## Universe & Spectrum Study Guide

1. What is the only part of the spectrum visible to the human eye? Visible light

Type of wave	How is damages living cells	Useful benefits
UV (ultra-violet)	Can cause skin cancer	Produce Vitamin D, tanning,
x-rays	Too much exposure can cause cancer	Medical imaging, security
Gamma	Can cause mutations to DNA	Kills cancer cells

2. Complete the data chart below

- 3. What type of wave is used for thermal imaging & why? Infrared is used because it is felt as heat
- 4. What is the name of our galaxy & describe its shape? The Milky Way. It is a spiral or barred spiral galaxy.
- 5. Complete the data chart below

Type of measurement	Distance	What it is most commonly
		used to measure in space
Astronomical unit (AU)	150 million km	Distances in our solar system
Light-year	9.5 trillion km	Distances to stars & galaxies

- 6. What is the difference between a galaxy & a nebula? A galaxy is a collection of stars, gas, and dust held together by gravity. A nebula is smaller than a galaxy and is a large cloud of gas and dust.
- 7. Put the following terms in order from smallest to largest: planet, nebula, solar system, galaxy, Local Group, Virgo Supercluster, universe
- 8. What is the difference between the red-shift & blue-shift? A red shift shows that a star or galaxy is moving away from Earth. A blue shift would show an object is moving toward Earth.
- 9. What inference about our universe do scientists make using evidence from the red-shift? They can infer that the universe is expanding.
- 10. What type of rays does the Hubble telescope collect that allows us to learn about invisible aspects of our universe? Ultraviolet, near-infrared
- 11. List the spectrum from longest wavelength to shortest. Radio, microwaves, infrared, visible, ultraviolet, x-ray, gamma ray
- 12. Which types of radiation can be used to disinfect & sanitize bacteria that could potentially harm humans? ultraviolet
- 13. List the visible light spectrum in order from longest wavelength to shortest? Red, orange, yellow, green, blue, indigo, violet
- 14. What is the relationship between wavelength and frequency? If wavelength is shorter, frequency is higher. If wavelength is longer, frequency is lower.
- 15. How does energy relate to frequency? High frequency= high energy

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16. What is the benefit of launching telescopes in space instead of using them in observatories on Earth? They are above the atmosphere so they can view more types of radiation that may be blocked or distorted if viewed from Earth.

Telescope	Year	Country that launched	Type of radiation it detects
	Launched	it	
Hubble	1990	USA	Wide range
Spitzer	2003	USA	Infrared
Chandra	1999	USA	x-ray

## 17. Complete the data chart below