

Lab Station One

1. Use the prism and flashlight to produce a spectrum of colors.
2. Try different angles and distances as you manipulate the materials to form the best spectrum possible.
3. Discuss the source of light that you are investigating in this activity.
4. In your journal, record detailed drawings and descriptions of your observations.
5. Write sentences to explain what you think is occurring.
6. Discuss questions that you have about this experience and record them in your journal.

Lab Station One

1. Use the prism and flashlight to produce a spectrum of colors.
2. Try different angles and distances as you manipulate the materials to form the best spectrum possible.
3. Discuss the source of light that you are investigating in this activity.
4. In your journal, record detailed drawings and descriptions of your observations.
5. Write sentences to explain what you think is occurring.
6. Discuss questions that you have about this experience and record them in your journal.

Lab Station Two

1. Observe the pencils from different angles.
2. Discuss the source of light that you are investigating in this activity.
3. In your journal, record detailed drawings and descriptions of your observations.
4. Write sentences to explain what you think is occurring.
5. Discuss questions that you have about this experience and record them in your journal.

Lab Station Two

1. Observe the pencils from different angles.
2. Discuss the source of light that you are investigating in this activity.
3. In your journal, record detailed drawings and descriptions of your observations.
4. Write sentences to explain what you think is occurring.
5. Discuss questions that you have about this experience and record them in your journal.

Lab Station Three

1. Position the hand lens in between the window and the white paper.
2. While holding the paper still, move the hand lens back and forth until you see a sharp picture form on the paper. Hold the lens steady as you study the picture.
3. Discuss the source of light that you are investigating in this activity.
4. In your journal, record detailed drawings and descriptions of your observations.
5. Write sentences to explain what you think is occurring.
6. Discuss questions that you have about this experience and record them in your journal.

Lab Station Three

1. Position the hand lens in between the window and the white paper.
2. While holding the paper still, move the hand lens back and forth until you see a sharp picture form on the paper. Hold the lens steady as you study the picture.
3. Discuss the source of light that you are investigating in this activity.
4. In your journal, record detailed drawings and descriptions of your observations.
5. Write sentences to explain what you think is occurring.
6. Discuss questions that you have about this experience and record them in your journal.

wave, wāv, noun

- A disturbance that transfers energy progressively from point to point in a medium

Webster's Dictionary

crest

trough

wavelength

Modeling Light


1. Cut out Sheet #1 and Sheet #2 on the bold lines.
2. Line up the two sheets as marked and tape together on the backside.
3. Place your sheets on top of the cardboard. Apply one continuous length of tape across the top of the sheets at the seam folding ends of tape under cardboard. Elevate the upper right hand corner of the cardboard by approximately 5 cm.
4. Place the paper covered cardboard at the edge of a sheet of chart paper. Overlap Sheet #1 onto the chart paper by 5 cm. Use a bright color to trace around the overlap.
5. Lay a meter stick across the edge of the chart paper.
6. Place your car on Sheet #2 in the corner indicated. Practice releasing the car and allowing it to roll down the ramp until you get fairly consistent results. Mark the starting position of the car using a bright color.
7. Release the car from the starting position and allow it to come to rest against the meter stick. Use a marker to draw a straight line next to the length of the car.
8. Complete 3 good trials controlling all variables as much as possible.
9. Apply double sided tape along one edge of the plastic wrap and cover the shaded area on sheet #1.
10. Predict the path the car will take when released.
11. Release the car from the starting position and allow it to come to rest. Use a marker to draw a straight line next to the length of the car.
12. Complete 3 good trials controlling all variables as much as possible.
13. Use your meter stick to extend the lines recorded for each trial.
14. Record your observations in your journal using labeled diagrams and sentences.
14. Discuss with your group what you observed, why you think it happened, and what this model shows us about the behavior of light as it travels through different media.

Sheet #1

Tape this edge of sheet 1 to the edge of sheet 2

Sheet #2

Place car in this corner.



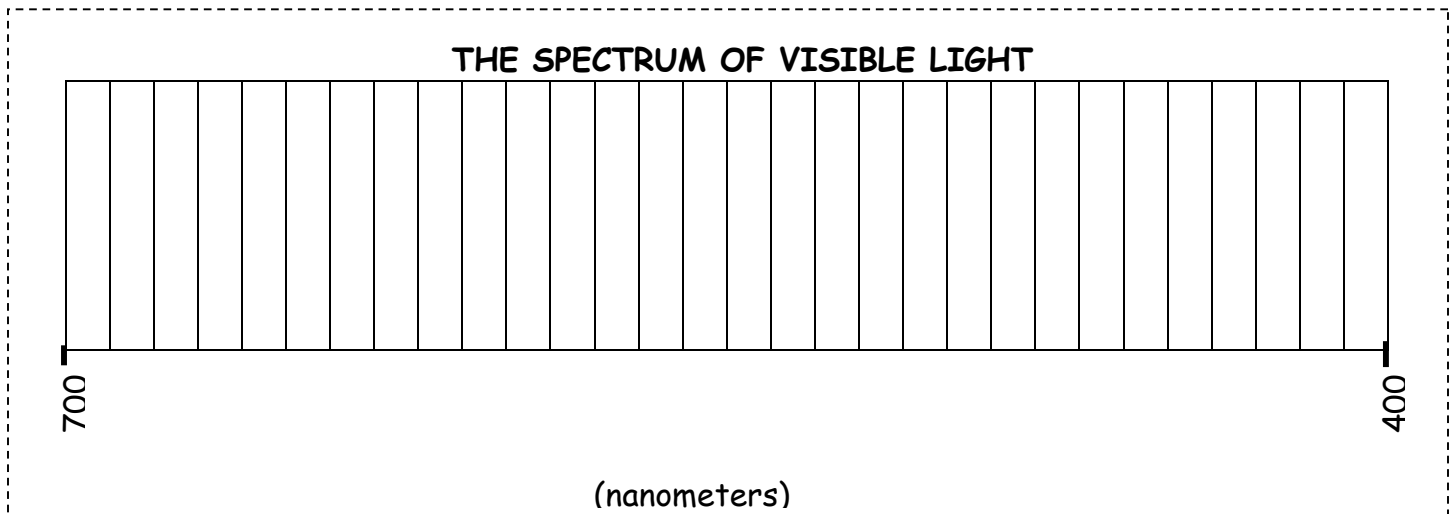
Tape this edge of sheet 2 to the edge of sheet 1

The Colors of Visible Light

The **wavelengths** of visible light are measured in units called **nanometers**. One nanometer unit equals one billionth of one meter. The boundaries, in nanometers, for the wavelengths of each color are listed below:

COLOR	BOUNDARIES
red	700 to 630 nm
orange	630 to 580 nm
yellow	580 to 530 nm
green	530 to 490 nm
blue	490 to 430 nm
violet	430 to 400 nm

On the grid below, mark off bands for the colors of visible light. Use the line across the bottom of the grid to record nanometer units numbered from 700 on the left to 400 on the right. Mark off the proportionate widths for each band and color appropriately. Blending colors at the boundaries can make the spectrum more realistic-looking.



Cut out the box on the dotted line and glue into your journal. Beneath the box, write about the following:

Refer back to your earlier journal drawings when you used the prism and diffraction grating. How do your results from these previous activities compare to the spectrum you colored based on the actual data of wavelengths. For example, are the colors in the same sequence? Are the widths of the color bands similar? Write a paragraph explaining your comparison of data.

Inspecting the Spectrum Scoring Rubric

A. Experimental Design	The problem is clear and testable. A valid, practical procedure is presented in a logical sequence to allow gathering of accurate data suitable for analysis to accomplish the task.	4
	The problem is clear and testable. Valid, practical procedure is presented that contains errors or omissions that may hinder the gathering of accurate data suitable for analysis to accomplish the task.	3
	The problem is testable. A practical procedure with many steps insufficiently described or missing prevents the gathering of accurate data for the task.	2
	The problem is partially testable. The procedure is highly incomplete, and the method used to gather data is inappropriate for the task.	1
	The problem is not testable. The procedure is missing, or cannot generate useful data.	0
B. Data collection	The collected data and observations are complete, clearly and logically recorded, and consistent with the procedure. Measurements are precise. Technology used to develop a clear and attractive display of data in charts and graphs.	4
	The collected data and observations are fairly complete, clearly recorded, and fairly consistent with the procedure. Data is clearly displayed in chart or graph form.	3
	The collected data and observations have several omissions, recorded in a way that is difficult to interpret, and relate somewhat to the procedure. Data display is unclear.	2
	The data gathered is very incomplete, and is not related to the procedure. No charts or graphs of the data are included.	1
	No data or observations are recorded	0
C. Evaluation of Data and Conclusion	Clear communication of complete and accurate analysis of data and observations. Accurate conclusion is reached, which is supported by the analysis.	4
	Communication of complete but slightly flawed analysis of data and observations, which leads to a slightly inaccurate conclusion.	3
	Unclear communication of accurate conclusion with no analysis, or the analysis does not support the conclusion.	2
	Unclear communication of inaccurate conclusion with no analysis.	1
	No conclusion or analysis is present.	0

D. Lab Skills, Safety, and Participation	Selects and uses appropriate equipment with care and proficiency. Listens attentively, and stays actively involved in an organized approach.	4
	Uncertain about equipment selection, but uses equipment carefully. Listens to instructions and stays involved, but may wait for others to lead.	3
	Is not familiar with use of equipment, so chooses inappropriate equipment, but does not abuse equipment. Distracted during instructions, so must rely on others for directions.	2
	Uses equipment improperly, and is haphazard and disorganized. Is distracted during instructions, and needs constant reminders to stay on task	1
	Does not use equipment or abuses equipment. Is disruptive during instructions and activity.	0
Total points		