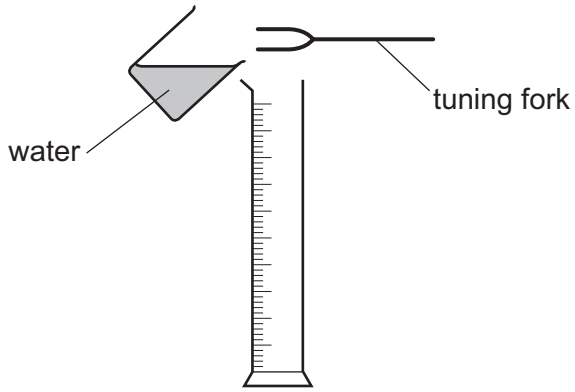
23 A police car travels at a velocity of 30.0 m s^{-1} directly towards a stationary observer. The horn of the car emits sound of frequency 2000 Hz. The speed of sound is 340 m s^{-1}.

What is the frequency of the sound heard by the observer?

A 1840 Hz **B** 2000 Hz **C** 2180 Hz **D** 2190 Hz

24 A vibrating tuning fork is held over a measuring cylinder, as shown.



Water is then gradually poured into the measuring cylinder. A much louder sound is first heard when the water level is 2.9 cm above the base of the measuring cylinder. A second much louder sound is heard when the water level reaches a height of 67.3 cm above the base.

The speed of sound in air is 330 m s^{-1}.

What is the frequency of the tuning fork?

A 128 Hz **B** 256 Hz **C** 512 Hz **D** 1024 Hz

25 A water wave in a ripple tank is diffracted as it passes through a gap in a barrier.

Which two factors affect the angle of diffraction of the wave?

A the amplitude and frequency of the incident wave

B the amplitude of the incident wave and the width of the gap

C the wavelength and amplitude of the incident wave

D the wavelength of the incident wave and the width of the gap

26 A double-slit interference pattern using red light of wavelength 7.0×10^{-7} m has a fringe spacing of 3.5 mm.

Which fringe spacing would be observed for the same arrangement of apparatus but using blue light of wavelength 4.5×10^{-7} m?

A 2.3 mm **B** 3.5 mm **C** 5.4 mm **D** 9.0 mm