

## Applied Science Post-enrolment work

### Waves in communication

Carry out some research to answer the following questions:

#### **Satellite communication**

True or false?

1. The upload and download signals for satellites are transmitted at the same frequency.
2. The signals are high power, transmitted over long distances and in the radio-wave/microwave region of the electromagnetic spectrum.
3. Microwaves can pass through the ionosphere to high orbit satellites.
4. Radio waves are not reflected by the ionosphere.
5. Radio waves are used for communication with high orbit satellites.

#### **Mobile phones**

True or False?

1. Mobile phones are used on a system of networks.
2. Mobile phone providers are allocated a band of frequencies in the microwave/radio region
3. Base stations transmit and receive signals over a large distance.

#### **Bluetooth ©**

True or False?

1. Bluetooth© devices are low-power devices that work over short distances to link one device to another.
2. Bluetooth© devices in mobile phones and tablets have a range of up to 5m.
3. Bluetooth© uses short wavelength radio signals, and so does not need a 'line of sight'
4. Bluetooth© devices can only connect to one device at a time.
5. Bluetooth© uses a system of 'frequency-hopping' to reduce interference with Wi-Fi as this uses similar frequencies.

## **Infrared**

True or False?

1. Infrared is used in low power devices such as remote controls.
2. Infrared operates over long distances, and does not required a 'line of sight'
3. Infrared does not work well in bright sunlight.
4. Atmospheric moisture reduces the range of the infrared signal.
5. Infared is a high frequency signal and can potentially transmit large amounts of data.

## **Wi-Fi**

True or False?

1. Wi-Fi allows computers, smart phones and other devices to connect to the internet via a router.
2. Wi-Fi uses high-power in the radio frequency region
3. Wi-Fi has a range up to 1000m
4. Wi-Fi can pass through walls to allow signals to be received in different rooms in a house.
5. Wi-Fi signals can also be transmitted through both optical fibres and electrical wiring.