

## BASIC INFORMATION

Date(s) Taught 3/16/2012

Content Area Science

Grade/Level Grade 9

Topic(s) Energy Quiz

**Agenda**

**9:14–9:20** The teacher collects homework assignments, passes the quiz out, and ensures that students have a distraction free environment to work.

**9:21–10:15** Students work on the quiz. The teacher circulates the classroom to ensure that the integrity of the testing environment is upheld and that students do not cheat. The teacher collects quizzes from students as they are completed. Once students are done with the quiz, they may work silently on homework.

**10:15–10:16** The teacher collects remaining quizzes.

## STANDARDS AND OBJECTIVES

California Content & ELD Standards

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### CA- California K-12 Academic Content Standards

#### Subject: Science

**Grade:** Grades Nine Through Twelve Standards that all students are expected to achieve in the course of their studies are unmarked. Standards that all students should have the opportunity to learn are marked with an asterisk (\*).

#### Area: Physics

#### Sub-Strand: Conservation of Energy and Momentum

**Concept 2:** The laws of conservation of energy and momentum provide a way to predict and describe the movement of objects. As a basis for understanding this concept:

**Standard a.:** Students know how to calculate kinetic energy by using the formula  $E = (1/2)mv^2$ .

**Standard b:** Students know how to calculate changes in gravitational potential energy near Earth by using the formula (change in potential energy) = mgh (h is the change in the elevation).

**Standard c:** Students know how to solve problems involving conservation of energy in simple systems, such as falling objects.

**Standard e:** Students know momentum is a separately conserved quantity different from energy.

**Standard f:** Students know an unbalanced force on an

object produces a change in its momentum.

**Standard h:** Students know how to solve problems involving conservation of energy in simple systems with various sources of potential energy, such as capacitors and springs.

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**Learning Objective(s) for Content**

Students will demonstrate their comprehension of energy concepts by completing this quiz and scoring at least 30 points out of a 42 possible points.

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**Learning Objective(s) for Academic Language**

Students will use appropriate units and dimensional analysis on 100% of the problems on the test.

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**Prerequisite Knowledge and Skills**

- Students know how to calculate kinetic energy by using the formula  $E = (1/2)mv^2$
- Students know how to calculate changes in gravitational potential energy near Earth by using the formula (change in potential energy) =  $mgh$  (h is the change in the elevation).
- Students know how to solve problems involving conservation of energy in simple systems, such as falling objects.
- Students know momentum is a separately conserved quantity different from energy.
- Students know an unbalanced force on an object produces a change in its momentum.
- Students know how to solve problems involving conservation of energy in simple systems with various sources of potential energy, such as capacitors and springs.

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## LEARNING ACTIVITIES, ASSESSMENT, AND RESOURCES

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**Sequence of Activities**

1. The teacher will distribute the quiz and collect homework assignments.
2. Students will complete the quiz.
3. The teacher will collect the quiz.

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**Differentiated Instruction**

All students will complete the same assessment. However, students will be given an opportunity to correct their mistakes after the test to receive additional points. This will give an opportunity for the teacher to differentiate instruction for these students and help them understand the correct way to solve the problems.

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**Monitoring and Assessing Learning**

The teacher will monitor the progress of students during the quiz. He will assess student learning by analyzing the results of the graded quizzes.

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**Rubrics (if applicable)**

The test will be graded out of 45 points. Students will receive +3 points for every correct answer. They will receive +1 point for every wrong answer that they correct.

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**Resources and Materials**

**Attachments:**

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## REFLECTION

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### Reflection

#### **Directing Learning Tasks**

Students are familiar with the procedure for taking quizzes. No confusion was observed with the procedure for taking the quiz. Some of the questions on the quiz were ambiguous or used vocabulary that students were not familiar with. I had to rephrase several of the questions orally (9, 13, and 14 on version A) for the class to make them clear.

Inquiry Skills

The quiz tested student's academic language, inquiry, and problem solving skills in addition to their understanding of the content. The questions also integrated with student prior knowledge. The process of completing the quiz was a learning activity for students in addition to being a form of assessment.

#### **Time Management**

The quiz was too long for the class period. Most students were rushed and barely finished before the bell rang.

#### **Summary**

The quiz integrated the concepts of energy and energy transfer with concepts like newton's laws, uniform circular motion, momentum, etc. This made many of the problems complicated and involved, as they tested more than just the content of this unit. Some students expressed frustration that these unexpected concepts showed up on the test. In retrospect, the extra day reviewing worksheet #4 was definitely needed to practice solving these complex problems.

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