

# Edexcel Physics GCSE

## Practical 3: Light and the EM Spectrum

### Practical Flashcards

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Outline the basic steps of the practical.



## Outline the basic steps of the practical.

1. Draw around the block on a piece of paper, remove the block and then draw a line normal to one of the sides
2. Draw three guides lines of incident at different angles to the normal
3. Place the block on the page and shine the ray light along your chosen guide line
4. Mark the incoming, and any outgoing rays of light with crosses
5. Turn lights on and measure the angles of reflection and refraction with a protractor and repeat for the other angles of incidence



What tool should be used to help draw the normal line on the sheet of a paper?



What tool should be used to help draw the normal line on the sheet of a paper?

A set square or protractor to ensure that the angle is at a right angle to the main line.



What is the purpose of drawing guidelines for the incident rays?



## What is the purpose of drawing guidelines for the incident rays?

You can shine the ray at the exact angles you want it without having to measure angles in the low light. It also reduces the length of time that the ray box needs to be on for since the incident angles are measured before it is switched on.



What precautions should be taken to use the ray box safely?





What precautions should be taken to use the ray box safely?

- Don't touch any metal parts since the box gets very hot when in operation
- Switch off when not in use to prevent overheating



What conditions are needed for this experiment?



What conditions are needed for this experiment?

Low lighting is needed so that the rays are visible.



What safety precaution should be taken when working in a darkened lab?



What safety precaution should be taken when working in a darkened lab?

All bags and equipment should be moved out of the way to reduce the likelihood of tripping due to poor visibility.



What two angles should you measure after you have marked the light rays on the paper? How?



What two angles should you measure after you have marked the light rays on the paper? How?

1. Angle of reflection
2. Angle of refraction

Using a protractor.



Which angle is the angle of incidence?





Which angle is the angle of incidence?

The angle as measured between the incident (incoming) ray and the normal.



Which angle is the angle of reflection?



Which angle is the angle of reflection?

The angle as measured between the reflected ray and the normal.

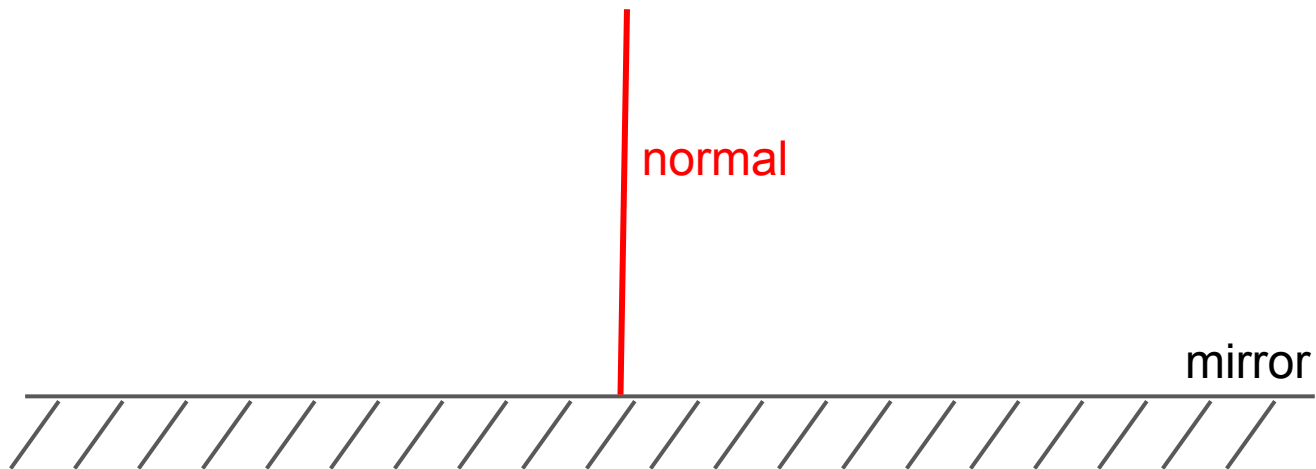


# What is the normal?



# What is the normal?

Any line perpendicular to the surface of the mirror.



# How do you draw the refracted ray?



## How do you draw the refracted ray?

Connect the point where the ray entered the block and the point where the ray left the block on the other side with a straight line.



What do you expect to find about the angle of incidence and the angle of reflection?





What do you expect to find about the angle of incidence and the angle of reflection?

The angle of incidence should be the same as the angle of reflection.



What do you expect to find about the angle of refraction for different materials?



What do you expect to find about the angle of refraction for different materials?

It should be different for each material depending on its refractive index.



For light passing from air into glass, how should the angle of refraction compare with the angle of incidence?



For light passing from air into glass, how should the angle of refraction compare with the angle of incidence?

The angle of refraction should be less than the angle of incidence.



For light passing from glass into air, how should the angle of refraction compare with the angle of incidence?



For light passing from glass into air, how should the angle of refraction compare with the angle of incidence?

The angle of refraction should be greater than the angle of incidence.



Explain the results for refraction between  
air and glass





## Explain the results for refraction between air and glass

Glass is more dense than air, so waves travel more slowly in glass. This causes them to bend towards the normal if entering glass and away from it if entering air.

