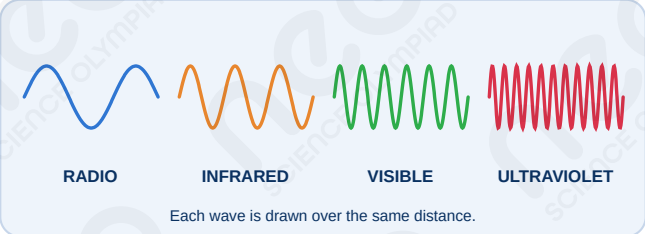
01



The diagram compares types of light. Which band has the shortest wavelength?

A) Radio
B) Infrared
C) Visible
D) Ultraviolet

02

A satellite moves from a lower circular orbit to a higher circular orbit around Earth.

How does its speed in the higher circular orbit compare with its speed in the lower circular orbit?

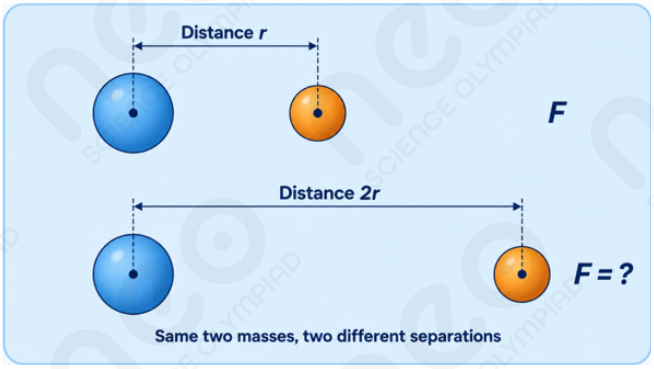
A) It is higher.
B) It is unchanged.
C) It is lower.
D) It cannot be determined without knowing the satellite's mass.

03

Why do astronomers analyze the spectrum of light from a distant star?

A) To learn about its temperature and chemical composition
B) To measure the star's sound waves directly
C) To increase the star's brightness
D) To count the planets in the universe

04



If the distance between two masses doubles, what happens to the gravitational force between them?

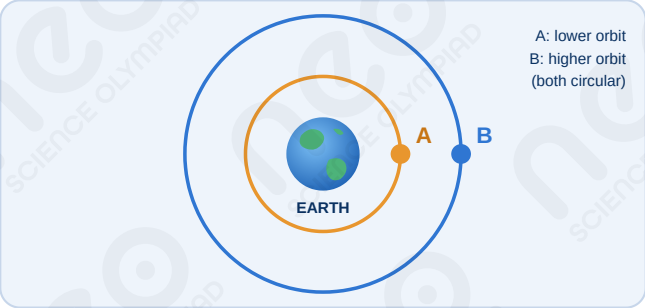
A) It doubles.
B) It halves.
C) It becomes one-quarter as large.
D) It becomes four times as large.

05

What is the primary source of energy produced inside the Sun?

A) Burning oxygen and hydrogen like a fire
B) Electricity generated by solar storms
C) Heat produced by collisions with asteroids
D) Nuclear fusion of hydrogen into helium

06



The diagram shows two circular satellite orbits around Earth. Which satellite moves faster?

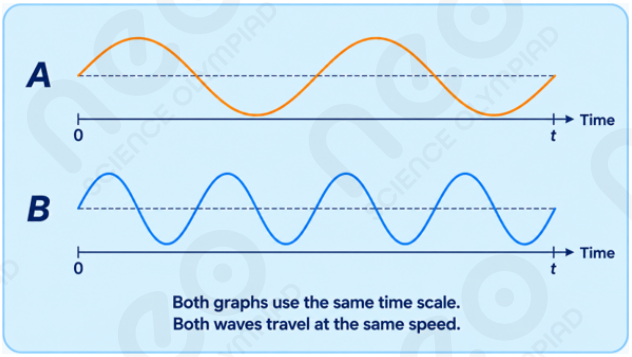
A) Satellite A in the lower orbit
B) Satellite B in the higher orbit
C) Both must have the same speed
D) Neither satellite moves

07

What does it mean when light from a distant galaxy is redshifted?

A) The galaxy must be cooler than the Sun.
B) Its light has shifted to longer wavelengths.
C) The galaxy is made up only of red stars.
D) The galaxy has stopped producing energy.

08



The diagrams show the oscillations of Waves A and B over the same time interval. Both waves travel at the same speed.

Which wave has the shorter wavelength?

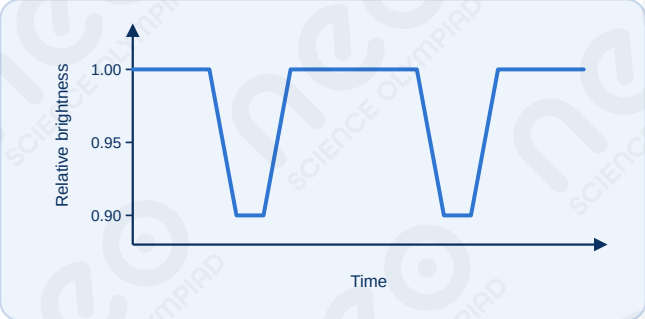
A) Wave A, because it completes fewer cycles in the same time.
B) Wave B, because it completes more cycles in the same time.
C) Both have the same wavelength because they travel at the same speed.
D) Their wavelengths cannot be compared without knowing their amplitudes.

09

Why do rockets need to carry their own oxidizer for most of their journey into space?

A) Oxidizer makes rockets invisible to radar.
B) Oxidizer removes Earth's gravitational pull.
C) Space provides no oxygen for combustion.
D) Oxidizer lets rockets exceed the speed of light.

10



The graph shows the brightness of a star over time. What is the most likely explanation for the repeated small dips?

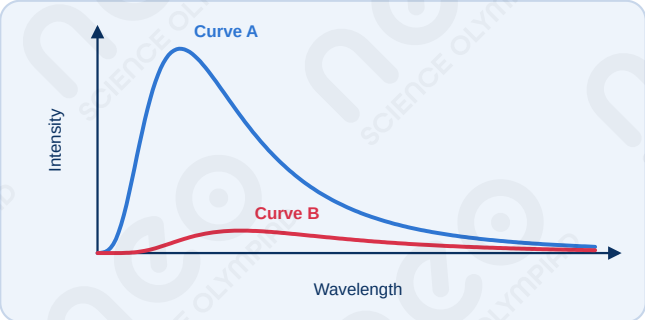
A) The star stops emitting light.
B) A planet crosses in front of the star.
C) The star moves outside the galaxy.
D) The telescope loses all power each time.

11

A star has a measured parallax angle of 0.5 arcseconds. Approximately how far away is it?

A) 2 parsecs
B) 0.5 parsecs
C) 5 parsecs
D) 10 parsecs

12



The graph shows the blackbody spectra of two stars. Which curve represents the hotter star?

A) Curve A
B) Curve B
C) Both are equally hot
D) Neither curve

13

What will most likely happen to the Sun after it uses up the hydrogen fuel in its core?

A) It will collapse into a black hole.
B) It will shrink into a small planet.
C) It will stop producing gravity.
D) It will expand into a red giant.

14



Spectrum of a star with dark absorption lines

What can astronomers learn by matching these lines with laboratory measurements?

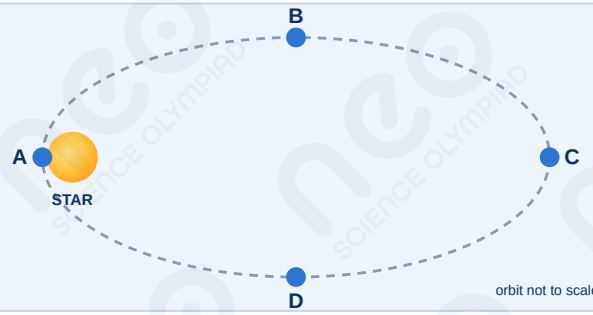
A) The star's exact age from one line
B) The number of planets in the galaxy
C) Elements in the star's atmosphere
D) The colors of the star's planets

15

Which electromagnetic radiation has a shorter wavelength than visible light?

A) Radio waves
B) Ultraviolet radiation
C) Microwaves
D) Infrared radiation

16



A planet moves around a star in the elliptical orbit shown. At which point does the planet move fastest?

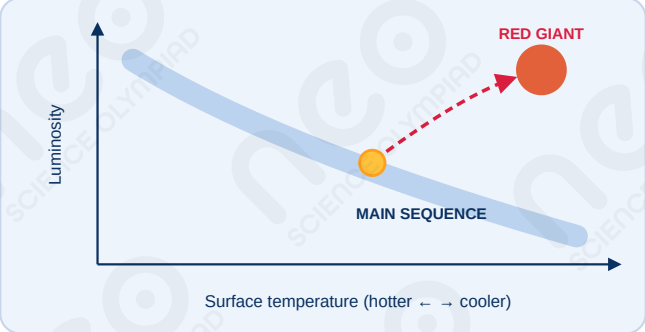
A) Point A
B) Point B
C) Point C
D) Point D

17

Why are radio telescopes useful in astronomy?

A) They can only observe objects inside Earth's atmosphere.
B) They create radio signals that push stars away.
C) They detect radio waves emitted by astronomical objects.
D) They directly photograph every exoplanet.

18



A star on the diagram moves from the main sequence toward the red-giant stage. Which change is expected?

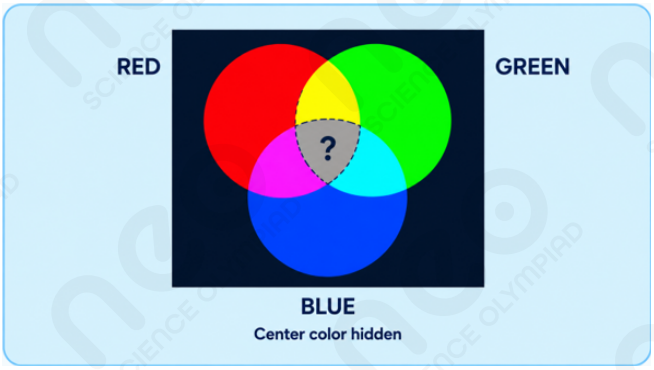
A) Its radius decreases to zero.
B) Nuclear fusion stops everywhere instantly.
C) It becomes a rocky planet.
D) Its outer layers expand and cool.

19

Scientists observe that a planet has a very thick atmosphere rich in carbon dioxide and extremely high surface temperatures. Which planet is the best match?

A) Venus
B) Mars
C) Mercury
D) Neptune

20



Red, green and blue lights overlap at the center. What color is seen at the center?

A) Black
B) Yellow
C) White
D) Cyan

Answer Key

1	D
2	C
3	A
4	C
5	D
6	A
7	B
8	B
9	C
10	B
11	A
12	A
13	D
14	C
15	B
16	A
17	C
18	D
19	A
20	C