

Name: _____

The Magic of Rainbows

By Lydia Lukidis



Rainbows are multi-colored arcs that appear in the sky. They are made up of seven different colors.

These colors are always in the same order. They are: red, orange, yellow, green, blue, indigo, and violet. An easy way to remember them is by the name ROY G. BIV. The letters in the name stand for each color.

Rainbows are beautiful. But they are rare. They don't happen every day. You probably know that you need two things for a rainbow to form. You need light and water. Rainbows often happen when the sun comes out after it has rained. Or there could be water in the form of mist, spray, fog, and dew. But what makes all these wonderful colors appear?

You may think that sunlight is white light. This is half true. To our eyes, it does look white. But inside that light, there are other colors. Can you guess which ones? It's the seven colors of the rainbow! We can't see them with our eyes. When a beam of sunlight shines down, we see white light. But if that beam of light hits a raindrop at a certain angle, it bends. This is called reflection and refraction. When this happens, the colors that make up the beam separate. Then they form a rainbow.

Let's get a bit more scientific. Light acts like a wave that vibrates. Every color has its own wave. The colors slow down at different speeds when they go into the raindrop. When they get reflected, they bend at different angles. So the light that enters the raindrop is white. But when it exits, it is a different color. Each raindrop actually makes its own rainbow. And when there are many raindrops, they create a bigger rainbow that we can see.

These seven colors are also called the spectrum of light. It was the scientist Sir Isaac Newton who first discovered this. He figured out that white light contains these colors, and that this causes rainbows. He discovered this in 1672 when he conducted some experiments.



You may think a rainbow is an arc or a half-circle. But actually, a rainbow is a full circle of light. It just appears to be broken in half, because we are looking at it from the ground. A rainbow can't be touched either. It may look solid, but it is not a physical object.

Another fun fact about rainbows is that they're not located at a specific distance. If you try to follow or approach it, it won't get any closer. The rainbow will always be visible at the angle the raindrops bend the light. So don't try to chase a rainbow, because it's impossible!

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1. Based on the information you read in the article, what does the acronym ROY G. BIV stand for? In your answer, make sure you list one word for every letter of the acronym.

2. Which two things are required to produce a rainbow?

- a. light and oxygen
- b. water and light
- c. wind and clouds
- d. rain and wind

3. When white light enters a raindrop, why does it exit the raindrop in the form of different colors?

4. In the article, you learned that white light is actually made up of the seven colors of the rainbow. Why can't we see those colors when the sunlight is shining down on us on a clear day?

- a. The colors are only visible once they've bent and separated by passing through a raindrop at different speeds.
- b. The colors are only visible when the sunlight reflects off glass or ice.
- c. You can only see the colors when the sun peeks through a snow storm.
- d. You can only see the colors in certain parts of the world, such as the tropics.

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Match each vocabulary word from the article with the correct definition.

- | | |
|---------------------|---|
| 1. _____ indigo | a. semi-circles; curves |
| 2. _____ reflection | b. a band of colors, such as in a rainbow |
| 3. _____ separate | c. come near to something; move closer |
| 4. _____ arcs | d. when a surface throws back light instead of absorbing it |
| 5. _____ vibrates | e. performed; organized |
| 6. _____ spectrum | f. not occurring very often |
| 7. _____ conducted | g. able to be seen |
| 8. _____ approach | h. dark blue color |
| 9. _____ rare | i. divide; come apart |
| 10. _____ visible | j. moves back and forth quickly and rapidly |

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In the article, "The Magic of Rainbows," you learned what causes a rainbow to form in the sky. On the lines below, tell about a time when you saw a rainbow.



ANSWER KEY

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Red Orange Yellow Green Blue Indigo Violet

2. Which two things are required to produce a rainbow?

- a. light and oxygen
- b. water and light**
- c. wind and clouds
- d. rain and wind

3. When white light enters a raindrop, why does it exit the raindrop in the form of different colors?

Since each color inside the white light has its own wave, the colors slow down at different speeds when they pass through the raindrop. This causes them to bend at different angles when they are reflected, and then they exit the raindrop as separate colors.

4. In the article, you learned that white light is actually made up of the seven colors of the rainbow. Why can't we see those colors when the sunlight is shining down on us on a clear day?

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Match each vocabulary word from the article with the correct definition.

1. h. indigo
2. d. reflection
3. i. separate
4. a. arcs
5. j. vibrates
6. b. spectrum
7. e. conducted
8. c. approach
9. f. rare
10. g. visible
- a. semi-circles; curves
- b. a band of colors, such as in a rainbow
- c. come near to something; move closer
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