



Practice Worksheet on Telescope Comparison

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Subject: Astronomy

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Long Answer Questions

1. Explain the primary wavelength range observed by the Hubble Space Telescope and its significance in astronomical observations.
2. Describe the advantages of Hubble's orbit distance (547 km) for its observations.
3. Explain the importance of the James Webb Space Telescope's primary wavelength (infrared) for its scientific goals.
4. Explain why the James Webb Space Telescope needs to operate at an extremely low temperature (approximately -233°C).
5. Discuss the significance of the Hubble Space Telescope's extended lifespan beyond its initial 15 years.
6. Summarize some of the major discoveries made by the Hubble Space Telescope that significantly impacted our understanding of the universe.

7. Explain the advantages of James Webb's orbit distance (1.5 million km) for its observations.

8. Discuss the ways in which the James Webb Space Telescope's key scientific goals expand upon those of the Hubble Space Telescope.

Multiple Choice Questions

1. In what year was the Hubble Space Telescope launched?

- a) 1970
- b) 1990
- c) 2000
- d) 2010

2. What is the approximate orbit distance of the Hubble Space Telescope?

- a) 1.5 million km
- b) 547 km
- c) 10,000 km
- d) 1 million miles

3. Which wavelengths of light does the Hubble Space Telescope primarily observe?

- a) Ultraviolet only
- b) Ultraviolet, Visible, and Near-Infrared
- c) Visible and Infrared
- d) Near-Infrared only

4. In what year was the James Webb Space Telescope launched?

- a) 2020
- b) 2021

- c) 2022
- d) 2023

5. What is the approximate diameter of the primary mirror of the James Webb Space Telescope?

- a) 2.4 meters
- b) 6.5 meters
- c) 4.5 meters
- d) 8.0 meters

6. What is the approximate orbit distance of the James Webb Space Telescope?

- a) 500 km
- b) 1 million km
- c) 1.5 million km
- d) 10 million km

7. Which wavelengths of light does the James Webb Space Telescope primarily observe?

- a) Infrared
- b) Ultraviolet
- c) Visible
- d) X-ray

8. What is the approximate operational temperature of the James Webb Space Telescope?

- a) Approximately 100°C
- b) Approximately 0°C
- c) Approximately -233°C
- d) Approximately 20°C

Answer Key

Long Answer Questions - Expected Responses

1. Explain the primary wavelength range observed by the Hubble Space Telescope and its significance in astronomical observations.

Expected Answer: The Hubble telescope primarily observes ultraviolet, visible, and near-infrared light, allowing it to capture detailed images of stars, galaxies, and nebulae.

2. Describe the advantages of Hubble's orbit distance (547 km) for its observations.

Expected Answer: Its orbit allows unobstructed views and avoids atmospheric distortion.

3. Explain the importance of the James Webb Space Telescope's primary wavelength (infrared) for its scientific goals.

Expected Answer: The James Webb telescope's primary mission is observing infrared light, which allows the telescope to see through dust clouds and detect the heat signatures of distant objects.

4. Explain why the James Webb Space Telescope needs to operate at an extremely low temperature (approximately -233°C).

Expected Answer: The extreme cold is essential for infrared detection; it minimizes interference from the telescope's own heat.

5. Discuss the significance of the Hubble Space Telescope's extended lifespan beyond its initial 15 years.

Expected Answer: Hubble's extended lifespan enabled numerous discoveries, showcasing its robust design and adaptability.

6. Summarize some of the major discoveries made by the Hubble Space Telescope

that significantly impacted our understanding of the universe.

Expected Answer: Hubble's key discoveries revolutionized our understanding of the universe's scale, structure, and evolution.

7. Explain the advantages of James Webb's orbit distance (1.5 million km) for its observations.

Expected Answer: JWST's distance from Earth minimizes interference from Earth's heat and light.

8. Discuss the ways in which the James Webb Space Telescope's key scientific goals expand upon those of the Hubble Space Telescope.

Expected Answer: JWST's infrared capabilities allow observation of the early universe, hidden objects, and exoplanet atmospheres, pushing the boundaries of astronomy.

Multiple Choice Questions – Correct Answers

1. In what year was the Hubble Space Telescope launched?

Correct Answer: 1990

2. What is the approximate orbit distance of the Hubble Space Telescope?

Correct Answer: 547 km

3. Which wavelengths of light does the Hubble Space Telescope primarily observe?

Correct Answer: Ultraviolet, Visible, and Near-Infrared

4. In what year was the James Webb Space Telescope launched?

Correct Answer: 2021

5. What is the approximate diameter of the primary mirror of the James Webb Space Telescope?

Correct Answer: 6.5 meters

6. What is the approximate orbit distance of the James Webb Space Telescope?

Correct Answer: 1.5 million km

7. Which wavelengths of light does the James Webb Space Telescope primarily observe?

Correct Answer: Infrared

8. What is the approximate operational temperature of the James Webb Space Telescope?

Correct Answer: Approximately -233°C