

Part 1 Assessment—How Far Have We Come?



JEFF MCADAMS, PHOTOGRAPHER, COURTESY OF CAROLINA BIOLOGICAL SUPPLY COMPANY

Scientific investigations often involve careful measurement and recording of data.

INTRODUCTION

This lesson is the assessment for Part 1: The Nature of Light. The assessment is in two sections. In Section A, you will conduct an inquiry into the size of shadows on a screen. You will take measurements and collect, record, and interpret data. Section B consists of questions, both multiple-choice and short-answer. Some of these require you to use your knowledge and skills to interpret diagrams, data tables, and experiments. You and your teacher will use the results of this assessment to evaluate how well you can apply the knowledge, concepts, and skills you have acquired in the first part of the module.

OBJECTIVES FOR THIS LESSON

Conduct an inquiry into the size of shadows produced on a screen.

Record and interpret data.

Use knowledge and skills acquired to answer questions that relate to Part 1: The Nature of Light.

Getting Started

- 1.** Your teacher will tell you when to do each section of the assessment and how long you will have for each section.
- 2.** In both sections, your work will be assessed partly on your layout, labeling, and drawing of data tables and diagrams.

MATERIALS FOR LESSON 13

For you

- 1 copy of Student Sheet 13.1: Section A—Performance Assessment
- 1 copy of Student Sheet 13.2: Section B—Written Assessment Question Sheet
- 1 copy of Student Sheet 13.3: Section B—Written Assessment Answer Sheet

(Your teacher will explain whether the materials listed below are for you, or for you and your lab partner)

- 1 assembled light stand
- 1 white screen
- 2 plastic stands
- 1 black paper square attached to a craft stick
- 1 meterstick
- 1 metric ruler
- 1 sheet of white paper
- 2 binder clips

SAFETY TIP

Do not touch the lightbulb in the light stand. It gets very hot and may cause painful burns.

SECTION A—PERFORMANCE ASSESSMENT

Inquiry 13.1

Measuring Shadows

PROCEDURE

Read all instructions before you start working.

- 1.** Set up the light stand so that the lightbulb filament is horizontal.
- 2.** Place the screen 50 cm from the end of the lightbulb filament.
- 3.** Use the binder clips to attach the white paper to the white screen.
- 4.** Use the black square (attached to the stick) to produce a shadow on the paper on the screen (see Figure 13.1).

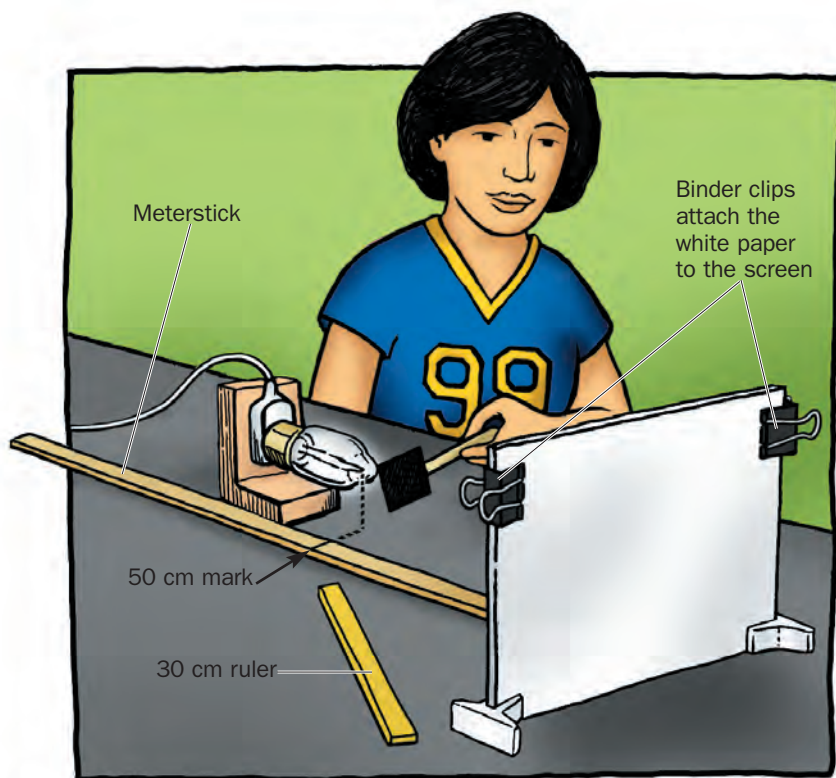


Figure 13.1 Use this apparatus to find the area of the shadow you produce on the paper.

5. Measure the size of your shadow (in cm) when the black square is 5 cm from the screen.
 - A. Record the dimensions of the shadow.
 - B. Calculate the area of the shadow (width \times height) in square centimeters.
6. Repeat this procedure, measuring the size of the shadow at four *additional* distances farther from the screen.
 - C. Record *all five* sets of measurements of the distance of the black paper square from the screen, shadow dimensions, and shadow area in a data table of your own design.
 - D. What can you conclude from your observations?
 - E. Use *words and a labeled diagram(s)* to explain your observations.

SECTION B —WRITTEN ASSESSMENT

Your teacher will outline the procedure for taking Section B of the assessment.