Name: _____ Date: _____

Why a Red Cape Turns Dark Under Blue Light

Circle group

Picture an actor in a bright red cape. The actor steps into a stage light that has been changed to blue. Suddenly the cape does not look red. It looks dark gray, almost black. The cape did not change. The light did.

We see color because things bounce some light to our eyes and soak up the rest. White light is a mix of all colors. A red cape soaks up most of the blue and green light. It bounces back the red light, so it looks red. A blue beam has almost no red in it. There is nothing red for the cape to bounce back. The cloth soaks up nearly all of it, and little reaches the audience.

Stage crews use this on purpose. They slide thin sheets of colored plastic, called gels, in front of lamps. An orange gel can make a scene feel like a sunset. A blue gel can suggest night. Costume designers test cloth under these lights. A color that looks right in a shop may look different on stage.

A white costume helps too. It bounces back whatever light it gets. Under a green lamp, white looks green. With a few switches, lighting artists can paint a whole scene.

Questions

1. What does a red cape look like under a blue light?

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_____

2. Why do we see things as having a color?

_____

_____

3. Why does the red cape look dark under blue light?

_____

_____

4. What are gels?

_____

_____

5. Why do costume designers test cloth under stage lights?

_____

_____

6. What color does a white costume look under a green lamp?

_____

_____

Words to know

audience: the people who watch a show
beam: a narrow line of light
gels: colored sheets that change the color of a light
designers: people who plan how things will look

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: _____

Why a Red Cape Turns Dark Under Blue Light

Triangle group

Imagine an actor in a bright red cape stepping into a stage light that has been changed to blue. Suddenly the cape does not look red anymore. It seems dark gray, almost black. The cape did not change at all. What changed was the light.

We see color because objects bounce some light back to our eyes and soak up the rest. White light is a mix of all colors. A red cape soaks up most of the blue and green parts of the light and bounces back the red part, so it looks red. Under a blue light, though, there is almost no red in the beam for the cape to bounce back. The fabric soaks up nearly everything, and little reaches the audience.

Stage crews use this idea on purpose. They slide thin sheets of colored plastic, called gels, in front of lamps. A warm orange gel can make a scene feel like a sunset, and a cool blue one can suggest night. Costume designers have to test fabrics under these lights, since a color that looks perfect in the shop may look quite different on stage.

A white costume is useful too, because it bounces back whatever light it receives. Under a green lamp, white looks green. Lighting artists use that to paint a whole scene with a few switches.

Questions

1. What does a red cape look like under a blue light?

_____

_____

2. Why do we see objects as having a color?

_____

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3. Why does the red cape look dark under blue light?

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4. What are gels?

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5. Why do costume designers test fabrics under stage lights?

_____

_____

6. What color does a white costume look under a green lamp?

_____

_____

Words to know

audience: the people who watch a show
beam: a narrow line of light
gels: colored sheets that change the color of a light
fabric: cloth made by weaving or knitting
designers: people who plan how things will look

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: _____

Why a Red Cape Turns Dark Under Blue Light

Square group

Imagine an actor wearing a vivid red cape who steps into a stage light that has been switched to blue. Abruptly, the cape no longer appears red at all. It seems dark gray, nearly black. The cape itself did not change in the slightest; what changed was the light.

We perceive color because objects reflect some of the light toward our eyes and absorb the remainder. White light is a combination of all colors. A red cape absorbs most of the blue and green portions of the light and reflects the red portion, which is why it looks red. Under a blue light, however, the beam contains almost no red for the cape to reflect. The fabric absorbs nearly everything, and very little reaches the audience.

Stage crews exploit this idea deliberately. They slide thin sheets of colored plastic, called gels, in front of their lamps. A warm orange gel can make a scene feel like a sunset, while a cool blue one can suggest nighttime. Costume designers must test fabrics under these lights, since a color that looks perfect in the shop may look quite different on stage.

A white costume is useful as well, because it reflects whatever light it receives. Beneath a green lamp, white appears green. Lighting artists take advantage of that to transform an entire scene with just a few switches.

Questions

1. What does a red cape look like under a blue light?

_____

_____

2. Why do we perceive objects as having a color?

_____

_____

3. Why does the red cape appear dark under blue light?

_____

_____

4. What are gels?

_____

_____

5. Why must costume designers test fabrics under stage lights?

_____

_____

6. What color does a white costume appear beneath a green lamp?

_____

_____

Words to know

audience: the people who watch a show
beam: a narrow line of light
gels: colored sheets that change the color of a light
fabric: cloth made by weaving or knitting
designers: people who plan how things will look

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: Why a Red Cape Turns Dark Under Blue Light

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

Circle: Why a Red Cape Turns Dark Under Blue Light

Easier · 206 words · Flesch-Kincaid grade 1.9

1. Dark gray, almost black.
2. Things bounce some light to our eyes and soak up the rest.
3. There is almost no red light in the beam for the cape to bounce back.
4. Thin sheets of colored plastic put in front of lamps.
5. A color that looks right in a shop can look different on stage.
6. Green.

Triangle: Why a Red Cape Turns Dark Under Blue Light

This passage · 223 words · Flesch-Kincaid grade 4.2

1. Dark gray, almost black.
2. Objects bounce some light back to our eyes and soak up the rest.
3. There is almost no red light in the beam for the cape to bounce back.
4. Thin sheets of colored plastic placed in front of lamps.
5. A color that looks right in a shop can look different on stage.
6. Green.

Square: Why a Red Cape Turns Dark Under Blue Light

Harder · 226 words · Flesch-Kincaid grade 6.2

1. Dark gray, nearly black.
2. Objects reflect some light toward our eyes and absorb the rest.
3. The beam contains almost no red light for the cape to reflect.
4. Thin sheets of colored plastic placed in front of lamps.
5. A color that looks perfect in a shop can look quite different on stage.
6. Green.