

Reflection Refraction

GCSE Physics · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

A ray of light hits a plane mirror with an angle of incidence of 35° . State the angle of reflection and explain how the angles are measured. (2 marks)

Step 1 · Law of reflection

Angle of incidence = angle of reflection, so the angle of reflection is 35° .

Step 2 · Measuring

Both angles are measured from the normal: a line drawn at 90° to the surface where the ray hits it.

Answer: 35° , measured from the normal

Check: Never measure from the mirror surface.

2. Now try one with the steps

Describe what happens to a ray of light passes from air into a glass block (a) along the normal and (b) at an angle. (3 marks)

Step 1 · Along the normal

Step 2 · At an angle

Step 3 · Leaving the block

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

- 1.** State three things that can happen to a wave when it meets the boundary between two materials. [3]

- 2.** State the law of reflection. [1]

3. Describe what is meant by the normal in a ray diagram. [1]

4. A ray hits a mirror with an angle of incidence of 35° . State the angle of reflection. [1]

5. Define refraction. [1]

6. Light passes from air into glass at an angle. State which way it bends. [1]

7. A ray of light enters a glass block along the normal. Describe what happens to it. [1]

8. Light leaves a glass block into air at an angle. State which way it bends. [1]

9. A ray strikes a mirror at 50° to the mirror's surface. State the angle of reflection. [2]

10. State what happens to the speed, wavelength and frequency of light passes from air into glass. [3]

11. Describe how to draw a ray diagram to show reflection from a plane mirror. [2]

12. Use the idea of wavefronts to explain why a wave changes direction when it enters a material where it travels more slowly. [3]

13. A 4.0 Hz water wave slows from 2.0 m/s to 1.2 m/s moves into shallow water. Calculate its wavelength in the shallow water. [3]

14. Explain why a swimming pool looks shallower than it really is. [2]

4. Before you hand it in

Measuring angles from the surface of the mirror or block

Draw the normal at 90° to the surface first, then measure from it.

"Refraction is light bending."

Refraction is a change of direction caused by a change in speed at a boundary.

"The frequency changes when light enters glass."

Speed and wavelength change; frequency stays the same.

Drawing light bending away from the normal enters glass

Slowing down (into glass or water): towards the normal. Speeding up (into air): away from the normal.