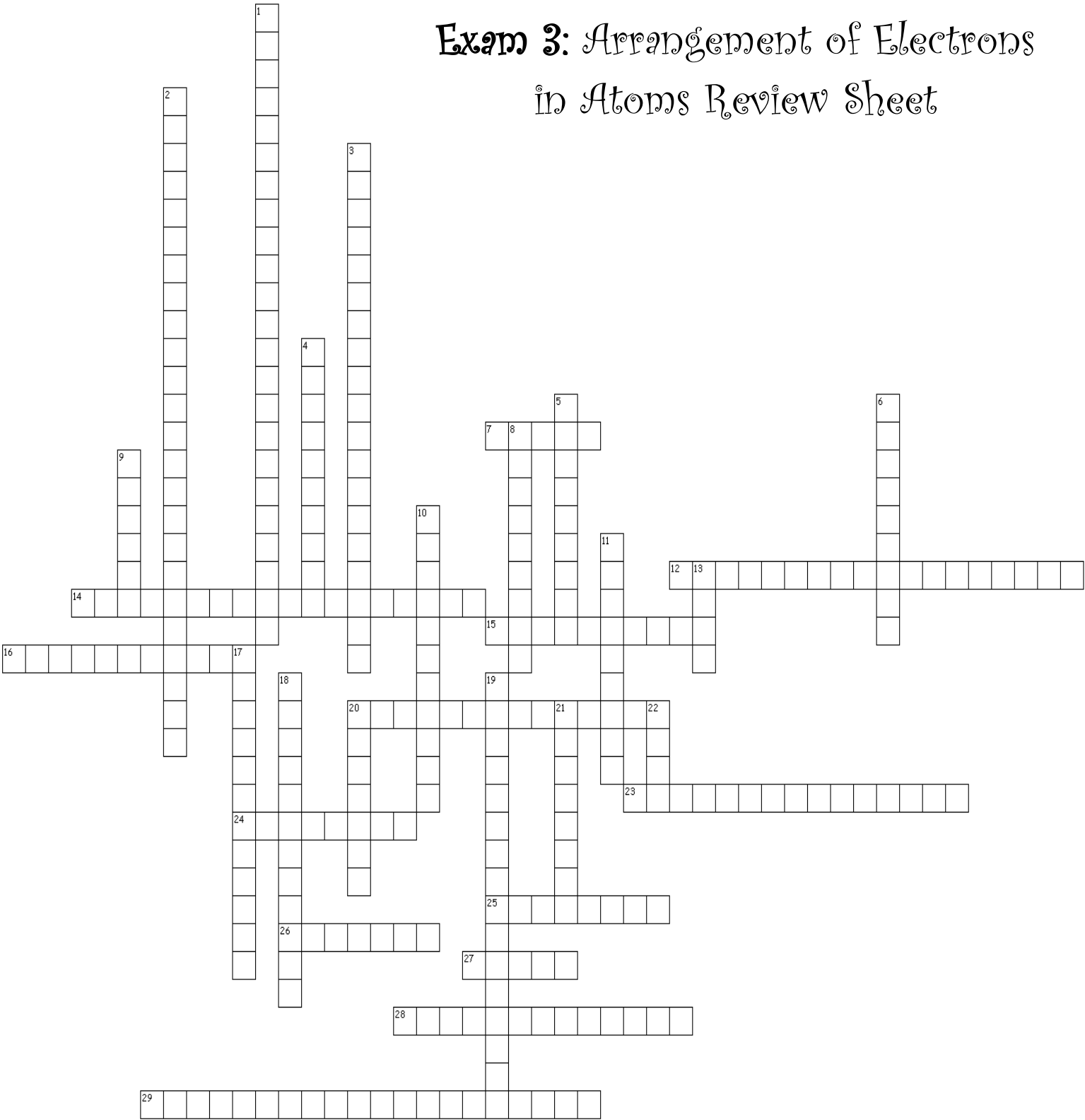


Exam 3: Arrangement of Electrons in Atoms Review Sheet



B. Complete the following table:

QUANTUM NUMBERS	INDICATES	SYMBOL	# RANGE
	Distance from nucleus		
	Shape of orbital (sublevel)		
	Orientation of orbital around axes		
	Spin direction of electron		

A. Complete the crossword puzzle:

Across

7. how fast the light form travels; symbolized by c; equal to 3.0×10^8 m/s
12. a band of colors with dark lines where energy (light) is absorbed
14. unbroken bands of colors for the wavelengths in visible part of electromagnetic radiation; like a rainbow; produced from sources such as stars (sun) and light bulbs
15. the distance between corresponding points on adjacent waves; symbolized by λ
16. the lowest energy state of an atom
20. specify properties (locations) of orbitals and property (spin) of electrons
23. quantum number that indicates the shape of the orbital
24. energy and frequency are ____ proportional
25. visible light radiation is divided into bands of color
26. three-dimensional region above and around the nucleus where electrons are located; can only hold two electrons
27. unit of frequency
28. a mathematical description of the wave properties of electrons and other very small particles; developed by Schrödinger
29. show how electrons occur in orbitals of atoms; different for each element

Down

1. all the forms of electromagnetic radiation
2. a form of energy (light) that exhibits wavelike behavior as it travels through space
3. the emission of electrons from a metal when light of a specific frequency shines on the metal
4. unit of wavelength
5. determined electrons have wave-like properties
6. the number of waves that pass a given point in a specific time, usually one second; symbolized by ν
8. quantum number that indicated the main level or the distance from the nucleus
9. a particle of electromagnetic radiation that has zero mass and carries a quantum of energy
10. calculated probable positions for electrons using quantum theory; determined orbital for electrons
11. the relationship between wavelength and frequency is ____ proportional
13. developed the planetary model of the atom which only worked for Hydrogen
17. a state in which an atom has a higher potential energy than in its ground state
18. an instrument with a prism or diffraction lens that can separate electromagnetic radiation by specific wavelengths
19. a series of specific wavelengths of emitted light; "fingerprint" for each element; produced when an atom returns to the ground state from the excited state
20. the minimum quantity of energy that can be gained or lost by an atom; proposed by Max Planck
21. quantum number that indicates the orientation of the orbital around the nucleus; represents the number of orbitals within each sublevel
22. quantum number that indicates the spin direction of the electron; spin must be in opposite direction

C. On the line below:

- List the types of electromagnetic radiation (start with longest wavelength) // Break visible light into the colors
- Mark the location of: long wavelength / short wavelength / low frequency / high frequency / low energy / high energy

_____ wavelength

_____ frequency

_____ energy

_____ wavelength

_____ frequency

_____ energy

D. Complete the following table:

Sublevel	Electron Capacity	# of Orbitals	Sublevel	Electron Capacity	# of Orbitals
s			d		
p			f		

E. Complete each of the following electron arrangements (on loose-leaf):

- Orbital notation for:
 - Sodium, Argon, Arsenic
- Electron configuration for:
 - Bromine, Calcium, Phosphorus
- Noble gas configuration notation for:
 - Chlorine, Strontium, Boron

F. Give the definition of (on loose-leaf):

- Aufbau Principle
- Pauli Exclusion Principle
- Hund's Rule
- Heisenberg Uncertainty Principle

