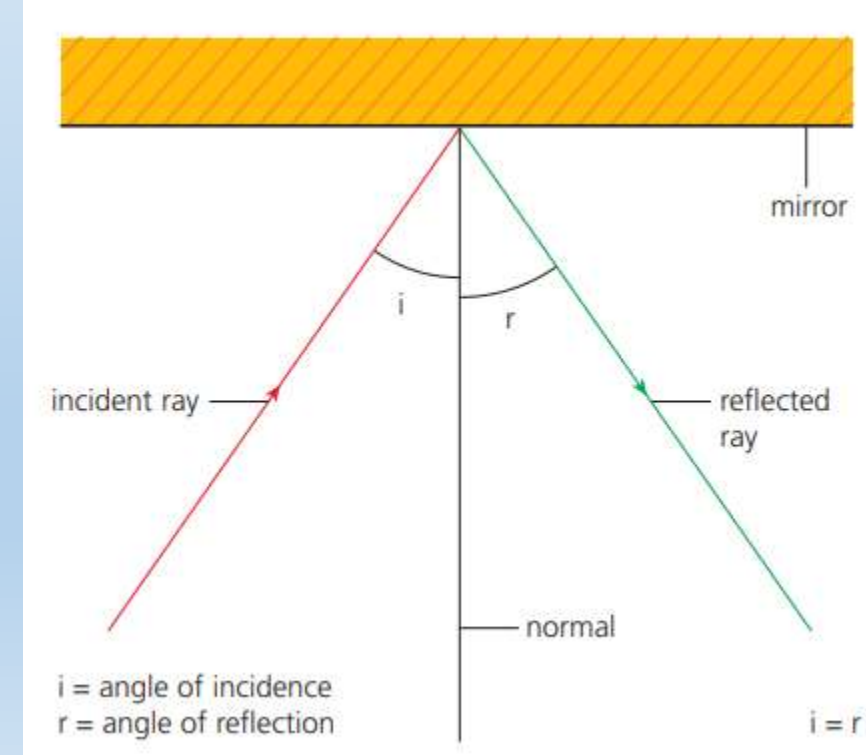
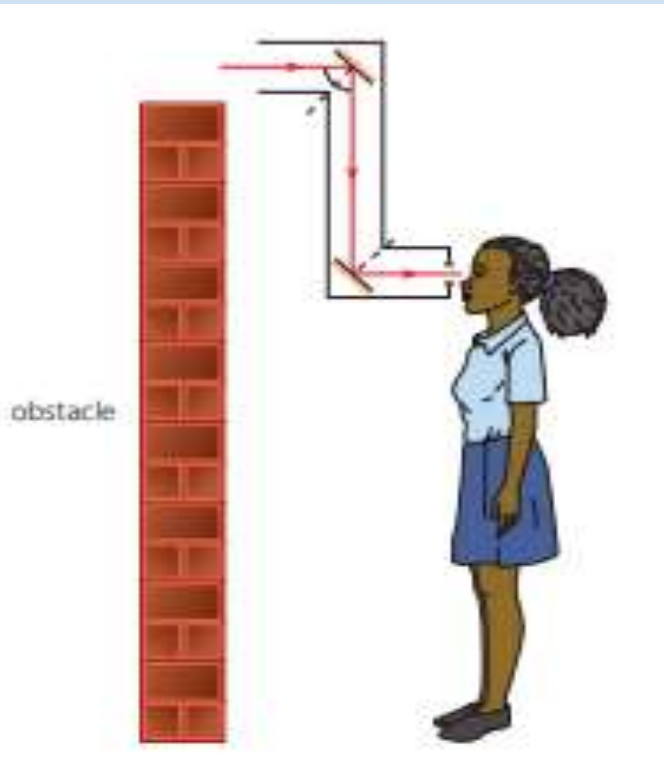




The law of reflection

Periscope

<https://youtu.be/HbiLfA14Hpk?si=w5XNL8syGZ47Irc9> -



Statement - The law of reflection and periscope

Learning Objective:

1. State the law of reflection
2. Demonstrate the law of reflection
3. Apply the law of reflection to real life

Key words:

Normal
Incident ray
Reflected ray
Angle of incidence
Angle of reflection
Law of reflection
Mirror

Starter

1. How do we see things
2. Draw a simple ray diagram for the given scenario
The rays coming from the sun fall on small plant and are reflected



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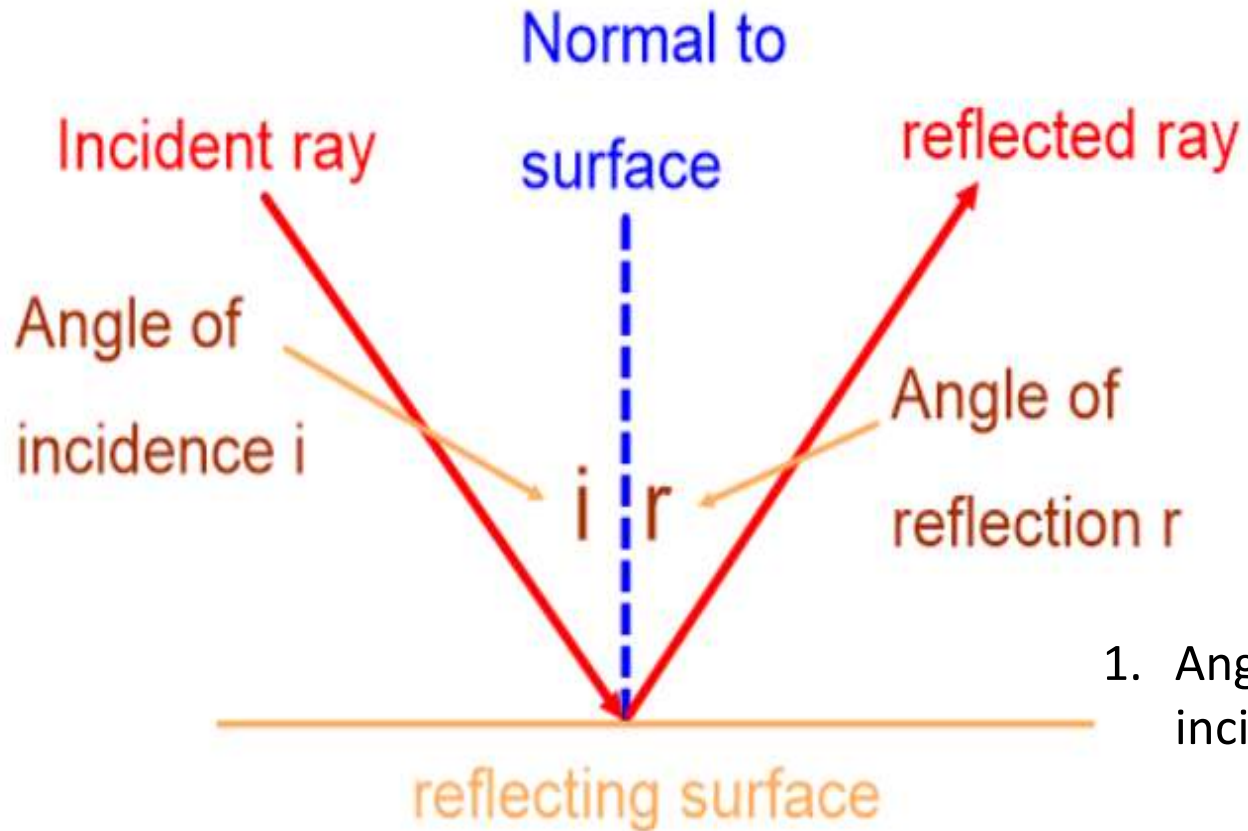
Angle of reflection

Law of reflection

Mirror

The image is a composite graphic for a science lesson. In the center is a ray diagram illustrating the law of reflection. A sun in the upper left emits a dashed line labeled 'Light' that hits a small yellow flower on a green stem. From the flower, another dashed line labeled 'Light' reflects into the eye of a person's head shown in profile. A thought bubble above the head contains a drawing of the same flower. To the left and right of the central diagram are two identical circular diagrams. Each circle is divided into eight colored segments, each containing an icon and a label: 'META-THINKING' (green), 'LINKING' (blue), 'ANALYSING' (orange), 'CREATING' (pink), 'REALISING' (purple), 'EMPATHETIC' (yellow), 'AGILE' (light green), and 'HARD WORKING' (red). The outer ring of the circle is labeled 'ADVANCED COGNITIVE PERFORMANCE CHARACTERISTICS (ACPs)' and the inner ring is labeled 'VALUES, ATTITUDES & ATTRIBUTES (VAAs)'. Below the central diagram is a horizontal row of eight icons corresponding to the labels in the circular diagrams: a puzzle piece for 'META-THINKING', a chain link for 'LINKING', a magnifying glass for 'ANALYSING', a pair of scissors for 'CREATING', a key for 'REALISING', a heart for 'EMPATHETIC', a person running for 'AGILE', and a person working for 'HARD WORKING'.

Law of Reflection



Note that the relevant **angles** are always **measured from the normal** to the ray.

$$\text{Angle of incidence} = \text{Angle of reflection}$$

1. Angle between normal and incident ray is angle of incidence
2. Angle between normal and reflected ray is angle of reflection

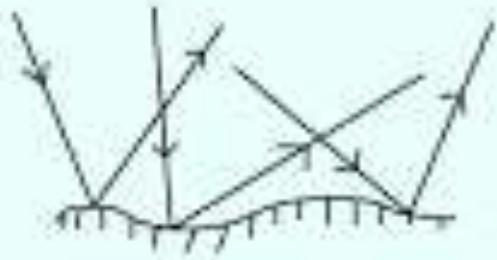
<https://simpop.org/reflection/reflection.htm>

The normal is an imaginary line which is perpendicular to the surface at a particular point. It is independent of the ray at that point. We choose to make measurements of the rays using the normal as a position of reference.

Types of Reflection

Types of Reflection

Irregular Reflection



Rough Surfaces

Regular Reflection



Smooth Surfaces

2. Compare and Explain

Question:

Why does a **smooth mirror** produce a clear image but a **rough wall** does not, even though both reflect light?

HPL Mapping:

- **ACP:** *Linking* – Connecting reflection laws to surface properties
- **VAA:** *Thoughtful* – Considering multiple factors



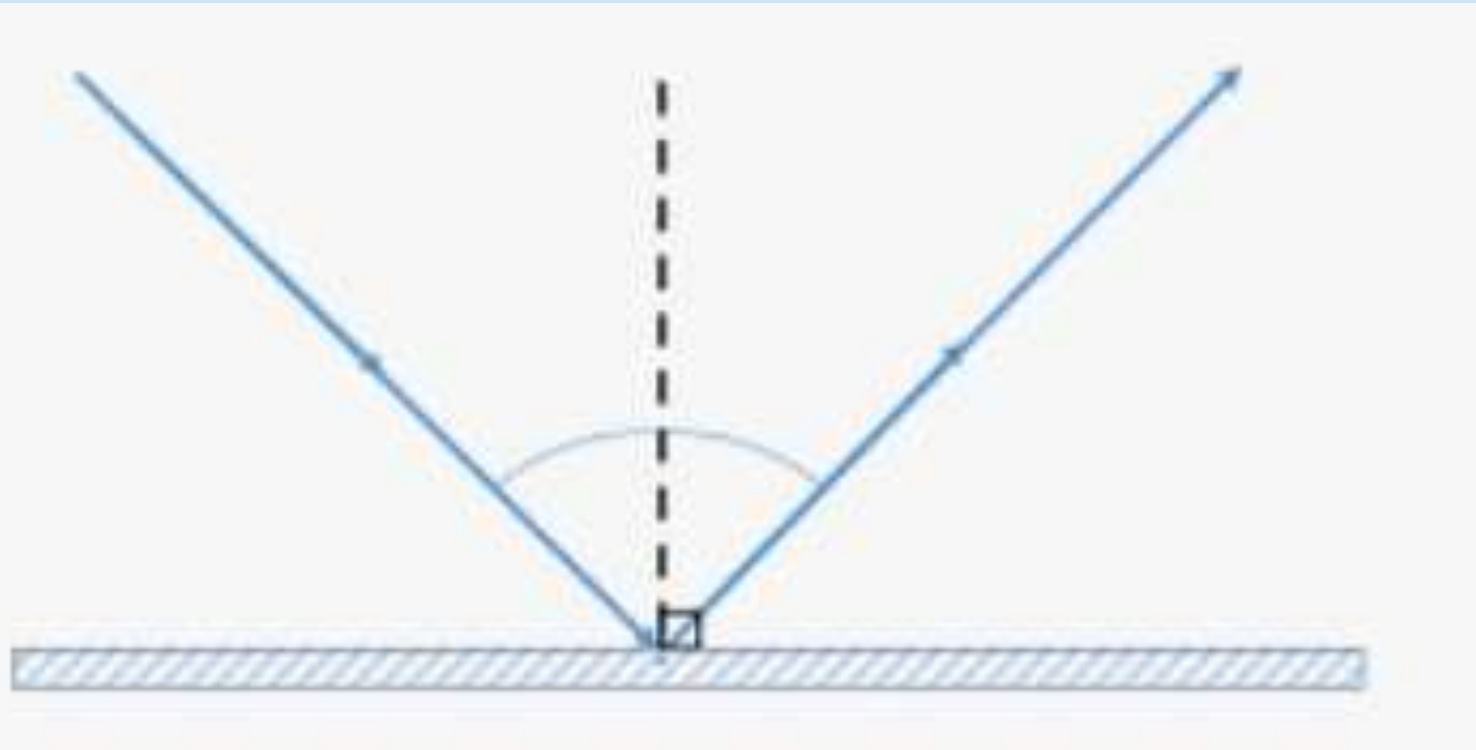


Activity



- **ACP:** Reasoning – Justifying predictions with evidence
- **VAA:** Accurate – Valuing precision in scientific work

Complete the visual with appropriate labelling



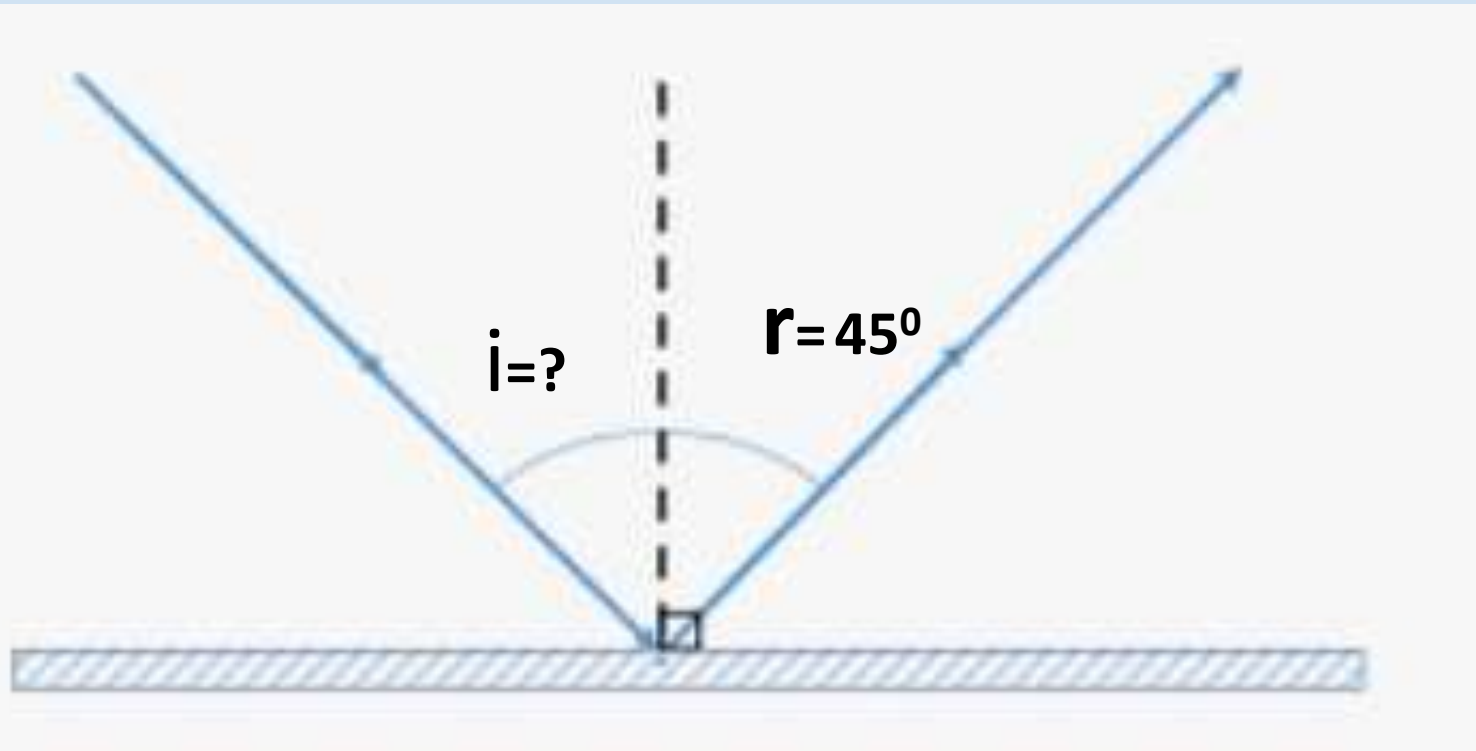
1. Incident ray
2. Reflected ray
3. Normal
4. Angle of incidence(i)
5. Angle of Reflection(r)



Activity



- **ACP: Reasoning** – Justifying predictions with evidence
- **VAA: Accurate** – Valuing precision in scientific work



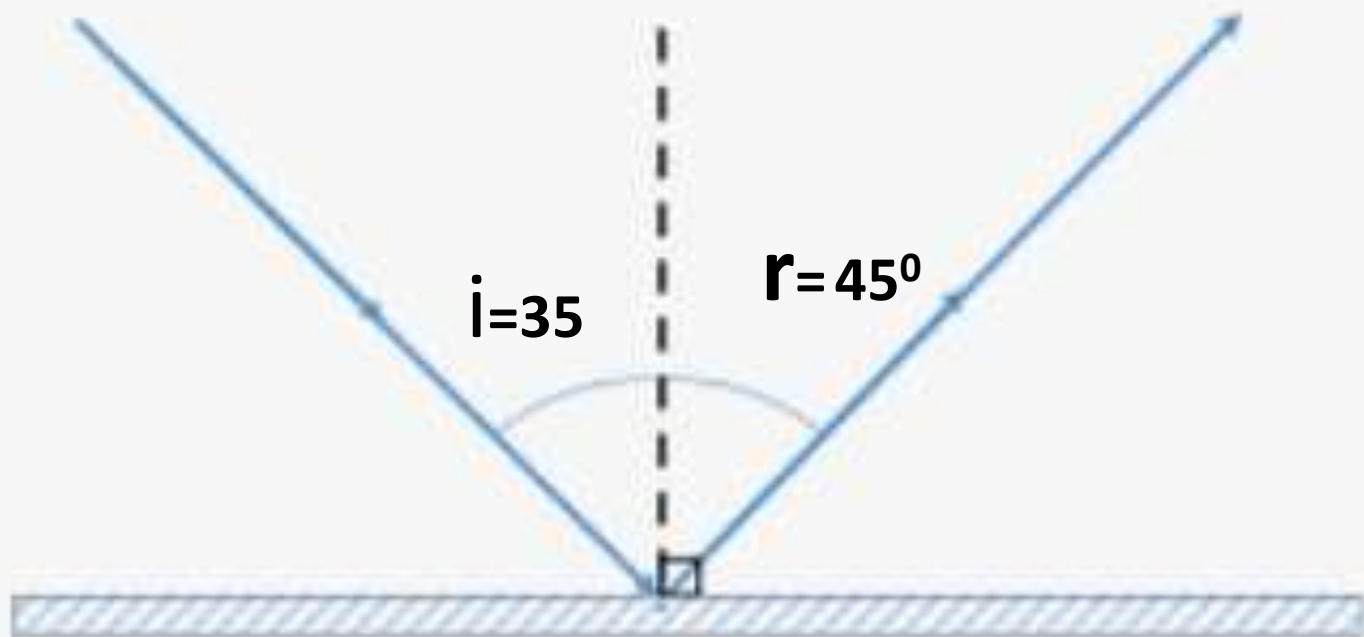
Identify the angle of incidence in the diagram



Activity



- **ACP: Reasoning** – Justifying predictions with evidence
- **VAA: Accurate** – Valuing precision in scientific work



Is it correct diagram? Justify your answer



Activity

1. Predict and Justify

Question:

If the angle of incidence is **35°**, predict the angle of reflection.
What would happen if the normal line was drawn incorrectly?

HPL Mapping:

- **ACP:** *Reasoning* – Justifying predictions with evidence
- **VAA:** *Accurate* – Valuing precision in scientific work



Activity



Draw a law of reflection diagram with Incident ray, Normal , Reflected ray, $i=35$ degree(angle of incidence) and angle of reflection $r=35$.



UAE IDENTITY - **Application to Real Life**



Question:

Why do UAE PUBLIC drivers use **rear-view mirrors** that are carefully positioned instead of placing them at random angles?

HPL Mapping:

- **ACP:** *Applying* – Using scientific laws in real contexts
- **VAA:** *Responsible* – Understanding safety implications



Plenary

Complete the following with appropriate keywords

The angle of incidence =

..... are used in periscope

The angle between normal and incident ray is called

The angle between normal and reflected ray is called

Question:

A student says, “If I change the angle of the mirror, the angle of reflection will stay the same.”
Do you agree? Explain your answer using the laws of reflection.

HPL Mapping:

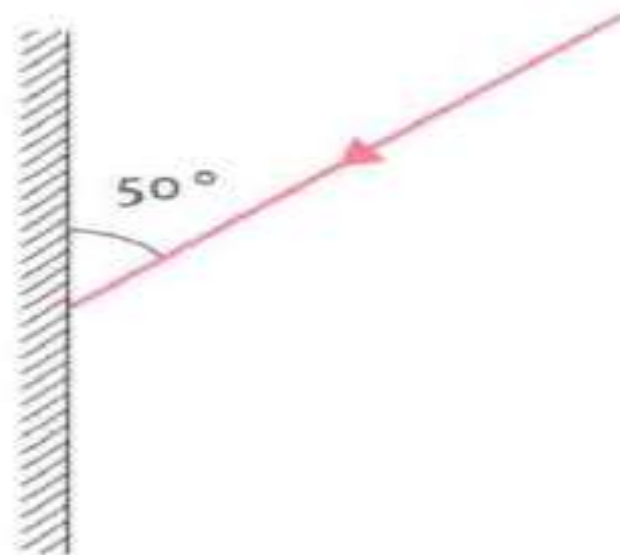
- ACP:** *Analyzing* – Identifying relationships between angles
- VAA:** *Open-minded* – Willingness to challenge incorrect ideas



AFL



A student drew this diagram to show how a ray of light is reflected by a flat mirror.



Make a copy of the diagram.

- a** On your copy of the diagram draw the reflected ray. Label the mirror, the incident ray and the reflected ray.
- b** Draw the normal to the surface of the mirror at the point where the ray is reflected. Label the normal.
- c** Mark the angle of incidence and the angle of reflection. Label them **I** and **R**.

1. **I can** state the law of reflection
2. I can understand the function of periscope
 - – use of law of reflection

For each of the learning objectives, rate your progress towards completing them using Red, Amber or Green.

- If you are green in every area then what has helped you / what have you done to make you successful?
- If you are Amber or Red what do you need to know, do, or be helped with, in order to make you green?

