Why Is the Sky Blue?

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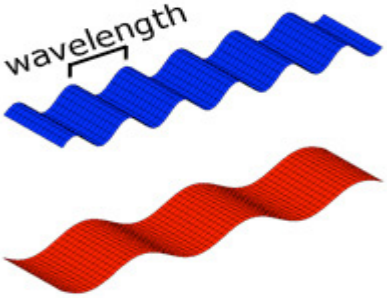
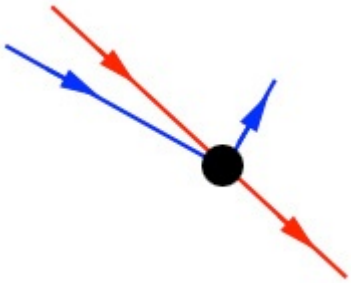
Gas molecules in the atmosphere scatter, in all directions, the short wavelength light that appears blue to us. Longer wavelength light is largely unaffected as it passes through the atmosphere. As a result, when you look at the sky, you see blue everywhere. Read on for a more detailed explanation.

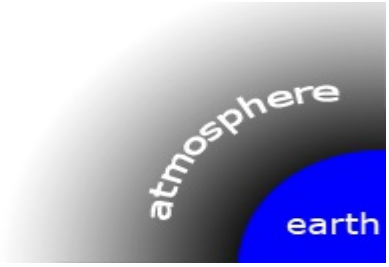
Fact 1. Light travels in waves. The light's wavelength determines its color. Short wavelength light, for example, appears blue, and long wavelength light appears red.



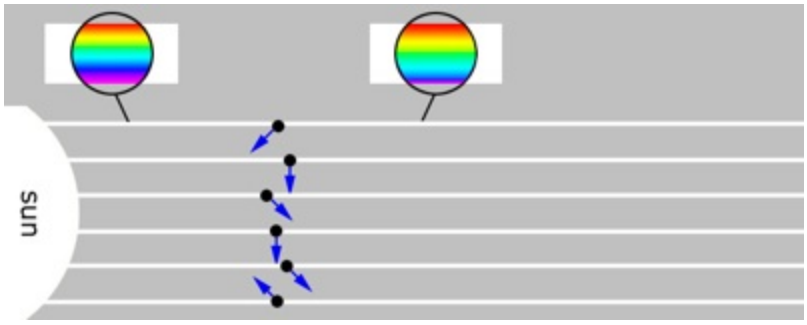
Fact 2. When light strikes particles that are larger than its wavelength, the light's path may be altered. When light strikes particles that are smaller than its wavelength, the light continues to travel unaffected.



Fact 3. The atmosphere contains many particles and gases, mainly nitrogen and oxygen.



Sunlight is composed of light of many different wavelengths. Longer wavelength light appears red, orange, and yellow, while shorter wavelength light appears blue, indigo and violet. The gas molecules in the atmosphere scatter, in all directions, shorter wavelength light (e.g., blue). The longer wavelength light (e.g., red) is largely unaffected by the atmosphere. As a result, when you look at the sky, you see the blue portion of the sun's light being scattered by the atmosphere. If you were to look at the sky while standing on the moon, you would see a very bright star surrounded by complete darkness. This is because the moon has no atmosphere and so sunlight is not scattered.



You might wonder why the sky is not the color of the even shorter wavelength violet. The primary reason for this is that our eyes are better at detecting blue light than they are at detecting violet light.

Name: _____ Date: _____

1. What color might short wavelength light appear to us?

A green
B blue
C red
D orange

2. This text describes what happens when light hits particles of different sizes. Why might the text include this description?

A to persuade the reader to agree with the author about how light and particles interact
B to present evidence for different views about how light and particles interact
C to inform the reader about how light and particles interact
D to compare and contrast two ideas about how light and particles interact

3. When light strikes particles that are larger than its wavelength, the light's path may be altered. The gas molecules in Earth's atmosphere affect the path of light with a shorter wavelength (blue light). Based on this evidence, what conclusion can be draw

A The gas particles are smaller than the wavelength of blue light.
B The gas particles are larger than the wavelength of blue light.
C The gas particles are larger than the wavelength of red light.
D The gas particles are smaller than the wavelength of violet light.

4. If Earth had no atmosphere at all, what would the sky mostly look like?

A It would look mostly red, with a very bright star.
B It would look mostly violet, with a very bright star.
C It would look mostly blue, with a very bright star.
D It would look mostly dark, with a very bright star.

5. What is the main idea of this text?

A Long wavelength light appears to us as red, while short wavelength light appears to us as blue.
B The main reason why the sky looks blue is that our eyes are better at detecting blue light than light of other colors.
C The sky appears blue because gas molecules in the atmosphere scatter the wavelength of light that appears blue to us.
D The atmosphere contains many particles and gases, mainly nitrogen and oxygen.

6. Why might the author have chosen to include diagrams in this text?

A to provide interesting information that does not have to do with the main idea of the text
B to distract readers from the discussion of some of the technical concepts in the text
C to suggest that the information in the text can be interpreted in different ways
D to highlight and clarify concepts that are important to understanding the main idea of the text

7. Choose the answer that best completes the sentence.

The gas molecules in the atmosphere scatter shorter wavelength light, _____ the longer wavelength light is largely unaffected by the atmosphere.

A but
B similarly
C then
D therefore

8. What happens to light's path when it strikes particles that are larger than its wavelength?

_____

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_____

9. Why might the path of longer wavelength light (red light) be mostly unaffected by Earth's atmosphere? Support your answer with evidence from the text.

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10. Imagine that you are standing on another planet looking at the sky in the daytime. The planet has an atmosphere, but the sky looks dark. What about the particles in that planet's atmosphere might cause the sky to look dark, instead of blue like Earth's sky? Support your answer with evidence from the text.

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