

Part 1 Atoms

Name: _____

Due Date: _____

Periodic Table of the Elements

1 H Hydrogen 1.01																	18 He Helium 4.00		
3 Li Lithium 6.94	4 Be Beryllium 9.01																	2 Ne Neon 20.18	
11 Na Sodium 22.99	12 Mg Magnesium 24.31																	10 Ar Argon 39.95	
19 K Potassium 39.10	20 Ca Calcium 40.08	21 Sc Scandium 44.96	22 Ti Titanium 47.88	23 V Vanadium 50.94	24 Cr Chromium 51.99	25 Mn Manganese 54.94	26 Fe Iron 55.85	27 Co Cobalt 58.93	28 Ni Nickel 58.69	29 Cu Copper 63.55	30 Zn Zinc 65.38	31 Ga Gallium 69.72	32 Ge Germanium 72.63	33 As Arsenic 74.92	34 Se Selenium 78.97	35 Br Bromine 79.90	36 Kr Krypton 83.80	17 F Fluorine 19.00	9 F Fluorine 19.00
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 95.95	43 Tc Technetium 98.91	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.42	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.6	53 I Iodine 126.90	54 Xe Xenon 131.29	8 O Oxygen 16.00	16 O Oxygen 16.00
55 Cs Cesium 132.91	56 Ba Barium 137.33	57-71 Lanthanides	72 Hf Hafnium 178.49	73 Ta Tantalum 180.95	74 W Tungsten 183.85	75 Re Rhenium 186.21	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.97	80 Hg Mercury 200.59	81 Tl Thallium 204.38	82 Pb Lead 207.20	83 Bi Bismuth 208.98	84 Po Polonium [208.98]	85 At Astatine 209.98	86 Rn Radon 222.02	7 N Nitrogen 14.01	15 N Nitrogen 14.01
87 Fr Francium 223.02	88 Ra Radium 226.03	89-103 Actinides	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [278]	110 Ds Darmstadtium [281]	111 Rg Roentgenium [280]	112 Cn Copernicium [285]	113 Nh Nihonium [286]	114 Fl Flerovium [289]	115 Mc Moscovium [289]	116 Lv Livermorium [293]	117 Ts Tennessine [294]	118 Og Oganesson [294]	6 C Carbon 12.01	14 C Carbon 12.01
89 Ac Actinium 227.03	90 Th Thorium 232.04	91 Pa Protactinium 231.04	92 U Uranium 238.03	93 Np Neptunium 237.05	94 Pu Plutonium 244.06	95 Am Americium 243.06	96 Cm Curium 247.07	97 Bk Berkelium 247.07	98 Cf Californium 251.08	99 Es Einsteinium [254]	100 Fm Fermium 257.10	101 Md Mendelevium 258.10	102 No Nobelium 259.10	103 Lr Lawrencium [262]	5 B Boron 10.81	13 B Boron 10.81	4 Ce Cerium 140.12	12 Ne Neon 20.18	
57 La Lanthanum 138.91	58 Ce Cerium 140.12	59 Pr Praseodymium 140.91	60 Nd Neodymium 144.24	61 Pm Promethium 144.91	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.93	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.06	71 Lu Lutetium 174.97	3 Li Lithium 6.94	13 Al Aluminum 26.98	11 Al Aluminum 26.98	5 B Boron 10.81	

Alkali Metal

Alkaline Earth

Transition Metal

Basic Metal

Metalloid

Nonmetal

Halogen

Noble Gas

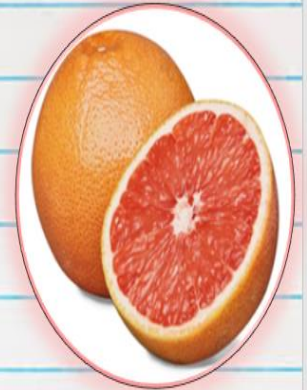
Lanthanide

Actinide

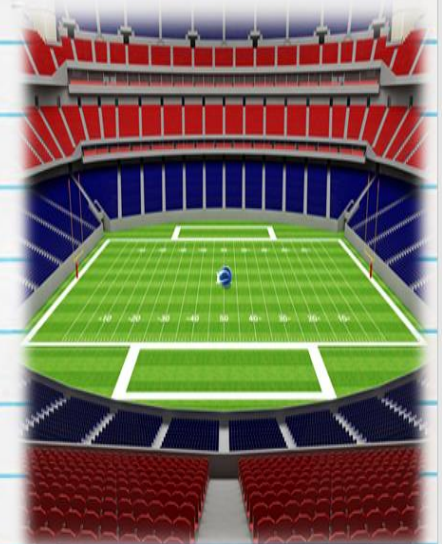
Part 1 Lesson 1 The Size of Atoms

Please watch the Ted Talk Video about "How small is the Atom?" use the images below to assist you. <https://www.youtube.com/watch?v=yQP4UJhNn0I>

How small is the atom?



An Atom is mostly...



How are you and a picture of hot gases swirling around our universe billions of years ago connected?



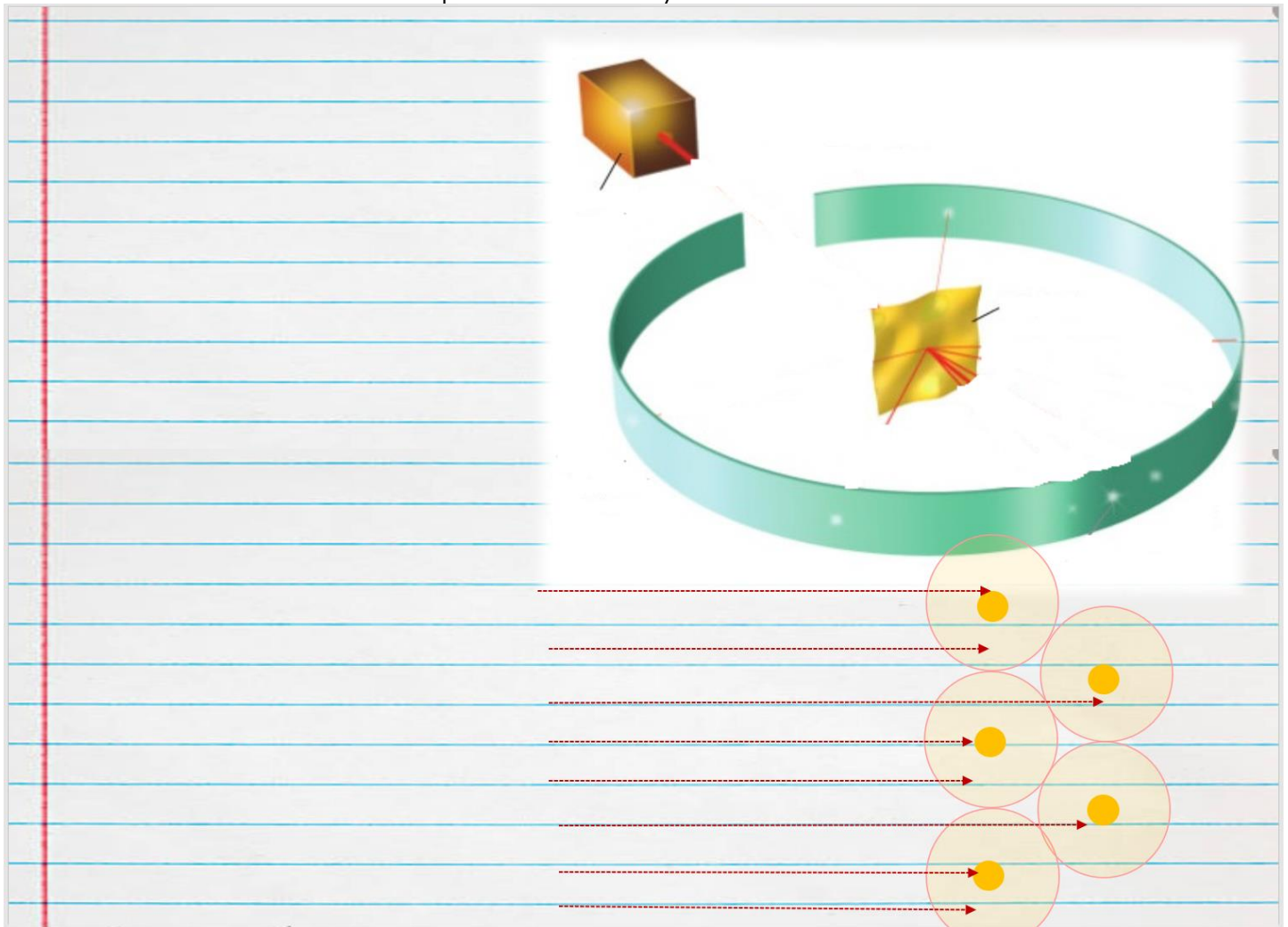
Part 1 Lesson 2 Structure of the Atom

An atom has charged particles, this means it has a () and a () charge. Atoms and some of the particles they are made of carry a charge.

Describe the Crookes tube below. Why was it an important tool?



Describe Rutherford's gold foil experiment using the diagram below. What did it show? Use the picture of the atoms with nucleus in the middle on the right to draw a close-up of what it found. You need to deflect the particle correctly.



An Atom is the smallest part of an element which can take part in a _____ reaction.

Chemical reaction: A process in which atoms of the same or different elements _____ themselves to form a new substance.

The atom consists of three fundamental _____.

Proton + (_____ charge) Determines the atom _____

Neutron 0 (_____ charge / no charge).

Electron - (_____ charge)

Mass

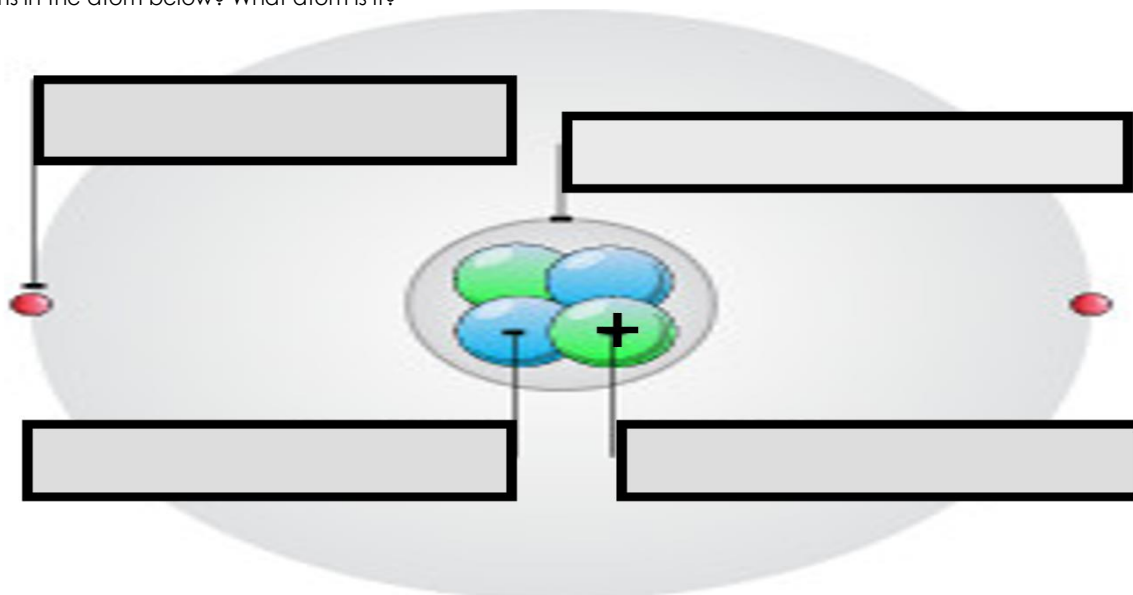
Charge

Proton

Neutron

Electron

Name the terms in the atom below? What atom is it?



Nucleus: The _____ charged center of the atom.

- The nucleus has an incredibly high _____.

QUIZ WIZ! Name the Particle! Work Bank: Proton, Neutron, Electron, Nucleus

1.	2.	3.
4.	5.	6.
7.	8.	9.
10.	*11	

Part 1 Lesson 3 Atomic Number

Please draw your best atomic cloud (500 dots minimum). I added a "not to scale" nucleus in the middle below. Remember, an atom is mostly _____ space.

H _____ U _____ P _____

You can't know with certainty both where an _____ is and where it's going next. That makes it impossible to plot an _____ for an electron around a nucleus. This is also true for the Proton and Neutron.

Neils _____ Model (1913): Depicts the atom as a small, positively charged nucleus surrounded by electrons that travel in circular orbits around the nucleus.

APE. $A=P+E$

Atomic #Number = #Protons = #Electrons

The atomic number is equal to the number of _____ in an atom's nucleus.

The atomic number determines which _____ an atom is.

Which is the Atomic Number, Atomic Mass, Atomic Symbol, and Name for the element below?

The atom Iridium (Atomic Number 77) will have how many protons in its nucleus?

Answer: _____

The atom Neodymium (Atomic Number 60) will have how many protons in its nucleus?

Answer: _____

The atom Rutherfordium (Atomic Number 104) will have how many protons in its nucleus?

Answer: _____

The atom Promethium (Atomic Number 61) will have how many protons in its nucleus?

Answer: _____

- Use your periodic table to answer below... Note: Ignore white letters

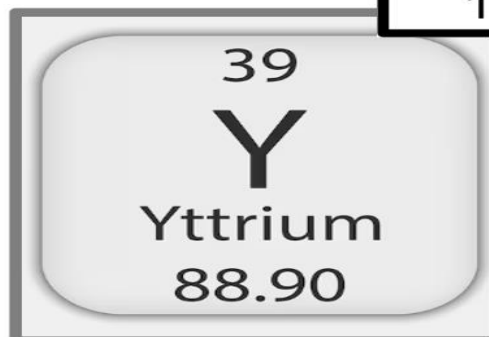
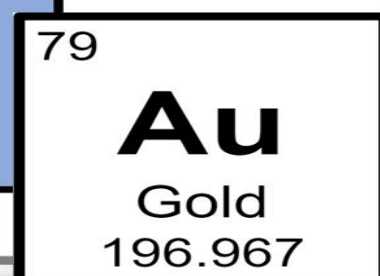
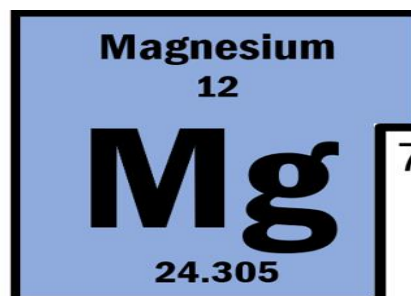
19 _____	63 _____ u	63 _____ u	15 _____
20 _____	57 _____ a	25 _____ n	
79 _____ u	60 _____		
105 _____ b	8 _____		
21 _____	53 _____	63 _____ u	7 _____
			58 _____

Part 1 Lesson 4 Isotopes, Neutrons, Atomic Mass

The Nucleus has almost all the mass of the atom. It's made up of protons (+) and neutrons (O). Everything is chiefly made of _____

Isotope: Atom with the same number of protons and electrons but different numbers of _____.

MAN: To find the number of neutrons: Subtract the atomic _____ from the atomic _____.



Please fill in the boxes with All of the correct information using the periodic table of the elements.

Please fill in the boxes with the correct information using the periodic table of the elements.

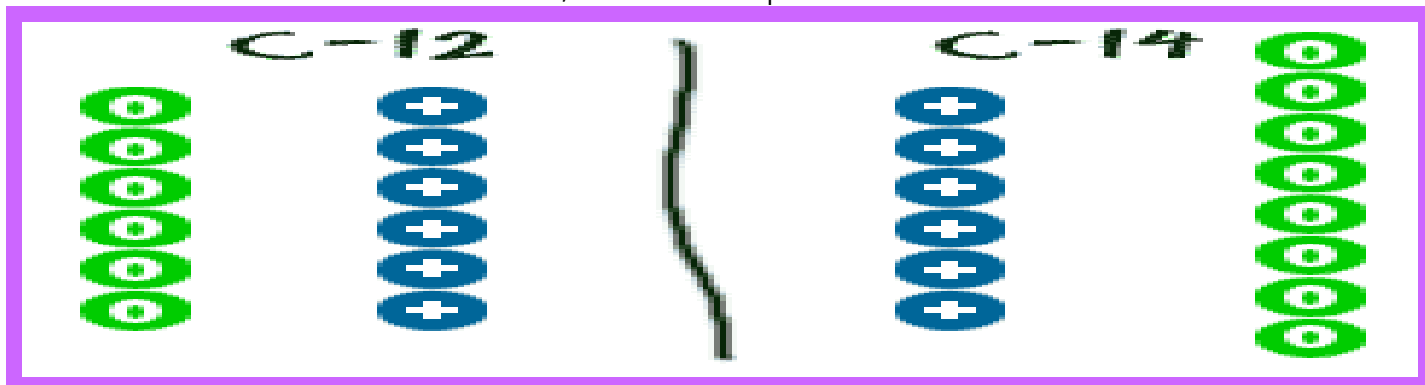
Protons (P+) + <input type="text"/> Neutrons (No) <input type="text"/> # <input type="text"/> Li <input type="text"/> Atomic Mass = <input type="text"/>	Protons - 6 Neutrons- <input type="text"/> # <input type="text"/> <input type="text"/> <input type="text"/> Atomic Mass = <input type="text"/>	Protons - <input type="text"/> Neutrons- <input type="text"/> # <input type="text"/> Ne <input type="text"/> Atomic Mass = <input type="text"/>	Protons - <input type="text"/> Neutrons- <input type="text"/> # 11 <input type="text"/> <input type="text"/> Atomic Mass = <input type="text"/>
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Please fill in the boxes with ALL of the correct information using the periodic table of the elements.

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Protons - <input type="text"/> Neutrons- 22 # <input type="text"/> <input type="text"/> <input type="text"/> Atomic Mass = <input type="text"/>	Protons - 17 Neutrons- <input type="text"/> # <input type="text"/> <input type="text"/> <input type="text"/> Atomic Mass = <input type="text"/>	Protons - <input type="text"/> Neutrons- <input type="text"/> # <input type="text"/> Ca <input type="text"/> <input type="text"/> Atomic Mass = <input type="text"/>	Protons - <input type="text"/> Neutrons- <input type="text"/> # 29 <input type="text"/> <input type="text"/> Atomic Mass = <input type="text"/>
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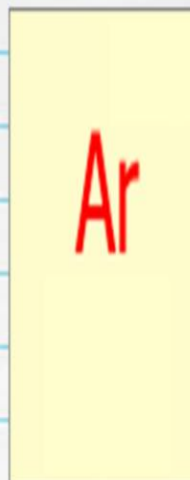
What is the difference between C¹², and C¹⁴? Explain below.



Please fill in the required field below.



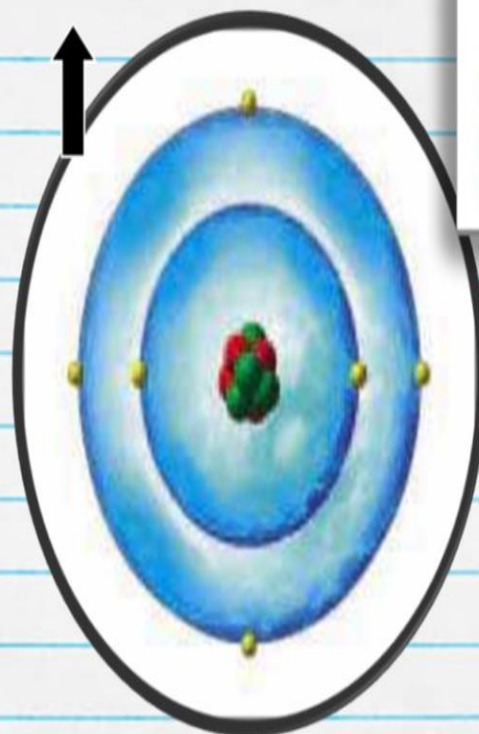
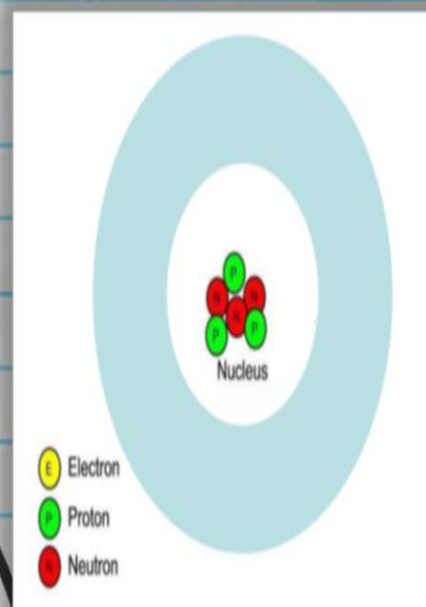
What is the atomic symbol?
 What is the atomic number?
 How many Protons?
 How many Electrons?
 What is the atomic Mass?
 How many Neutrons?



What is the atomic symbol?
 What is the atomic number?
 How many Protons?
 How many Electrons?
 What is the atomic Mass?
 How many Neutrons?



What is the atomic symbol?
 What is the atomic number?
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Part 1 Lesson 5 Wrap-Up and Review

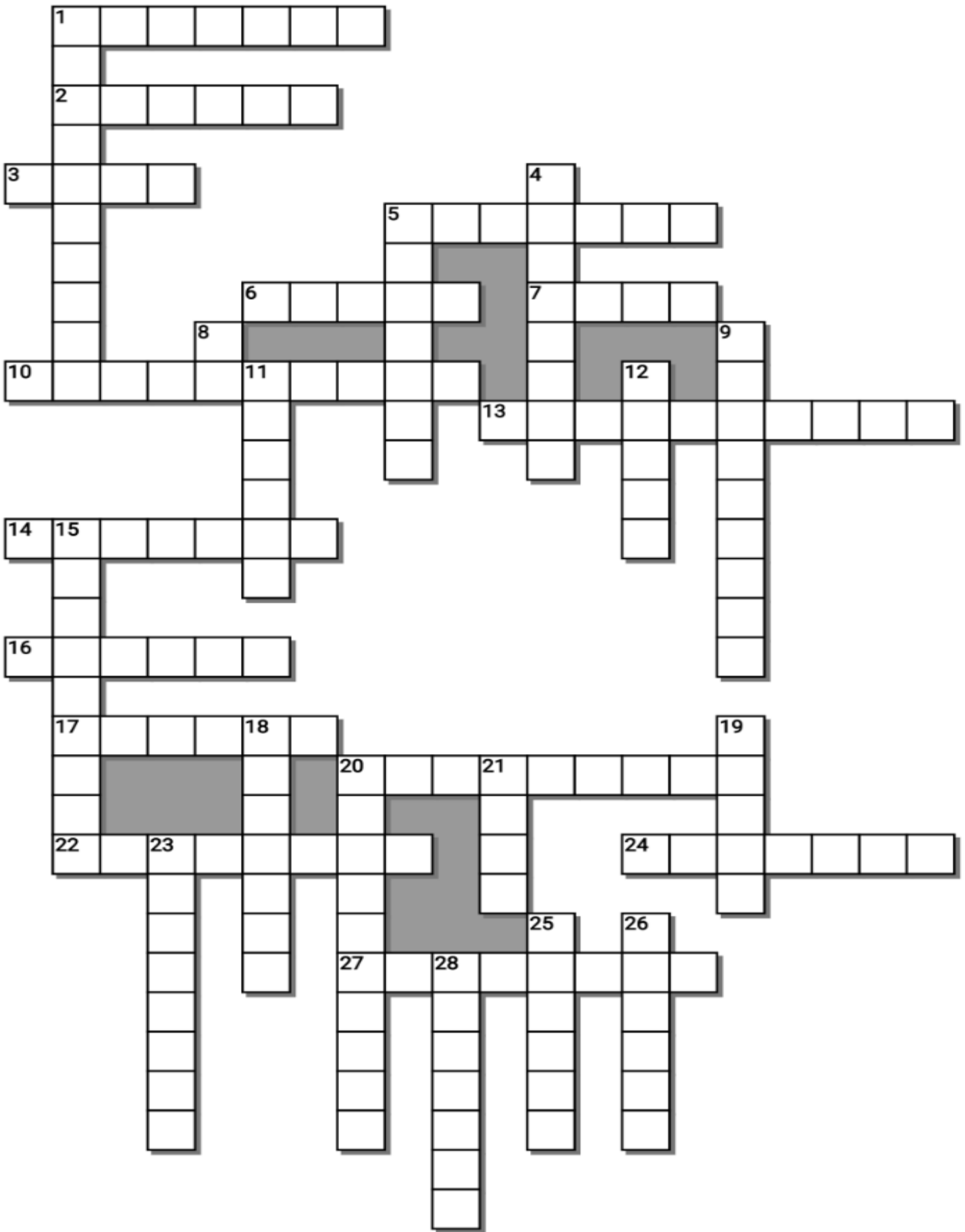
Meet the Elements

In each box, please find and then write the correct element by name, its atomic number, atomic mass, and atomic symbol. Use the information in each box to help you. (5 pts each correct box)

B			16
	14.01 amu	Bromine	
55	4	Pb	Chlorine
Gold	16.00 amu	77	Ne
259.00 amu	Zn	I don't have a neutron	40.08 amu

Name That Element

I am the lightest element on the periodic table?	I am the second lightest element on the periodic table?	I glow in signs when excited?	I coat most pennies, I have an atomic number of 29?
My atomic name starts with an Y? (Two Possible)	I am the only element that has three letters?	My name was used to create a fake element that can destroy superman?	I must be from France with my name?
Name four elements with four letters?	I must be from Europe with my name?	I must be from America with my name?	I have a planet as part of my name?
I am named after a famous scientist $E=MC^2$?	I am named after a US State?	I am named after a famous prize?	I can help give you strong bones? My atomic mass is 40.78.
I am found as part of rat poison? I have 33 electrons	I am a liquid metal? My atomic symbol is Hg?	My atomic symbol is a W?	I have 19 protons?



Across

1. This element is a liquid metal at room temperature
2. This atom has 6 protons in its nucleus?
3. Neils _____ Model (1913): Depicts the atom as a small, positively charged nucleus surrounded by electrons that travel in circular orbits around the nucleus.
5. The positively charged central core of an atom, consisting of protons and neutrons and containing nearly all its mass.
6. An electron _____ is the region of negative charge surrounding an atomic nucleus that is associated with an atomic orbital. It is defined mathematically, describing a region with a high probability of containing electrons.
7. The mass of an atom or a molecule is referred to as the atomic _____.
10. _____ Uncertainty Principle? You can't know with certainty both where an electron is and where it's going next. That makes it impossible to plot an orbit for an electron around a nucleus.
14. A _____ tube is an early experimental electrical discharge tube, with partial vacuum, in which cathode rays, streams of electrons, were discovered.
16. A stable subatomic particle occurring in all atomic nuclei, with a positive electric charge equal in magnitude to that of an electron, but of opposite sign.
17. The _____ number or proton number of a chemical element is the number of protons found in the nucleus of every atom of that element.
20. This element is represented with the symbol K on the Periodic Table
22. A stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
24. This element has four neutrons in its nucleus
27. This is the only element that can exist without a neutron in its nucleus?

Down

1. A scanning tunneling _____ is a type of microscope used for imaging surfaces at the atomic level.
4. This element has atomic mass of 26.9?
5. A subatomic particle of about the same mass as a proton but without an electric charge, present in all atomic nuclei except those of ordinary hydrogen.
8. Iron has the Symbol...
9. An atom has charged _____
11. To find the number of neutrons: Subtract the atomic mass from the atomic _____.
12. The atom consists of _____ fundamental particles
15. Chemical reaction: A process in which atoms of the same or different elements _____ themselves to form a new substance.
18. Each of two or more forms of the same element that contain equal numbers of protons but different numbers of neutrons in their nuclei, and hence differ in relative atomic mass but not in chemical properties; in particular, a radioactive form of an element.
19. An atom is made of mostly _____ space
20. This element has a symbol of P on the Periodic Table
21. An _____ is the smallest part of an element which can take part in a chemical reaction.
23. The Periodic Table of _____
25. This element has 29 protons in its nucleus
26. This element has two protons in its nucleus
28. The nucleus has an incredibly high _____.

-----teacher can remove word bank to make more difficult-----

ALUMINUM, ATOM, ATOMIC, BOHR, CARBON, CLOUD, COPPER, CROOKES, DENSITY, ELECTRON, ELEMENTS, EMPTY, FE, HEISENBERG, HELIUM, HYDROGEN, ISOTOPE, LITHIUM, MASS, MERCURY, NEUTRON, NUCLEUS, NUMBER, PARTICLES, PHOSPHORUS, POTASSIUM, PROTON, REARRANGE, RUTHERFORD, THREE, MICROSCOPE

Part 1 Review Game Lesson 6

1-10 = 10 pts * = Bonus + 1 pt,
 (Secretly write owl in correct space +1 pt)
 Final Question = 5 pt wager

Name: _____

Due: Today

Score ____ / 100

HAVE A GOOD LOOK ATOM	ROUND ABOUT	NUMBERIFFIC	SUPER SMALL	ATOMIC POWER <small>Bonus round 1 pt each</small>
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

Final Question Wager ____ /5 Answer: _____

Part 1 Atoms

Name:

Due Date:

Periodic Table of the Elements

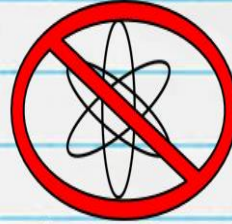
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- Alkali Metal
- Alkaline Earth
- Transition Metal
- Basic Metal
- Metalloid
- Nonmetal
- Halogen
- Noble Gas
- Lanthanide
- Actinide

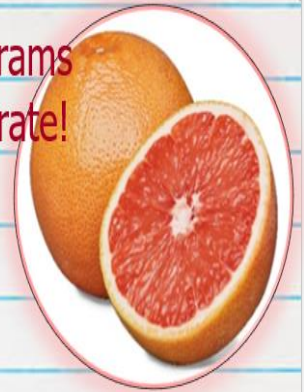
Part 1 Lesson 1 The Size of Atoms

Please watch the Ted Talk Video about "How small is the Atom?" use the images below to assist you. <https://www.youtube.com/watch?v=yQP4UJhNn0I>

How small is the atom?



These diagrams aren't accurate!



If each atom in a grapefruit were the size of a blueberry, the grapefruit would be the size of the earth.



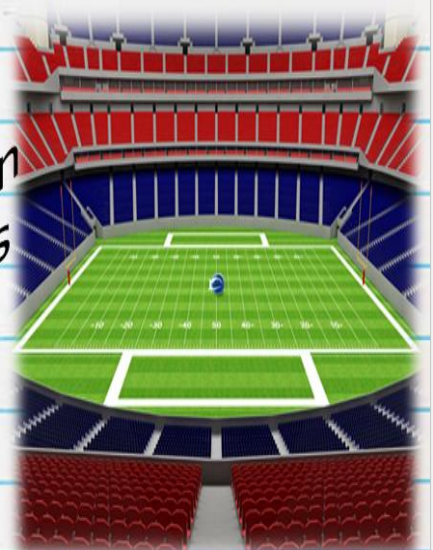
If a blueberry was an atom, you wouldn't be able to see the nucleus as it would be too small.

If a blueberry was blown-up to the size of a football stadium, the nucleus would be the size of a marble somewhere near the middle.

An Atom is mostly...

EMPTY SPACE

Mass is mostly all in the nucleus

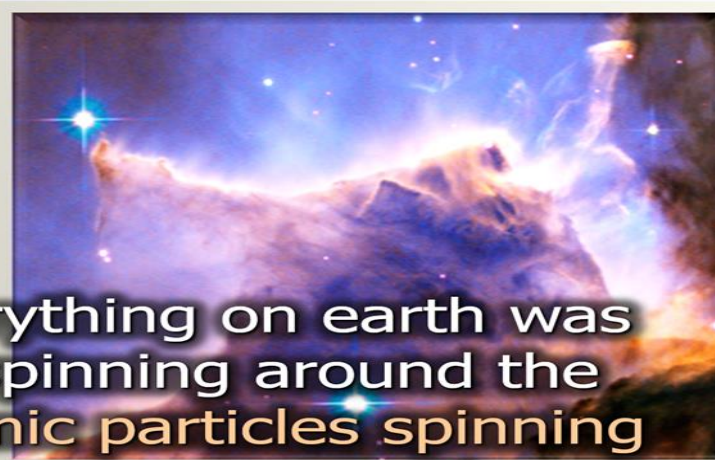


Density of Nucleus 6.2 billion cars stuffed in a box

Nuclear density is the density of the nucleus of an atom, averaging about $4 \times 10^{17} \text{ kg/m}^3$

How are you and a picture of hot gases swirling around our universe billions of years ago connected?

How are you and a picture of hot gases swirling around our universe billions of years ago connected?



Everyone and everything on earth was once a gas cloud spinning around the universe. The atomic particles spinning around billions of years ago are the same atoms that make up planets and all that are on them.

Part 1 Lesson 2 Structure of the Atom

An atom has charged particles, this means it has a (+) and a (-) charge. Atoms and some of the particles they are made of carry a charge.

Describe the Crookes tube below. Why was it an important tool?

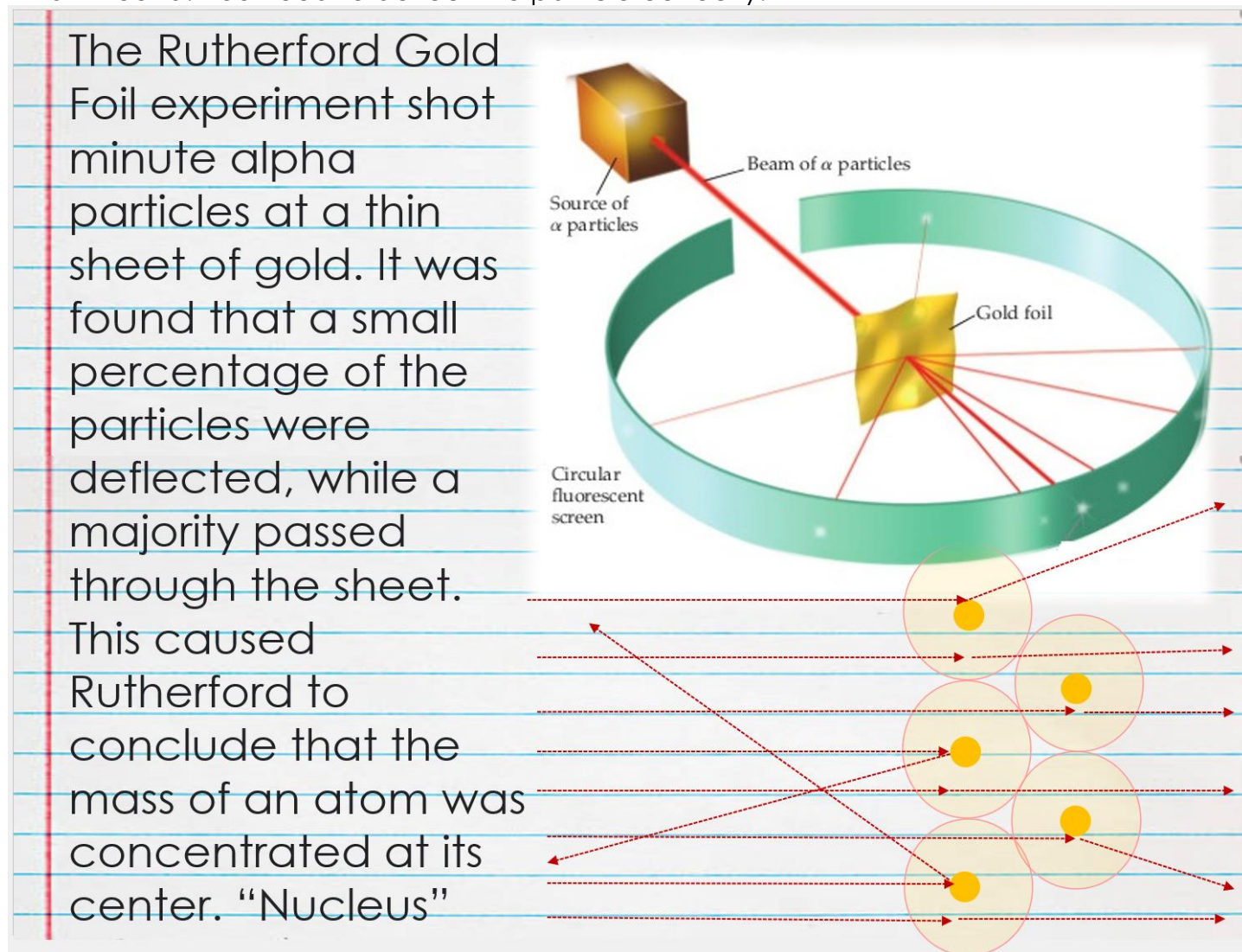
Crookes Tube (1869-1875)



The Crookes Tube is an early experimental electrical discharge tube, with partial vacuum, invented by English physicist William Crookes and others, in which cathode rays were discovered.

This device helped discover the properties of cathode rays, culminating in J.J. Thomson's 1897 identification of cathode rays as negatively charged particles, which were later named electrons.

Describe Rutherford's gold foil experiment using the diagram below. What did it show? Use the picture of the atoms with nucleus in the middle on the right to draw a close-up of what it found. You need to deflect the particle correctly.



An Atom is the smallest part of an element which can take part in a **chemical** reaction.

Chemical reaction: A process in which atoms of the same or different elements **rearrange** themselves to form a new substance.

The atom consists of three fundamental **particles**.

Proton + (**Positive** charge) Determines the atom **Identity**

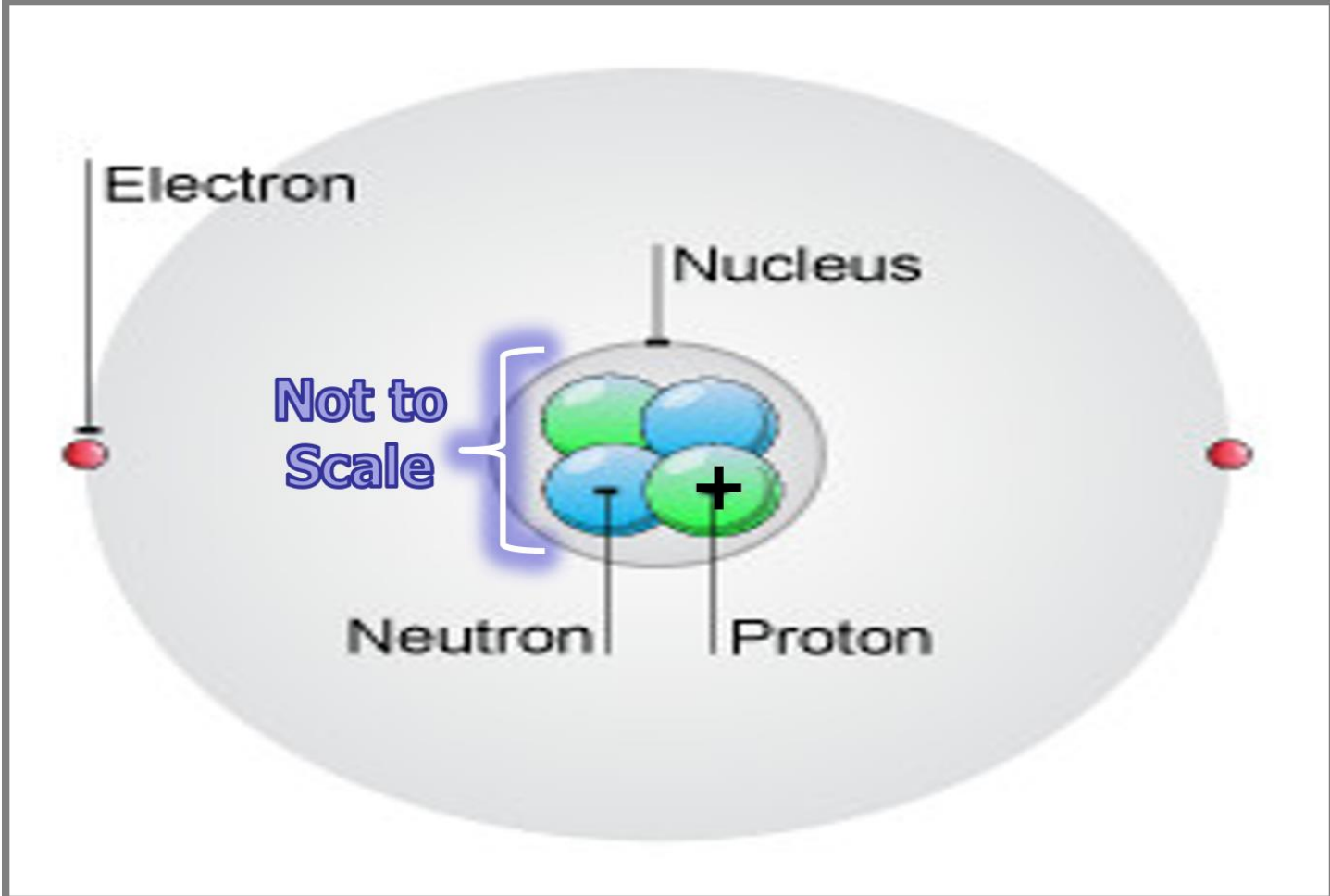
Neutron 0 (**Neutral** charge / no charge).

Electron - (**Electrical** charge) **Helps to determine the elements Properties**

	<u>Mass</u>	<u>Charge</u>
Proton	1	+1
Neutron	1	0
Electron	0	-1

The diagram shows a central nucleus containing two protons (yellow circles with '+') and two neutrons (red circles with '0'). A single electron (purple circle with '-') is shown orbiting the nucleus. Labels with arrows point to a 'Proton', a 'Neutron', and the '-Electron'.

Name the terms in the atom below? What atom is it?



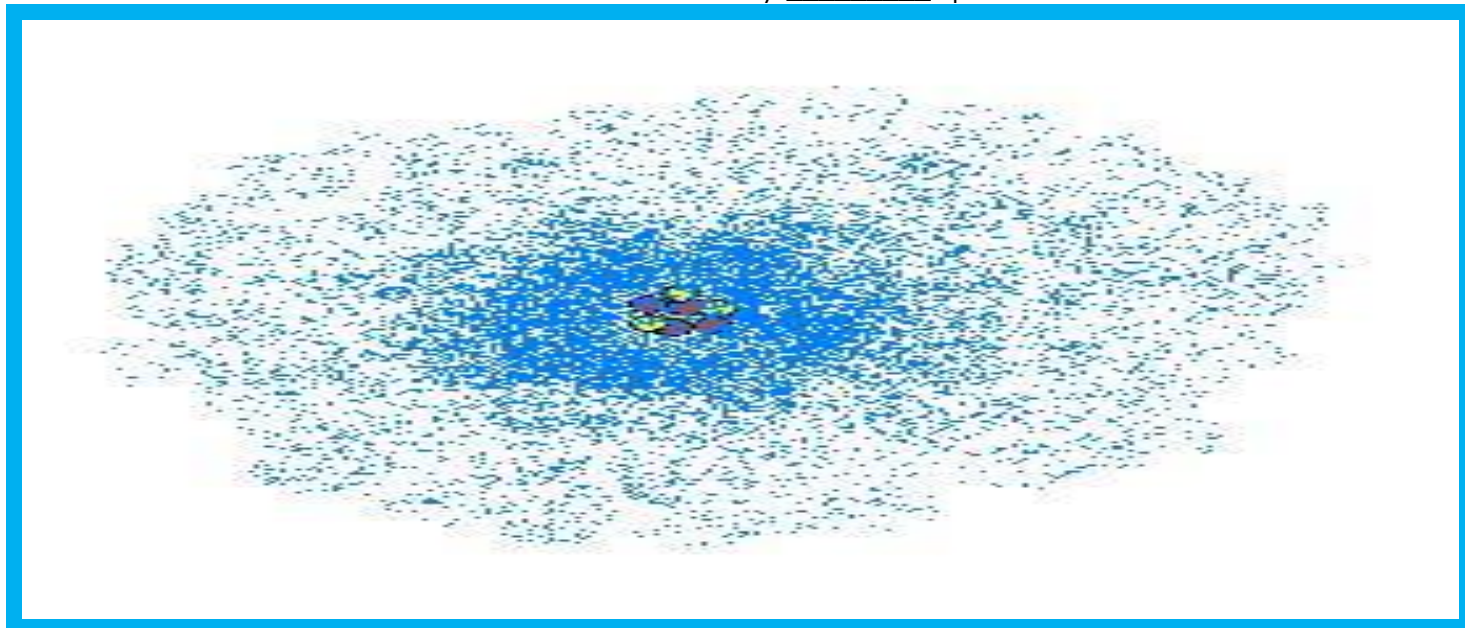
Nucleus: The **positive** charged center of the atom.

- The nucleus has an incredibly high **density**
- QUIZ WIZ! Name the Particle! Work Bank: Proton, Neutron, Electron, Nucleus

1. Nucleus	2. Electron	3. Neutron
4. Proton	5. Electron	6. Nucleus
7. Electron	8. Nucleus	9. Nucleus
10. Proton or Nucleus	*11 The Flash	

Part 1 Lesson 3 Atomic Number

Please draw your best atomic cloud (500 dots minimum). I added a "not to scale" nucleus in the middle below. Remember, an atom is mostly _____ space.



Heisenberg Uncertainty Principle

You can't know with certainty both where an **electron** is and where it's going next. That makes it impossible to plot an **orbit** for an electron around a nucleus. This is also true for the Proton and Neutron.

Neils **Bohr** Model (1913): Depicts the atom as a small, positively charged nucleus surrounded by electrons that travel in circular orbits around the nucleus.

APE. $A=P+E$

Atomic #Number = #Protons = #Electrons

The atomic number is equal to the number of **Protons** in an atom's nucleus.

The atomic number determines which **element** an atom is.

Which is the Atomic Number, Atomic Mass, Atomic Symbol, and Name for the element below?

Atomic Number	→ 47
Atomic Symbol	→ Ag
Name of Element	→ Silver
Atomic Mass	→ 107.8682

The atom Iridium (Atomic Number 77) will have how many protons in its nucleus? Answer: 77	The atom Neodymium (Atomic Number 60) will have how many protons in its nucleus? Answer: 60
The atom Rutherfordium (Atomic Number 104) will have how many protons in its nucleus? Answer: 104	The atom Promethium (Atomic Number 61) will have how many protons in its nucleus? Answer: 61

19 K	63 E u	63 E u	15 P	
20 C a	57 L a	25 M n		
79 A u	60 N d			
105 D b	8 O			
21 S c	53 I	63 E u	7 N	58 C e

Please fill in the boxes with ALL of the correct information using the periodic table of the elements.

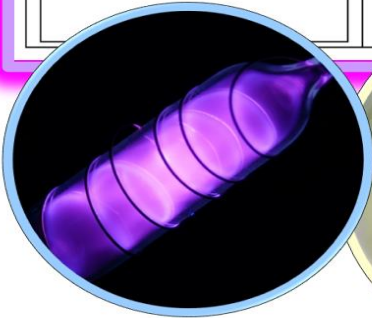



Please fill in the boxes with the correct information using the periodic table of the elements.

Protons (P)+ – 3 Neutrons (No) 4	Protons – 6 Neutrons- 6	Protons – 10 Neutrons- 10	Protons – 11 Neutrons- 12
# 3 Li Lithium	# 6 C Carbon	# 10 Ne Neon	# 11 Na Sodium
Atomic Mass = 6.941	Atomic Mass = 12.011	Atomic Mass = 20.10	Atomic Mass = 22.990

Please fill in the boxes with ALL of the correct information using the periodic table of the elements.

Please fill in the boxes with the correct information using the periodic table of the elements.

Protons – 18 Neutrons- 22	Protons – 17 Neutrons- 18	Protons – 20 Neutrons- 20	Protons – 29 Neutrons- 34/36 Isotopes
# 18 Ar Argon	# 17 Cl Chlorine	# 20 Ca Calcium	29 Cu Copper
Atomic Mass = 40	Atomic Mass = 35.4	Atomic Mass = 40.78	Atomic Mass = 63.5

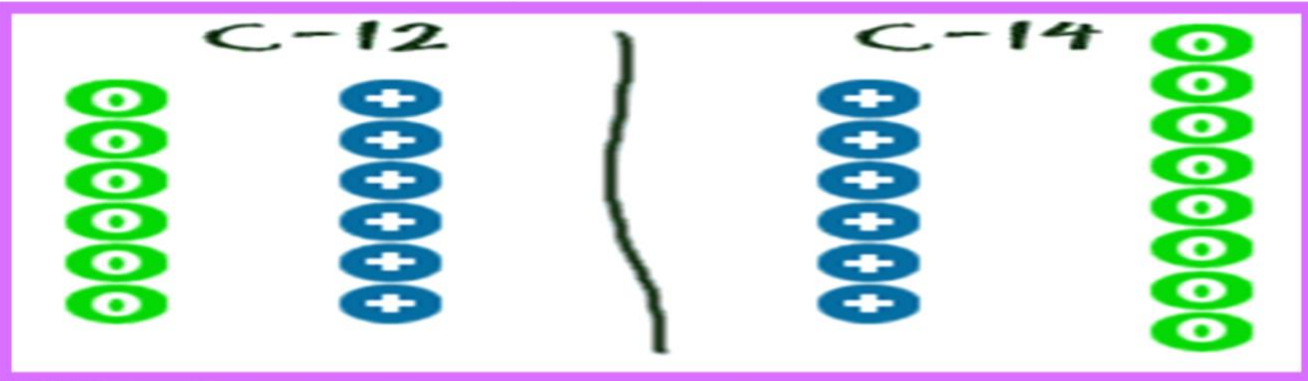
Part 1 Lesson 4 Isotopes, Neutrons, Atomic Mass

The Nucleus has almost all the mass of the atom. It's made up of protons (+) and neutrons (O). Everything is chiefly made of **Nothing!**

Isotope: Atom with the same number of protons and electrons but different numbers of **neutrons.**

What is the difference between C12, and C14? Explain below.

What is the difference between C12, and C14? Explain below.



Atoms of carbon-12 (more common) have 6 neutrons, while atoms of the isotope carbon-14 (rare) contain 8 neutrons. A neutral atom would have the same number of protons and electrons, so a neutral atom of carbon-12 or carbon-14 would have 6 electrons

MAN: To find the number of neutrons: Subtract the atomic **mass** from the atomic **number.**

Please fill in the required field below.



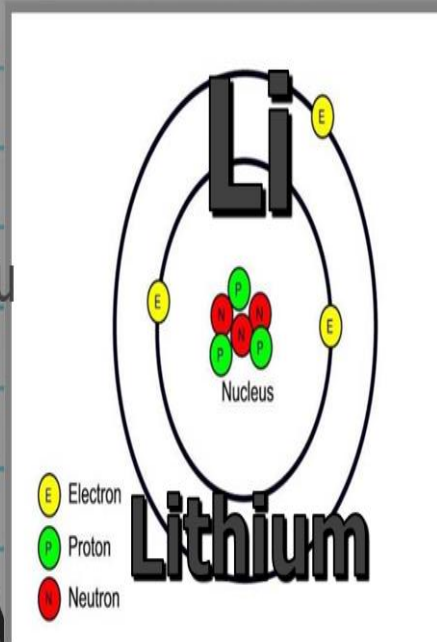
What is the atomic symbol? **F**
 What is the atomic number? **#9**
 How many Protons? **9**
 How many Electrons? **9**
 What is the atomic Mass?
 How many Neutrons? **10**



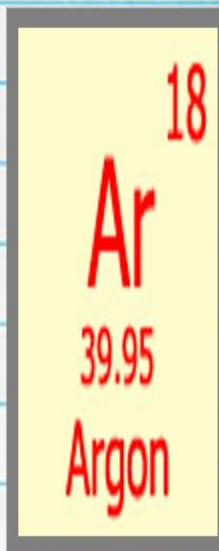
What is the atomic symbol? **Fe**
 What is the atomic number? **#26**
 How many Protons? **26**
 How many Electrons? **26**
 What is the atomic Mass? **55.84 amu**
 How many Neutrons? **30**



What is the atomic symbol? **Li**
 What is the atomic number? **#3**
 How many Protons? **3**
 How many Electrons? **3**
 What is the atomic Mass? **6.94 amu**
 How many Neutrons? **4**



What is the atomic symbol? **Ar**
 What is the atomic number? **#18**
 How many Protons? **18**
 How many Electrons? **18**
 What is the atomic Mass? **39.93 amu**
 How many Neutrons? **22**



Part 1 Lesson 5 Wrap-Up and Review

Meet the Elements

In each box, please find and then write the correct element by name, its atomic number, atomic mass, and atomic symbol. Use the information in each box to help you. (5 pts each correct box)

Meet the Elements**Answers**

Name:

Due: Today

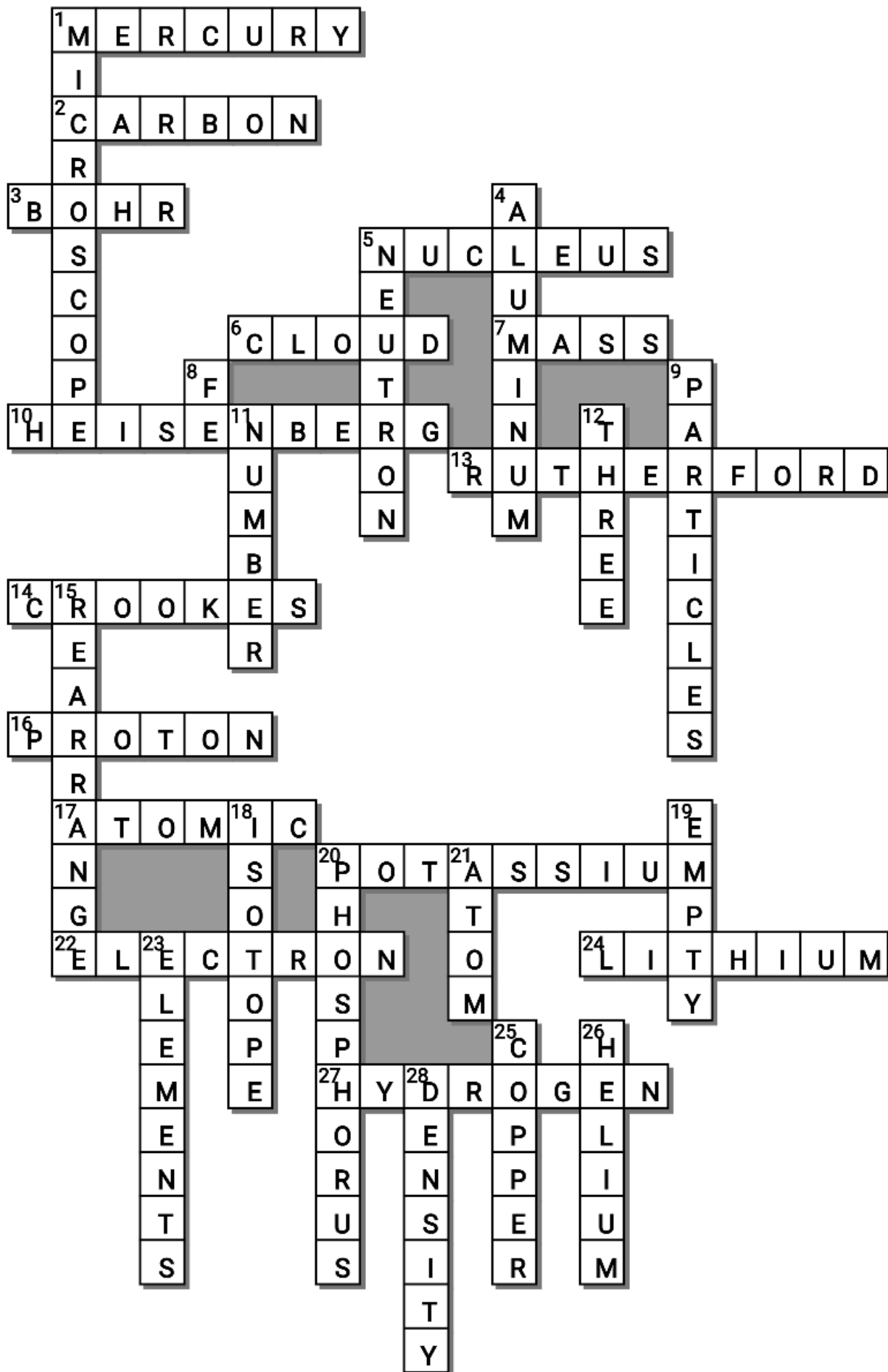
In each box, please find and then write the correct element by name, its atomic number, atomic mass, and atomic symbol. Use the information in each box to help you. (5 pts each correct box)

5 B Boron 10.81 amu	7 N Nitrogen 14.01 amu	35 Br Bromine 79.90 amu	16 S Sulfur 32.065
55 Cs Cesium 132.91	4 Be Beryllium 9.01	82 Pb Lead 207.20	17 Cl Chlorine 35.45 amu
79 Au Gold 196.97 amu	8 O Oxygen 16.00 amu	77 Ir Iridium 192.22	10 Ne Neon 20.18
102 No Nobelium 259.00 amu	30 Zn Zinc 65.41	I don't have a neutron 1 H Hydrogen 1.01	20 Ca Calcium 40.08 amu

Name That Element

Name That Element Only Who can find the spelling error?

<p>I am the lightest element on the periodic table?</p> <p>Hydrogen</p>	<p>I am the second lightest element on the periodic table?</p> <p>Helium</p>	<p>I glow in sign's when excited?</p> <p>Neon Krypton, Argon, Xenon, Helium</p>	<p>I coat most penny's I have an atomic number of 29?</p> <p>Pennies Copper</p>
<p>My atomic name starts with an Y? (Two Possible)</p> <p>Yttrium</p>	<p>I am the only element that has three letters?</p> <p>Tin</p>	<p>My name was used to create a fake element that can destroy superman?</p> <p>Krypton</p>	<p>I must be from France with my name?</p> <p>Francium</p>
<p>Name four elements with four letters?</p> <p>Zinc, Neon, Gold, Lead</p>	<p>I must be from Europe with my name?</p> <p>Europium</p>	<p>I must be from America with my name?</p> <p>Americium</p>	<p>I have a planet as part of my name?</p> <p>Mercury, Plutonium, Uranium, Neptunium,</p>
<p>I am named after a famous scientist $E=MC^2$?</p> <p>Einsteinium</p>	<p>I am named after a US State?</p> <p>Californium</p>	<p>I am named after a famous prize?</p> <p>Nobelium</p>	<p>I can help give you strong bones? My atomic mass is 40.78.</p> <p>Calcium</p>
<p>I am found as part of rat poison? I have 33 electrons</p> <p>Arsenic</p>	<p>I am a liquid metal? My atomic symbol is Hg?</p> <p>Mercury</p>	<p>My atomic symbol is a W?</p> <p>Tungsten</p>	<p>I have 19 protons?</p> <p>Potassium</p>



Across

1. This element is a liquid metal at room temperature
2. This atom has 6 protons in its nucleus?
3. Neils _____ Model (1913): Depicts the atom as a small, positively charged nucleus surrounded by electrons that travel in circular orbits around the nucleus.
5. The positively charged central core of an atom, consisting of protons and neutrons and containing nearly all its mass.
6. An electron _____ is the region of negative charge surrounding an atomic nucleus that is associated with an atomic orbital. It is defined mathematically, describing a region with a high probability of containing electrons.
7. The mass of an atom or a molecule is referred to as the atomic _____.
10. _____ Uncertainty Principle? You can't know with certainty both where an electron is and where it's going next. That makes it impossible to plot an orbit for an electron around a nucleus.
14. A _____ tube is an early experimental electrical discharge tube, with partial vacuum, in which cathode rays, streams of electrons, were discovered.
16. A stable subatomic particle occurring in all atomic nuclei, with a positive electric charge equal in magnitude to that of an electron, but of opposite sign.
17. The _____ number or proton number of a chemical element is the number of protons found in the nucleus of every atom of that element.
20. This element is represented with the symbol K on the Periodic Table
22. A stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
24. This element has four neutrons in its nucleus
27. This is the only element that can exist without a neutron in its nucleus?

Down

1. A scanning tunneling _____ is a type of microscope used for imaging surfaces at the atomic level.
4. This element has atomic mass of 26.9?
5. A subatomic particle of about the same mass as a proton but without an electric charge, present in all atomic nuclei except those of ordinary hydrogen.
8. Iron has the Symbol...
9. An atom has charged _____
11. To find the number of neutrons: Subtract the atomic mass from the atomic _____.
12. The atom consists of _____ fundamental particles
15. Chemical reaction: A process in which atoms of the same or different elements _____ themselves to form a new substance.
18. Each of two or more forms of the same element that contain equal numbers of protons but different numbers of neutrons in their nuclei, and hence differ in relative atomic mass but not in chemical properties; in particular, a radioactive form of an element.
19. An atom is made of mostly _____ space
20. This element has a symbol of P on the Periodic Table
21. An _____ is the smallest part of an element which can take part in a chemical reaction.
23. The Periodic Table of _____
25. This element has 29 protons in its nucleus
26. This element has two protons in its nucleus
28. The nucleus has an incredibly high _____.

-----teacher can remove word bank to make more difficult-----

ALUMINUM, ATOM, ATOMIC, BOHR, CARBON, CLOUD, COPPER, CROOKES, DENSITY, ELECTRON, ELEMENTS, EMPTY, FE, HEISENBERG, HELIUM, HYDROGEN, ISOTOPE, LITHIUM, MASS, MERCURY, NEUTRON, NUCLEUS, NUMBER, PARTICLES, PHOSPHORUS, POTASSIUM, PROTON, REARRANGE, RUTHERFORD, THREE, MICROSCOPE

Part 1 Review Game Lesson 6

1-10 = 10 pts * = Bonus + 1 pt,
 (Secretly write owl in correct space +1 pt)
 Final Question = 5 pt wager

Name: _____

Due: Today

Score ____ / 100

HAVE A GOOD LOOK ATOM	ROUND ABOUT	NUMBERIFFIC	SUPER SMALL	ATOMIC POWER <small>Bonus round 1 pt each</small>
1) Letter A) Cathode rays were negatively charged particles, which were later named electrons.	6) Chemical Reaction	11) Copper #29	16) The Nucleus	*21) Goddard
2) A=J.J. Thompson Plum Pudding Model B=Rutherford Model	7) Heisenberg Uncertainty Principle	12) Potassium Has 20 Neutrons	17) Letter B (Electron Cloud)	*22) Bruce Banner
3) A=Electron negatively charged, B=Neutron (neutral charge) C=Nucleus D=Electron Negatively Charged HELIUM	8) Letter B.) Neils Bohr Model	13) Isotope	18) The Neutron was incorrect because it has a neutral charge	*23) Fro ZOne
4) Lettter C.) About 2.3×10^{17} kg/m ³	9) Atomic Number = 7 Number of Protons = 7 Number of Neutrons = $14.01 - 7 = 7.01$ Or Z	14) Rutherford Concluded... B.) that the mass of an atom was concentrated at its center.	19) Neodymium	*24) Fe = Iron Man
5) An Atom is Mostly Empty Space	10) Sodium, 11P+, 11E-, 12 N	15) False	20) They are all Hydrogen (Isotopes)	*25) Lex Luther

Final Question Wager ____ /5. Answer: Calcium is atomic number #20, Atomic symbol Ca, with 20 Protons, 20 Electrons, 20 Neutrons, and a atomic mass of 40.

