LAB: TRENDS ON THE PERIODIC TABLE
Group 1

OBJECTIVE: To show a trend in certain atomic properties such as ionization energy, electronegativity and atomic radius.

PROCEDURE:

1. Obtain a cell plate and a card with the A group elements typed on it and obtain straws.

2. Measure and cut the straws with scissors to represent the lengths listed for ionization energy in the table below. Be sure to pay attention to the scale for each.**IN ALL THREE PARTS, BE SURE TO ADD 1 CM TO THE LENGTH OF EACH STRAW TO COMPENSATE FOR THE DEPTH OF THE CELL**

   Scale for Ionization Energy: divide the number given by 1000. This equals the number of cm.

3. Put the straws in the appropriate spaces on the well plate as they are cut.

Element	Ionization Energy	Electronegativity	Atomic radius
H	1310	2.1	.32
He	2370		.31
Li	519	1.0	1.23
Be	900	1.5	.89
B	799	2.0	.82
C	1090	2.5	.77
N	1400	3.0	.74
O	1310	3.5	.70
F	1680	4.0	.68
Ne	2080		.67
Na	494	0.9	1.54
Mg	736	1.2	1.36

LAB: TRENDS ON THE PERIODIC TABLE
Group 2

OBJECTIVE: To show a trend in certain atomic properties such as ionization energy, electronegativity and atomic radius.

PROCEDURE:

1. Obtain a cell plate and a card with the A group elements typed on it and obtain straws.

2. Measure and cut the straws with scissors to represent the lengths listed for electronegativity in the table below. Be sure to pay attention to the scale for each.**IN ALL THREE PARTS, BE SURE TO ADD 1 CM TO THE LENGTH OF EACH STRAW TO COMPENSATE FOR THE DEPTH OF THE CELL**

   Scale for Electronegativity and Atomic radius: value given equals the number of cm.

3. Put the straws in the appropriate spaces on the well plate as they are cut.

Element	Ionization Energy	Electronegativity	Atomic radius
H	1310	2.1	.32
He	2370		.31
Li	519	1.0	1.23
Be	900	1.5	.89
B	799	2.0	.82
C	1090	2.5	.77
N	1400	3.0	.74
O	1310	3.5	.70
F	1680	4.0	.68
Ne	2080		.67
Na	494	0.9	1.54

LAB: TRENDS ON THE PERIODIC TABLE
Group 3

OBJECTIVE: To show a trend in certain atomic properties such as ionization energy, electronegativity and atomic radius.

PROCEDURE:

1. Obtain a cell plate and a card with the A group elements typed on it and obtain straws.

2. Measure and cut the straws with scissors to represent the lengths listed for atomic radius in the table below. Be sure to pay attention to the scale for each.**IN ALL THREE PARTS, BE SURE TO ADD 1 CM TO THE LENGTH OF EACH STRAW TO COMPENSATE FOR THE DEPTH OF THE CELL**

   Scale for Electronegativity and Atomic radius: value given equals the number of cm.

3. Put the straws in the appropriate spaces on the well plate as they are cut.

Element	Ionization Energy	Electronegativity	Atomic radius
H	1310	2.1	.32
He	2370		.31
Li	519	1.0	1.23
Be	900	1.5	.89
B	799	2.0	.82
C	1090	2.5	.77
N	1400	3.0	.74
O	1310	3.5	.70
F	1680	4.0	.68
Ne	2080		.67
Na	494	0.9	1.54

LAB: TRENDS ON THE PERIODIC TABLE
Group 4

OBJECTIVE: To show a trend in certain atomic properties such as ionization energy, electronegativity and atomic radius.

PROCEDURE:

1. Obtain a sheet of graph paper and a set of colored pencils.

2. Label the x axis atomic number and the y axis ionization energy.

3. Be sure to number the x and y axis; remembering to adjust the scale so that all numbers will fit.

4. Plot the data points for the elements listed below. Be sure to use a different color pencil for each group. (for example: all group IA are red dots, and all group IIA are blue dots, etc.)

Element	Ionization Energy	Electronegativity	Atomic radius
H	1310	2.1	.32
He	2370		.31
Li	519	1.0	1.23
Be	900	1.5	.89
B	799	2.0	.82
C	1090	2.5	.77
N	1400	3.0	.74
O	1310	3.5	.70
F	1680	4.0	.68
Ne	2080		.67
Na	494	0.9	1.54
Mg	736	1.2	1.36

LAB: TRENDS ON THE PERIODIC TABLE
Group 5

OBJECTIVE: To show a trend in certain atomic properties such as ionization energy, electronegativity and atomic radius.

PROCEDURE:

1. Obtain a sheet of graph paper and a set of colored pencils.

2. Label the x axis atomic number and the y axis electronegativity.

3. Be sure to number the x and y axis; remembering to adjust the scale so that all numbers will fit.

4. Plot the data points for the elements listed below. Be sure to use a different color pencil for each group. (for example: all group IA are red dots, and all group IIA are blue dots, etc.)

Element	Ionization Energy	Electronegativity	Atomic radius
H	1310	2.1	.32
He	2370		.31
Li	519	1.0	1.23
Be	900	1.5	.89
B	799	2.0	.82
C	1090	2.5	.77
N	1400	3.0	.74
O	1310	3.5	.70
F	1680	4.0	.68
Ne	2080		.67
Na	494	0.9	1.54
Mg	736	1.2	1.36

LAB: TRENDS ON THE PERIODIC TABLE
Group 6

OBJECTIVE: To show a trend in certain atomic properties such as ionization energy, electronegativity and atomic radius.

PROCEDURE:

1. Obtain a sheet of graph paper and a set of colored pencils.

2. Label the x axis atomic number and the y axis atomic radius.

3. Be sure to number the x and y axis; remembering to adjust the scale so that all numbers will fit.

4. Plot the data points for the elements listed below. Be sure to use a different color pencil for each group. (for example: all group IA are red dots, and all group IIA are blue dots, etc.)

Element	Ionization Energy	Electronegativity	Atomic radius
H	1310	2.1	.32
He	2370		.31
Li	519	1.0	1.23
Be	900	1.5	.89
B	799	2.0	.82
C	1090	2.5	.77
N	1400	3.0	.74
O	1310	3.5	.70
F	1680	4.0	.68
Ne	2080		.67
Na	494	0.9	1.54
Mg	736	1.2	1.36

Element	Ionization Energy	Electronegativity	Atomic radius
Al	577	1.5	1.18
Si	786	1.8	1.11
P	1060	2.1	1.06
S	1000	2.5	1.02
Cl	1260	3.0	.99
Ar	1520		.98
K	418	0.8	2.03
Ca	590	1.0	1.74
Ga	577	1.6	1.26
Ge	762	1.8	1.22
As	966	2.0	1.20
Se	941	2.4	1.17
Br	1140	2.8	1.14
Kr	1350		1.12
Rb		0.8	2.16
Sr	548	1.0	1.91
In	556	1.7	1.44
Sn	707	1.8	1.40
Sb	833	1.9	1.40
Te	870	2.1	1.36
I	1010	2.5	1.33
Xe	1170		1.31
Cs	376	0.7	2.35
Ba	502	0.9	1.98
Tl	590	1.8	1.48
Pb	716	1.8	1.47
Bi	703	1.9	1.46
Po	812	2.0	1.45
At	920	2.2	1.45
Rn	1040		
Fr			

Name: _____ Block: __ Date: _____

Complete the discussion questions for the trend that your group studied. Upon the teachers command, return to your original group and share the information that you learned. Compare the two methods of illustrating the periodic trends. Be sure that everyone in the group has all information presented.

DISCUSSION:

1. Vertical columns represent (circle one) PERIODS/GROUPS
2. Horizontal rows represent (circle one) PERIODS/GROUPS

3. For the Ionization Energy Cell Plate or Graph:
   a. As atomic number increases within a GROUP, what happens to Ionization energy? Why?

   b. As atomic number increases within a PERIOD, what happens to Ionization energy? Why?

4. For the Electronegativity Cell Plate or Graph:
   a. As atomic number increases within a GROUP, what happens to Electronegativity? Why?

   b. As atomic number increases within a PERIOD, what happens to Electronegativity? Why?

5. For the Atomic radius Cell Plate or Graph:
   a. As atomic number increases within a GROUP, what happens to atomic radius? Why?

   b. As atomic number increases within a PERIOD, what happens to atomic radius? Why?

6. Application to ionic radius:
   a. Ionic radii of METALS are (circle one) LARGER/SMALLER than the corresponding atomic radii. Why?

   b. Ionic radii of NONMETALS are (circle one) LARGER/SMALLER than the corresponding atomic radii. Why?

7. Predict the following:
   a. Approximate atomic radii for Francium (Fr)_____ and Radium (Ra) _____
   b. Approximate ionization energy for Rubidium (Rb)_____, Francium _____ and Radium _____
   c. Approximate electronegativity for Francium _____ and Radium _____

8. Which has a larger atomic radius – Francium or Radium?

9. Label the periodic table below with arrows representing increasing trends (both across and down).

Ionization Energy, Electronegativity and Atomic Radius