

The Light Spectrum

The picture on the right shows a very famous album cover called 'Dark Side of the Moon' from the band Pink Floyd. It was released in 1973 and although it contains many well-known songs today, it also shows this iconic (famous) image. The image shows what must be a glass prism with a beam of light hitting it from the left. You can see inside the prism, the ray of light is spreading out until eventually, the colours within the 'white light' become separated into the spectrum we see on the right of the picture.



What is White Light?

White light is the name given to a normal beam of light with no colour. A plain light coming from a torch or a lamp would be called white light. Light the sun is also called white light. However, just like when we mix lots of paint colours to make a very dark brown, the white light is made up of different colours of light. When the different coloured lights are mixed they make white, not the usual paint mixing colours we know well.

How Does White Light Separate?

So how is the spectrum made?

How can white light be separated so we can see these different colours?

Well, it's all down to **refraction**. Refraction happens when something, like water or a glass prism, bends light. The thing about the different colours of light, is that they all bend a different amount. Red light bends the least, so is at the top of the spectrum we see in the picture. Violet light bends the most, so is at the other end of the spectrum, with all the other colours in between.

Why Does the Visible Spectrum look like a Rainbow?

...because a rainbow is a type of visible spectrum. Earlier we talked about light being refracted through a glass prism or water and that's just what happens to make a rainbow. Rainbows **only** happen when the Sun provides some white light and it is raining. This means that there is light and water – perfect conditions for refraction to happen. The colours we know as the rainbow **are** the colours of the visible spectrum: red orange, yellow, green, blue, indigo and violet.

Questions About The Light Spectrum

Answer the questions below in full sentences.

1. Who released the album 'Dark Side of The Moon'?

2. How many colours are in the visible spectrum and in what order?

3. What happens to white light to make it into a spectrum?

4. What colour bends the least when a spectrum is made?

5. What colour is violet?

6. Give an example of white light not mentioned in the text.

7. Why has the author used the phrase 'what must be' in paragraph one?

8. Why do you think the author has put the word **only** in bold in the final paragraph?

9. Find an example of an adjective in the text.

10. What does the word 'iconic' mean in paragraph one and how do you know?

Questions About The Light Spectrum

Answers

1. Who released the album 'Dark Side of The Moon'?

Pink Floyd

2. How many colours are in the visible spectrum and in what order?

Seven (red, orange, yellow, green, blue, indigo, violet)

3. What happens to white light to make it into a spectrum?

It refracts

4. What colour bends the least when a spectrum is made?

Red

5. What colour is violet?

Purple / reddish-purple (as opposed to indigo being a bluish-purple)

6. Give an example of white light not mentioned in the text.

Any white light NOT mentioned (NOT: sunlight, a torch beam, a lamp)

7. Why has the author used the phrase 'what must be' in paragraph one?

It MUST BE a glass prism because it is bending the light (and it is triangular)

(Note: The refraction would not happen through a pane of glass)

8. Why do you think the author has put the word only in bold in the final paragraph?

To reiterate/show the importance of that fact it can only happen in that circumstance.

9. Find an example of an adjective in the text.

Examples include: famous, iconic, dark brown, red, violet etc.

10. What does the word 'iconic' mean in paragraph one and how do you know?

It means 'famous'. The author used brackets next to the word to give an alternate word with the same meaning. Accept alternate suitable synonyms.

The Light Spectrum

The picture on the right shows a renowned album cover called *Dark Side of the Moon* by the band Pink Floyd. It was released in 1973 and although it contains many well-known songs today, it also shows this iconic image. The image shows what must be a glass prism with a light ray hitting it from the left. You can see inside the prism, the ray of light is spreading out until eventually, the colours within the 'white light' become separated into the spectrum we see on the right of the picture.



What is White Light?

White light is the name given to a normal beam of light with no colour filters. A plain light coming from a torch or a lamp would be called white light. Also, light coming from the Sun would be called white light. However, just like when we mix lots of paint colours to make a very dark brown, the white light is made up of different coloured light. When the different coloured lights are mixed they make white, not the usual paint mixed colours we are used to.

How Does White Light Separate?

So how is the spectrum made? And how can white light be separated so we can see these different colours? Well, it's all down to refraction. Refraction happens when something – like water or a glass prism – bends light. The thing about the different colours of light, is that they all bend a different amount. Red light bends the least, so is at the top of the spectrum we see in the picture above. Violet light bends the most, so is at the other end of the spectrum, with all the other colours in between.

Why Does the Visible Spectrum look like a Rainbow?

...because a rainbow *is* a type of visible spectrum. Earlier we talked about light being refracted through a prism or water and that's exactly what happens to make a rainbow. Rainbows *only* happen when the Sun is providing some white light *and* it is raining. This means that there is light and water – perfect conditions for refraction to occur. The colours we know as the rainbow *are* the colours of the visible spectrum: red, orange, yellow, green, blue, indigo and violet.

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Questions About The Light Spectrum

Answer the questions below in full sentences.

1. Who released the album 'Dark Side of The Moon'?

2. How many colours are in the visible spectrum and in what order?

3. What happens to white light to make it into a spectrum?

4. Which colour bends the most when a spectrum is made?

5. What two things need to be present to make a rainbow?

6. Give an example of white light not mentioned in the text.

7. Why has the author used the phrase 'what must be' in paragraph one?

8. Why do you think the author has put the word *only* in italics in the final paragraph?

9. What type of adjective is 'well-known' in paragraph one?

10. Why has the author told us that mixing light colours is different to mixing paint colours?

Why did they mention paint at all?

Questions About The Light Spectrum

Answers

1. Who released the album 'Dark Side of The Moon'?

Pink Floyd

2. How many colours are in the visible spectrum and in what order?

Seven (red, orange, yellow, green, blue, indigo, violet)

3. What happens to white light to make it into a spectrum?

It refracts

4. What colour bends the most when a spectrum is made?

Violet

5. What two things need to be present to make a rainbow?

White light AND water /rain

6. Give an example of white light not mentioned in the text.

Open ended: Any white light NOT mentioned (NOT: sunlight, a torch beam, a lamp)

7. Why has the author used the phrase 'what must be' in paragraph one?

It MUST BE a glass prism because it is bending the light (and it is triangular)

(Note: The refraction would not happen through a pane of glass)

8. Why do you think the author has put the word *only* in italics in the final paragraph?

To reiterate/show the importance of that fact it can only happen in that circumstance.

9. What type of adjective is 'well-known' in paragraph one?

A compound adjective which uses a hyphen to link the two words together into one adjective.

10. Why has the author told us that mixing light colours is different to mixing paint colours? Why did they mention paint at all?

We have experience of mixing paint colours, so we might assume that light mixes the same way but it does not.

The Light Spectrum

The picture on the right shows a renowned album cover called *Dark Side of the Moon* by the band Pink Floyd. It was released in 1973 and although its contents were ground-breaking, the picture remains iconic. The image shows what must be a glass prism with a light ray hitting it from the left. Inside the prism, we see refraction in action until eventually the colours within the 'white light' become separated into the visible spectrum we see on the right of the picture.



What is White Light?

White light is the scientific name given to a beam of light with no colour filters. A plain light coming from a torch or a lamp would be referred to as this. Similarly, the light coming from the Sun would also be called white light. However, just like when we mix many different paint colours to make a very dark brown, the white light is made up of different coloured light. When the different coloured lights are mixed they make white, not the usual paint-mixed colours we are used to.

How Does White Light Separate?

So how is the visible spectrum made? And how can white light be separated so we can see these different colours? Well, it's all down to refraction. Refraction happens when something – such as water or a glass prism – bends light. The thing about the different colours of light, is that they all bend a different amount. Red light bends the least, so is at the top of the spectrum we see in the picture above. Violet light bends the most, so is at the other end of the spectrum, with all the other colours in between.

Why Does the Visible Spectrum look like a Rainbow?

...because a rainbow is a type of visible spectrum. Previously we talked about light being refracted through a glass prism or water and that's exactly what happens to make a rainbow. Rainbows only happen when the Sun is providing some white light and it is raining. This means that there is light and water – perfect conditions for refraction to happen. The colours we know as the rainbow are the colours of the visible spectrum: red, orange, yellow, green, blue, indigo and violet.

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Questions About The Light Spectrum

Answer the questions below in full sentences.

1. Who released the album 'Dark Side of The Moon'?

2. Why do you think it is called the 'visible' spectrum? What does this suggest?

3. What happens to white light to make it into a spectrum?

4. What colour bends the most when a spectrum is made?

5. What two things need to be present to make a rainbow?

6. Give an example of white light not mentioned in the text.

7. Why has the author used the phrase 'what must be' in paragraph one?

8. What does the word 'iconic' mean – used in the first paragraph?

9. What type of adjective is 'ground-breaking' in paragraph one?

10. Why has the author told us that mixing light colours is different to mixing paint colours?

Why did they mention paint at all?

Questions About The Light Spectrum

Answers

1. Who released the album 'Dark Side of The Moon'?

Pink Floyd

2. Why do you think it is called the 'visible' spectrum? What does this suggest?

It suggests that there are other parts of the spectrum that are NOT visible – and this is indeed the case.

3. What happens to white light to make it into a spectrum?

It refracts

4. What colour bends the most when a spectrum is made?

Violet

5. What two things need to be present to make a rainbow?

White light AND water /rain

6. Give an example of white light not mentioned in the text.

Open ended: Any white light NOT mentioned (NOT: sunlight, a torch beam, a lamp)

7. Why has the author used the phrase 'what must be' in paragraph one?

It MUST BE a glass prism because it is bending the light (and it is triangular)

(Note: The refraction would not happen through a pane of glass)

8. What does the word 'iconic' mean – used in the first paragraph?

To suggest that the image is an icon – something which people revere or look up to.

9. What type of adjective is 'ground-breaking' in paragraph one?

A compound adjective which uses a hyphen to link the two words together into one adjective.

10. Why has the author told us that mixing light colours is different to mixing paint colours? Why did they mention paint at all?

We have experience of mixing paint colours, so we might assume that light mixes the same way but it does not.