

# Lesson 9 - Filters

Science - Physics - Key Stage 3

Light and Space

Miss Wickham



# Recap questions

1. How many colours is white light made up of?
2. State the colours that make up white light.
3. Why would an object look yellow?
4. Why would an object look black?
5. Other than reflection and absorption, what else can happen to light at a surface?



# Task

Complete the table, writing the colour the object will appear in the different colour lights

Object	Blue light	Red light	Green light
Red apple			
Blue teddy			
Green shirt			



# Task

Complete the table, writing the colour the object will appear in the different colour lights

Object	Blue light	Red light	Green light	cyan light	Magenta light
Cyan pillow					
Blue socks					
Yellow vase					



# Glass filters

What colour would a red chair appear in white light?

What colour would a red chair appear in white light if you had blue filtered glasses on?

What colour would a blue cushion look in white light with red filtered glasses on?

What colour would a blue cushion look in white light with one red lens and one blue lens filtered glasses on?



	White paper	Red apple	Green apple	Magenta car
Colour(s) that the objects can reflect				
Appearance of object in white light				
Appearance of object in red light				
Appearance of object in green light				
Appearance of object in blue light				



# Answer the following questions

1. Susan has 2 different teddies, one blue and one green. A blue filter is applied to the white light in her room. What colour will each of the teddies appear and why?
2. Explain why when a white light is shone onto a white football it appears white.
3. State the colour a green book will appear when using the following filters:
  - a) White
  - b) Blue
  - c) Red
4. White light was shone onto a red filter and the light from the filter appeared red. Max then added a green filter after the red and no colour was projected onto his wall, explain why.
5. Explain why Ronnie's cyan tshirt will appear blue in blue light.



# Answers



# Recap questions

1. How many colours is white light made up of?  
**seven**
2. State the colours that make up white light.  
**Red, orange, yellow, green, blue, indigo, violet**
3. Why would object look yellow?  
**It reflects yellow light only and absorbs all other colours**
4. Why would an object look black?  
**It absorbs all colours from the visible spectrum, no colour reflected**
5. Other than reflection and absorption, what else can happen to light at a surface?  
**transmission**



# Task

Complete the table, writing the colour the object will appear in the different colour lights

Object	Blue light	Red light	Green light
Red apple	black	red	black
Blue teddy	blue	black	black
Green shirt	black	black	green



# Task

Complete the table, writing the colour the object will appear in the different colour lights

Object	Blue light	Red light	Green light	cyan light	Magenta light
Cyan pillow	blue	black	green	cyan	blue
Blue socks	blue	black	black	blue	blue
Yellow vase	black	red	green	black	red



# Glass filters

What colour would a red chair appear in white light?

**Red**

What colour would a red chair appear in white light if you had blue filtered glasses on?

**Black**

What colour would a blue cushion look in white light with red filtered glasses on?

**Black**

What colour would a blue cushion look in white light with one red lens and one blue lens filtered glasses on?

**Red lens will make the cushion appear black, blue lens will make the cushion appear blue**



	White paper	Red apple	Green apple	Magenta car
Colour(s) that the objects can reflect	All	Red only	Green only	Blue and red
Appearance of object in white light	White (no colours absorbed).	Red (all colours absorbed apart from red).	Green (all colours, absorbed apart from green).	Magenta
Appearance of object in red light	Red (only red light to reflect).	Red	Black (no green light to reflect).	Red
Appearance of object in green light	Green (only green light to reflect).	Black (no red light to reflect).	Green	Black
Appearance of object in blue light	Blue (only blue light to reflect).	Black (no red light to reflect).	Black (no green light to reflect).	Blue



# Answer the following questions

1. Susan has 2 different teddies, one blue and one green. A blue filter is applied to the white light in her room. What colour will each of the teddies appear and why?  
**The blue teddy will appear blue as it is reflecting blue light. The green teddy will appear black as it is reflecting no light and absorbing the blue light.**
1. Explain why when a white light is shone onto a white football it appears white.  
**White light is made up of 7 colours, when the light hits the football, no colours are absorbed and all are reflected making the football appear white.**
2. State the colour a green book will appear when using the following filters:
  - a) White - **green**
  - b) Blue - **black**
  - c) Red - **black**



# Answer the following questions

4. White light was shone onto a red filter and the light from the filter appeared red. Max then added a green filter after the red and no colour was projected onto his wall, explain why.

**Because only red is transmitting through to the green filter and because this is not the same wavelength as green, the red is being absorbed by the green filter.**

5. Explain why Ronnie's cyan tshirt will appear blue in blue light.

**Cyan is made up of green and blue. Therefore the blue can be reflected and the green is being absorbed.**

