

TSOKOS READING ACTIVITY**Section 4-3**

1. Essential Idea: All waves can be described by the same sets of mathematical ideas. Detailed knowledge of one area leads to the possibility of prediction in another.
2. Nature Of Science: Imagination: It is speculated that polarization had been utilized by the Vikings through their use of Iceland Spar over 1300 years ago for navigation (prior to the introduction of the magnetic compass). Scientists across Europe in the 17th–19th centuries continued to contribute to wave theory by building on the theories and models proposed as our understanding developed.
3. Theory Of Knowledge:
 - a. Wavefronts and rays are visualizations that help our understanding of reality, characteristic of modelling in the physical sciences. How does the methodology used in the natural sciences differ from the methodology used in the human sciences?
 - b. How much detail does a model need to contain to accurately represent reality?
4. Understandings:
 - a. Wavefronts and rays
 - b. Amplitude and intensity
 - c. Superposition
 - d. Polarization
5. Applications And Skills:
 - a. Sketching and interpreting diagrams involving wavefronts and rays
 - b. Solving problems involving amplitude, intensity and the inverse square law
 - c. Sketching and interpreting the superposition of pulses and waves
 - d. Describing methods of polarization
 - e. Sketching and interpreting diagrams illustrating polarized, reflected and transmitted beams
 - f. Solving problems involving Malus's law
6. Guidance:
 - a. Students will be expected to calculate the resultant of two waves or pulses both graphically and algebraically
 - b. Methods of polarization will be restricted to the use of polarizing filters and reflection from a non-metallic plane surface
7. Data Booklet Reference:
 - a. $I \propto A^2$
 - b. $I \propto x^{-2}$

- c. $I \propto I_0 \cos^2 \theta$
8. Utilization: A number of modern technologies, such as LCD displays, rely on polarization for their operation
9. Aims:
- Aim 3: these universal behaviours of waves are applied in later sections of the course in more advanced topics, allowing students to generalize the various types of waves
 - Aim 6: experiments could include (but are not limited to): observation of polarization under different conditions, including the use of microwaves; superposition of waves; representation of wave types using physical models (eg slinky demonstrations)
 - Aim 7: use of computer modelling enables students to observe wave motion in three dimensions as well as being able to more accurately adjust wave characteristics in superposition demonstrations
10. Read section 4-3, Pg. 162-170, in your textbook.
11. Use the Cornell Notes system to take notes on the lesson material. You have the following options:
- You can print multiple copies of one of the forms on the following pages of this document and handwrite your notes.
 - You can use the MS Word form supplied below and type your notes.
 - You can then print your work and submit a hardcopy, or
 - You can upload your work to FOCUS. If you choose this option, you must use a filename in the format, "LastnameFirstinitialPerXAsgmtName". For example, "SmithKPer4ReadActT9-3.doc"
 - You can take notes on notebook paper using the Cornell Notes format and submit the hardcopy.
12. When using this form, remember the Five R's of Notetaking:
- Record** – the most important or emphasized information
 - Reduce** – and synthesize information wherever possible, making it as concise as you can
 - Recite** – read your notes out loud
 - Reflect** – and consider how this information is connected to your personal experiences and what you already know
 - Review** – look over your notes more than once
13. As a minimum, you must include notes on the following topics:
- Wavefront
 - Intensity
 - Inverse square law
 - Superposition
 - Reflection of pulses
 - Concept of Polarization
 - Plane polarized
 - Polarization by Reflection

14. Answers may be typed or neatly printed. You do not need to include this page of instructions with your assignment.
15. *Note: The following computer skills should be practiced:*
- a. *Use Microsoft Equation to type any equations.*
 - b. *Drawings may be freehand, but try to make use of the ‘Shapes’, ‘Insert Picture’ or ‘Insert Clipart’ functions of MS Word.*
 - c. *A reading assignment may contain drawings that would be useful in your notes. If you have scanning capability, you should practice scanning pictures and inserting them into documents. As you prepare for college, you should consider investing in a desktop printer-scanner-copier.*
 - d. *Just remember that for formal reports you have to cite any images that you insert into your document. You don’t have to cite scanned images for this exercise unless you use a source other than the textbook.*

CORNELL NOTES and the 5 R's

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Name:
Date:
Topic:

Questions/Key Points	Notes
SUMMARY:	

Name _____

Date _____

CORNELL NOTES

Topic _____

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Questions/key points

Notes

Summary