Refractive index: choosing the correct angles

Teacher / technician

YEAR 10 / LESSON 59 / PHYSICS + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. The value 1.50 is a specified practice value, not a universal refractive index for all glass or plastics.

Coverage and delivery

Shared Physics / Double Award: 3.18. n = sin i / sin r for air-to-material entry.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Booklets	1 each	30
Calculator, ruler and protractor	1 set per pair	15 sets

Immediate safety

Desk-based calculation and diagram work. No light sources or glass blocks are required.

Preparation and delivery

Read alongside the student method

YEAR 10 / LESSON 59 / PHYSICS + SCIENCE (DOUBLE AWARD)

1. Prepare correctly labelled diagrams in both directions. Check calculators are in degrees and demonstrate inverse sine.

2. Use medium labels before incidence/refraction labels to prevent reversing the ratio. Keep practice values clearly labelled.

Close of lesson

• Retain corrected calculations and return calculators.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

YEAR 10 / LESSON 59 / PHYSICS + SCIENCE (DOUBLE AWARD)

- From the normal.
- Degrees.
- Approximately 1.50, allowing for rounded angles.
- sin r / sin i, with i inside glass and r in air.
- About 25.4°.
- It gives the indeterminate ratio 0/0.

References and provenance

Pearson Physics specification

IOP: reflection and refraction

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.