

Mystery Spectra of Elements (Lab)

Background:

Visible light travels in wavelengths that range from 400 to 700 nm (smaller than human cells) as seen in the diagram below. Spectra Lines from Visible Light emitted from stars or galaxies can be recorded by astronomers using specialized equipment. These recordings help scientists determine the chemical composition of stars. However, gases and dust in space and Earth will sometimes block some light emitted by stars and only certain waves will be capture, as shown in the mystery spectra lines in this lab. Therefore, scientists can determine all the elements that are present in stars.

Purpose:

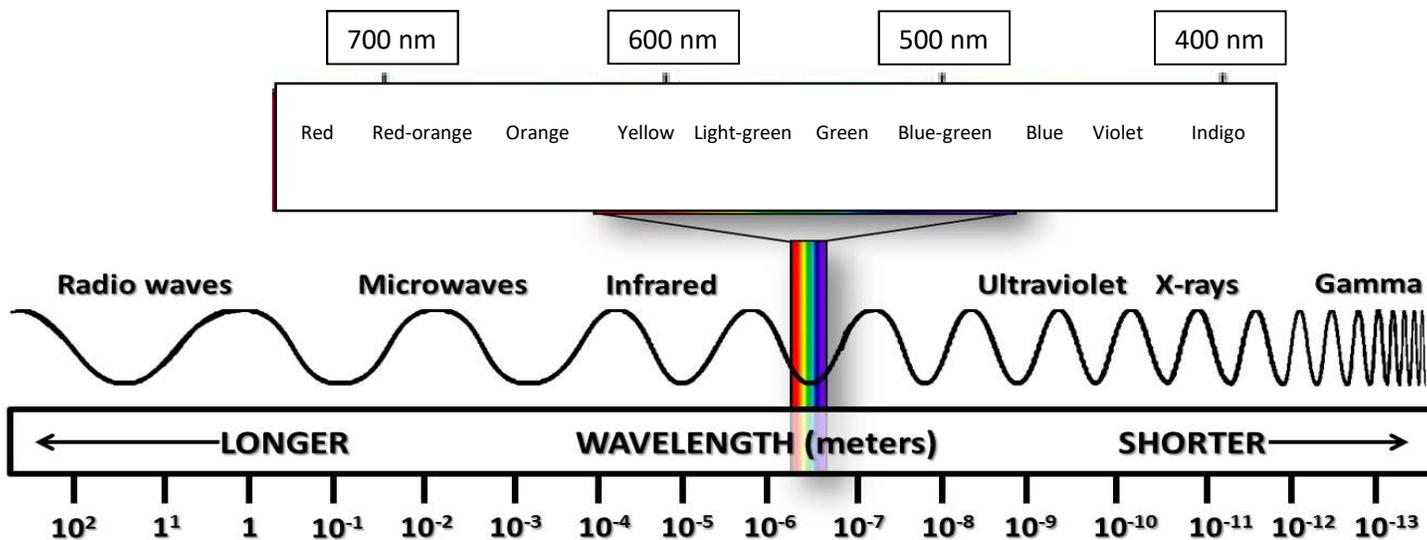
1. To understand some components of the electromagnetic spectrum
2. To learn how to record, draw, and identify the spectra of different elements
3. To learn to make proper observations, inferences, and predictions
4. To learn how to use data, data-tables, and number-lines

Equipment:

1. Ruler
2. Color pencils
3. Pencil

Procedures:

1. Very lightly, color the spectrum for visible light on the diagram below. Follow the color-code (3 minutes)
2. Rotate clockwise within the stations to create your spectra lines for 5 different elements
3. Go to your first station and copy the name of the element that you will be working with, in your number-line.
4. Each element has spectra data recorded in nanometers (nm) in the data-table. Create a spectral line for that element in your first number-line provided. Each line that you mark must match the proper color of the size of the wavelength in (nm). (see the diagram below to determine the color of your marks). (3 minutes)
5. Move to the next station and repeat step #4 for the next element. (3 minutes)
6. Continue your rotation until you complete 5 elements in total (3 minutes per station)
7. On the last number-line, create a spectrum by combining 3 elements of your choice, from the ones you have previously recorded. (5 minutes)



Teachers:

Place a copy of this page on each station and highlight the element that students will be working with on each station. You should have a different element highlighted on 10 different stations

Element	Major Spectral Lines (nm)
Carbon	430, 480, 495, 510, 520, 540, 570, 595, 605, 660
Hydrogen	434, 486, 656
Helium	447, 471, 492, 501, 588, 668
Oxygen	372, 558, 630, 636, 730, 732, 778, 798

Lithium	460, 497, 610, 670
Cadmium	468, 479, 508, 609, 642
Calcium	400, 423, 432, 447, 457, 498, 613, 645, 646, 649
Sodium	588, 589
Strontium	462, 481, 488, 496, 661, 686
Mercury	382, 385, 415, 495, 536, 469, 473

Name _____

Date _____

Period _____

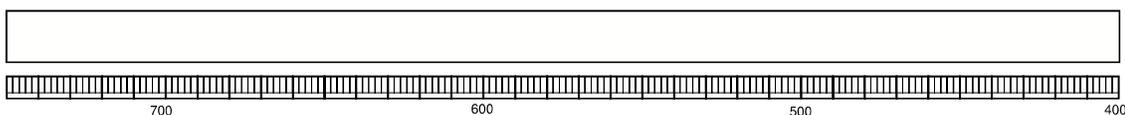
Mystery Spectra

Complete a spectra line for 5 different element below

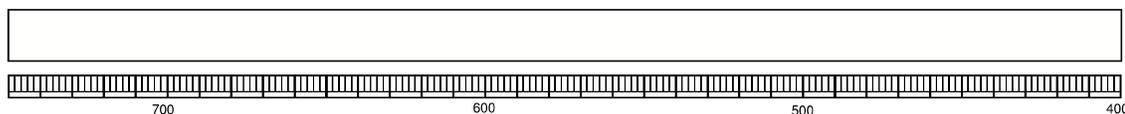
Element Name: _____



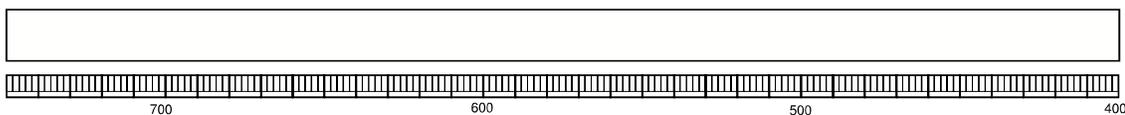
Element Name: _____



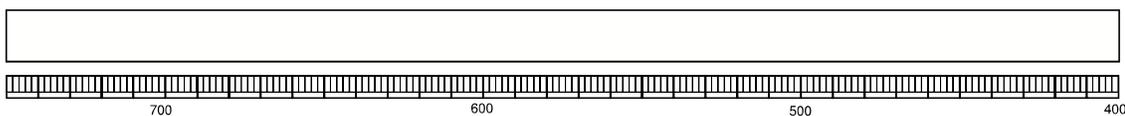
Element Name: _____



Element Name: _____



Element Name: _____



Create a spectra line by combining 3 different elements that you have collected above

Element Name: _____

