

How Are Stars Classified?**E3:A1**

Previously you learned that stars come in an array of diameters, colors, and temperatures. Scientists classify objects using observable characteristics so they can organize them and analyze differences among them. For example, butterflies can be classified by the size and shape of their wings or by color patterns and the type of antennae on their heads. Stars too can be classified in many ways, but classification by spectra is the method the science community employs today. In this activity, you will learn about how stars are classified.

Classifying Stellar Spectra

1. Classify 14 different stars using their graphical spectra.
Use the shape of each curve, which represents the range of wavelengths in the continuous spectrum of the star, and the strength of marked spectral lines to sort and classify the spectra.
2. What characteristics did you use to group (classify) the spectra? _____
3. How many different groups did you come up with? _____
4. Compare your classification with another group's effort. Were there any differences between the two groups' classification schemes? Describe the differences.

5. Read FYI: *Spectral Classification—A Look Back* and FYI: *Stellar Spectra—What's in a Star?* Complete the reading guide and questions after reading. When everyone has completed this, go on to #6.

6. Compare your classification system with the one commonly used today. What differences are there between your classification scheme and the one described in the FYI?

7. Reclassify each of the 14 spectra using the table of stellar spectra characteristics supplied by your teacher.

Remember that each class is subdivided into 10 subclasses.

Try to estimate both major class and subdivision number. For example, a spectrum that appears to be an F trending toward G may receive a designation of F5 or F6 instead of F0 or F1.

NOTE: some of the classes are repeated, and one or two may fall in an “other” or “unknown” category.

Spectrum Number	Estimated Spectral Type	Justification
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

8. Discuss your results as a class and compare your answers to the official divisions.

9. Arrange your spectra in order from hottest stars (O) to coolest (M).

10. For decades, students have memorized the 7 stellar classes by using the mnemonic “Oh Be A Fine Girl (or Guy), Kiss Me.” Write something of your own to help you remember the key letters.

11. In several of the graphs, an emission line appears. Based on your knowledge of what causes emission spectra, what is the source of the line?

12. How accurate were your determinations of stellar class (plus or minus how many subclasses)?