

Light Evaluation

Teacher Section

Overview: Kids will demonstrate how well they understand important key concepts from this section.

Suggested Time: 45-60 minutes

Objectives: Students will be tested on the key concepts:

- Explain the different parts of the electromagnetic spectrum.
- Show how light has wavelength (frequency, or color), intensity (brightness), polarization (direction), and phase (time shift).
- Demonstrate how simple lenses are used in a magnifying glass, the eye, camera, telescope, and microscope.
- White light is a mixture of many wavelengths (colors), and that retinal cells react differently with different wavelengths.
- Design experiments that show how light interacts with matter by transmission (including refraction), absorption, or scattering (including reflection).

Students will also demonstrate these principles:

1. Collecting and interpreting data from an experiment
2. Making valid observations based on their actions in lab

Materials (one set for entire class for the lab practical)

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| • scissors | • red and green gummy bear |
| • tape | • red laser |
| • pencil | • flashlight |
| • two handheld magnifier with concave lenses | • glass of water |
| • two convex lenses | • coin |
| • plain paper | • five dollar bill |
| • apple | |

Lab Preparation

1. Print out copies of the student worksheets, lab practical, and quiz.
2. Have a tub of the materials in front of you at your desk. Kids will come up when called and demonstrate their knowledge using these materials.

Lesson

The students are taking two tests today: the quiz and the lab practical. The quiz takes about 20 minutes, and you'll find the answer key to make it easy to grade.

Light Grade 7 Evaluation

Student Worksheet

Overview: Today you're going to take two different tests: the quiz and the lab practical. You're going to take the written quiz first, and the lab practical at the end of this lab. The lab practical isn't a paper test – it's where you get to show your teacher that you know how to do something.

Lab Test & Homework

1. Your teacher will call you up so you can share how much you understand about light and how it works. Since science is so much more than just reading a book or circling the right answer, this is an important part of the test to find out what you really understand.
2. While you are waiting for your turn to show your teacher how much of this stuff you already know, you get to get started on your homework assignment. The assignment is due next week, and half the credit is for creativity and the other half is for content, so really let your imagination fly as you work through it. Choose one:
 - a. Write a short story or skit about cells from the perspective of a photon. You'll read this aloud to your class.
 - b. Make a poster that teaches the main concepts of your favorite part of the electromagnetic spectrum. This can be about radio waves, gamma rays, x-rays, infrared, microwaves, or visible light works or is used in our everyday life. When you're finished, you'll use it to teach to a class in the younger grades and demonstrate each of the principles that you've learned.
 - c. Write and perform a poem or song about lasers that teaches the audience what LASER stands for, how it generates a beam in the first place, and three ways a laser is different from a flashlight. This will be performed for your class.