

Visible Light Colour

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

Name _____ Class _____ Date _____

1. Worked example

Explain why a red jumper looks red in white light. (2 marks)

Step 1 · White light

White light contains all the colours (wavelengths) of the visible spectrum.

Step 2 · The jumper

The dye reflects red wavelengths and absorbs all the others, so only red light reaches your eye.

Answer: It reflects red and absorbs other colours

Check: The colour you see is the colour that is reflected.

2. Now try one with the steps

Describe the difference between specular and diffuse reflection. (3 marks)

Step 1 · Specular

Step 2 · Diffuse

Step 3 · Both

Answer:

3. Practice

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

1. Describe the difference between specular and diffuse reflection. [2]

2. Explain why a red object looks red in white light. [2]

3. Describe what a red filter does to white light. [2]

4. State the colour a blue object appears in red light. [1]

5. State the colour a white object appears in green light. [1]
6. Explain why a black object looks black. [1]
7. State which colour of visible light has the longest wavelength. [1]
8. Describe the difference between transparent, translucent and opaque objects. [3]
9. White light passes through a green filter and then a red filter. Describe what is seen. [2]
10. Explain why a red shirt looks black under blue light. [2]
11. Explain why you can read a sheet of paper from any angle but cannot see your reflection in it. [2]
12. Predict the colour of a yellow object seen in red light and explain. [2]
13. Red light has a wavelength of about 700 nm. Calculate its frequency. Speed of light = 3.0×10^8 m/s. [3]
14. Explain, in terms of wavelengths, why a green leaf looks green. [2]

4. Before you hand it in

"A red filter turns light red."

A red filter absorbs every colour except red, which it transmits.

"A blue object in red light looks purple."

A blue object can only reflect blue; with only red light, nothing is reflected, so it looks black.

"Rough surfaces don't obey the law of reflection."

In diffuse reflection each ray obeys the law, but the surface faces point in many directions, so rays scatter.

Saying the colour seen is the colour absorbed

We see the wavelengths that are reflected (or transmitted, for a filter).