Mass of Atoms Worksheet

Name: _____ Date: _____ Period: _____

1. Complete the table below.

Subatomic Particle	Relative Mass	Actual Mass
Proton		
Neutron		
Electron		

2. The mass of an atom is due to the _____ and the _____ in the

   _____ of an atom. The mass of the _____ is insignificant.

3. Explain why atoms have different isotopes. In other words, how is it that helium can exist in three different forms?

4. Explain the difference between the terms *mass number* and *atomic mass*.

5. How many atomic masses does an element have?

6. How many mass numbers does an element have?

7. Which one – *atomic mass* or *mass number* – is found on the Periodic Table?

8. Rounding the _____ found on the Periodic Table gives _____
   <u>atomic mass or mass number</u>

   _____.

9. Argon has three naturally occurring isotopes: argon-36, argon-38, and argon-40. Based on argon's reported atomic mass, which isotope is the most abundant in nature? Explain.

10. Why is the mass in amu of a carbon-12 atom reported as 12.011 in the periodic table of the elements, rather than 12?

11. Calculate the average atomic mass of sulfur if 95.00% of all sulfur atoms have a mass of 31.972 amu, 0.76% has a mass of 32.971 amu, and 4.22% have a mass of 33.967 amu.

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15. 85.47 amu

14. 79.91 amu

18. 35.458 amu

13. 207.188 amu

17. 47.879 amu

16. 238.03 amu

11. 32.057 amu

12. There are three isotopes of silicon. They have mass numbers of 28, 29 and 30. The average atomic mass of silicon is 28.086 amu. What does this say about the relative abundances of the three isotopes?

13. The four isotopes of lead are shown below, each with its percent abundance and the composition of its nucleus. Calculate the mass number of each isotope and enter it in the appropriate column of the table. Then, fill in the column for **Isotope Symbol**.

Lead	# of p^+	# of n^0	Mass Number	Isotope Symbol	Percent Abundance	Relative Mass (amu)
Isotope 1	82	122			1.37%	203.973
Isotope 2	82	124			26.26%	205.974
Isotope 3	82	125			20.82%	206.976
Isotope 4	82	126			51.55%	207.977

Finally, calculate the average atomic mass of lead.

14. Calculate the average atomic mass of bromine. One isotope of bromine has an atomic mass of 78.92 amu and a relative abundance of 50.69%. The other major isotope of bromine has an atomic mass of 80.92 amu and a relative abundance of 49.31%.

15. Rubidium has two common isotopes, ^{85}Rb and ^{87}Rb. If the abundance of ^{85}Rb (84.91 amu) is 72.2% and the abundance of ^{87}Rb (86.91 amu) is 27.8%, what is the average atomic mass of rubidium?

16. Uranium has three common isotopes. If the abundance of ^{234}U (234.04 amu) is 0.01%, the abundance of ^{235}U (235.04 amu) is 0.71%, and the abundance of ^{238}U (238.05 amu) is 99.28%, what is the average atomic mass of uranium?

17. Titanium has five common isotopes: ^{46}Ti (45.953 amu, 8.00%), ^{47}Ti (46.952 amu, 7.30%), ^{48}Ti (47.948 amu, 73.80%), ^{49}Ti (48.948 amu, 5.50%), ^{50}Ti (49.945 amu, 5.40%). What is the average atomic mass of titanium?

18. Naturally occurring chlorine that is used in pool treatment is 75.53% ^{35}Cl (mass = 34.969 amu) and 24.47% ^{37}Cl (mass = 36.966 amu). Calculate the average atomic mass.