

Higher Assignment Guide Sheet B: Critical Angle

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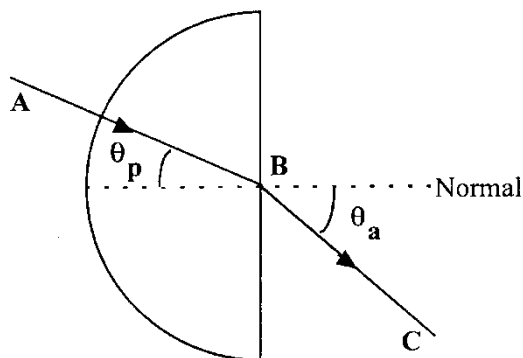
Critical Angle

Apparatus

Ray box and single slit, 12 V power supply, semicircular perspex block, sheet of white paper, protractor.

Instructions

- Place the block on the white paper and trace around its outline. Draw in the normal at the midpoint **B**.
- Draw a line representing the angle $\theta_p = 10^\circ$, the line **AB** in the diagram above.
- Direct the raybox ray along **AB** and mark in the point **C** where the ray emerges.
- Draw a line representing the refracted ray, the line **BC** in the diagram above.
- Measure the angle θ_a , the refracted angle in air.
- Use an appropriate format to record your results.
- Repeat for other values of incident angle θ_p .
- Determine the critical angle θ_c for this perspex block.



Risk Assessment

- Check all electrical cables
- This activity may take some time if done carefully, so the lamps may become hot.
- The base of the block should be frosted or painted with white paint, or total reflection at the base will prevent the path of the ray through the block being visible.
- Be observant to those around you.

Research

1. <http://practicalphysics.org/law-refraction.html>
2. <https://www.physicsclassroom.com/class/refrn/Lesson-3/The-Critical-Angle>
3. <https://www.bbc.com/bitesize/guides/z88dd2p/revision/1>
4. <http://tap.iop.org/vibration/index.html>
5. <http://practicalphysics.org/teaching-ray-optics.html>

6. <https://www.bbc.com/bitesize/guides/z88dd2p/revision/3>
7. <https://learning.hccs.edu/faculty/john.barry/physics-manuals/Physics-I-Lab-Manual.pdf>
8. <https://www.youtube.com/watch?v=qEKzsIoW4YE>
9. <http://practicalphysics.org/optics.html>
10. <https://www.bbc.com/bitesize/guides/z9yrxsg/revision/1>
11. <https://www.bbc.com/bitesize/guides/z88dd2p/revision/3>
12. http://tap.iop.org/mechanics/wep/216/page_46406.html
13. <http://www.ifsc.usp.br/~fotonica/pdfs/2012/refractometry-zilio.pdf>
14. <http://hyperphysics.phy-astr.gsu.edu/hbase/phyopt/totint.html>