

the Eye and Pinhole Camera

KS3 Physics · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Which part of the eye detects light?

Step 1 · The retina

A layer at the back of the eye containing light-sensitive cells (rods and cones).

Step 2 · What happens

Light causes chemical changes in these cells, which send electrical signals along the optic nerve to the brain.

Answer: The retina

Check: Light transfers energy, causing chemical and electrical effects.

2. Now try one with the steps

What happens to your pupils when you walk into bright sunlight?

Step 1 · Iris

Step 2 · Bright light

Answer:

3. Practice

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

1. Which part of the eye contains light-sensitive cells? [1]

2. What is the pupil? [1]

3. What does the lens of the eye do? [1]

4. What carries signals from the retina to the brain? [1]

5. What happens to the pupil in bright light, and why? [2]
-
-
6. Describe the image formed in a pinhole camera. [2]
-
-
7. What happens to the image if the pinhole is made much bigger? [2]
-
-
8. A pinhole camera is moved closer to the object. What happens to the image size? [1]
-
-
9. A 200 cm object is 400 cm from a pinhole camera with a 20 cm box. How tall is the image, in cm? [2]
-
-
10. The same camera's box is lengthened to 40 cm. How tall is the image now, in cm? [1]
-
-
11. The image on your retina is upside down. Why do you see the world the right way up? [1]
-
-
12. Match parts of the eye with parts of a digital camera: lens, iris, retina. [3]
-
-
-
13. Describe the energy transfers when light reaches the retina. [2]
-
-
14. A 10 cm image is formed of a 200 cm object. What is the magnification (image height $\div$ object height)? [1]
-
-

4. Before you hand it in

"The pupil is a part that detects light."

The retina detects light; the pupil lets it in.

"The image in a pinhole camera is the right way up."

The image is inverted (and left-right reversed).

"Light goes out of the eye to see things."

Light from objects enters the eye through the pupil and is focused onto the retina.