6th Grade
Reading/Literature
Week 2 - Day 1

Checklist for Day 1

☐ How Are Rainbows Formed?

☐ Why Is The Sky Blue?

☐ BrainPop Video: Reading Skills + Quiz

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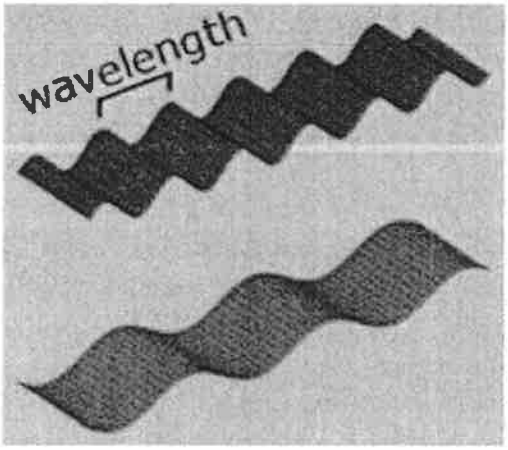
How Are Rainbows Formed?

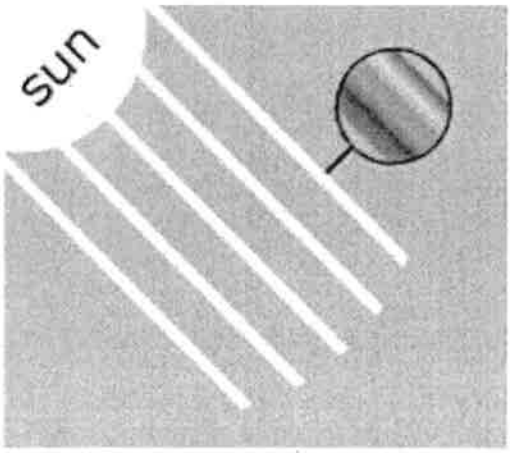
by Dr. Hany Farid

Sunlight is composed of light of varying wavelengths. Short wavelength light appears blue, violet and indigo, and long wavelength light appears red, orange and yellow. When sunlight enters a raindrop in the air, the light splits into a multitude of colors. This light then reflects off the back of the raindrop and re-emerges in the direction in which the light first entered. The light emerging from many raindrops creates a rainbow. Read on for a more detailed explanation.

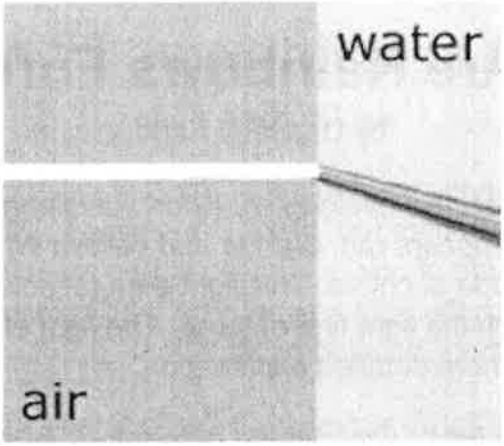
Fact 1. Light travels in waves. The light's wavelength determines its perceived color. Short wavelength light, for example, appears blue, and long wavelength light appears red.



Fact 2. Sunlight is composed of light of many wavelengths. In the range that we can see, this includes the colors of the rainbow.

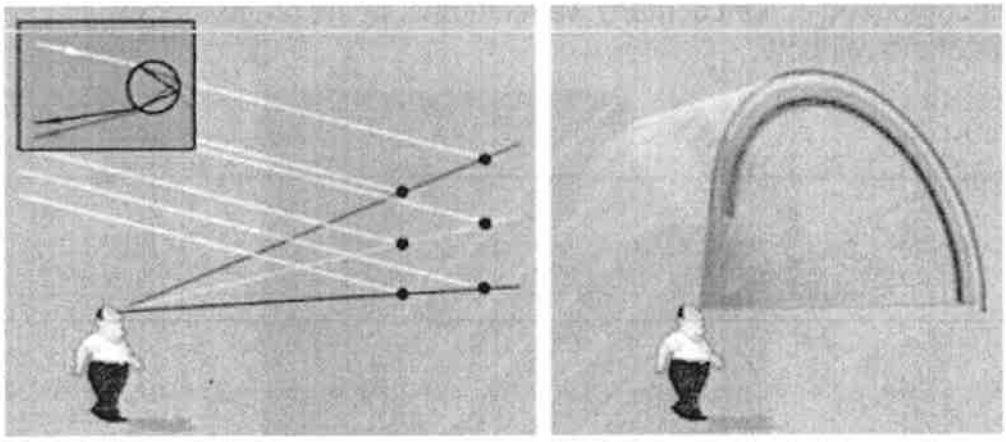


Fact 3. When light enters water it bends (refracts). The amount of bending depends on the wavelength of light. As a result, the light splits into its component colors.



When a ray of sunlight enters a raindrop it bends (refracts). The light then strikes the back of the raindrop, where some of the light passes through and some is reflected. As the light exits the raindrop, it is refracted again. The angle at which the light emerges depends on the wavelength of light. This path is illustrated in the small box below, where only the bending of two wavelengths (blue and red) are shown.

Consider now the diagram on the left. The sun is behind you (white rays) and there is rain in front of you (black dots). As the sunlight enters each raindrop, the light is refracted and reflected as described above. Because the sun is so far away, the rays of sunlight are nearly parallel to one another. As a result, the angle between the red line and each ray of sunlight striking a raindrop on that line will be the same. So, the light that reaches your eye along this ray will be of the same wavelength (color). The same is true for the yellow, blue and intermediate lines corresponding to each color of the rainbow.



Consider now the diagram on the right which explains why the colors of a rainbow form an arc. The angle between the incoming rays of sunlight (white) and all of the red lines, forming a circular cone, have the same angle. As a result, the light that reaches your eye along these lines have the same wavelength (color). The same is true for each band of the rainbow.

The reason that rainbows are somewhat rare is that you will only see them when there is rain in front of you and somewhat in the distance, and the sun is behind you and fairly low on the horizon.

Name: _____ **Date:** _____

1. What is sunlight composed of?

A. light of varying intensity

B. light of varying wavelengths

C. light traveling at different speeds

D. light of a single color

2. What does the author explain in the first paragraph of the text?

A. why rain causes light to split into separate colors

B. how a rainbow is formed

C. how light travels

D. why rainbows are shaped like an arc

3. Please read these sentences from the text.

"Sunlight is composed of light of varying wavelengths. [...] When light enters water, it bends (refracts). The amount of bending depends on the wavelength of light. As a result, the light splits into its component colors."

What can you conclude based on this evidence?

A. Each wavelength of light bends the same amount when it enters water.

B. When light enters water, its wavelength is altered.

C. Each component color of light has a different wavelength.

D. The component colors of light all have the same wavelength.

4. When would you be most likely to see a rainbow?

A. in the evening on a cloudy, rainy day

B. at noon on a partly cloudy day

C. in the morning on a bright, sunny day

D. in the evening on a partly rainy, partly sunny day

5. What is the main idea of this text?

A. The colors of a rainbow form an arc because of the angles at which light of different wavelengths reaches your eye.

B. Rainbows form when sunlight enters raindrops, splits into different color components, and then re-emerges from the raindrops.

C. You will only see rainbows when there is rain in front of you and somewhat in the distance, and the sun is behind you and fairly low on the horizon.

D. Sunlight is composed of light of varying wavelengths. Short wavelength light appears blue, and long wavelength light appears red.

6. Why might the author have chosen to list Facts 1, 2, and 3 separately instead of describing them in one paragraph?

A. to make the explanation of how rainbows form seem more complicated

B. to indicate that these facts do not affect the way rainbows form

C. to show that these facts are not related to each other in any way

D. to emphasize the importance of these facts to the way rainbows form

7. Choose the answer that best completes the sentence below.

Light's wavelength determines its perceived color; _____, short wavelength light appears blue.

A. however

B. similarly

C. initially

D. for instance

8. When light enters water, it bends. What does the amount of bending depend on?

_____

_____

_____

9. For a rainbow to form, sunlight needs to enter and then re-emerge from raindrops. Describe what happens to the light between when it first enters a raindrop and when it comes out of the raindrop. Support your answer with evidence from the text.

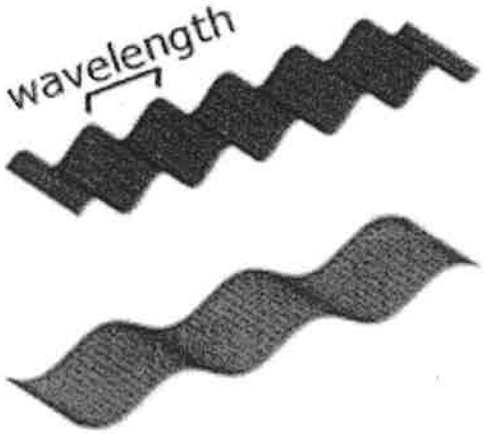
10. Why might you only see a rainbow when rain is in front of you? Support your answer with evidence from the text and images.

Why Is the Sky Blue?

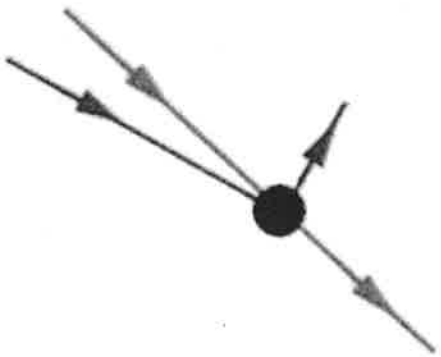
by Dr. Hany Farid

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.

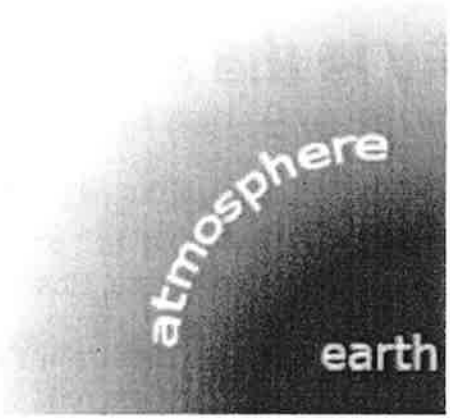
Fact 1. Light travels in waves. The light's wavelength determines its color. Short wavelength light, for example, appears blue, and long wavelength light appears red.



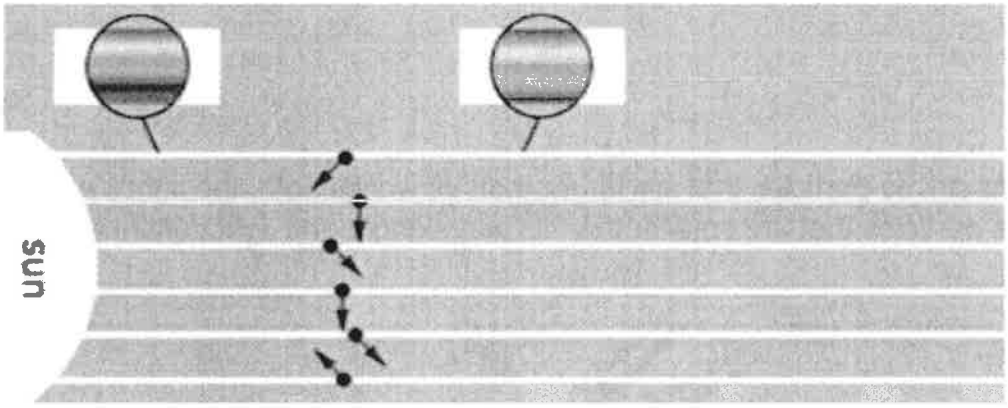
Fact 2. When light strikes particles that are larger than its wavelength, the light's path may be altered. When light strikes particles that are smaller than its wavelength, the light continues to travel unaffected.



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 drawn about the size of the gas molecules in Earth's atmosphere?

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 below.

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?

_____

_____

_____

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.

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.

Reading Skills Quiz

Name: _____
Date: _____
Class: _____

1. What information should you gather when you preview a text?

a. The names of every character in the work.
b. A general idea of what the text is about.
c. Information about where, when, and how the book was published.
d. Details about the life of the author.

2. Place the following events in sequence: A) Take notes; B) Preview; C) Discuss with friend

a. A, C, B
b. C, A, B
c. B, C, A
d. B, A, C

3. When's the best time to stop and reread a piece of text?

a. When you come across something you don't understand
b. When you are halfway through the text
c. After you've already read it several times
d. When you are finished with the entire text

4. What's the most likely effect of watching TV while you're reading?

a. You'll be able to concentrate more easily
b. You'll gain a better grasp of the material
c. You'll overlook important details in what you're reading
d. You'll get a better grade on your next book report

5. 

Why would you use a dictionary when you're reading a novel for your English class?

a. To look up information about the novel's author
b. To find a list of synonyms for a word in the novel
c. To look up historical information about the novel
d. To look up the definition of a word in the novel

6. What is the main purpose of note-taking?

a. It allows you to memorize the text word-for-word
b. It allows you to write your report while you read your book
c. It allows you to recognize and review key ideas
d. It proves to your teacher that you've done your reading

7. In the phrase, "It's usually a good idea to read a text comprehensively," what's the best synonym for "comprehensively?"

a. Repeatedly
b. Inadequately
c. Quickly
d. Thoroughly

8. What's the main purpose of talking with someone else about what you've read?

a. Making sure you've memorized the text properly
b. Allowing yourself to come up with new ideas
c. Making sure you know how to pronounce the author's name, and the names of the characters
d. Making sure that you've used complete sentences in your notes

9. If you can't talk to someone about what you just read, what's another way to produce a conversation's desired effect?

a. Write in your journal about what you did that day
b. Ask your teacher for an extension on your report
c. Go and read another piece by the same author
d. Write a blog post about your opinion of the text

10. Skimming a text is most similar to:

a. Eating a large dinner
b. Having a light snack
c. Cooking a large dinner
d. Looking up a recipe