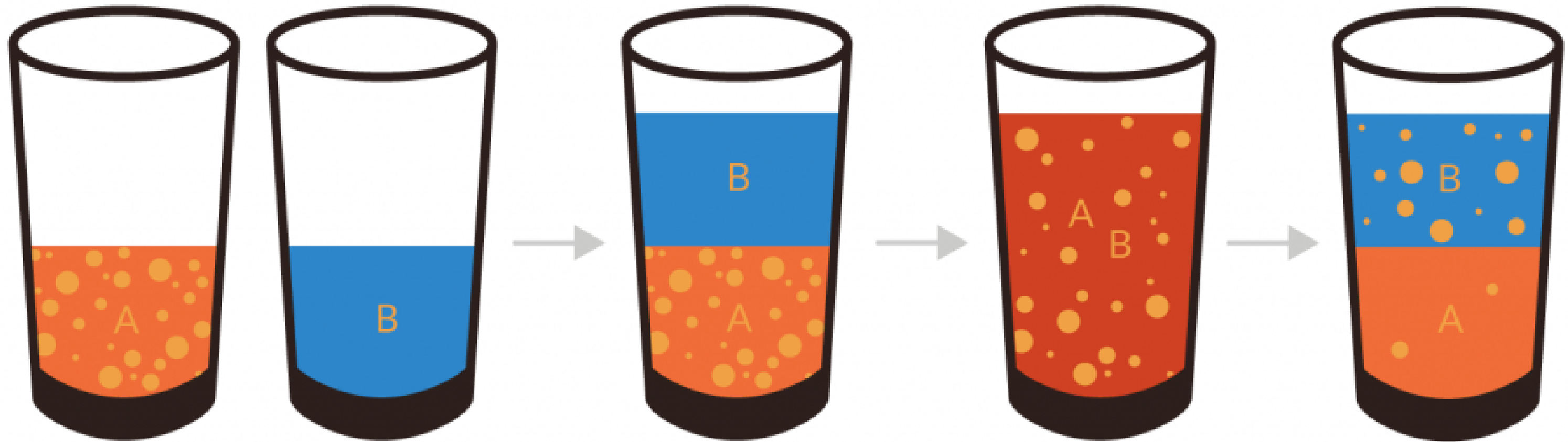
- Not all roles were hands-on
- Some groups needed more time to finish labs
- Some vocabulary and concepts still unclear.
- A lot of writing

Celebrations

- Understandable explanations and instructions
 - The experiments were interesting and fun!
 - Most teams worked well together
 - Hypotheses were sometimes right
-

QUESTIONS FROM LAST LAB

THE EXTRACTION PROCESS



STEP ONE:
A contains solute to extract

STEP TWO:
Add both liquids together

STEP THREE:
Shake it up

STEP FOUR:
Wait, A and B will separate,
and the solute will be
extracted into B



FRIDAY, JUNE 3 - SCIENCE

Sit with your research groups.

Match the following terms with their definitions below:

Polar
Solubility
Solvent

Extraction
Dissolve
Solute

Like-dissolve-like
Non-polar
Capsaicin

The molecule in chili peppers responsible for making them spicy

A process to separate a desired substance from a mixture

When something has completely mixed with its solvent

Similar substances tend to mix better with themselves than with opposites

Uneven sharing of electrons along a molecule

Even sharing of electrons across a molecule

Something that dissolves when placed in a liquid

A substance, often a liquid into which some things dissolve

The ability of a substance to completely dissolve in a solvent.

The story so far...

1. Phenomena and Question Making
2. Design a Scientific Investigation
3. Salsa Making
4. Solubility & Polarity
5. Extraction

Essential Question: What makes chili peppers spicy?

Agenda::

Warm up

Review

Solvent Evaporation

Post taxes on DP

Today's Lesson Goal:

Develop a method and process to separate alcohol from capsaicin.

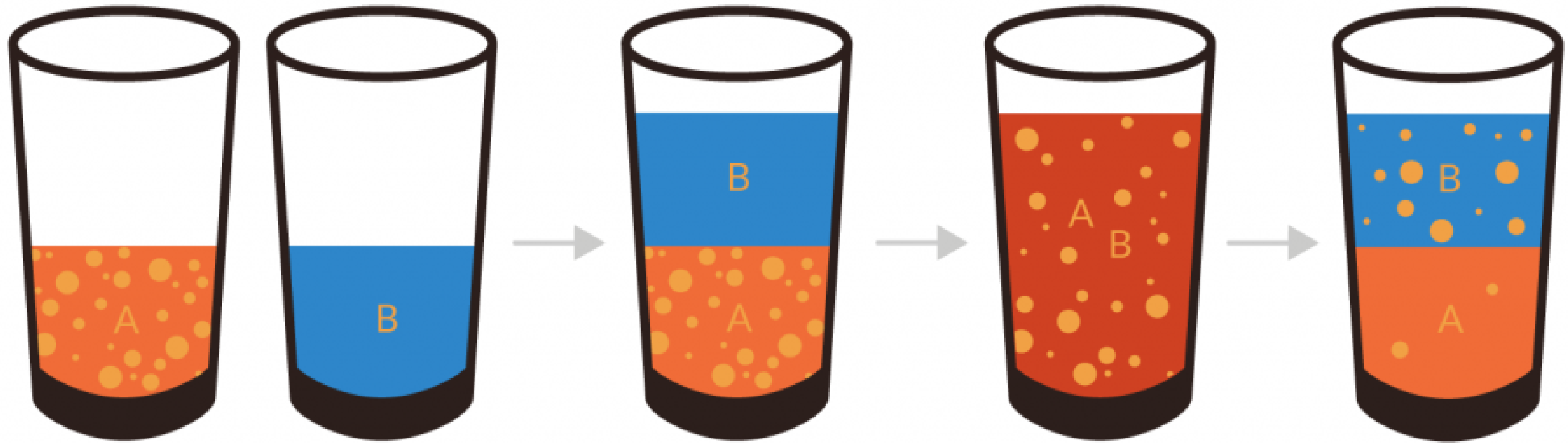
Understand how evaporation can be used to separate different liquids.



CONGRATULATIONS!
YOU'VE LEARNED REAL SCIENTIFIC SKILLS!



THE EXTRACTION PROCESS



STEP ONE:
A contains solute to extract

STEP TWO:
Add both liquids together

STEP THREE:
Shake it up

STEP FOUR:
Wait, A and B will separate,
and the solute will be
extracted into B



EVAPORATING THE SOLVENT



Evaporation - The conversion of liquid into its gas form.

Different liquids evaporate at different temperatures and liquids with lower boiling points evaporate faster.

Boiling point of Ethanol: 173 °F

Boiling Point of Capsaicin: 410 °F

HOW CAN WE EVAPORATE THE SOLVENT CONTAINING OUR CAPSAICIN?

	<u>SINGLE</u>	<u>MARRIED</u>	<u>KIDS</u>
RENT:			
PHONE:	\$125	\$250	
SDGE:	\$130	\$260	
CABLE:	\$65		
MAINT:	\$250 (OWN)		
CAR:	DONE BY YOU	\$210	
CAR INS:	\$105		
LICENSING	\$86	\$172	
FUEL	\$120	\$240	
INSURANCE HOME	\$107	\$107	
HEALTH	\$400	\$800	
FOOD	DONE BY YOU		
CHILDREN MEDICAL		INCLUDED WITH CAREER	
CLOTHING			\$50
CHILDCARE			\$950 FOR 1 1400 FOR 2
TOYS			\$30
PETS			
FOOD	\$50		
MEDICAL	\$50		
TOYS	\$20		
PERSONAL			
HAIR/NAILS	\$25	\$50	
CLOTHING	\$160	\$320	
DRY CLEANING	\$10	\$20	
HEALTH CLUB	\$30	\$60	

ENTERTAINMENT

SPOTIFY	\$10	
MOVIES	\$15	\$30
CONCERTS	\$90 PER CONCERT	SO \$7.5 PER MONTH
SPORTING EVENTS	\$90 PER	\$7.5 PER MONTH
NETELIX	\$15	
PRIME	\$9	
HULU	\$7	
DISNEY +	\$8	
HBO MAX	\$10	

LOANS

PUT YOUR COLLEGE LOAN HERE

SAVINGS

WHATEVER YOU HAVE LEFT