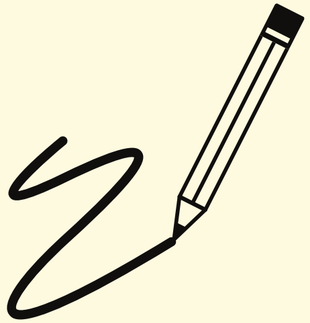
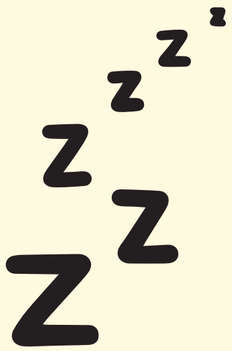
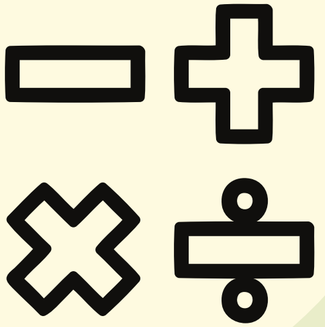
Exploring Hot Peppers

KBAR

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





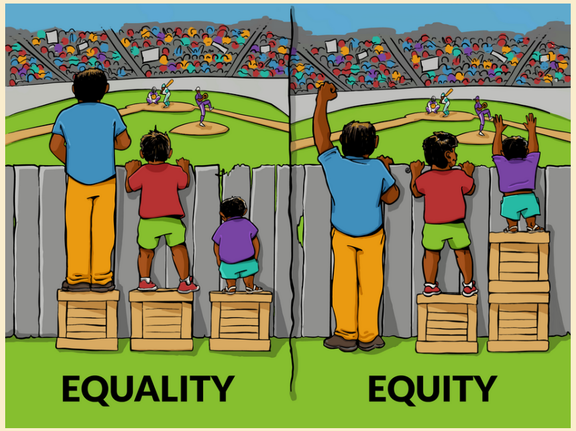


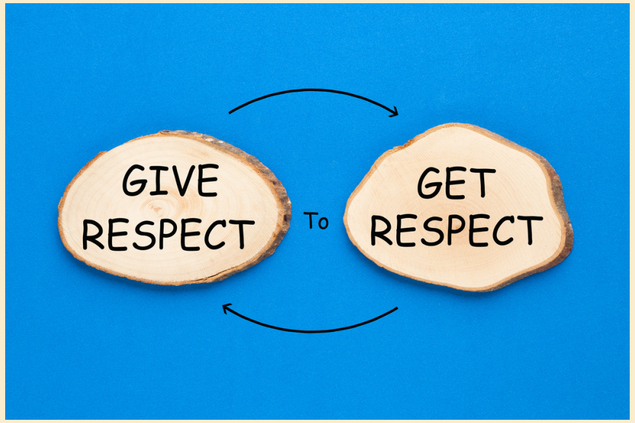
NO PHONES!

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?

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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. . .

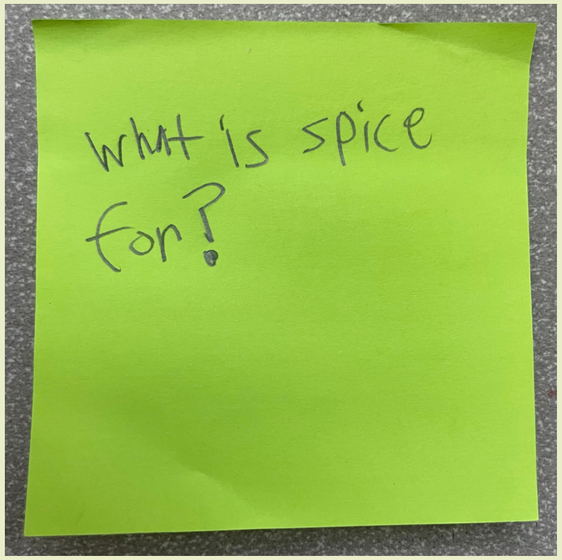
- Some people didn't react
- Faces turning bright red
- Some eyes were watering
- Mucous and snot coming from their faces
- One performer was beginning to vomit
- Some performers appeared distracted and couldn't focus on playing the music.
- Some performers touched their faces
- The music changed

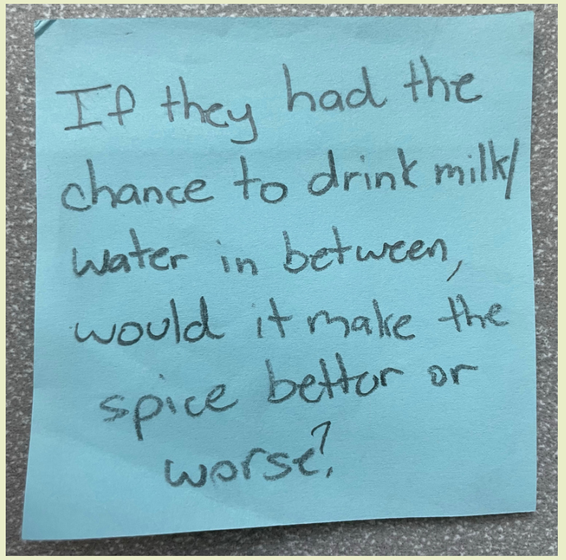
I Noticed. . .

- 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.

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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 THINK THE ANSWER TO YOUR QUESTION WILL BE AND WHY?

METHOD

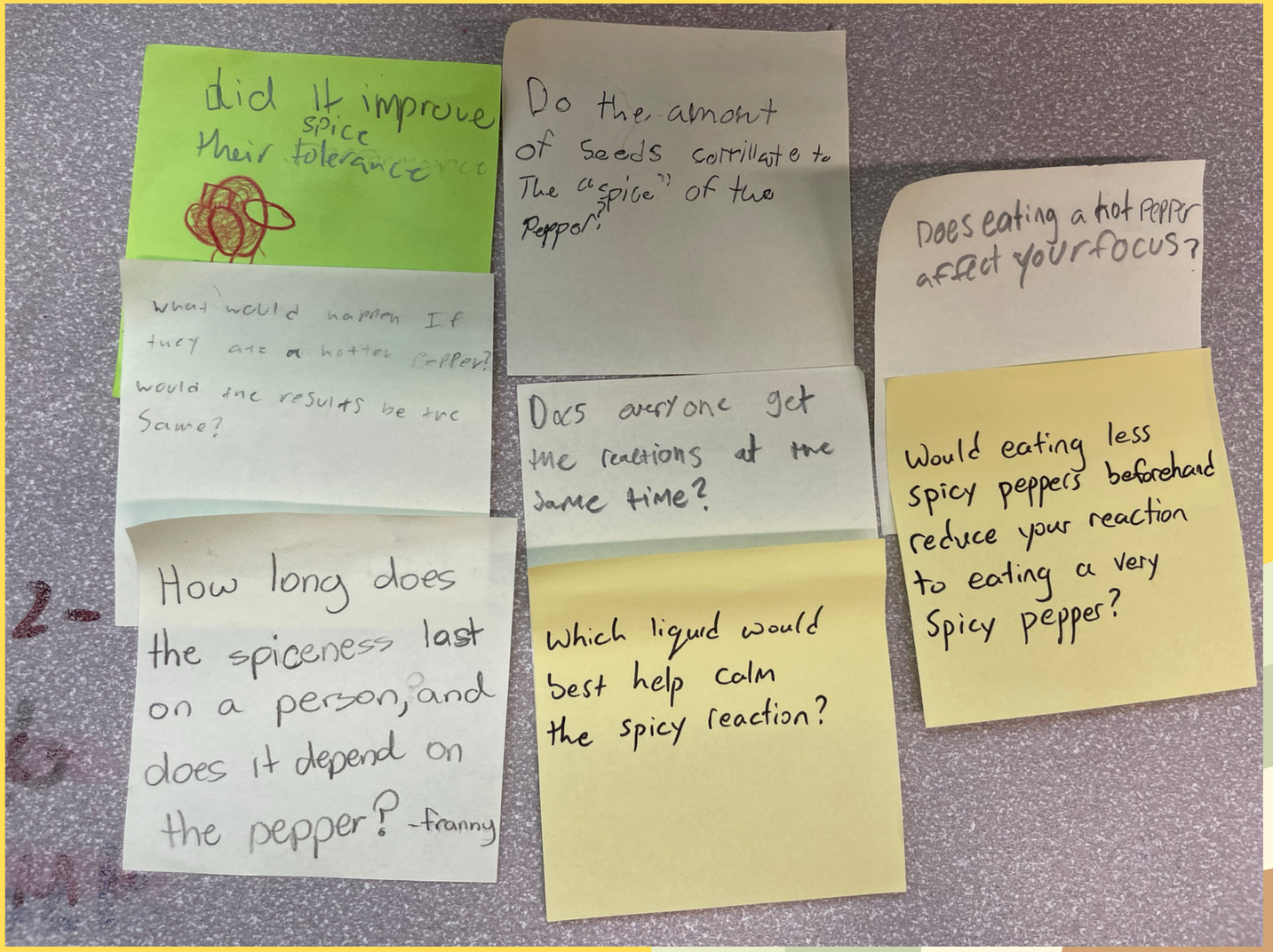
MAKE A DETAILED PLAN TO TEST YOUR HYPOTHESIS

DATA

RECORD YOUR EXPERIMENTS 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

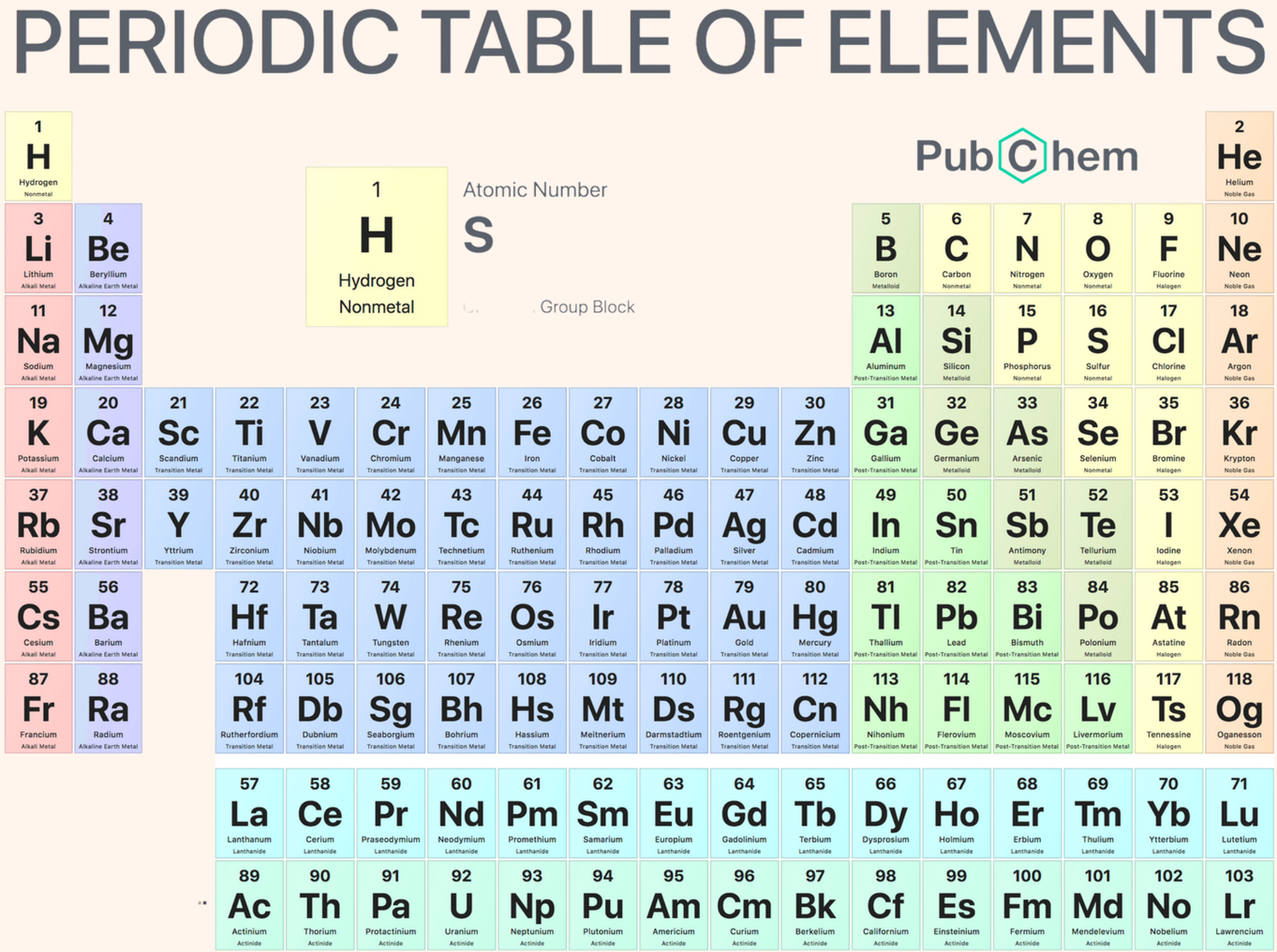
This Week's Question: What exactly is inside hot peppers that makes them so spicy?

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

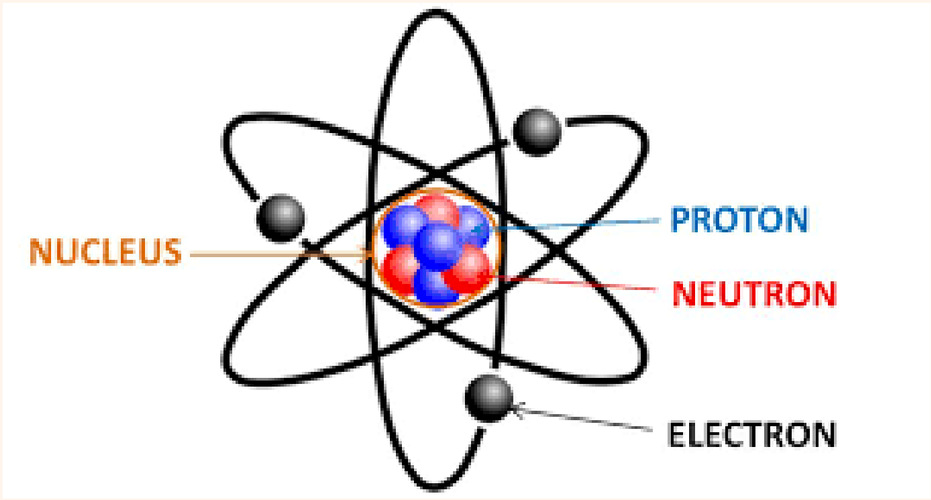


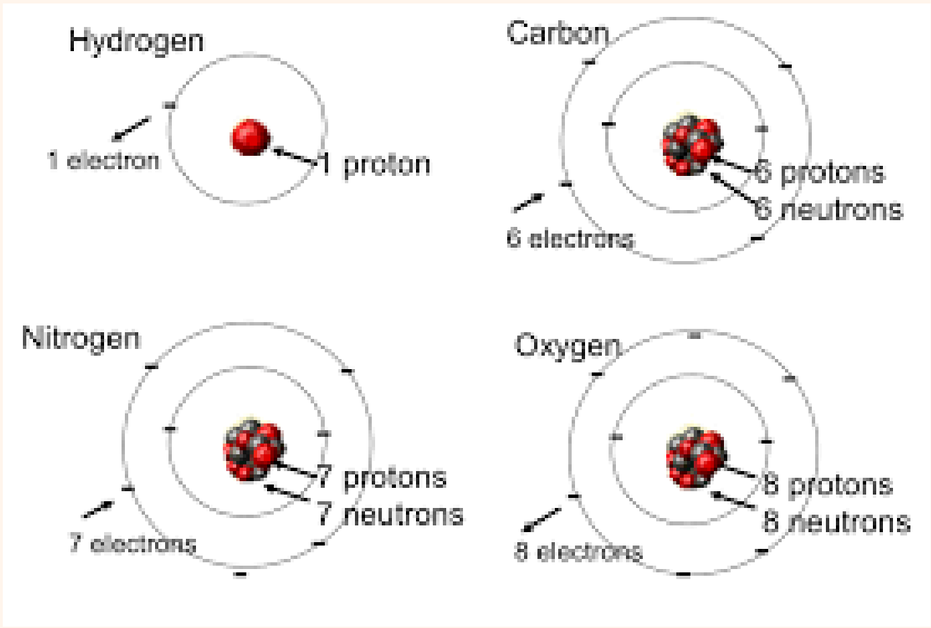
An atom is made of 3 primary components

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





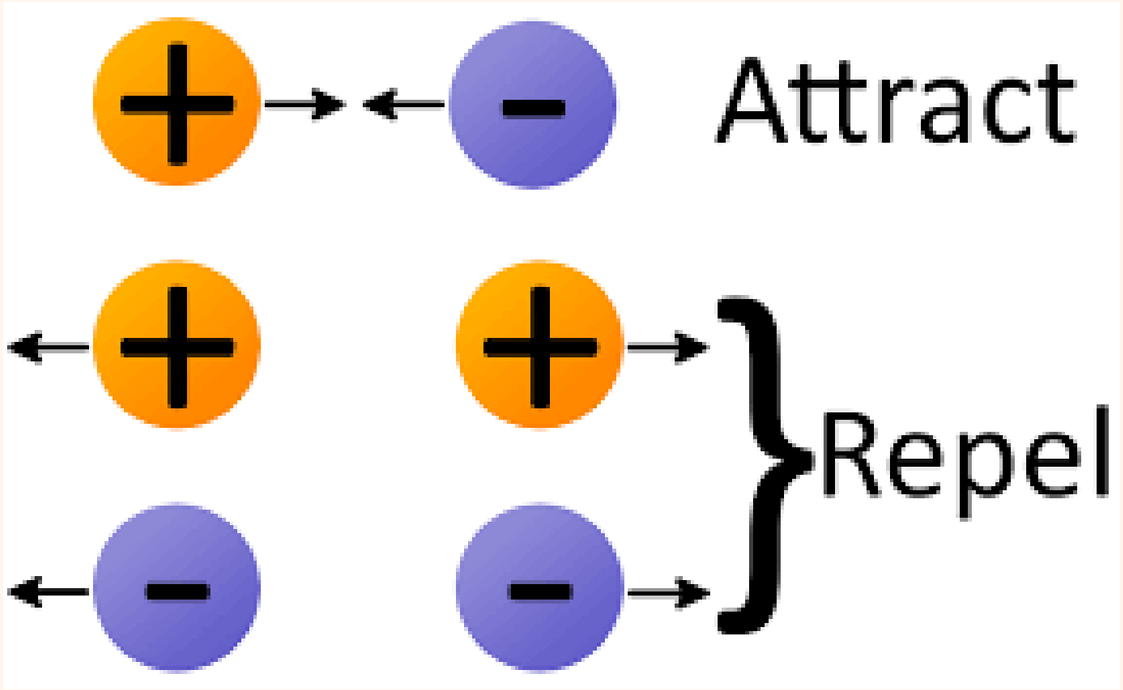
Opposites Attract!

Positive protons repel other protons

Negative electrons repel electrons

BUT

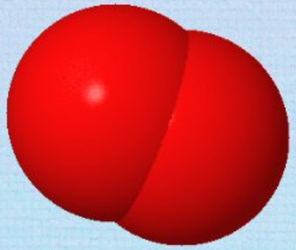
Protons and electrons attract each other



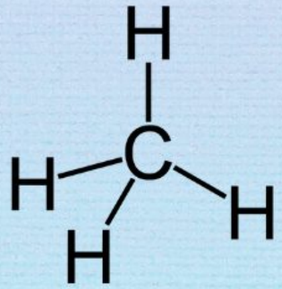
The electrical charge of atoms can pull them together to make a molecule

What Is a Molecule?

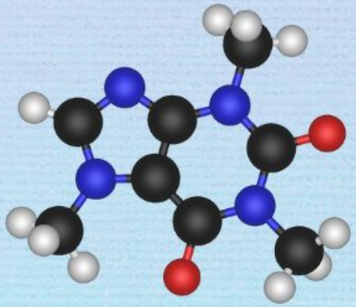
A MOLECULE IS AN ELECTRICALLY NEUTRAL GROUP
OF ATOMS JOINED TOGETHER BY CHEMICAL BONDS



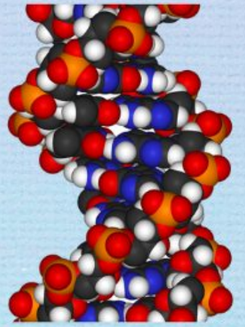
Oxygen



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.

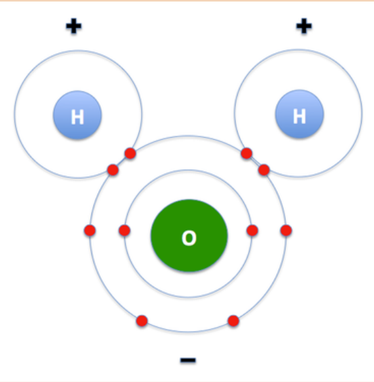
By the end of class, we'll be able to decide what liquid we should use to separate spice from chili peppers

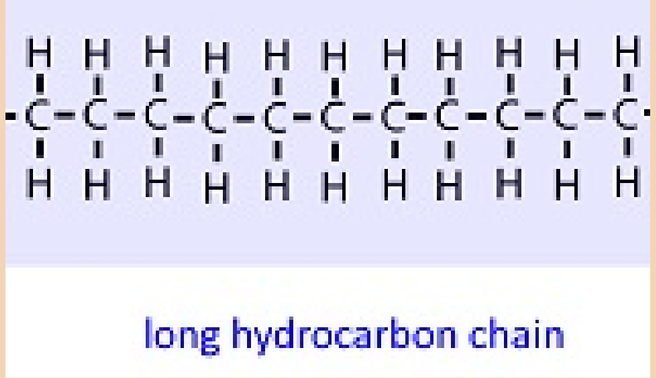
FRIDAY, MAY 27: WARMUP

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

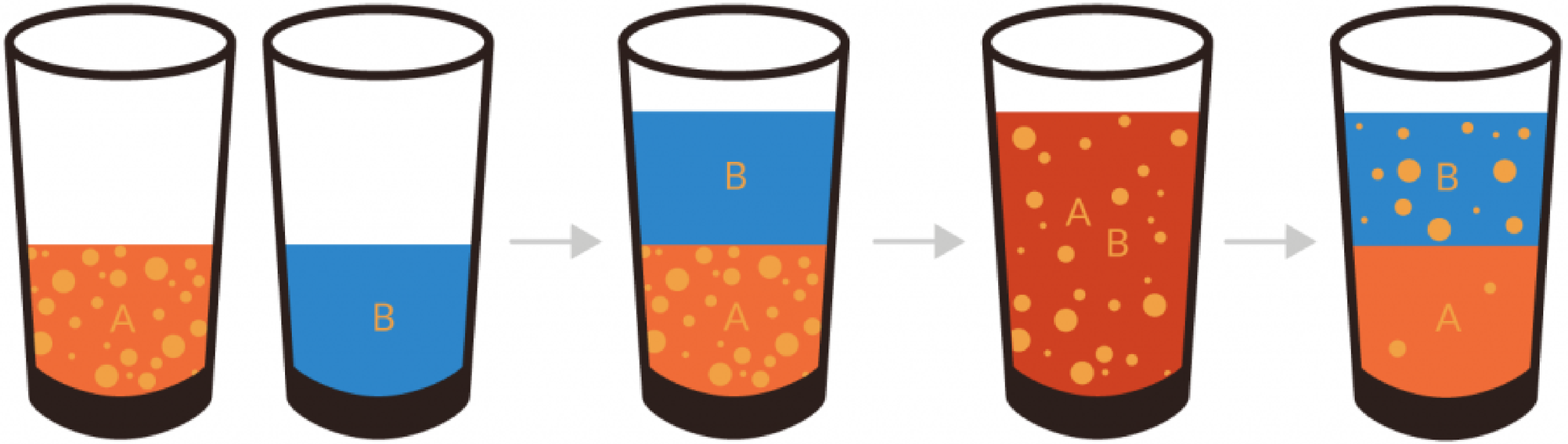
- Not all roles were hands-on
- Some groups needed more time to finish labs
- Some vocabulary and concepts still unclear.
- A lot of writing

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	**Extraction**	**Like-dissolve-like**
Solubility	**Dissolve**	**Non-polar**
Solvent	**Solute**	**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 bettter 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:

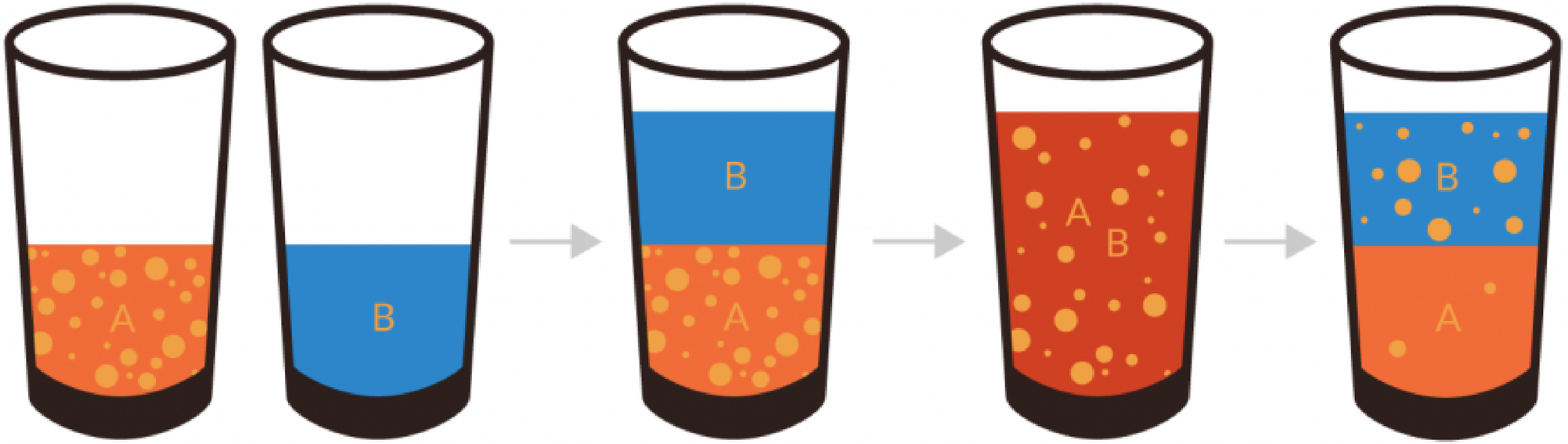
Develop a method and process to separate alcohol from capsaicin.

Understand how evaporation can be used to separate different liquids.

CONGRATULATIONS!

YOU'VE LEARNED REAL SCIENTIFIC SKILLS!

THE EXTRACTION PROCESS



STEP ONE:
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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?

	SINGLE	MARRIED	KIDS
RENT:			
PHONE:	$125	$250	
SOGE:	$130	$260	
CABLE:	$65		
MAINT:	$250 (OWN)		
CAR:	DONE BY YOU		
CAR INS:	$105	$210	
LICENSING	$86	$172	
FUEL	$120	$240	
INSURANCE			
HOME	$107	$107	
HEALTH	$400	$800	
FOOD	DONE BY YOU		
CHILDREN			
MEDICAL	INCLUDED WITH CAREER		$50
CLOTHING			$950 FOR 1 1400 FOR 2
CHILDCARE			$30
TOYS			
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	
NETFLIX	$15	
PRIME	$9	
HULU	$7	
DISNEY +	$8	
HBO MAX	$10	

LOANS

PUT YOUR COLLEGE LOAN HERE

SAVINGS

WHATEVER YOU HAVE LEFT