**Part 1: Spectrometer**

Once you have assembled your spectrometer with the instructions in the lecture, use it to examine the spectra of three different light sources. Make sure that at least one of them is the sun or moon, but the others can be incandescent lights, compact fluorescent bulbs, LED lights, halogen or xenon bulbs, televisions, computer screens, candles, fireplaces, etc.

Then, answer the following questions in a separate document:

1. Describe the differences in appearance among the three spectra.
2. What feature of the light source do the spectra represent? In other words, what is it that you are actually analyzing?
3. Why do you think spectrometers are so valuable for studying celestial objects?

**Part 2: Estimating the Number of Visible Stars in the Night Sky**

For this, you will need an empty toilet paper roll and a clear, dark night. Before you start, jot down the number of stars that you think you can see in the night sky.

Aim your toilet roll at a part of the sky well above the horizon to avoid any haze pollution. Hold your roll steady and allow your eyes to get used to the light for a few seconds. Count the number of stars that you can see within through the roll. Do this four more times in other parts of the sky and average the five counts.

The viewing diameter of a toilet roll is about 1/135th of the entire sky, at least for a relatively flat area. Mountains, buildings or large trees will obscure some of the sky. To determine the number of visible stars, multiply your average by 135.

In the same document as Part 1, answer the following questions:

1. How similar is this to your original estimation?
2. What percentage of our galaxy do you think that we can see with the naked eye from Earth?

**Part 3: Solar System Model**

Using the lecture on Page 3 of Module 8, answer the following questions using the same document:

1. Why do you think that the inner planets are relatively close together but the outer planets are spaced so widely apart?
2. Why do you think that the gaseous planets are gaseous but the inner planets are not?