

Teaching Tips for Lesson 1: Meet Chemistry

Game Plan:

- A. Review activities of previous meeting.
- B. Read Lesson 1 text together. Create and play element bingo game. Assign practice pages.
- C. Conduct Lab Activity: Application of scientific principles (observation, hypothesis, testing, conclusion).
- D. Administer Lesson 1 test.

A: Review activities of previous meeting.

Begin this class meeting with a thorough review of the activities completed during the previous class meeting. Encourage your students to tell you what took place and what was discussed. Not only does this review get your students thinking about the scientific principles you discussed earlier, but it also gives you some feedback regarding your effectiveness in presenting the material. If you made an assignment using the black boxes, take time to discuss your students' results. Allow plenty of time for discussion as this lets your students know that you respect their efforts given to the assignment and appreciate their creativity.

B. Read Lesson 1 text together. Create and play element bingo game. Assign practice pages.

Read Lesson 1 text together. Using blank bingo cards, have students create their own Element Bingo Cards. Instruct them to randomly write the symbols for elements in the spaces on the card. There are 36 spaces on each card so you may limit your students to using symbols for the first 45-50 elements. Distribute plastic chips to be used as markers (these plastic chips are found in your manipulatives bag). Once the cards are completed, begin play by calling out an element name. Students who have that element's

symbol place a chip on that space on their card. Six marked spaces in a row horizontally, vertically or diagonally make a bingo. A student with a bingo verifies his or her success by calling out the element symbols and corresponding names that make up the bingo. Only then can he or she be awarded the official bingo. Depending upon your class rules, you can award bingo winners with a prize or possibly bonus points to be used towards the Lesson 1 test!

There are three practice pages that can be utilized in this lesson to give your students opportunities to practice identifying correct element names and symbols. Assign those as necessary.

C: Lab Activity: Application of scientific principles (observation, hypothesis, testing, conclusion).

Observation of Unknown Powders!

Continue by introducing the main activity of the class period: discovering the identity of several unknown powders. Prepare for this activity the day before class by gathering 6-8 different powders from your kitchen cupboard. We have used white and whole wheat flours, vital wheat gluten (which makes a really neat rubbery glob!), baking powder, baking soda, dried yeast, salt, sugar, powdered sugar, sucanat or turbinado, garlic powder, corn starch, corn meal, parmesan cheese, etc. **DO NOT USE** any substances which could potentially be dangerous to any student such as soaps or drain openers! **All substances should be edible.** Be aware of any students who may have a restricted diet (ie. diabetic students should not taste the sugary substances). Place approximately one-half cup of each of these into containers labeled only with letters A through G or H (depending on how many you choose to use). Make a key to the identity of each powder and keep it hidden from view.

In addition to preparing the “unknown powders,” you will need to prepare three test solutions. These can be prepared in small jars (baby food jars work well). The three test solutions are water, vinegar and iodine. Tap water and regular distilled white vinegar will work fine. You can purchase concentrated iodine solution at a drug store to

prepare the iodine test solution. It is called tincture of iodine. Make the iodine solution by adding a few drops of the concentrated iodine to a baby food jar of tap water. Note that iodine can stain your hands as well as your clothing. In addition, iodine, if ingested, can be poisonous. **Caution** your students regarding these safety precautions. This is a perfect opportunity to discuss the importance of knowing about chemicals and their potential hazards! Clearly label each test solution container.

It will be your students' job to identify each unknown powder utilizing observational skills discussed at the previous class meeting. To make the process organized, use the data tables provided in the student text. Instruct your students to put their name on the data table and the ID letter for the powder they are examining first. Notice that the first column on the data table is for when each student first receives each substance. He or she is to first look at it, feel it, smell it, listen to it and finally taste it. We have found that if you proceed through the data table as a group, a more organized class can be maintained. The lids of baby food jars or lids from yogurt cups or margarine dishes work well as vessels to hold the unknown powders while you observe them. Encourage your students to record descriptive words as they observe each powder. Discourage observations such as, "It looks like flour," and "It tastes like flour," and "It feels like flour." Instead, encourage observations like, "It feels powdery and smooth," or "It is white with small brown flecks," or "It has the smell of bread dough."

Once all class members have completed their initial observations, continue by adding the first test solution (water) to a small portion of the unknown powder. Follow the same steps of viewing, touching, smelling and listening. **Caution students NOT to taste the powders after test solutions have been added!** Continue to explore the properties of the powder by adding the second and third test solutions (vinegar and iodine) to separate portions of the powder. Remember to **caution** your students that the **iodine can cause stains and is poisonous** and should not be ingested. In addition, advise your students that the vinegar is a weak acid and can burn one's eyes.

After all students have examined the first powder with all three solutions, have your students hypothesize the identity of that powder. Emphasize any test results that you or they feel is crucial to being able to identify the powder. Note these on your chalkboard or flip chart. As you continue with the next solution, refer to these

observations made with the first powder to help your students build a knowledge base of information regarding the powders.

I usually do not reveal the identity of any of the powders until the very end of the activity. Instead, I continue to encourage the students to continue guessing and deliberating among themselves as to the identity of the powders. You may wish to “take a vote” about the identity of the powders. When you ask for the identity of each powder, probe for an explanation or reasons why that decision was made. Continue to compare and contrast the observations made for each powder as you reveal their identities.

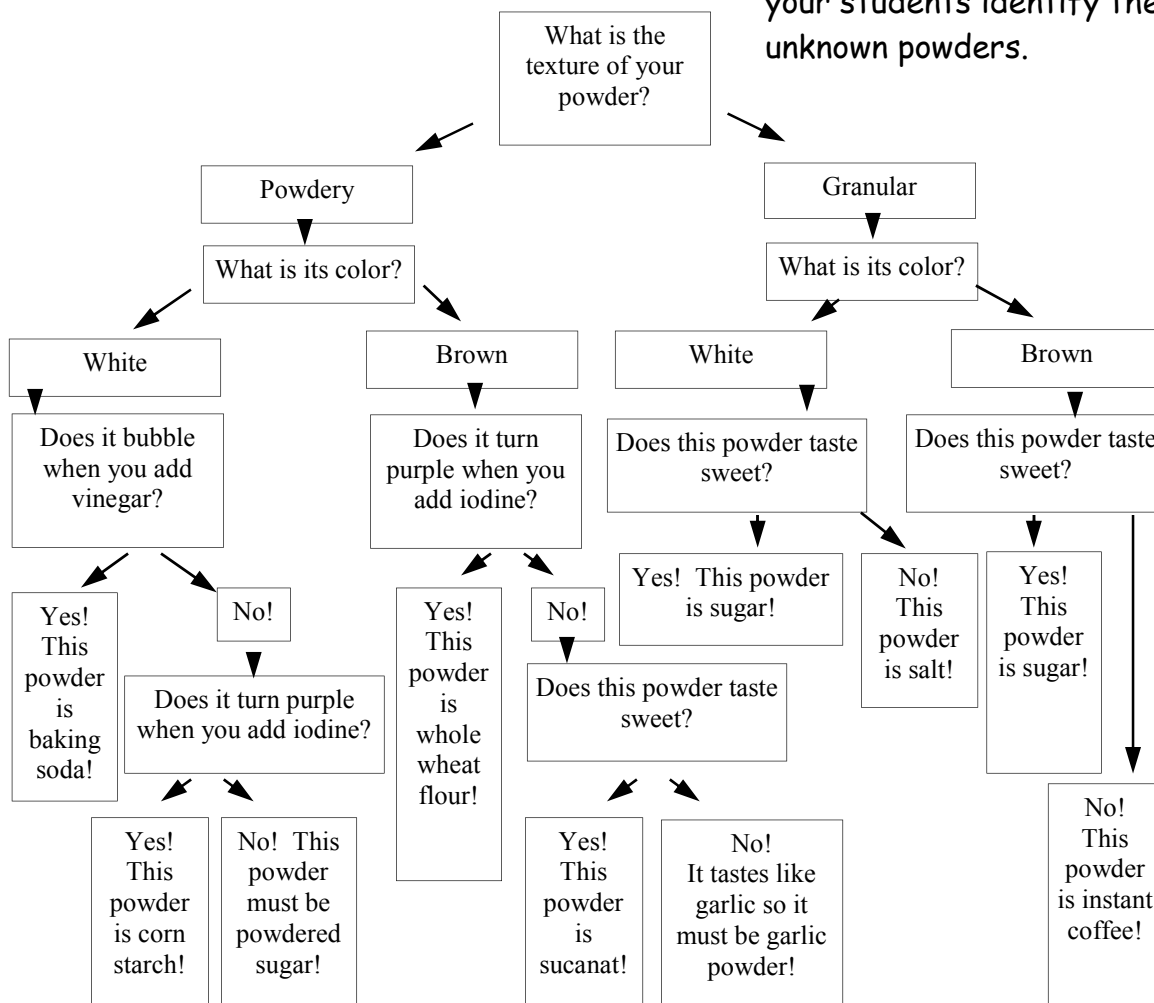
Note that the iodine test solution will turn bluish black or purple in the presence of a starch. Starches would be found in any flour or corn starch you used. Starches are not found in sugars, so the iodine solution should retain its brown color when testing sugar products. However, sometimes corn starch is added to powdered sugar (confectioners sugar) to keep it from caking, so you might get a positive starch test when using the iodine test solution. Check the list of ingredients on your powdered sugar bag to determine if corn starch has indeed been added. This can bring-up interesting discussions with your students!

The vinegar test solution will react with baking powder or baking soda samples to produce carbon dioxide gas observed by the presence of bubbles. If you’ve chosen to use any prepared mixes like cake mix or a muffin mix as an unknown powder, your students may find puzzling results due to the fact that baking powder may be mixed into the flour of the mix, but again this could provide good “fodder” for discussion of the test results.

You may ask your students to develop a key or flow chart like those used to identify leaves or flowers, which might assist someone in identifying the powders. For example, you may have your students divide the powders according to their textures. Then within those groups, you may have students divide the powders according to color. Based upon their observations, a fellow student should be able to work his or her way through the key to identify each powder. An example of a flow chart can be found on the next page.

At the end of class, take time to emphasize that accurate hypotheses come from

Possible Flow Chart to help your students identify their unknown powders.



consistent, carefully made observations. In addition, stress that accuracy in recording observations creates credible work which is an essential attribute of a reputable scientist. Request that your students clean up their work areas as well as any spills made during the activity.

If you wish to provide your students with a take-home activity, consider sending home one additional unknown powder. This unknown may be one that you and your students examined during class or, possibly, a mixture of two or more. Send home an empty data table with each student and, if necessary, small containers of vinegar and iodine. Discuss your students' results at the next class meeting.

D: Administer Lesson 1 Test; When you feel your students are ready, administer the Lesson 1 Test.

Name _____ Date _____

Friendly Chemistry

Lesson 1 Test - Element Names and Symbols

Write the correct element symbol for each element name below.

Element Name	Element Symbol	Element Name	Element Symbol
1. Carbon		9. Calcium	
2. Beryllium		10. Phosphorus	
3. Neon		11. Chromium	
4. Sodium		12. Iron	
5. Helium		13. Cobalt	
6. Boron		14. Iodine	
7. Aluminum		15. Magnesium	
8. Fluorine		16. Arsenic	

In each question below, there is an element symbol. Choose the correct name which matches that symbol. Circle that name. Spelling counts!

17. H	hydrogin	hydrogan	hidrogen	hydrogen
18. F	floruine	fluorine	flourine	florine
19. He	helium	hellium	heleum	hilium
20. B	beryllium	boron	bromine	barium
21. Cl	chlorene	chlorine	calcium	calceum
22. Cu	cobalt	copper	chormium	chromium
23. Mn	magneium	magnesium	manganese	mangenese
24. O	oxigen	oxygen	oxygen	xenon
25. Ca	carbon	calcium	cesium	carbin
26. Ar	astatine	argon	arsenic	krypton
27. Li	lithium	litium	lawrencium	lanthanum
28. Na	nitrogen	sodium	narium	nobelium
29. K	krypton	potassium	pottassium	kryptin
30. Cr	carbon	copper	chlorine	chromium

Lesson 1: Meet Chemistry!

When you meet someone for the first time, you like to know that person's name and something about him or her. Since we are getting acquainted with chemistry, let's get to know the subject a little better by learning where the word *chemistry* originated. In about 100 AD, Greek scientists were very busy studying scientific processes in an attempt to change non-valuable elements into more valuable elements such as gold. The Greeks thought elements naturally "transmuted" into gold in the earth, and these scientists wanted to learn those "transmutation" processes and be able to repeat them in the lab. These theories of turning simpler, more common elements into gold (known as *alchemy*), were also taking place in China and other locations. The popularity of the idea rose and declined over several hundred years and although it eventually was found to be impossible, many, many ideas and processes were discovered about the nature of the earth's elements. It is from the term *alchemy* that our present-day term of *chemistry* is derived.



Now that you know where your new friend's "name" came from, let's get to know more about chemistry. It is generally taught that chemistry is the study of matter (pretty simple, so far) and the way various kinds of matter react with each other (still fairly simple!). **Matter** is defined as any substance, whether it be solid, liquid or gas. And that is basically what chemistry is all about!

Now, you might say, "Sure, that definition sounds so simple and easy to understand, but what about all those neutrons and isotopes and all those symbols and foreign-looking codes for matter?" We have to admit that there is almost another language you will begin to learn as you study chemistry. With this book, you will learn a great deal about matter and the way different types of matter react with each other *as well as* the words and symbols used to describe those substances and their reactions. As you continue through this book, you will be introduced to new terms and symbols that will soon become second nature. Expect to find yourself using more and more of the terms we discuss! So, for now, let's just stick with our simple definition of **chemistry: the study of matter and how various kinds of matter react with each other.**

When we speak of matter, especially in the context of learning chemistry, visions of bottles containing strange-smelling crystals and colored liquids may come to mind. However, the matter we are referring to is everywhere around you! Your notebook, your pencil, you, your room, your house, your food, and the very vital substance required by all living things – water – are kinds of matter that we can study in the context of chemistry. Chemistry is not reserved only for the study of those odd-smelling crystals and liquids. Chemistry can be applied to any object around you. The wood in your house can be analyzed and found to be composed of carbon, hydrogen and oxygen. The hamburger you enjoy is also made of carbon, hydrogen and oxygen with some added nitrogen. And, as we have already said, the water that you drink and wash with (which is made of hydrogen and oxygen) is one of the most "down to earth" kinds of matter that we could discuss. So, if your vision of chemistry was bubbling liquids in corkscrew-shaped tubes being monitored by people wearing goggles and white coats, alter it slightly to include almost everything around you!

Did you catch some "scientific language" in the preceding paragraph (hydrogen, oxygen, carbon and nitrogen)? Those are names of **elements**.

Ancient chemists began to understand that there were certain kinds of existing matter, that could not be broken down into simpler forms of matter. These forms of matter, that could not be separated by one means or another, were given the name **elements**, indicating that they were elemental or elementary or the basis for all that follows, as in elementary school. Combined elements are what make up matter. Examples of elements that you are probably familiar with are hydrogen, oxygen, lead and gold. There are more than 100 known elements today. The actual number is difficult to say since new elements are being discovered or synthesized as you read this. Look at table on the next page to see a list of currently known elements. Note that 92 of those elements are considered to be naturally occurring elements; that is, to occur on earth, not having been made by man. Note that the rest are considered not to be naturally occurring since these elements have been made by scientists.

The history of naming elements is very interesting and a study unto itself! Some names and symbols may appear to be strange and obscure. You will find in the examples we use to illustrate concepts that many of the same elements are mentioned over and over again. You will pick up names and symbols of the more common elements as we go along.

Look now at the periodic table of elements found on the next page. Look first at the key which shows the information found in each square of the table. Note how the element symbol consists of 1-3 letters and that the first letter is always an upper case letter. If there is more than one letter for a symbol, the second and third letters are always lower case letters. Observe the numbers found in each square. Note how the atomic number is always a whole number and the atomic mass number is *not* a whole number. We will learn much more about these number later in the course.

Let's review what has been discussed so far. We first stated that **chemistry** is the study of matter and how various kinds of matter react with each other.

Second, everything around us is composed of **matter** and the study of matter could be applied to all things.

Finally, we learned that some matter cannot be broken down into simpler forms of matter and is designated as an **element**.

Friendly Chemistry

Element Name	Symbol	Element Name	Symbol	Element Name	Symbol
Actinium*	Ac	Hahnium	Ha	Radon*	Rn
Aluminum*	Al	Helium*	He	Rhenium*	Re
Americum	Am	Holmium*	Ho	Rhodium*	Rh
Antimony*	Sb	Hydrogen*	H	Rubidium*	Rb
Argon*	Ar	Indium*	In	Ruthenium*	Ru
Arsenic*	As	Iodine*	I	Rutherfordium	Rf
Astatine*	At	Iridium*	Ir	Samarium*	Sm
Barium*	Ba	Iron*	Fe	Scandium*	Sc
Berkelium	Bk	Krypton*	Kr	Selenium*	Se
Beryllium*	Be	Lanthanum*	La	Silicon*	Si
Bismuth*	Bi	Lawrencium	Lr	Silver*	Ag
Boron*	B	Lead*	Pb	Sodium*	Na
Bromine*	Br	Lithium*	Li	Strontium*	Sr
Cadmium*	Cd	Lutetium*	Lu	Sulfur*	S
Californium	Cf	Magnesium*	Mg	Tantalum*	Ta
Carbon*	C	Manganese*	Mn	Technetium*	Tc
Cerium*	Ce	Mendelevium*	Md	Tellurium*	Te
Cesium*	Cs	Mercury*	Hg	Terbium*	Tb
Chlorine*	Cl	Molybdenum*	Mo	Thallium*	Tl
Chromium*	Cr	Neodymium*	Nd	Thorium*	Th
Cobalt*	Co	Nitrogen*	N	Thulium*	Tm
Copper*	Cu	Nobelium	No	Tin*	Sn
Curium	Cm	Osmium*	Os	Titanium*	Ti
Dysprosium	Dy	Oxygen*	O	Tungsten*	W
Einsteinium	Es	Palladium*	Pd	Uranium*	U
Erbium*	Er	Phosphorus*	P	Vanadium*	V
Europium*	Eu	Platium*	Pt	Xenon*	Xe
Fermium	Fm	Plutonium*	Pu	Ytterbium*	Yb
Fluorine*	F	Polonium*	Po	Yttrium*	Y
Francium*	Fr	Potassium*	K	Zinc*	Zn
Gadolinium*	Gd	Praeseodymium*	Pr	Zirconium*	Zr
Gallium*	Ga	Promethium*	Pm		
Germanium*	Ge	Proactinium*	Pa		
Gold*	Au	Radium*	Ra		
Hafnium*	Hf				

* indicates naturally occurring element

Atomic Number → 1

Element Symbol → **H**

Element Name → Hydrogen

Atomic Mass → 1.0080

1	H Hydrogen 1.0080	2	He Helium 4.0026
3	Li Lithium 6.94	5	B Boron 10.811
4	Be Beryllium 9.012	6	C Carbon 12.0115
11	Na Sodium 22.9898	7	N Nitrogen 14.0067
12	Mg Magnesium 24.31	8	O Oxygen 15.994
19	K Potassium 39.102	9	F Fluorine 18.994
20	Ca Calcium 40.08	10	Ne Neon 20.18
37	Rb Rubidium 85.47	13	Al Aluminum 26.9815
38	Sr Strontium 87.62	14	Si Silicon 28.086
55	Cs Cesium 132.91	15	P Phosphorus 30.974
56	Ba Barium 137.34	16	S Sulfur 32.06
71	Lu Lutetium 174.97	17	Cl Chlorine 35.453
72	Hf Hafnium 178.49	18	Ar Argon 39.948
73	Ta Tantalum 180.95	19	K Potassium 39.102
74	W Tungsten 183.85	20	Ca Calcium 40.08
75	Re Rhenium 186.2	21	Sc Scandium 44.96
76	Os Osmium 190.2	22	Ti Titanium 47.9
77	Ir Iridium 192.22	23	V Vanadium 50.94
78	Pt Platinum 195.09	24	Cr Chromium 51.996
79	Au Gold 196.97	25	Mn Manganese 54.938
80	Hg Mercury 200.59	26	Fe Iron 55.847
81	Tl Thallium 204.37	27	Co Cobalt 58.933
82	Pb Lead 207.2	28	Ni Nickel 58.71
83	Bi Bismuth 208.98	29	Cu Copper 63.546
84	Po Polonium (210)	30	Zn Zinc 65.37
85	At Astatine (210)	31	Ga Gallium 69.72
86	Rn Radon (222)	32	Ge Germanium 72.59
		33	As Arsenic 74.9216
		34	Se Selenium 78.96
		35	Br Bromine 79.909
		36	Kr Krypton 83.80
		37	Rb Rubidium 85.47
		38	Sr Strontium 87.62
		39	Y Yttrium 88.91
		40	Zr Zirconium 91.22
		41	Nb Niobium 92.91
		42	Mo Molybdenum 95.94
		43	Tc Technetium (99)
		44	Ru Ruthenium 101.07
		45	Rh Rhodium 102.91
		46	Pd Palladium 106.4
		47	Ag Silver 107.868
		48	Cd Cadmium 112.40
		49	In Indium 114.82
		50	Sn Tin 118.69
		51	Sb Antimony 121.75
		52	Te Tellurium 127.60
		53	I Iodine 126.904
		54	Xe Xenon 131.30
		55	Cs Cesium 132.91
		56	Ba Barium 137.34
		57	Fr Francium (223)
		58	Ce Cerium 140.12
		59	Pr Praseodymium 140.91
		60	Nd Neodymium 144.24
		61	Pm Promethium (147)
		62	Sm Samarium 150.4
		63	Eu Europium 151.96
		64	Gd Gadolinium 157.25
		65	Tb Terbium 158.9
		66	Dy Dysprosium 162.50
		67	Ho Holmium 164.93
		68	Er Erbium 167.26
		69	Tm Thulium 168.93
		70	Yb Ytterbium 173.04
		71	Lu Lutetium 174.97
		72	Hf Hafnium 178.49
		73	Ta Tantalum 180.95
		74	W Tungsten 183.85
		75	Re Rhenium 186.2
		76	Os Osmium 190.2
		77	Ir Iridium 192.22
		78	Pt Platinum 195.09
		79	Au Gold 196.97
		80	Hg Mercury 200.59
		81	Tl Thallium 204.37
		82	Pb Lead 207.2
		83	Bi Bismuth 208.98
		84	Po Polonium (210)
		85	At Astatine (210)
		86	Rn Radon (222)
		87	Fr Francium (223)
		88	Ra Radium (226)
		89	Lu Lutetium 174.97
		90	Th Thorium 232.0
		91	Pa Protactinium 231.0
		92	U Uranium 238.03
		93	Np Neptunium 237.0
		94	Pu Plutonium (244)
		95	Am Americium (243)
		96	Cm Curium (247)
		97	Bk Berkelium (247)
		98	Cf Californium (251)
		99	Es Einsteinium (254)
		100	Fm Fermium (257)
		101	Md Mendelevium (258)
		102	No Nobelium (259)
		103	Lr Lawrencium (260)
		104	Rf Rutherfordium (261)
		105	Db Dubnium (262)
		106	Sg Seaborgium (263)
		107	Bh Bohrium (264)
		108	Hs Hassium (265)
		109	Mt Meitnerium (266)
		110	Ds Darmstadtium (267)
		111	Rg Roentgenium (268)
		112	Cn Copernicium (269)
		113	Nh Nihonium (270)
		114	Fl Flerovium (277)
		115	Mc Moscovium (288)
		116	Lv Livermorium (293)
		117	Ts Tennessine (289)
		118	Og Oganesson (294)

Periodic Table Of the Elements

57	La Lanthanum 138.91	58	Ce Cerium 140.12	59	Pr Praseodymium 140.91	60	Nd Neodymium 144.24	61	Pm Promethium (147)	62	Sm Samarium 150.4	63	Eu Europium 151.96	64	Gd Gadolinium 157.25	65	Tb Terbium 158.9	66	Dy Dysprosium 162.50	67	Ho Holmium 164.93	68	Er Erbium 167.26	69	Tm Thulium 168.93	70	Yb Ytterbium 173.04
89	Lu Lutetium 174.97	90	Th Thorium 232.0	91	Pa Protactinium 231.0	92	U Uranium 238.03	93	Np Neptunium 237.0	94	Pu Plutonium (244)	95	Am Americium (243)	96	Cm Curium (247)	97	Bk Berkelium (247)	98	Cf Californium (251)	99	Es Einsteinium (254)	100	Fm Fermium (257)	101	Md Mendelevium (258)	102	No Nobelium (259)

Element Bingo

Below is a blank bingo card. In each square, write the symbol of an element. Write that symbol only once. When everyone has done this, your teacher will begin calling out the names of elements. When an element is called, look for its symbol on your card. Place a marker (colored chip, button, etc.) on that square. When you get six in a row across, down or diagonally, yell "BINGO," to potentially win the round. In order to win, you must correctly identify the elements whose symbols you marked.

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Element Bingo 2

Play two cards at once! Fill in this card like you did the first. Double your chances to win that nifty prize your teacher has for the winner.

Ne					

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Name _____ Date _____

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Element Symbol Practice 1

Write the correct element symbol beside each element name below. Some questions may appear more than once. The first problem has been completed for you!

1. Lithium	Li	21. Manganese	
2. Magnesium		22. Magnesium	
3. Carbon		23. Chlorine	
4. Hydrogen		24. Silicon	
5. Oxygen		25. Phosphorus	
6. Helium		26. Iron	
7. Boron		27. Cobalt	
8. Fluorine		28. Copper	
9. Calcium		29. Nickel	
10. Nitrogen		30. Arsenic	
11. Strontium		31. Argon	
12. Sodium		32. Aluminum	
13. Neon		33. Gallium	
14. Copper		34. Germanium	
15. Beryllium		35. Rubidium	
16. Argon		36. Silver	
17. Sulfur		37. Beryllium	
18. Chromium		38. Selenium	
19. Oxygen		39. Bromine	
20. Potassium		40. Iodine	

Friendly Chemistry

Name _____ Date _____

Friendly Chemistry

Element Symbol Practice 2

Write the correct element name beside each element symbol below. Some questions may appear more than once. The first problem has been completed for you!

1. C	Carbon	21. Mg		41. K	
2. Al		22. N		42. He	
3. He		23. K		43. N	
4. H		24. Si		44. F	
5. Be		25. Zn		45. Na	
6. Fe		26. Zr		46. Ne	
7. F		27. Al		47. Ni	
8. Cl		28. Cr		48. N	
9. Ca		29. As		49. C	
10. Ni		30. Ar		50. Ca	
11. Br		31. B		51. Cl	
12. Si		32. Ga		52. Co	
13. Ne		33. Ge		53. Cu	
14. Cr		34. Rb		54. Cr	
15. V		35. O		55. Ar	
16. B		36. Ag		56. As	
17. Na		37. Se		57. Mg	
18. Cu		38. Sn		58. Mn	
19. S		39. Br		59. S	
20. I		40. H		60. Au	

Friendly Chemistry

Name _____ Date _____
Friendly Chemistry

Element Symbol Practice 3

Circle the question number for the element name and symbols which are written correctly. The first question has been completed for you!

- | | |
|--|------------------|
| 1. <input checked="" type="radio"/> Carbon | 21. Mg Magnesium |
| 2. Al Alluminum | 22. N Nitorgen |
| 3. He Heleum | 23. K Potasium |
| 4. H Hydrogen | 24. Si Silicon |
| 5. Be Beryllium | 25. Zn Zirconium |
| 6. Fe Iron | 26. Zr Zinc |
| 7. F Flourine | 27. Li Lithium |
| 8. Cl Clhorine | 28. Cr Chromium |
| 9. Ca Carbon | 29. As Arsenic |
| 10. Ni Nickel | 30. Ar Argon |
| 11. Br Bromine | 31. B Boron |
| 12. Si Silver | 32. Ga Galium |
| 13. Ne Neon | 33. Ge Germium |
| 14. Cr Chromium | 34. Rb Rubidium |
| 15. Va Vanadium | 35. O Oxygen |
| 16. Be Berkelium | 36. Ag Silver |
| 17. Na Sodium | 37. Se Selenium |
| 18. Cu Cobalt | 38. Sn Tin |
| 19. S Sodium | 39. Br Barium |
| 20. I Iron | 40. Hf Hafnium |

Lesson 1 Lab Investigation

In order to make your first lab fun and meaningful (and safe!), please read the following first:

What you're going to do:

In your first lab activity, you will be given several “unknown powders” which you will be asked to identify. By making observations of these powders using your five senses, hopefully you'll be able to determine the identity of each!

To help keep things organized, you have been supplied with data tables on which to record your observations for each unknown powder. You will find these on the next pages. Note that each unknown powder gets its own data table.

Turn the page and look at one of those data tables now. Note that there is a place to put the ID number for each powder. Also note that you will systematically make the same observations for each powder (how each looks, smells, feels, sounds and tastes).

After these initial observations you will test a portion of each by adding vinegar and then some iodine solution. DO NOT taste any of these powders once you have added the vinegar or iodine solution!!! Vinegar is an acid and is very sour and iodine can be poisonous!!! DO NOT taste any powder after adding the vinegar or iodine solution!

Your instructor may ask that you wear appropriate safety gear as you conduct this lab activity. We strongly suggest you wear safety glasses (not only is vinegar sour, but it can really sting if you get it in your eyes!). Note also that iodine can stain your skin and clothes. Wearing an apron or smock would be a good idea, too!

When you're done:

Follow your instructor's instructions to clean up your lab area. Then be ready to discuss what you think each powder could be. Check with your instructor if he or she would like a written report.

Remember:

Be careful;

Do only what your instructor will allow, but ask if you'd like to try something;

Help get things cleaned up; and

Have fun!

Data Table for Unknown Powders Lab

Name _____

Unknown Powder ID Number _____

	When I first looked at this unknown powder...	When I added drops of water...	When I added drops of vinegar ...	When I added drops of iodine ...	Additional observations I made...
it LOOKED like...					
it SMElLED like...					
it FELT like...					
it SOUNDED like...					
it TASTED like...		DO NOT TASTE AFTER ADDING TEST SOLUTIONS!			

Based upon my observations, I hypothesize that this substance is _____.

Data Table for Unknown Powders Lab

Name _____

Unknown Powder ID Number _____

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