Name: _____ Date: _____

Swirling Colors on a Soap Bubble

Circle group

A soap bubble floats past a sunny window. Its skin shines with swirls of pink, green and blue. But the soap and water have no color at all. So where do the colors come from?

It starts with the wall of the bubble. It is a thin skin of soapy water. It is much thinner than a sheet of paper. Sunlight looks white, but it is really a mix of every color of light. Light moves in waves. When sunlight hits the bubble, some of it bounces off the outside of the skin. Some goes into the skin and bounces off the inside. The two beams then meet.

The thickness of the skin matters. For one color, the waves line up and get stronger. For another color, the waves cancel each other out. So one spot may look bright green and another may look bright blue. The skin is not the same thickness everywhere. That is why you see a patchwork of colors.

The skin keeps changing. Gravity slowly pulls the water down. The top of the bubble gets thinner. The colors shift and swirl. Just before the bubble pops, the thinnest part may look clear or dark.

Questions

1. What colors shine on the bubble?

_____

_____

2. Does the soapy water have any color of its own?

_____

_____

3. What is the wall of a bubble like?

_____

_____

4. What is sunlight really made of?

_____

_____

5. Why do you see a patchwork of colors?

_____

_____

6. Why do the colors shift and swirl?

_____

_____

Words to know

wave: a pattern that light and sound move in
beam: a narrow stream of light
cancel: to wipe out the effect of something
gravity: the pull that draws things toward the ground

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Swirling Colors on a Soap Bubble

Triangle group

A soap bubble drifts through a sunny window, and its surface glitters with swirling pinks, greens, and blues. Yet the soap and water in the bubble have no color at all. Where do the colors come from?

The answer starts with the wall of the bubble. It is a thin skin of soapy water, far thinner than a sheet of paper. Sunlight looks white, but it is really a mix of every color of light, and light travels in waves. When sunlight reaches the bubble, some of it bounces off the outer face of the skin. Some goes into the skin and bounces off the inner face. The two bounced beams then meet.

Depending on how thick the skin is, the waves of one color may line up and grow stronger, while the waves of another color may cancel each other out. So one spot may show bright green while another spot shows bright blue. Because the skin is not the same thickness everywhere, you see a patchwork of colors.

The skin keeps changing, too. Gravity slowly pulls the water downward, so the top of the bubble grows thinner. The colors shift and swirl as this happens. Just before the bubble pops, its thinnest part may look clear or dark.

Questions

1. What colors glitter on the bubble's surface?

_____

_____

2. Does the soapy water have any color of its own?

_____

_____

3. What is the wall of a bubble like?

_____

_____

4. What is sunlight really made of?

_____

_____

5. Why do you see a patchwork of colors?

_____

_____

6. Why do the colors shift and swirl as time passes?

_____

_____

Words to know

glitter: to sparkle with many bright flashes
wave: a pattern that light and sound move in
beam: a narrow stream of light
cancel: to wipe out the effect of something
gravity: the pull that draws things toward the ground

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Swirling Colors on a Soap Bubble

Square group

A soap bubble drifts lazily through a sunlit window, and its delicate surface shimmers with swirling bands of pink, green, and blue. Strangely, the soap and water that form the bubble have no color whatsoever. So where do all of those brilliant colors originate?

The answer begins with the wall of the bubble, which is an extremely thin skin of soapy water, far thinner than a single sheet of paper. Sunlight appears white, but it is actually a blend of every color of light, and light travels in waves. When sunlight reaches the bubble, part of it reflects off the outer face of the skin, while part of it enters the skin and reflects off the inner face. The two reflected beams then meet one another.

Depending on how thick the skin happens to be at that spot, the waves of one color may line up and grow stronger, while the waves of another color may cancel each other out. Consequently, one region may glow bright green while a neighboring region glows bright blue. Because the skin varies in thickness from place to place, you observe a patchwork of colors.

The skin never stops changing, either. Gravity slowly drags the water downward, which causes the top of the bubble to grow thinner and thinner. The colors shift and swirl as this happens. Shortly before the bubble finally bursts, its thinnest part may appear clear or dark.

Questions

1. Which colors shimmer on the bubble's surface?

_____

_____

2. Do the soap and water that form the bubble have any color?

_____

_____

3. How does the passage describe the wall of the bubble?

_____

_____

4. What is sunlight actually a blend of?

_____

_____

5. Why does a patchwork of colors appear on the bubble?

_____

_____

6. What causes the colors to shift and swirl as time passes?

_____

_____

Words to know

wave: a pattern that light and sound move in
beam: a narrow stream of light
cancel: to wipe out the effect of something
gravity: the pull that draws things toward the ground

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: Swirling Colors on a Soap Bubble

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: Swirling Colors on a Soap Bubble

Easier · 198 words · Flesch-Kincaid grade 2.6

1. Pink, green and blue.
2. No, it has no color at all.
3. A thin skin of soapy water, thinner than paper.
4. A mix of every color of light.
5. The skin is not the same thickness everywhere, so spots show different colors.
6. Gravity pulls the water down, so the skin keeps changing.

Triangle: Swirling Colors on a Soap Bubble

This passage · 210 words · Flesch-Kincaid grade 4.9

1. Pinks, greens, and blues.
2. No, it has no color at all.
3. A thin skin of soapy water, thinner than a sheet of paper.
4. A mix of every color of light.
5. The skin is not the same thickness everywhere, so different spots show different colors.
6. Gravity pulls the water down, so the skin keeps changing thickness.

Square: Swirling Colors on a Soap Bubble

Harder · 236 words · Flesch-Kincaid grade 7.9

1. Pink, green, and blue.
2. No, they have no color whatsoever.
3. An extremely thin skin of soapy water, far thinner than a sheet of paper.
4. Every color of light.
5. The skin varies in thickness from place to place, so each region shows a different color.
6. Gravity drags the water downward, so the skin keeps changing in thickness.