



Section A

1. What speed does everything in the electromagnetic spectrum travel at?
2. Which radiation in the electromagnetic spectrum has the lowest frequency?
3. Which radiation in the electromagnetic spectrum has the highest frequency?

Section B

1. List the radiations in the electromagnetic spectrum in order of increasing frequency.
2. List the radiations in the electromagnetic spectrum in order of increasing wavelength.

Section C

1. Astronomers use refracting telescopes to view space.
Which type of radiation is detected by a refracting telescope?
 - A. X-Rays
 - B. Ultraviolet
 - C. Visible Light
 - D. Gamma Rays
 - E. Microwaves
2. A member of the electromagnetic spectrum has a shorter wavelength than visible light and a lower frequency than X-rays.
This type of radiation is
 - A. gamma
 - B. ultraviolet
 - C. infrared
 - D. microwaves
 - E. radio waves

3. The diagram shows part of the electromagnetic spectrum arranged in order of increasing wavelength.

gamma rays	R	ultraviolet	visible light
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Which row in the table identifies radiation R and describes its frequency?

	Radiation R	Frequency of radiation R
A.	X-rays	higher frequency than visible light
B.	microwaves	lower frequency than visible light
C.	X-rays	lower frequency than visible light
D.	infrared	lower frequency than visible light
E.	microwaves	higher frequency than visible light

4. The diagram shows members of the electromagnetic spectrum in order of increasing wavelength.

Gamma rays	P	Ultraviolet radiation	Q	Infrared radiation	R	TV & radio waves
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Which row in the table identifies the radiations represented by the letters P, Q and R?

	P	Q	R
A.	X-rays	visible light	microwaves
B.	X-rays	microwaves	visible light
C.	microwaves	visible light	X-rays
D.	visible light	microwaves	X-rays
E.	visible light	X-rays	microwaves



Section D

1. The star Betelgeuse is 500 light-years from Earth. Betelgeuse emits x-rays, infrared radiation and visible light. These are all part of the electromagnetic spectrum.
- List these radiations in order of **increasing** wavelength. 1
 - State a suitable detector for:
 - X-Rays
 - Infrared Radiation 2

2. Radio waves emitted by galaxies are detected and used to provide images of the galaxies. How does the wavelength of radio waves compare with the wavelength of light? 2

3. a) State an optical device that can split white light into different colours. 1
- b) Astronomers can use the peak wavelength of light emitted by stars to provide information about their temperature. The peak wavelength corresponds to a particular colour. Information about three stars is given in the table.

<i>Star</i>	<i>Colour of peak wavelength in visible spectrum</i>
Rigel	Blue
Betelgeuse	Red
Sun	Green

The shorter the peak wavelength, the hotter the star is.

- Which star is hottest? 1
- Is the sun hotter, colder or the same temperature as Betelgeuse? 1

Telescopes can detect visible light waves.

- Name one other type of wave that can be detected using a telescope. 1

4. Complete the passage below using words from the following list.

greater sound light energy height mass less

Radio signals are waves which transfer The radio signals travel at the speed of light, which is than the speed of sound. The period of a satellite orbit depends on its above the Earth. 2