Refraction: three block shapes

Teacher / technician

YEAR 10 / LESSON 58 / PHYSICS + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Record actual measurements separately from labelled practice examples.

Coverage and delivery

Shared Physics / Double Award: 3.17. Investigate rectangular and semicircular blocks and triangular prisms.

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

Requisition • class of 30, ten groups of three

Item	Per pair / setup	Class total
Ray box and low-voltage source	1 per group	10 sets
Three acrylic shapes	1 of each per group	10 of each shape
Ruler, protractor and paper	1 set per group	10 sets; 40 sheets
Booklets	1 per learner	30

Immediate safety

Use smooth-edged acrylic blocks and LED ray boxes, not lasers. Keep beams on the bench and out of eyes. Switch off before repositioning equipment, keep leads tidy and avoid darkening access routes.

Preparation and delivery

Read alongside the student method

YEAR 10 / LESSON 58 / PHYSICS + SCIENCE (DOUBLE AWARD)

1. Pilot radial entry and approximately 20° internal incidence at the semicircle's flat face. Check a prism orientation with an identifiable transmitted ray.

2. Identify faint reflected rays separately. Do not reuse the old instruction that called the exit ray reflected or directed it out through the curved entry face.

Close of lesson

• Switch off, collect blocks without scratching and retain the three labelled diagrams.

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 58 / PHYSICS + SCIENCE (DOUBLE AWARD)

- It meets the local surface normally.
- Through the flat face in this setup.
- Away from the normal.
- The surfaces have different orientations.
- Reflection returns into the original medium; refraction transmits into another medium with a changed speed and often direction.
- The rectangular parallel-sided block with air on both sides.

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.