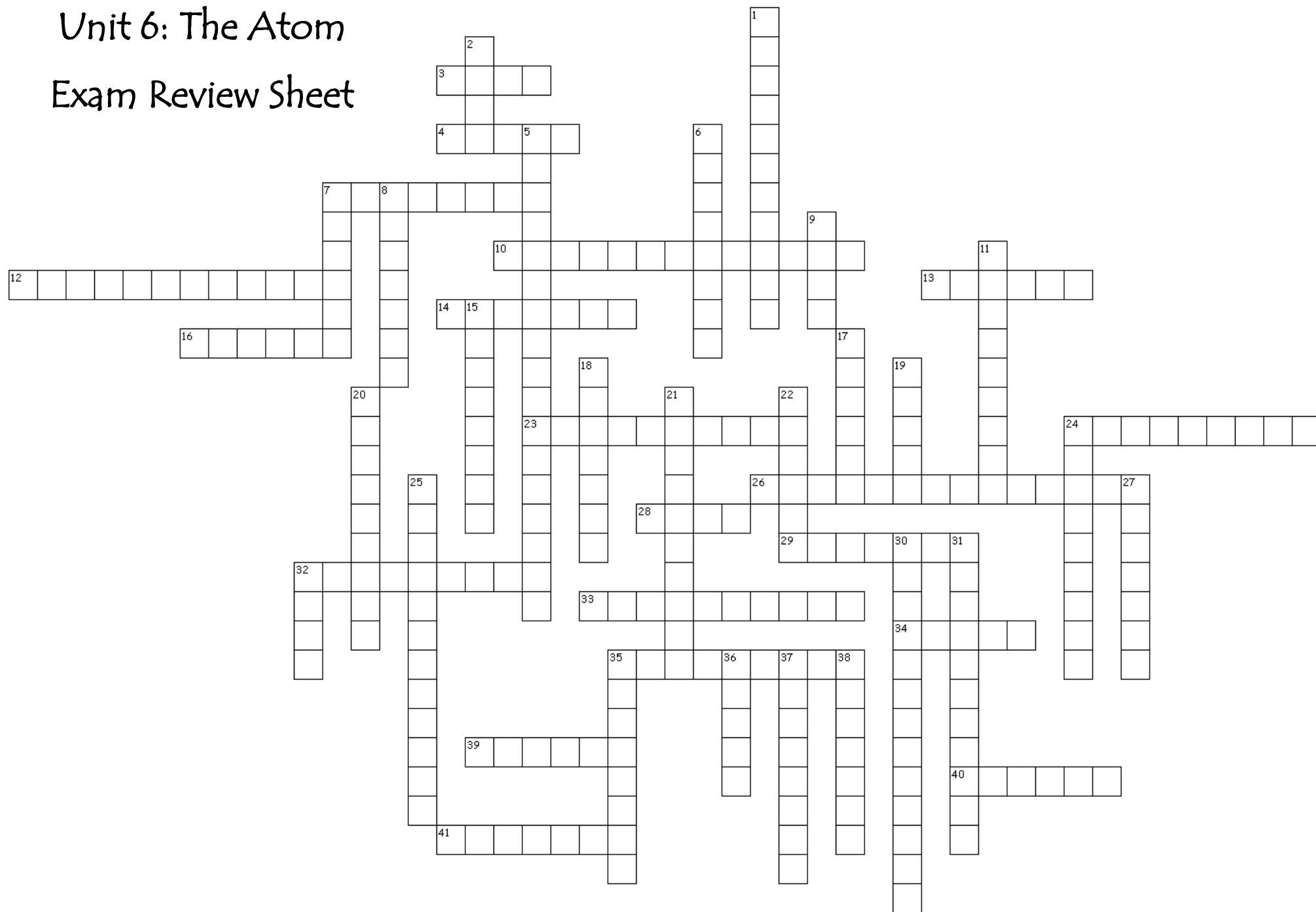


Unit 6: The Atom

Exam Review Sheet



Name _____ Date _____ Mod _____ Exam Date _____

Across

3. His model was the first to include energy levels.
4. The process of an atom's nucleus changing to form a different element is called nuclear ____.
7. The time required for half of a sample of radioactive nuclei to decay.
10. The process of an unstable nucleus emitting one or more particles or energy in the form of electromagnetic radiation.
12. The number of protons in an atom.
13. Subatomic particles making up protons and neutrons.
14. Chemist who began assigning atomic numbers to elements.
16. Combining of smaller atoms into large atoms releasing large amounts of energy.
23. The number of protons plus the number of neutrons in an atom.
24. The mass of an element expressed in grams.
26. 1/12 the mass of a carbon-12 atom.
28. Unit that measures nuclear radiation exposure to humans.
29. The center of an atom that is small, dense, and positively charged.
32. Individual who used latin names for chemical symbols.
33. The first person to use the word atom to describe very small particles making up matter.
34. She discovered radioactivity.
35. The charged particle or energy emitted by an unstable nucleus is called nuclear ____.
39. Chemist who gathered evidence in support of Democritus' Particle Theory of Matter.
40. The force particles that bind quarks into p^+ and n^0 .
41. The nucleus of a specific isotope with a specific mass number.

List the six flavors of quarks:

- _____
- _____
- _____
- _____
- _____
- _____

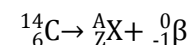
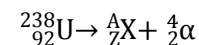
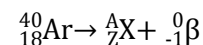
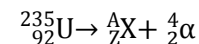
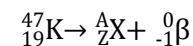
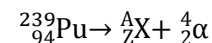
Down

1. The area of the electron cloud where a certain/specific electron can be found.
2. The SI base unit for amount of substance.
5. A weighted average of the isotopes for a given atom.
6. A negatively charged particle moving around the nucleus.
7. A group of quarks.
8. Electrons, tau, muons, and neutrinos.
9. Unable to be divided.
11. High energy electromagnetic radiation.
15. Regions in space where electrons are likely to be found.
17. Alpha particles are the nucleus of this atom.
18. Breaking apart of large radioactive atoms into smaller atoms releasing large amounts of energy.
19. The organization that formulates naming rules for chemical elements and compounds.
20. A mole of any substance contains ____ number of representative particles, or 6.02×10^{23} representative particles.
21. Individual who discovered the nucleus and proton through his Gold Foil Experiment.
22. A positively charged particle with a mass of $\sim 1\text{amu}$. It identifies the element.
24. The first person to put the known elements into the periodic table.
25. The long tunnels that used to identify subatomic particles are called particle ____.
27. His model was the first to include electrons (spread like raisins through a positive pudding).
30. The entire region around the nucleus where all of electrons for an atom can be found.
31. His theory suggested that electrons have wave-like properties and are found in orbitals.
32. The type of nuclear radiation with a -1 charge formed from a decaying neutron.
35. Unit that measures nuclear radiation exposure to the environment.
36. The largest type of nuclear radiation with a +2 charge.
37. Any atoms of an element having the same number protons, but different numbers of neutrons.
38. A particle with a mass of $\sim 1\text{amu}$ and no charge.

- Be able to correctly derive information from a periodic table: what is atomic #, mass #, how do you find the number of neutrons, etc.:

Element	Chemical Symbol	Atomic Number	Number of Protons	Number of Neutrons	Mass Number	Number of Electrons
	C					
	Mn					
Potassium						
		35				
Fluorine						
	Fe					
						56
Magnesium						
	H					
Hydrogen					2	
	Ar					
Oxygen						

- Energy level diagrams –** Complete the following diagrams on loose-leaf:
 - Magnesium
 - Boron
 - Phosphorus
- Nuclear Reactions --** Complete the following nuclear reactions on loose-leaf:



- Half Life –** Complete the following problems on loose-leaf. Be sure to show all of your work!
 - A piece of uranium-238 has a mass of 1.0×10^3 g. How much of this isotope, with a half life of 4.5×10^9 years, will remain in 3.6×10^{10} years?
 - Polonium-218 has a half life of 3.0 min. A sample with a mass of 50.0 g is stored in a laboratory. How much of the isotope will remain after 15 min?
 - A sample of gallium-67 was ordered by a research laboratory some time ago. When received in the lab, it had a mass of 492 g. Today, only 15 g (1/32 of the original amount) remains. How long ago (in days) was the gallium-67 received in the laboratory? The half life of gallium-67 is 78 hours.
 - In studies to determine the half life of an isotope, the isotope was found to decay to 1/16 of its original amount in 6.0 hours. From this information, calculate the half life of the isotope.
- Average Atomic Mass –** Complete the following problems on loose-leaf. Be sure to show all of your work!
 - If 75.77% of chlorine has a mass of 34.969 amu and 24.23% has a mass of 36.966 amu, what is the average atomic mass of chlorine?
 - If 158 atoms of Mg have a mass of 23.985 amu, 40 have a mass of 24.986 amu and 2 have a mass of 25.983 amu, what is the average atomic mass of magnesium?
- Mole Conversions –** Complete the following problems on loose-leaf. Be sure to show all of your work!
 - What is the mass in grams of 2.50 mol of S?
 - How many moles of Ca in 72.1 grams of Ca?
 - How many moles of Cu in 203 grams of Cu?
 - What is the mass of 0.39 mol of Si?

