



General Certificate of Secondary Education
2025

Centre Number

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Candidate Number

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Double Award Science Physics

Unit 7: Practical Skills

Booklet A
Higher Tier

[GDW75]



GDW75

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Answer **all** parts of Question 1.

INFORMATION FOR CANDIDATES

The total mark for this paper is **15**.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Follow all health and safety instructions.

You may not have access to notes, textbooks and other material to assist you.

You may use a ruler and a scientific calculator if required.

The apparatus and materials required to complete the task(s) are provided.

For Examiner's
use only

Question Number	Marks
1	

Total Marks	
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- 1** The experiment to be carried out is the refraction of a ray of light as it passes through a transparent block.

Use Diagrams A, B, and C to complete the experiment.

- (a)** The angle of incidence for Diagram A is 40° as recorded in **Table 1** below.

Measure the angle of incidence, labelled i , for Diagrams B and C and record the values in **Table 1**.

Table 1

Diagram	Angle of incidence $i / ^\circ$	Angle of refraction $r / ^\circ$
A	40	
B		
C		

[5]

Place the edge of the transparent block in the position shown in Diagram A.

Draw around the block.

The point at which the ray of light enters the transparent block is called the incident point.

Use the ray box to direct a ray of light along the arrow to the incident point as shown in Diagram A.

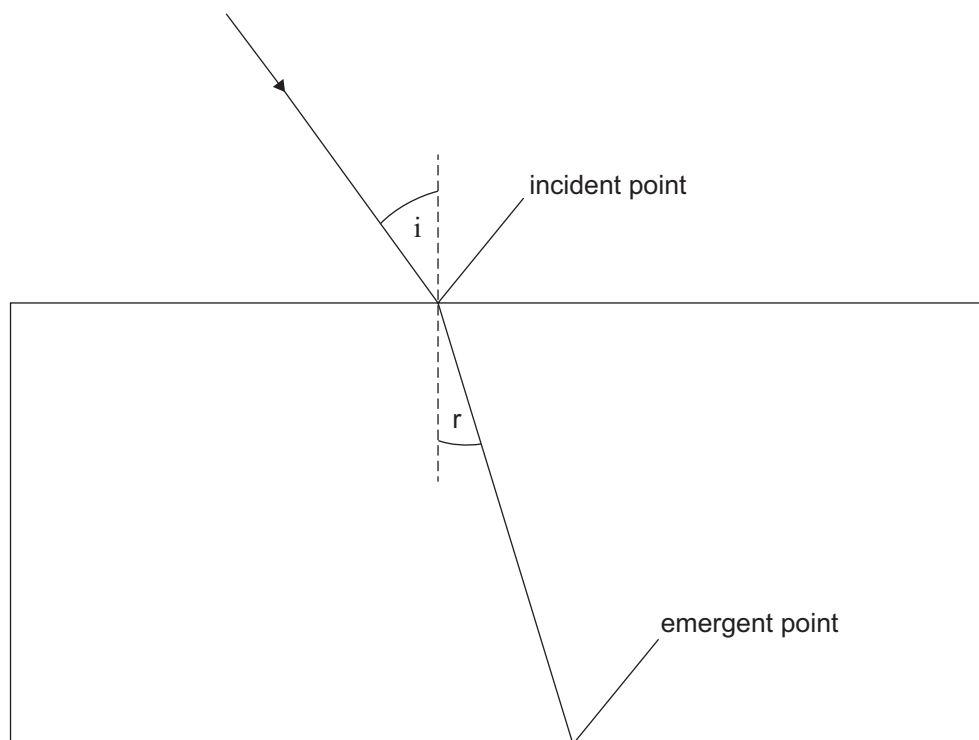
The point at which the ray of light leaves the transparent block is called the emergent point.

Mark the emergent point on Diagram A.

Remove the transparent block and use a ruler to draw a straight line to join the incident point to the emergent point.

Your completed diagram should look similar to the one shown on page 3.

Examiner Only	
Marks	Remark



Measure the angle of refraction for Diagram A and record your value in **Table 1**.

Repeat the experiment for Diagrams B and C and record your values in **Table 1**.

You must complete the remainder of the paper on your own.

(b) State the independent variable in this experiment.

_____ [1]

(c) Explain fully why the ray of light is refracted towards the normal as it moves from the air into the transparent block.

_____ [2]

Another student carried out a similar experiment with a different material. The angles of incidence and the angles of refraction were measured.

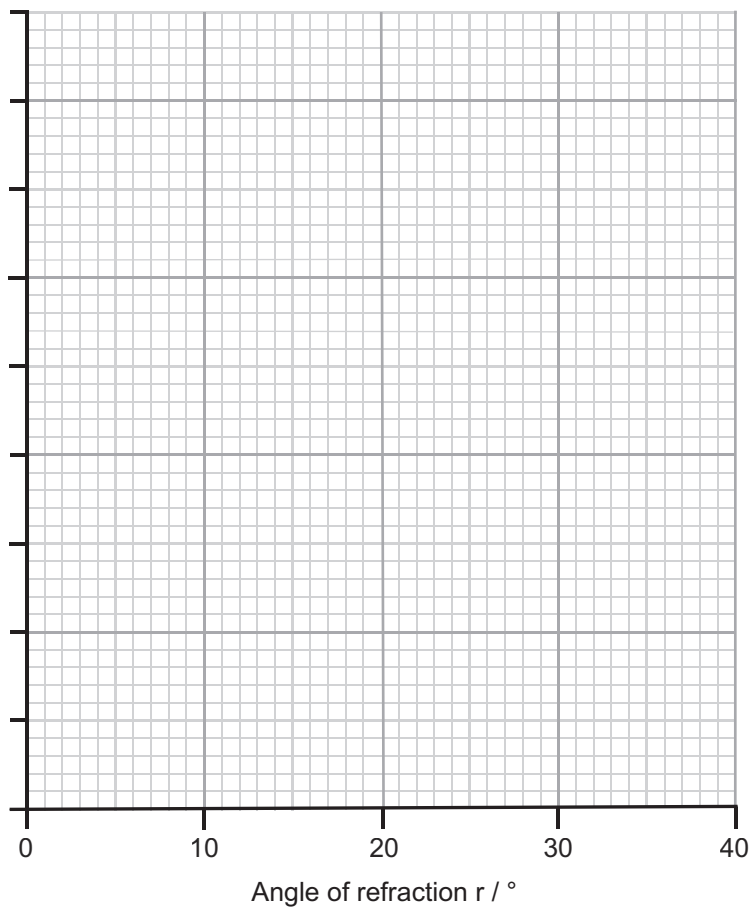
The results are shown in **Table 2** below.

Table 2

Angle of incidence $i / ^\circ$	Angle of refraction $r / ^\circ$
0	0
10	6
30	17
50	27
60	31
80	35

Examiner Only

Marks Remark



- (d)** Plot a graph of angle of incidence (vertical axis) against angle of refraction (horizontal axis).

Choose a suitable scale for the vertical axis and label it.

Plot the points.

Draw a **curved** line of best fit.

[5]

Examiner Only	
Marks	Remark

(e) Tick the box (✓) which best describes the relationship between the angle of incidence and the angle of refraction.

Directly proportional

☐

Related but not proportional

☐

Independent of each other

☐

State a reason for your choice.

_____ [2]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only	
Marks	Remark

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APPARATUS AND MATERIALS LIST AND CONFIDENTIAL INSTRUCTIONS

To be accessed by Head of Department only

It is the responsibility of the centre to ensure that appropriate risk assessments are carried out for all practical skills assessments.

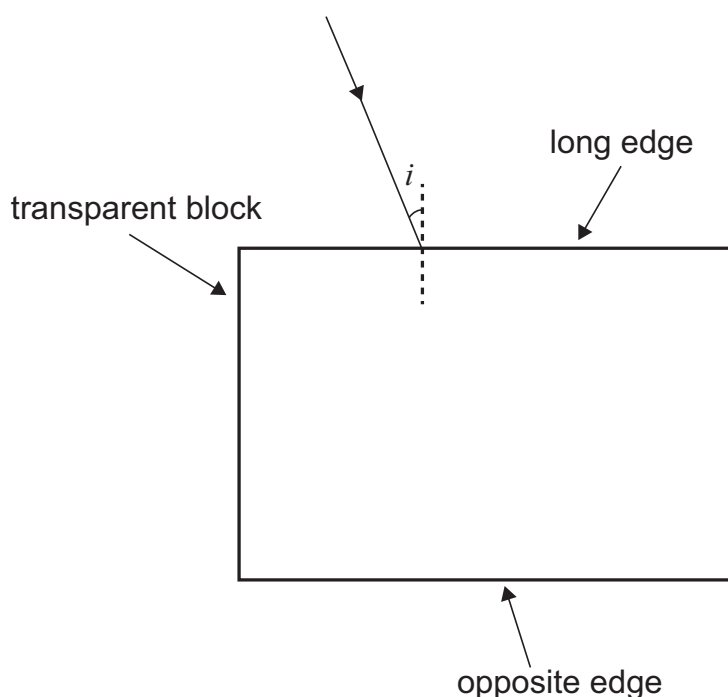
Apparatus list GDW75 Physics 2025

- Ray box and single slit
- Power supply suitable for a ray box
- Transparent perspex/glass rectangular block (approx. 115 mm × 65 mm × 20 mm)
- Protractor (accurate to 1 degree)
- Ruler (30 cm)
- A4 photocopies of pages 4, 5 and 6
(1 set of diagrams A, B and C per group of candidates)

Teacher Instructions

Prepare apparatus as below:

- Connect the ray box to power supply.
- Insert the single slit into the ray box.
- Adjust the power supply so a bright ray of light is observed from the ray box.
- Set the rectangular perspex/glass block on a sheet of white paper and check that a ray incident on the long edge can be seen emerging from the opposite edge.



- Tape over the power supply so that it cannot be adjusted during the investigation by candidates.

Set up for candidates:

- Place the ray box with single slit inserted, and the connected power supply on the bench.
- Place the perspex/glass block, the copies of the diagrams A, B and C, the 30cm ruler and the protractor close to the ray box.
- Best working conditions may require the lab to be slightly darkened while candidates complete the practical part of the investigation.

Upon completion of the assessment:

To ensure confidentiality, centres are responsible for the prompt and secure disposal of all copies of diagrams A, B and C.

Diagram A

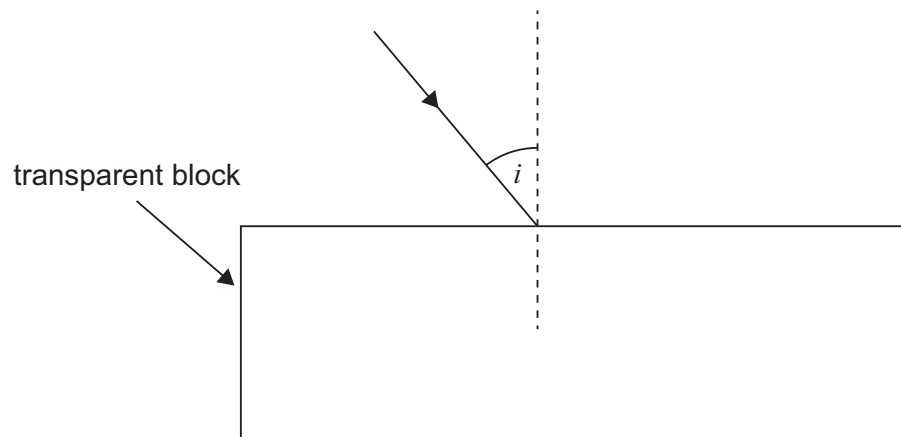


Diagram B

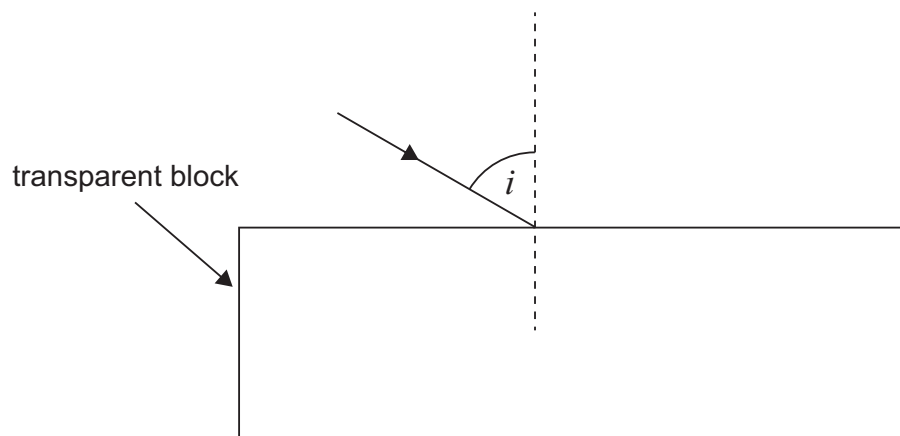


Diagram C

