Stars Review and Exam

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Subjects(s): Physics

Topic or Unit of Study: Stars

Grade/Level: 9th grade

Time Allotment: 2 class period – 100 minutes

Objective: Review all of the material learned in the Stars unit and prepare for the test.

Summary: At this point, students have learned all of the material they will learn in the Stars unit. This lesson is designed to review all of this material and to help prepare for the unit test, which is attached into this lesson.

STANDARDS & ASSESSMENT

Standards:

11.B.4a Identify a technological design problem inherent in a commonly used product

11.B.4b Propose and compare different solution designs to the design problem based upon given constraints including available tools, materials and time

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

13.A.4c Describe how scientific knowledge, explanations and technological designs may change with new information over time

Assessment/Rubrics: 4 problem sheets for the Group Problem Solving activity, Group Problem Solving Guide, Stars Unit Review, Stars Unit Exam

IMPLEMENTATION

Learning Context: This is the 8th and final lesson in the unit and happens on the 9th and 10th days of the unit. In total, this unit lasts 2 full school weeks. Students have learned that white light is a mixture of all colors, not all white light is exactly the same, emission

lines, absorption lines, Wien's Law, Harvard classification scheme, how to classify stars using temperature, equivalent widths, and how to classify stars using ratios of equivalent widths. This information is covered on the exam.

Procedure:

Day 1

- Review Equivalent Widths worksheet
- Do Group Problem Solving activity as a review. Divide students into pairs, or threes, depending on class size. Ideally, there should be 12 or 16 pairs total. Group each pair with three other pairs, so there are 3 or 4 big groups. There are 4 different problems to solve, and are done so in pairs. The problem sheets stay at a station and the pairs move to different stations. Every few minutes or so, depending on how much time the students need, announce for the students to switch stations. There are 4 stations each pair needs to visit, so there will be a total of 3 rotations. A visual representation of this activity is shown in the Group Problem Solving sheet.
    - The problem sheets cover the main topics that will be on the exam
- Discuss the answers to the problem sheets
- Pass out Stars Unit Review sheet. With the remaining time in the class period, let students work on the Stars Unit Review sheet however they want (groups, alone, on the board).
- Finish Stars Unit Review sheet for homework
    - Tell students the exam will be very similar to the review sheet

Day 2

- Start by taking the first 5-10 minutes answering any questions that arose from the Stars Unit Review sheet
- Administer the exam

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:

- 4 problem sheets for the Group Problem Solving Activity
- Group Problem Solving Guide
- Stars Unit Review
- Stars Unit Exam
- Rulers

Resources: The full document from where the readings were taken is labeled: Stellar Classification