

Chemistry
Syllabus
Scavenger
Hunt

Honors Chemistry

Mrs. Harry, Kecoughtan High School, Room 233

E-mail: sdharry@hampton.k12.va.us

YouTube Channel Name: Stephanie Harry

See Mrs. Harry for your Group code to join Edmodo for your class.

Phone: 757-848-2170

The information in this syllabus is subject to change.

Purpose:

Chemistry is the science, which deals with the composition of matter including the many physical and chemical changes, which matter undergoes, and experiments concerning such topics as the gas laws, acid, bases, solutions, and structure of matter.

Prerequisites: 1 credit of Algebra I

REQUIRED MATERIALS:

- Scientific Calculator (must have LOG key) - [recommend Texas Instruments TI-30 series], Large 3-ring Notebook, Paper (loose leaf), Pens and Pencils, Headphones, 3x5 index cards, Safety Rules & Contract (kept in binder at all times).

NOTE: YOU MAY NOT USE

- A calculator "app" (pda, cell phone, mp3 player, laptop, etc.) you must use an actual calculator or
- A graphing calculator.

Textbook and/or eTextbook (available through Parent Portal)

Pearson Chemistry, Virginia Edition 2013, by Wilberham, Staley, Matta, and Waterman. Replacement cost \$120.00.

Hampton City Schools Grading Scale GPA Weights Effective SY 2012-2013				
LETTER	NUMERICAL SPAN	Un-weighted GPA WT	Honors (3) GPA WT	AP and IB GPA WT
A	93-100	4.0	4.5	5.0
A-	90-92	3.7	4.2	4.7
B+	87-89	3.3	3.8	4.3
B	83-86	3.0	3.5	4.0
B-	80-82	2.7	3.2	3.7
C+	77-79	2.3	2.8	3.3
C	73-76	2.0	2.5	3.0
C-	70-72	1.7	2.2	2.7
D	64-69	1.0	1.5	2.0
F	Below 64	0	0	0

Weight of Grades (Hampton City Schools Department of Chemistry)		
	1 st & 3 rd Quarter	2 nd & 4 th Quarter
Tests & Projects	40%	40%
Quizzes	25%	25%
Coursework	30%	35%
Critical Skills Assessment (CSA)	5%	Counts as part of exam grade

Tutoring

Tutoring is available Tuesday/ Wednesday afterschool until 3:50 PM.

Paid tutor: Contact Dr. Willie Darby, Associate Professor at Hampton University, at 757-727-5249 or via email at willie.darby@hamptonu.edu.

MAKE-UP WORK (HCS Policies JED & JGDA)

Students must make up work missed due to absences. Make-up work can be requested while the student is out, if more than two (2) days, or must be requested from the teacher as soon as the student returns. The class work must be made up within a specific time period equaling one-day make-up per one-day absence. In case of a prearranged absence the class work is due on the day of return. Students are encouraged to make up work before returning to school. Students missing one (1) or two (2) days may do so by getting work from a classmate. Students missing three (3) or more days can contact the office to request make-up work. Please allow at least 24 hours notice to the teacher. Extenuating circumstances may be considered in extending the time for make-up. If work is not completed, it will result in a lower grade, failing grade, or denial of high school credits.

Additional Make-up Work Guidelines (Mrs. Harry Policy)

If you are going to be or have been absent, it is **YOUR** responsibility to check the homework board, Absentee folder and retrieve missing worksheets from the bin the 1st day you return to class. If you have any questions or concerns

Please see Mrs. Harry at the end of class block.

At the discretion of the teacher, tests, quizzes, and labs will be made up after school, and/or during your scheduled class. Late work may be accepted at the teacher's discretion.

Classroom Rules:

1. Bring materials to class **EVERYDAY**.
2. **Chemistry is a lab science course** therefore you should come to every class dressed appropriately for lab (See safety contract). Follow all instructions, especially in the laboratory.
3. **All Hampton City Schools rules will be enforced.**
4. Follow teachers' rules.

Quarter	Topic(s)	Chapter(s) covered	Time Allotted
First Quarter	Unit 1: Intro. to Chemistry & Measurements	1 & 3	8 blocks
	Unit 2: Atomic Structure	4, 7.1 & 9.1	7 blocks
	Unit 3: Periodic Table	6	5 blocks
Second Quarter	Unit 4: Bonding and Nomenclature	7, 8, & 9	7 blocks
	Unit 5: The Mole	10	5 blocks
	Unit 6: Chemical Reactions	11	4 blocks
	Unit 7: Stoichiometry	12	5 blocks
Third Quarter	Unit 8: Matter and Energy	2, 13, 17.1-17.3	6 blocks
	Unit 9: Gas Laws	14	4 blocks
	Unit 10: Water & Solutions	15 & 16	6 blocks
	Unit 11: Acids & Bases	19	6 blocks
Fourth Quarter	Unit 12: Electron Configuration	5	5 blocks
	Unit 13: Redox & Electrochemistry	20 & 21	4 blocks
	Unit 14: Nuclear Chemistry	25	4 blocks
	Unit 15: Reaction Rates & Equilibrium	18	4 blocks
	Unit 16: Organic Chemistry	22, 23, 24	5 blocks

Name _____ Date _____ Block _____

CHEMISTRY SYLLABUS SCAVENGER HUNT

Purpose: The purpose of this activity is to familiarize the student with the information contained within the class syllabus, student safety contract, sci-bucks, and ion survival guide.

DIRECTIONS: USE YOUR CLASS SYLLABUS, STUDENT SAFETY CONTRACT, SCI-BUCKS, AND ION SURVIVAL GUIDE TO LOCATE THE ANSWERS TO THIS WORKSHEET. FOR TRUE/FALSE QUESTIONS, IF THE ANSWER IS FALSE PROVIDE THE CORRECT INFORMATION TO MAKE THE STATEMENT TRUE.

1. What date will the element test be administered? _____
2. What special function is required for the scientific calculator?

3. Which two types of calculators cannot be used in this course?

4. The only time students can request makeup work is when the student returns to class. (True/False) _____

5. If you don't use any of your sci-bucks what is the maximum number of points that will be added to your final grade at the end of the marking period? (Circle one)
a) 1 b) 4 c) 2 d) 0
6. What are the three consequences that can result for students not completing work?

7. How much does it cost to turn in late homework for full credit?

8. What is the specific amount of time students have for completing missed classwork due to their absence?

9. For the 2nd quarter Coursework is worth 30% of the final grade. (True/False)

10. Per Mrs. Harry Make-Up Work policy, it is the teachers' responsibility to give you your missed work, hand you your missed worksheets from the bin and check the Absentee folder. (True/False) _____

11. Student can expect to cover how many units during the 2nd quarter? (Circle one)
a) 3 b) 4 c) 6 d) 9

12. Approximately how many blocks will be used to cover Acids & Bases Unit?

13. What is the title of the Chemistry book used for this course?

14. Where should students keep the student safety contract?

15. Every student has been given \$40 worth of Sci-Bucks for this quarter. (True/False)

16. How much time does a student have to submit late work and have it graded for full credit? _____

17. How much does it cost to retake a quiz for higher grade?

18. What two skills must you be able to complete to receive full credit on the Element test? _____

19. For homework you are required to watch the Science Lab Safety video. Where can you find the link for this video? _____

20. Mrs. Harry is available for tutoring Thursday after school (True/False) _____

Three- Dimensional (3D) Unit Cell

Name _____ Date _____ Due Date _____

Three Dimensional (3D) Unit Cell

A crystal is rigid body in which the constituent particles are arranged in a repeating pattern. The simplest unit of repetition in this arrangement is called the unit cell. Crystals can be formed from solutions, melts or vapors. If the given substance is pure, with other conditions being constant, the crystals will always have the same shape and pattern. X-ray crystallography is a method used to determine the internal arrangement of ions, atoms, or molecules.

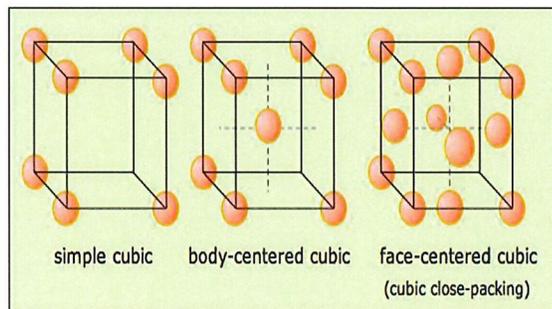
In this activity you will build unit cells to show the 3D arrangements of some of these crystals.

EQUIPMENT AND MATERIALS

- ~ Small gumdrops
- ~ Toothpicks
- ~ Tape and/or glue
- ~ 6 –three dimensional cutouts (provided by teacher)

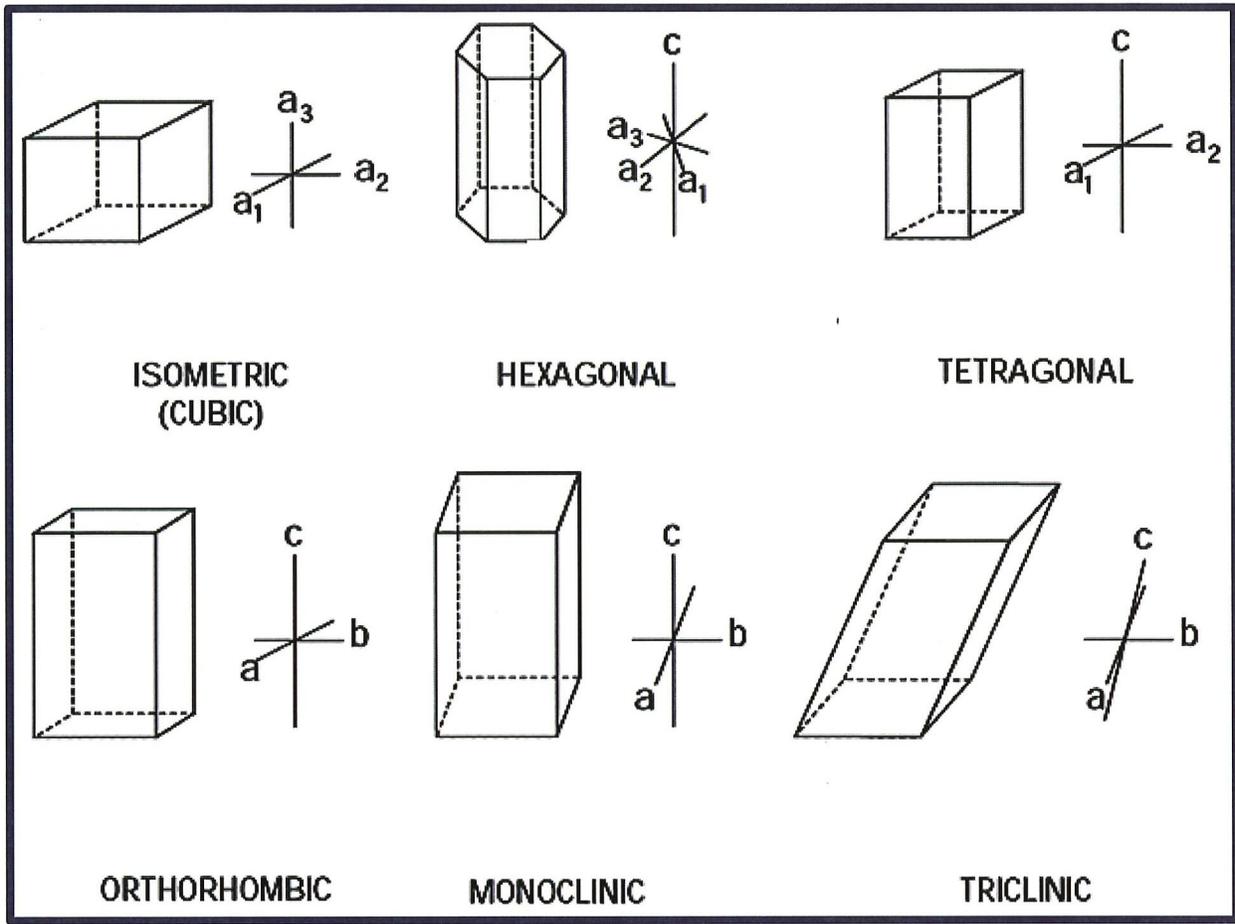
PROCEDURES:

1. Part 1: Using gumdrops and toothpicks, construct the following unit cells: simple cubic, body-centered cubic, and face-centered cubic (see images). *You are not permitted to use any other materials to construct or hold your structures together.*
2. Use glue or tape to attach the correct label to each unit cell.
3. Place the unit cells in a shoebox or small cardboard box (only acceptable containers) to bring to class for grading purposes. Your full name and block must be clearly marked on top of the box.
4. Part 2: Use the color key, provided by your teacher and color the six 3D cutouts. Cut along the solid lines and fold along the dotted lines for each 3D unit cell cutout. Use glue and/or tape hold the 3D units together.
5. Using only the Unit Cell chart, provided by teacher, identify and label (attach using glue or tape) each 3D unit cell. Place each 3D unit cell inside shoe box or small cardboard box (Step 3) and bring to class on due date for grading.
6. This assignment is worth 100 points and the rubric has been included. This sheet should be placed in the shoebox/cardboard box. Your grade will be recorded on the rubric.



Cutout	Color (color the entire structure)
A	
B	
C	
D	
E	
F	

[https://chem.libretexts.org/Textbook_Maps/General_Chemistry_Textbook_Maps/Map%3A_Chem1_\(Lower\)/07%3A_Solids_and_Liquids/7.08%3A_Cubic_Lattices_and_Close_Packing](https://chem.libretexts.org/Textbook_Maps/General_Chemistry_Textbook_Maps/Map%3A_Chem1_(Lower)/07%3A_Solids_and_Liquids/7.08%3A_Cubic_Lattices_and_Close_Packing)



<http://www.snipview.com/q/Hexagonal%20crystal%20system>

THREE-DIMENSIONAL UNIT CELL RUBRIC

Part I: Unit Cell Constructions (42 points)

- A. Correctness/sturdiness etc.... of structure (21 points) _____
- B. Neatness of structure (9 points) _____
- C. Labeling of structures (12 points) _____

Subtotal _____

Part II: Cutout Unit Cells (58 points)

- A. Colored correctly/completely (6 points) _____
- B. Correctness of structures: taping/gluing, assembling (18 points) _____
- C. Labeling of structures (30 points) _____
- D. Following overall directions (4 points) _____

Subtotal _____

Total _____

Name _____ Date _____ Due Date _____

Teacher Information

When I first gave this assignment, I had each of the cutouts printed on color paper. But this can be costly, so students were given black and white copy of the cutouts and they had to color in each cutout using my assigned color chart. This made it very easy to grade.

Here is the Key for the cutouts:

Cutout	Label
A	Isometric (cubic)
B	Triclinic
C	Hexagonal
D	Orthorhombic
E	Monoclinic
F	Tetragonal

By assigning each letter a color it makes grading accuracy of the name easier. If A is supposed to be colored red, then when it's turned in it should be labelled Isometric (cubic).

Dimensional Analysis Lab

Name _____ Date _____ Block _____

Partner(s): _____

Dimensional Analysis Lab A

Virginia SOL's covered

CH.1eSj – Read measurements record data, reporting the significant digits of the measuring equipment.

CH.1gSt – Perform calculations according to significant digits rules.

CH.1gSu – Convert measurements using dimensional analysis.

CH.1eSw – Read a measurement from a graduated scale, stating measured digits plus the estimated digit.

CH.1gSp – Use common SI prefixes and their values (milli-, centi-, kilo-) in measurements and calculations

Directions: Collect the measurement for each station, using only the equipment provided. Use dimensional analysis (only) to solve each calculation. Show your work for each calculation. Final answer must have correct unit and significant figures.

Station 1: Length of Goggle Sanitizer Cabinet

Find the length of the goggle sanitizer cabinet in miles. Return ruler back to station #1.

Station 2: Mass of LARGE paper clip

Find the mass of the paper clips in pounds.

Station 3: Volume of Container A

Find the volume of the container A in gallons.

Station 4: Temperature of your armpit

Find the temperature of your armpits in Kelvins. (Kelvin = °C + 273)

Station 5: Length of time to solve word puzzle (Version A)

Find the maximum length of time it takes you to find 5 words in the word search puzzle, in years.
(Teacher must sign off puzzle when you complete it).

Name _____ Date _____ Block _____

Partner(s): _____

Dimensional Analysis Lab B

Virginia SOL's covered

CH.1eSj – Read measurements record data, reporting the significant digits of the measuring equipment.

CH.1gSt – Perform calculations according to significant digits rules.

CH.1gSu – Convert measurements using dimensional analysis.

CH.1eSw – Read a measurement from a graduated scale, stating measured digits plus the estimated digit.

CH.1gSp – Use common SI prefixes and their values (milli-, centi-, kilo-) in measurements and calculations

Directions: Collect the measurement for each station, using only the equipment provided. Use dimensional analysis (only) to solve each calculation. Show your work for each calculation. Final answer must have correct unit and significant figures.

Station 1: Length of a fire extinguisher

Find the length of the fire extinguisher in miles. Return ruler back to station #1

Station 2: Mass of binder clip

Find the mass of the binder clip in pounds.

Station 3: Volume of Container B

Find the volume of the container B in gallons.

Station 4: Temperature of your armpit

Find the temperature of your armpits in Kelvins. (**Kelvin = °C + 273**)

Station 5: Length of time to solve word puzzle (Version B)

Find the maximum length of time it takes you to find 5 words in the word search puzzle, in years. **(Teacher must sign off puzzle when you complete it).**

Name _____ Date _____ Block _____

Partner(s): _____

Dimensional Analysis Lab C

Virginia SOL's covered

CH.1eSj – Read measurements record data, reporting the significant digits of the measuring equipment.

CH.1gSt – Perform calculations according to significant digits rules.

CH.1gSu – Convert measurements using dimensional analysis.

CH.1eSw – Read a measurement from a graduated scale, stating measured digits plus the estimated digit.

CH.1gSp – Use common SI prefixes and their values (milli-, centi-, kilo-) in measurements and calculations

Directions: Collect the measurement for each station, using only the equipment provided. Use dimensional analysis (only) to solve each calculation. Show your work for each calculation. Final answer must have correct unit and significant figures.

Station 1: Length of a Broken Glass Container (on top of lab bench)

Find the length of the broken glass container in miles. Return ruler back to station #1.

Station 2: Mass of *SMALL* paper clip

Find the mass of the paper in pounds.

Station 3: Volume of Container C

Find the volume of the container C in gallons.

Station 4: Temperature of your armpit

Find the temperature of your armpits in Kelvins. (Kelvin = °C + 273)

Station 5: Length of time to solve word puzzle (Version C)

Find the maximum length of time it takes you to find 5 words in the word search puzzle, in years. (Teacher must sign off puzzle when you complete it).

Name _____ Date _____ Block _____

Partner(s): _____

Dimensional Analysis Lab D

Virginia SOL's covered

CH.1eSj – Read measurements record data, reporting the significant digits of the measuring equipment.

CH.1gSt – Perform calculations according to significant digits rules.

CH.1gSu – Convert measurements using dimensional analysis.

CH.1eSw – Read a measurement from a graduated scale, stating measured digits plus the estimated digit.

CH.1gSp – Use common SI prefixes and their values (milli-, centi-, kilo-) in measurements and calculations

Directions: Collect the measurement for each station, using only the equipment provided. Use dimensional analysis (only) to solve each calculation. Show your work for each calculation. Final answer must have correct unit and significant figures.

Station 1: Length of First Aid Kit

Find the length of the first aid kit in miles. Return ruler back to station #1.

Station 2: Mass of binder clip

Find the mass of the binder clip in tons.

Station 3: Volume of Container D

Find the volume of the container D in gallons.

Station 4: Temperature of your armpit

Find the temperature of your armpits in Kelvins. (**Kelvin = °C + 273**)

Station 5: Length of time to solve word puzzle (Version D)

Find the maximum length of time it takes you to find 5 words in the word search puzzle, in years. **(Teacher must sign off puzzle when you complete it).**

**Atomic
Structure Lab
“Journey into
the Atom”**

Name: _____ Period: _____
Lab Partner: _____ Date: _____

Atomic Structure – A Journey into the Atom

Introduction:

Atoms are composed of subatomic particles, such as the protons and the neutrons, which make up the nucleus of the atom and are similar in mass, and electrons, which are found orbiting the nucleus in an electron, cloud and have a negligible mass. All atoms contain the same kinds of particles but may differ in the number of each particle. This accounts for the presence of isotopes and ions for the different elements.

This activity will allow you to use what you know about the composition of the atom, as well as isotopes and ions, to describe sixteen atoms. The atoms are contained in Ziploc bags and the subatomic particles are coded as follows.

Protons – black beans
Neutrons – white beans
Electrons – popcorn

Purpose:

CH.2aSa – Determine the atomic number, atomic mass, the number of protons, and the number of electrons of any atom of a particular element using a periodic table.

Equipment:

Materials:

Ziploc bags representing atoms

Procedure:

Analyze each Ziploc bag (atom) and record its vital statistics in the data table provided.

Data Analysis:

1. List all sets of isotopes. How do you know they are isotopes?
2. List all sets of ions. How do you know they are ions?

Name: _____ Period: _____
Lab Partner: _____ Date: _____

Atomic Structure – A Journey into the Atom –*Teacher Notes*

Description

This activity will allow students to use what they know about the composition of the atom, as well as isotopes and ions, to describe sixteen atoms. The atoms are contained in Ziploc bags and the subatomic particles are coded as follows.

Protons – black beans
Neutrons – white beans
Electrons – popcorn

Time Frame: 50 minutes (1 class period)

Materials: Sixteen Ziploc bags representing atoms with different combinations of beans and popcorn.

Procedures: See student handout. Atomic Structure – A Journey into the Atom.

Teacher Talk: Prepare Ziploc bags as follows

- #1: 6 black beans, 6 white beans, 6 popcorn
- #2: 1 black beans, 1 white beans, 1 popcorn
- #3: 1 black beans, 2 white beans, 1 popcorn
- #4: 6 black beans, 8 white beans, 6 popcorn
- #5: 7 black beans, 7 white beans, 7 popcorn
- #6: 7 black beans, 8 white beans, 7 popcorn
- #7: 1 black beans, 1 white beans, 0 popcorn
- #8: 7 black beans, 7 white beans, 10 popcorn
- #9: 19 black beans, 21 white beans, 19 popcorn
- #10: 19 black beans, 19 white beans, 19 popcorn
- #11: 19 black beans, 19 white beans, 18 popcorn
- #12: 8 black beans, 8 white beans, 8 popcorn
- #13: 8 black beans, 8 white beans, 10 popcorn
- #14: 15 black beans, 17 white beans, 15 popcorn
- #15: 11 black beans, 13 white beans, 11 popcorn
- #16: 11 black beans, 13 white beans, 10 popcorn

Extensions: Propose the following question to students.

Sometimes isotopes that are radioactive are used as medical tracers to detect disease. One of the most useful is iodine-131 which is used to detect abnormalities in the thyroid gland. The isotope can even be used to treat thyroid cancer since the radioactivity destroys cancer cells. Cancers that cannot be treated with an internalized radioisotope may utilize cobalt-60 for external radiotherapy. How would these two very useful isotopes and their non-radioactive states be represented using the coding system?

**Scientific
Notation
Matching
Race**

Scientific Notation Matching Race

Created by Stephanie Harry

I came up with this game to (1) as a formative assessment for converting numbers to and from scientific notation (2) fun way to get my students and me up and moving.

Materials:

3x5 index cards – I used cards four different colors
Marker

Teacher set-up

I created four sets of cards. One set for each group. I chose to use different color index cards for each group. Each group has 10 cards to match. On one card I wrote a number in scientific notation and on another index card I wrote the number in standard form.

Special Tips:

1. I had my cards laminated to help preserve them. You could also cover the index cards with clear packing tape.
2. I chose to write the standard form on the lined side of the index card and the scientific notation on the back of the card. However, I did switch this set-up in between index colors. *See image below.*
3. To ensure understanding of when the exponent is positive or negative I created cards, with similar numbers, however one number was less than one and the other was not. *See image below.*

Disclaimer: I own the rights to this activity. You are not permitted to sell this idea/game/concept.

Game Instructions:

1. I strategically placed students in groups. Using my students' score on a previous formative assessment, I created mixed skill level groups.
2. Because of the weather, I had to create an open space in my classroom to play this game. **See Layout for Game** below.
3. I placed all the scientific notation cards, for each group, on the floor. You can decide if you would like to have the cards face up or face down.
4. The first person, in the group, takes a paper clip and a standard form index card, from their group pile. They had to locate the correct match, paperclip, and turn in the two cards together. The next team member could not begin until this was completed. The team will rotate each member until all cards have been matched.
5. Team members may consult their group for help but: a) only one group member allowed in gaming area at a time; b) team member can not allow another team member to obtain the correct card for them; c) team member

can not bring game cards to the group and ask question "Is this the match to this card".

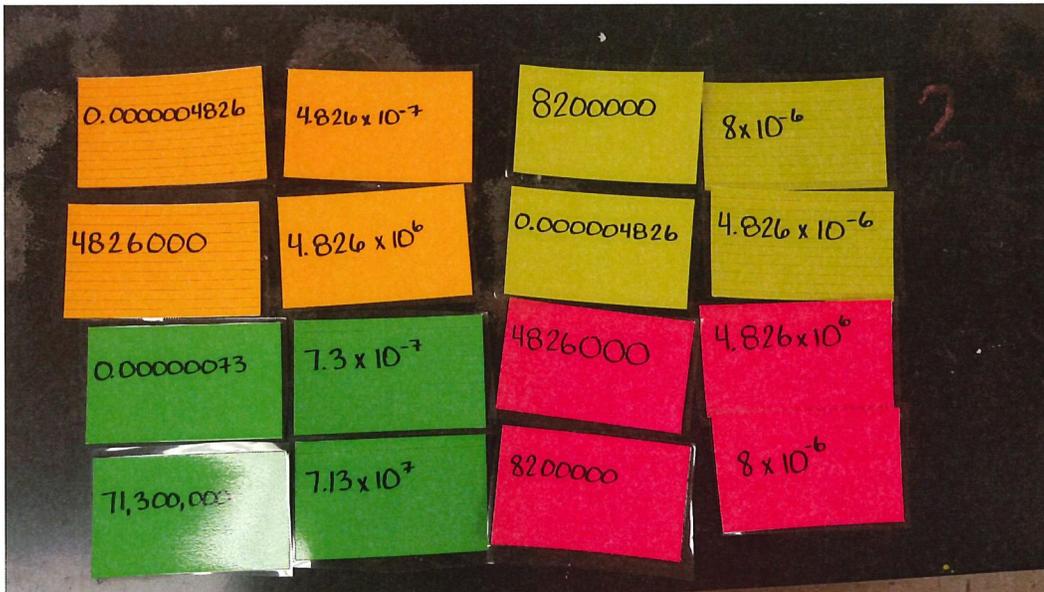
6. Points:

- 1st team to match all cards = 50 points; 2nd team = 40 points; 3rd team = 35 points; 4th team = 30 points
- Each card matched correctly (determined by teacher) = 5 points each (50 points total)
- Each card matched incorrectly = - 5 points each (maximum of - 50 points)
- Team members working together as a group = 20 points maximum
- Group following game instructions. = 20 points

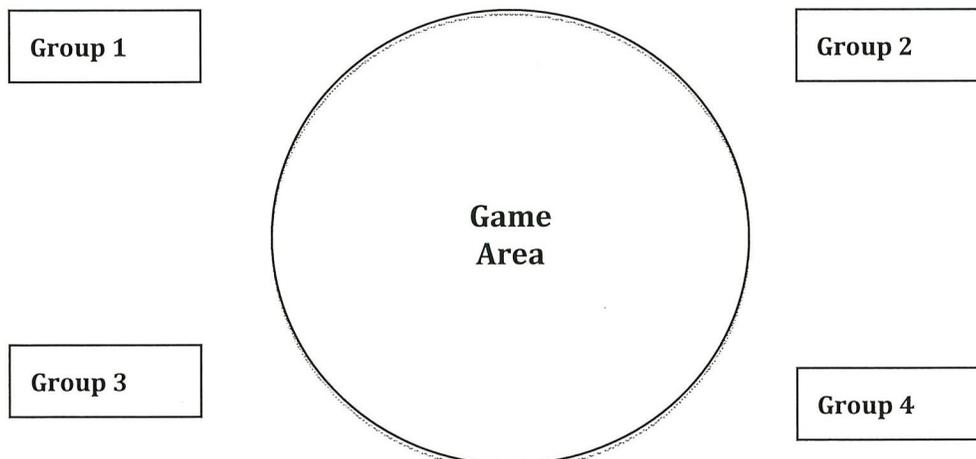
Team with most points wins

7. Have fun and feel free to make adjustments to the game....I know I will 😊😊😊

Sample of index cards



Layout for Game



Cards for the Game

4826000

4.826×10^6

4.826×10^{-6}

0.000004826

5.8×10^{-8}

5.8×10^8

5800000000

0.0000000058

6.98×10^4

6.98×10^{-4}

69800

0.000698

6.9×10^5

690000

6.9×10^{-2}

0.069

2.66×10^7

26600000

2.6×10^{-7}

0.00000026