

# Understanding and Comparing Stars



Elainie C. Huncik  
Youngstown State University

This lesson is based on Ohio's Learning Standards (PS.U.3) for a high school physical science class. Students will learn how astronomers categorize stars based on their color, temperature, luminosity, size, and mass. Students will also become familiar with Hertzsprung-Russell diagrams. Each student will be assigned a star from a predetermined list of stars and will be tasked with doing research about the properties of the star and compiling the information to share with their classmates. Students may create a poster, presentation, paper, model, etc. to compare their star with others and answer questions about how stars with different properties share some similarities but also have many differences. The lesson can be broken into three parts, as outlined below. Sessions are flexible and can be carried out over several days to accommodate various schedules.

## Session 1

Session 1 will begin with a student-focused lecture, where the instructor asks the students questions to gauge what they already know about stars. Students will learn what stars are, why we study them, the lifecycles of stars, how to read Hertzsprung-Russell diagrams, and how astronomers categorize stars. If time allows, students should complete the HR Diagram activity included in the written report (with guidance from the instructor) to enforce their understanding of HR Diagrams.

## Session 2

In session 2, students will begin their projects. This is in-class time for students to work on their projects and receive guidance from the instructor, but students are encouraged to complete their projects outside of class. For the project, students will be assigned a star from a predetermined list of stars and will be tasked with doing research about the properties of the star and compiling the information to share with their classmates. Students may create a poster, presentation, paper, model, etc. to compare their star with others and answer questions from their peers (and their instructor).

## Session 3

Session 3 is the final session, in which students will present their project and be expected to answer questions and compare their stars with other students. This can be done in a similar manner to a poster session, where students are free to move around and look at other projects, or students can present to the entire class. There are benefits to both methods, so the instructor is free to choose based on the capabilities of the class.

**Underlying Theory:** This lesson utilizes Universal Design for Learning (UDL) to effectively teach to a wide variety of learners. The lesson plan can easily be modified to accommodate almost any group of students. Because students can use their own approach to the project, they can choose their strongest method so that they can focus on the content of the project rather than struggling with the format or presentation. This lesson can be mostly student-led, so students can stay engaged and explore new information with some guidance from their instructor.

**Conclusion:** Students will be assessed in session 3 when presenting and sharing their projects. Students will be assessed on how well their project meets the requirements set by the instructor, and how well they understand the content of their project based on their presentation and answers to questions. At the end of this lesson, students will have gained many skills, including interpretation of diagrams, comparison of scientific information, and communication skills. They will understand the lifecycles of stars, how to read HR Diagrams, and what can be learned from properties of stars.