What Are Stars?

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Subjects(s): Physics

Topic or Unit of Study: Stars

Grade/Level: 9th grade

Time Allotment: 1 class period – 50 minutes

Objective: Introduce the students to stars.

Summary: In this lesson, students will be first exposed to stars and learn a number of things. What are stars? How do they form? Do they give off light? How do you classify them?

STANDARDS & ASSESSMENT

Standards:

12.F.4a Explain theories, past and present, for changes observed in the universe

12.F.4b Describe and compare the chemical and physical characteristics of galaxies and objects within galaxies

Assessment/Rubrics: Please Do Now (PDN), Exit Survey

IMPLEMENTATION

Learning Context: This is the 3rd lesson of the unit and happens on the 4th day of the unit. Students will have had 3 days learning about light, emission lines, absorption lines, and spectrographs. This lesson will introduce stars to the students. They will learn the basic necessary information about stars and brainstorm ways to classify stars. This will act as a precursor to the next lesson, which introduces the Harvard classification scheme.

Procedure:

- Give students the PDN as they enter the classroom

- Collect PDN when students finish
- Begin discussion by asking, "What is a star?"
    - Talk about this for a few minutes, hopefully letting students lead the discussion
    - Do not blatantly answer this question for the students yet.
- "How does a star form?"
    - Get all of the prior knowledge out front and give students the basics to star formation
- "Do stars give off light?"
- "What causes this light?" (How do stars generate light?)
    - Give students a very brief explanation of this, leaving out the intricate details
    - Introduce fusion and the very basics to how it works
- "What characteristics of stars can be measured?
    - Make a list of the board of what students come up with.
    - Students will most likely not name absorption lines (composition), so try to guide them to this with the fact that stars give off light and what they saw with their spectroscopes
    - Make sure they name temperature and absolute luminosity
- "Of these measurable characteristics, which ones are good to use to classify stars?"
    - Circle the ones that WE are going to use for classification – temperature and absorption lines. Mention that luminosity can also be used, but we will not during this unit.
- Show Evolution of Stars video (3 minutes)
- If time permits, have students answer the Exit Survey. If not, use it at the beginning of class tomorrow.
- Read Harvard Classification for homework
    - Each student must have one question ready to ask about the reading

Differentiated Instruction: Students with hearing or visual impairments will be placed in the front of the classroom, enabling them to hear and see the teacher's instruction better. AD/ADHD students will be placed by the teacher's desk or an easily accessible area so the teacher can make sure these students are staying on task. LD students will receive differentiated instruction on a case by case basis. The differentiated instruction will depend on what learning disability the student has and how that specific student will cope with the presented lesson.

MATERIALS AND RESOURCES

Instructional Materials:

- Chalkboard
- Chalk
- PDN
- Exit Survey
- Method for showing the Evolution of Stars video
- Harvard Classification reading

Resources: Evolution of Stars video can be found here:
http://www.youtube.com/user/dipanjan07