

Q1. (2018)

0 4 . 2

A special lamp can produce UV radiation.

Which **two** statements describe the electromagnetic waves emitted by a UV lamp?

[2 marks]

Tick **two** boxes.

They have a higher frequency than X-rays.

☐

They have the same wave speed as visible light.

☐

They have a longer wavelength than microwaves.

☐

They have a lower frequency than gamma rays.

☐

They have a greater wave speed than radio waves.

☐

Q2. (2018)

0 4 . 4

Ionising radiation is used for some medical imaging.

Name **two** types of electromagnetic waves that are used.

[2 marks]

1 _____

2 _____

Q3. (2019)

0 5

The Sun emits all types of electromagnetic waves.

Figure 7 shows the electromagnetic spectrum.

Figure 7

Radio waves	Microwaves	Infrared	Visible light	Ultraviolet	X-rays	Gamma rays
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0 5 . 3

Some microwaves are **not** absorbed by the Earth's atmosphere.

Why is this useful?

[1 mark]

Q4. (2019)

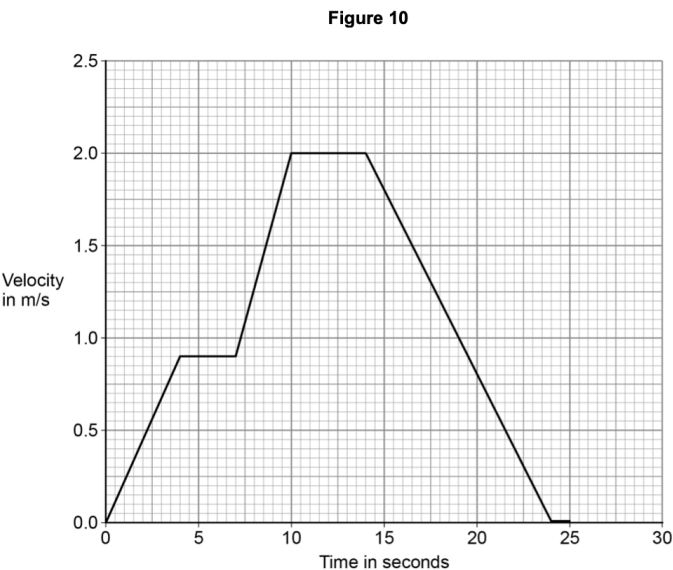
0 6

Figure 9 shows a runner using a smart watch and a mobile phone to monitor her run.

Figure 9



Figure 10 is a velocity–time graph for part of the runner’s warm-up.



The smart watch and mobile phone are connected to each other by a system called Bluetooth.

Bluetooth is wireless and uses electromagnetic waves for communication.

a)

0

6

3

Suggest why the phone and watch being connected by a wireless system is an advantage when running.

[1 mark]

b)

0

6

6

Table 3 shows some information about four types of Bluetooth.

Type	Power in milliwatts	Range in metres
1	100	100
2	2.50	10.0
3	1.00	1.00
4	0.50	0.50

Mobile phones use type 2 Bluetooth to communicate with other devices.

Suggest **two** reasons why.

[2 marks]

1

2

Q5. (2020)

0 3 . 4 Which of the following are gamma rays used for?

[1 mark]

Tick (✓) **one** box.

Cooking food

☐

Energy-efficient lamps

☐

Sterilising medical equipment

☐

Q6. (2020)

0 3 . 6 Electromagnetic waves are also used in communications.

Describe how microwaves and visible light are used in communications.

[4 marks]

Microwaves

Visible light

Q7. (2022)

0 1 . 4 Different types of electromagnetic waves have different uses.

Draw **one** line from each type of electromagnetic wave to its use.

[3 marks]

Type of electromagnetic
wave

Use

Microwaves

Electrical heaters

Ultraviolet

Energy efficient lamps

X-rays

Imaging bones

Satellite communications

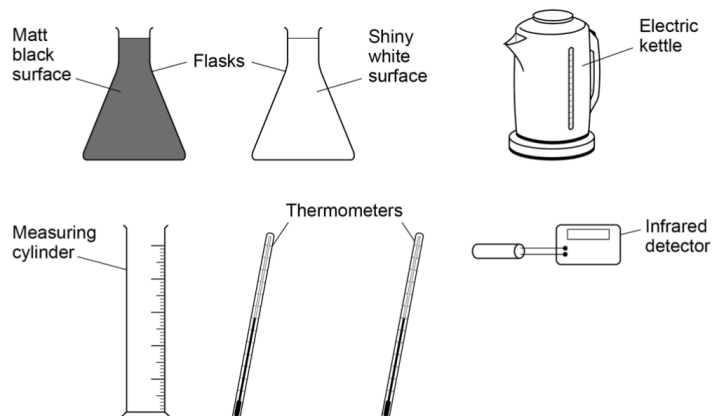
Q8. (2022)

0 2

A student investigated how the colour of a surface affects the power of the infrared radiation emitted by the surface.

Figure 2 shows the equipment used.

Figure 2



The infrared detector measures the power of the infrared radiation emitted by the flasks.

a)

0 2 . 1

The student poured hot water into each flask.

What should the student do to reduce the risk of burning herself with the hot water?

[1 mark]

b)

0 2 . 2

Describe how the student should use the equipment in Figure 2 to compare the power of the infrared radiation emitted by each surface.

[4 marks]

c)

A student investigated how the power of the infrared radiation emitted from a flask changed with time.

Table 1 shows the results.

Table 1

Time in seconds	Power in watts
0	8.0
60	7.2
120	6.5
180	5.9
240	5.4
300	5.0
360	4.7
420	4.5

0 2 . 3

Describe the pattern shown by the data in Table 1.

[2 marks]

d)

0 2 . 4

What is the most likely value for the power of the infrared radiation emitted after 480 seconds?

Use Table 1.

[1 mark]

Tick (✓) **one** box.

4.0 W

☐

4.2 W

☐

4.4 W

☐

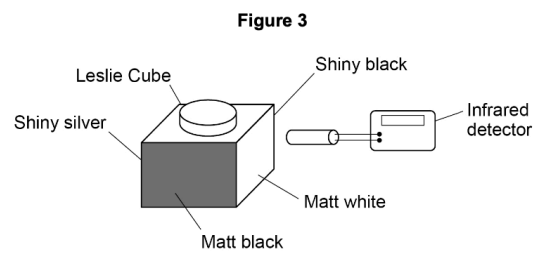
4.6 W

☐

e)

A Leslie Cube is used to demonstrate that different surfaces emit different amounts of infrared radiation.

Figure 3 shows an infrared detector and a Leslie Cube filled with hot water.



- 0 2 . 5 Give **one** advantage of using a Leslie Cube rather than the equipment in **Figure 2** on page 4.

[1 mark]

f)

- 0 2 . 6 The teacher improved the demonstration by using four infrared detectors connected to a data logger and computer. Each detector was pointed at a different surface of the Leslie Cube.

The distance between the surface and the detector was the same in each case.

Give **two** reasons why this improved the demonstration.

[2 marks]