Pre Test for the \textit{Expanding Universe}

Name: _________________________________

Teacher: ________________________________

\textbf{DIRECTIONS:} Before beginning the Expanding Universe activity, please take a few minutes to answer the questions below. If you don’t know how to answer a question, put a “?” in the answer space. Since you have not done the activity yet, there may be some words and questions below that you have not seen before. Do your best to answer, and remember, this won’t be graded!

1. How old is the universe (in years)?

2. What is a supernova? Why are supernovae useful for finding the distance to other galaxies?

3. Imagine you are looking through a spectrometer at light from a distant galaxy. You observe that the spectral lines (bright, colored lines) look redder than when you observe them in a lab. Does this mean the galaxy is moving towards you or away from you?

   \textbf{Answer:}
   
   \textbf{Explanation:}
4. The spectrum below is for an element observed in the lab.

![LAB SPECTRUM FOR HYDROGEN](image)

The three spectra shown below are of three different hypothetical galaxies. In each case, the spectral line shown is hydrogen.

![A](image) ![B](image) ![C](image)

a. Write "1" below the galaxy which is moving fastest, "2" below the galaxy which is moving slowest, and "3" below the galaxy that is in between.

b. Which of the galaxies is the farthest away, A, B, or C? Explain.

5. What is the Universe?

6. How do astronomers know the universe is expanding?