



## Assessment Evidence

### Performance Tasks

Students will:

- Explain why they think various objects appear to be a certain color.
- Manipulate a model of white light (red, green and blue photons) hitting a surface.
- Predict the reflected color when various combinations of light are absorbed by the surface.
- Describe the absorption settings used to create several different reflected colors.
- Identify the colors that appear from each combination of red, green and blue light.
- Predict how gas filters will affect the color of light that passes through.
- Compare surface absorption to gas filtration of light.
- Analyze the HSB color system and compare it to the RGB one used in the activity.

### Other Evidence

Students will write responses to the following (these responses can be accessed through the online portal recorded during this activity):

- If a surface absorbs red and green, what color will it appear to be?
- If light from a red filter is combined with light from a green filter, what will the resulting color be?
- What colors do you think are used in the chlorophyll reaction, if leaves filled with chlorophyll appear to be green?
- What's the difference between a **surface** that absorbs red and a **filter** that absorbs red?
- Why is the sky blue? Think about the gas absorption model.
- Sometimes pigments (paint colors) are called subtractive, and light from filters are called additive. Why? Use the two diagrams provided to explain this.
- What creates the color of a material?
- If you were a graphic designer designing posters for a concert hall that had dim lighting, what colors would you use to make them most noticeable? Explain why you would choose those colors.
- Would you enjoy working as a graphic designer? Why or why not?
- What other careers can you think of that might depend on an understanding of light absorption and color?

## Technology

Computers, Internet Access

## Internet Resources

- ITSI-SU activity <http://itsisu.portal.concord.org/activities/70>

Note: the teacher will need to have an [account set up](#), as well as a class for their students to enroll in with this activity assigned. Once you create a teacher account, you can access the ITSI-SU [help guides](#) to get you set up your class with assigned activities.

### Supplies/Materials

- copies of various color after image illusions provide tangible follow-up to the discussion to evaluate student understanding of the concepts

### Lesson: Light Absorption and Reflection (1-45 minutes period)

#### Engage:

- Students should log in to the [ITSI-SU website](#) and launch the activity, “**Color Absorption and Reflection**”.
- Discuss in pairs or as a class why objects appear to be the colors they are and what might affect their perceived color.

#### Explore:

- The students will manipulate a model of white light hitting a surface by changing the amount and color of photons that are absorbed or reflected by the surface.
- Then, predict and determine how various reflected combinations of light colors result in different perceived surface colors

#### Explain:

- They will describe the six different extreme combinations of light and the perceived color that results from each (The teacher may choose to record these as a whole class and project it, or write it on a chalk or whiteboard).

#### Elaborate:

- The students will investigate the effects of gas particles as a filter that absorbs light and how color changes as a result by continuing to manipulate the online model.
- They will record and analyze the similarities and differences between a surface that reflects light and a gas that absorbs light.

#### Evaluate:

- As a class, discuss how objects appear to be certain colors and how that perception might be changed (this is where you can bring different lights in to demonstrate).
- Students will complete the *Further Investigation* activity to apply the understandings gained and explore a different way of describing and measuring light and color.
- The instructor should review the ITSI-SU reports to read student responses and identify any areas need further study or explanation.