Objectives Waves

Topic	Objectives
Characteristics of waves (16.1)	describe in words what a wave is explain the terms wave carrier, equilibrium, perturbation, coupling and propagation (with examples) distinguish between transverse and longitudinal waves, know two examples for each waves transport energy, not matter
Wave propagation	describe the propagation of linear waves in a displacement vs. time and a displacement vs. position diagram and switch between the two representations
Harmonic waves (16.2)	explain in words what a harmonic wave is (as opposed to a simple harmonic motion) graphical representation determine amplitude, period, frequency, wavelength, wave number, etc. from graph know relation between wave speed, wavelength and frequency
Sound waves (16.3, 16.5, 16.6)	explain what parameters determine the propagation of sound waves in different media describe an experiment allowing to measure the speed of sound calculate the speed of sound waves in different media know the relation between frequency and pitch and between amplitude and loudness know basic intervals and how they can be "added" understand the relation between sound intensity and sound intensity level; calculate the change in intensity from attenuation/gain
Electromagnetic waves (24.2)	know classes of electromagnetic waves (with typical wavelengths) sketch the electric and magnetic field vectors in an electromagnetic wave calculate the intensity of an electromagnetic wave from the magnitude of the electric or magnetic field
Superposition of waves, interference and diffraction (17.1 – 17.3, 27)	explain how an interference pattern arises know qualitative differences between interference patterns of double slit and grating know conditions for diffraction to occur describe two applications of diffraction (e.g. spectral analysis, X-ray diffraction)

Constant	Value
Speed of sound in air	344 m/s (at 20°C)
Speed of light	$2.99792458 \cdot 10^8$ m/s
Visible light	400 nm to 800 nm