Title: Element Clues

1. Print out a copy of the note cards, *knowns* and *unknowns*.
   (they are on separate pages, after the **Results** and **Discussion** sections, so they are easy to print and cut out)
2. Cut out the *known* elements cards and arrange the *knowns* in the order they would be on the periodic table.
3. Cut out the *unknown* element cards, inspect their properties, and determine where the *unknowns* would best fit in with the trends of the other elements in each group.
   Note: none of the *unknowns* is a repeat of a *known*.
4. Determine the identity of the *unknowns* and record in Data Table 3.
5. Use the Chemical Elements Handbook (Appendix A of the textbook)
   http:://www.webelements.com , or other online periodic tables to find information.

Data Table 2: Descriptions of Selected Elements

Symbol	Element name	Description	Date Discovered	Graphic (optional)
Li				
Ag				
Cu				
C				
O_2				
He				
Ne				
Ca				
Be				
Sn				
Ne				
Br_2				
K				
Ba				
Xe				

Data Table 3: Identification and Descriptions of *Unknowns*					
#	Symbol	Element name	Description	Date Discovered	Graphic (optional)
1					
2					
3					
4					
5					
6					
7					
8					
9					

Discussion:

1. Summarize what you did.
2. Explain how you predicted the identity of the *unknown* elements.

Conclusion: none required for this activity

Extension:
List the website name and URL and provide a 2—3 sentence description for 2 additional interactive periodic table sites

The *Knowns*

In	
Physical state	solid
Density	7.31 g/cc
Hardness	very soft
Conductivity	medium
Melting point	157°C
Solubility (H_2O)	none
Color	silvery white

I_2	
Physical state	solid
Density	4.93 g/cm^3
Hardness	soft
Conductivity	very poor
Melting point	113.5°C
Solubility (H_2O)	negligible
Color	bluish-black

Pb	
Physical state	(observe)
Density	11.35 g/cm^3
Hardness	somewhat soft
Conductivity	poor
Melting point	327.5°C
Solubility (H_2O)	none
Color	(observe)

Ar	
Physical state	(observe)
Density	0.00178 g/cm^3
Hardness	none
Conductivity	very poor
Melting point	–189.2°C
Solubility (H_2O)	none
Color	(observe)

Ga	
Physical state	solid
Density	5.904 g/cc
Hardness	soft
Conductivity	medium
Melting point	30°C
Solubility (H_2O)	none
Color	silvery

Cs	
Physical state	solid
Density	1.87 g/cm^3
Hardness	soft
Conductivity	good
Melting point	29°C
Solubility (H_2O)	reacts violently
Color	silvery white

Li	
Physical state	solid
Density	0.534 g/cm^3
Hardness	soft, claylike
Conductivity	good
Melting point	180°C
Solubility (H_2O)	reacts with water
Color	silver

Ag	
Physical state	solid
Density	10.50 g/cm^3
Hardness	somewhat soft
Conductivity	excellent
Melting point	961°C
Solubility (H_2O)	none
Color	silver

Cu	
Physical state	(observe)
Density	8.96 g/cm^3
Hardness	somewhat soft
Conductivity	excellent
Melting point	1083°C
Solubility (H_2O)	none
Color	(observe)

C	
Physical state	(observe)
Density	2.10 g/cm^3
Hardness	soft yet brittle
Conductivity	good
Melting point	3550°C
Solubility (H_2O)	negligible
Colo	(observe)

Cl_2	
Physical state	gas
Density	0.00321 g/cm^3
Hardness	none
Conductivity	very poor
Melting point	–101°C
Solubility (H_2O)	slight
Color	greenish yellow

He	
Physical state	gas
Density	0.00018 g/cm^3
Hardness	none
Conductivity	very poor
Melting point	–272°C
Solubility (H_2O)	none
Color	colorless

Na	
Physical state	solid
Density	0.971 g/cm^3
Hardness	soft, claylike
Conductivity	good
Melting point	98°C
Solubility (H_2O)	reacts rapidly
Color	silver

Ca	
Physical state	solid
Density	1.57 g/cm^3
Hardness	medium
Conductivity	good
Melting point	845°C
Solubility (H_2O)	reacts
Color	silvery white

Be	
Physical state	solid
Density	1.85 g/cm^3
Hardness	brittle
Conductivity	excellent
Melting point	1287°C
Solubility (H_2O)	none
Color	gray

Sn	
Physical state	(observe)
Density	7.31 g/cm^3
Hardness	somewhat soft
Conductivity	good
Melting point	232°C
Solubility (H_2O)	none
Color	(observe)

Ne	
Physical state	gas
Density	0.00090 g/cm^3
Hardness	none
Conductivity	very poor
Melting point	−249°C
Solubility (H_2O)	none
Color	colorless

Br_2	
Physical state	liquid
Density	3.12 g/cm^3
Hardness	none
Conductivity	very poor
Melting point	−7.2°C
Solubility (H_2O)	negligible
Color	reddish brown

K	
Physical state	solid
Density	0.86 g/cm^3
Hardness	soft, claylike
Conductivity	good
Melting point	63°C
Solubility (H_2O)	reacts rapidly
Color	silver

Ba	
Physical state	solid
Density	3.6 g/cm^3
Hardness	soft
Conductivity	good
Melting point	710°C
Solubility (H_2O)	reacts strongly
Color	silvery white

Xe	
Physical state	gas
Density	0.00585 g/cm^3
Hardness	none
Conductivity	very poor
Melting point	−111.9°C
Solubility (H_2O)	none
Color	colorless

The Unknowns

Unknown #1	
Physical state	solid
Density	2.33 g/cm^3
Hardness	brittle
Conductivity	intermediate
Melting point	1410°C
Solubility (H_2O)	none
Color	gray

Unknown #2	
Physical state	gas
Density	0.00170 g/cm^3
Hardness	none
Conductivity	very poor
Melting point	−219.6°C
Solubility (H_2O)	slight
Color	pale yellow

Unknown #3	
Physical state	solid
Density	1.53 g/cm^3
Hardness	soft
Conductivity	good
Melting point	39°C
Solubility (H_2O)	reacts violently
Color	silvery white

Unknown #4	
Physical state	gas
Density	0.00374 g/cm^3
Hardness	none
Conductivity	very poor
Melting point	−156.6°C
Solubility (H_2O)	none
Color	colorless

Unknown #5	
Physical state	solid
Density	19.3 g/cm^3
Hardness	soft
Conductivity	excellent
Melting point	1064°C
Solubility (H_2O)	none
Color	gold

Unknown #6	
Physical state	solid
Density	2.54 g/cm^3
Hardness	somewhat soft
Conductivity	good
Melting point	769°C
Solubility (H_2O)	reacts rapidly
Color	silvery white

Unknown #7	
Physical state	solid
Density	5.32 g/cm^3
Hardness	fairly brittle
Conductivity	fair to poor
Melting point	937°C
Solubility (H_2O)	none
Color	gray

Unknown #8	
Physical state	solid
Density	1.74 g/cm^3
Hardness	medium
Conductivity	good
Melting point	651°C
Solubility (H_2O)	reacts slowly
Color	silvery white

Unknown #9	
Physical state	solid
Density	11.85 g/cc
Hardness	very soft
Conductivity	medium
Melting point	303°C
Solubility (H_2O)	none
Color	silvery white