

## Year 11 ATAR Physics – Unit 2

### Revision Checklist – Waves CAP

To aid your focused preparation for the Topic Test component of the CAP, sections from the syllabus which are struck out below will not feature in this topic test (but will be assessable in the Semester 1 examination). Given that the focus of the practical validation is on resonance in pipes, the topic test will not have much of a focus on this component. There will be no questions regarding intensity, or uncertainty calculations.

#### Science as a Human Endeavour

~~Application of the wave model has enabled the visualisation of imaging techniques. These can include:~~

- ~~• medical applications, such as ultrasound  
*Pearson Physics 11 pp. 383-384*~~
- ~~• geophysical exploration, such as seismology.  
*Pearson Physics 11 p. 355*  
*WACE Study Guide pp. 141-142*~~
- ~~• Noise pollution comes from a variety of sources and is often amplified by walls, buildings and other built structures. Acoustic engineering, based on an understanding of the behaviour of sound waves, is used to reduce noise pollution. It focuses on absorbing sound waves or planning structures so that reflection and amplification do not occur.  
*Pearson Physics 11 pp. 384-386*~~

#### Science Understanding

- waves are periodic oscillations that transfer energy from one point to another  
*WACE Study Guide pp. 130*  
*Pearson Physics 11 Section 10.1*  
*Exploring Physics Problem Set 19*
- mechanical waves transfer energy through a medium; longitudinal and transverse waves are distinguished by the relationship between the directions of oscillation of particles relative to the direction of the wave velocity  
*WACE Study Guide pp. 130-131*  
*Pearson Physics 11 Section 10.1*  
*Exploring Physics Problem Set 19*
- waves may be represented by displacement/time and displacement/distance wave diagrams and described in terms of relationships between measurable quantities, including period, amplitude, wavelength, frequency and velocity  
*This includes applying the relationships*
$$v = f \lambda, \quad T = \frac{1}{f}$$
*WACE Study Guide pp. 131-134*  
*Pearson Physics 11 Section 10.2*  
*Exploring Physics Problem Set 19*
- the mechanical wave model can be used to explain phenomena related to reflection and refraction, including echoes and seismic phenomena  
*WACE Study Guide pp. 137-142*

*Pearson Physics 11 Section 10.3*

*Exploring Physics Problem Set 20*

- the superposition of waves in a medium may lead to the formation of standing waves and interference phenomena, including standing waves in pipes and on stretched strings

*This includes applying the relationships for*

strings attached at both ends and pipes open at both ends

$$\lambda = \frac{2\ell}{n}$$

pipes closed at one end

$$\lambda = \frac{4\ell}{(2n-1)}$$

*WACE Study Guide pp. 143-149*

*Pearson Physics 11 Sections 10.4, 10.5*

*Exploring Physics Problem Set 20*

- a mechanical system resonates when it is driven at one of its natural frequencies of oscillation; energy is transferred efficiently into systems under these conditions

*WACE Study Guide pp. 146*

*Pearson Physics 11 pp. 364-365*

*Exploring Physics Problem Set 20*

- ~~the intensity of a wave decreases in an inverse square relationship with distance from a point source~~

~~*This includes applying the relationship*~~

~~$$I \propto \frac{1}{r^2}$$~~

~~*WACE Study Guide pp. 135-137*~~

~~*Pearson Physics 11 pp. 380-382*~~