Law of reflection

Class practical

Showing angle of incidence equal to angle of reflection.

Apparatus and materials

For each group of students

Ray box or lamp (12 V 24 - 48 W) [1]

Low voltage power supply for lamp

Single slit

Plane mirror

Holder for mirror

Paper protractor (see technical notes)

White paper

Health & Safety and Technical notes

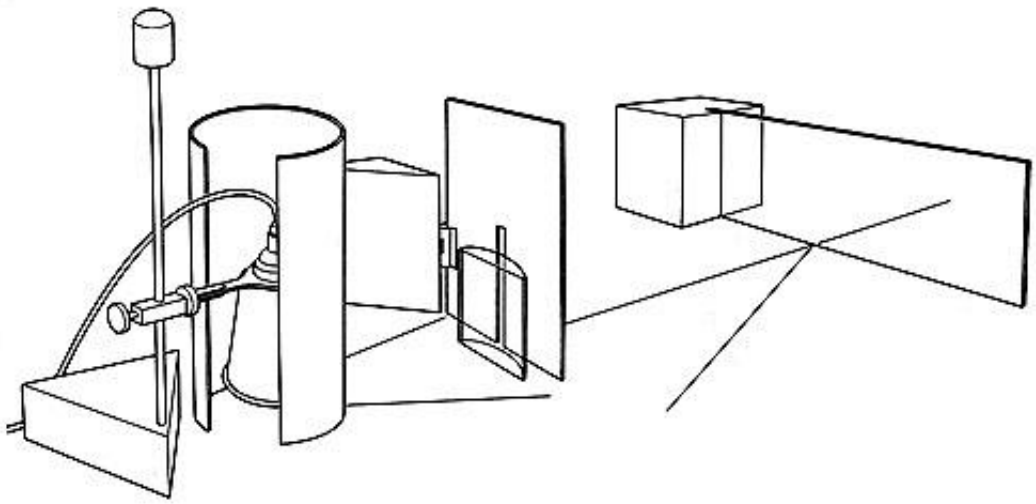
Many ray boxes of traditional design become very hot after a lesson of use. Warn the class and provide them with heat-proof gloves or cloths if they need to handle the ray box when still hot.

Read our standard health & safety guidance

A suitable protractor template [3] is provided.

A cylindrical lens can be fitted within the ray box to give a clear, long ray streak.

Procedure



Set up the apparatus to produce a single ray streak on the paper. Stand the mirror on the paper protractor with the two bases aligned. Students will quickly see the 'equal angles'.

Teaching notes

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1 Students should see rays of light being reflected at a plane mirror. They should extract some kind of rule about 'equal angles'. It is possible to sketch in a series of rays in order to keep a record of the experiment. But it is just as easy to read off the angles of incidence and reflection from the protractor, if it is aligned with the mirror.

2 An alternative is to use a Hartl disc or some other arrangement, which has a protractor and a scheme for showing the behaviour of a single ray.

This template [4] with two sets of parallel lines can be used with an Over Head Transparency (OHT) to simulate reflection and interference of plane waves, at a straight barrier.

Photocopy or print the lines onto an OHT. Cut into two sets. Use the lines as wave fronts towards the mirror at an angle.

This is not 'real interference' but rather a Moire Pattern analogue.

This experiment was safety-checked in January 2007.

Source URL: http://www.nuffieldfoundation.org/practical-physics/law-reflection

Links:
[1] http://www.nuffieldfoundation.org/node/1897
[2] http://www.nuffieldfoundation.org/node/1634/
[3] http://www.nuffieldfoundation.org/sites/default/files/files/Law of reflection_LAW_OF_REFLECTION_2000.pdf
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