PACT - Day 4

Author: Stephen Herr
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BASIC INFORMATION

Date(s) Taught	3/15/2012
Content Area	Science
Grade/Level	Grade 9
Topic(s)	• Kinetic Energy • Elastic Potential Energy • Energy Transfer
Agenda	9:14–9:21 Students quietly work on the warm up problem displayed on the project. 9:22–9:42 Students will whiteboard problems 2, 4, 7, and 8 from homework assignment #3. 9:43–10:05 Students will whiteboard problems 1, 4, 11, and 12 from homework assignment #4. 10:06–10:15 The teacher will review what material will be on the quiz and clarify any questions students may still have.

STANDARDS AND OBJECTIVES

California Content & ELD Standards

Display: ○ Collapse All ◉ Expand All

CA- California K-12 Academic Content Standards

Subject: Science

Grade: Grades Nine Through TwelveStandards 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 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.

Learning Objective(s) for Content

- Students will be able to correctly calculate the kinetic energy of an object given its mass and velocity using the equation kinetic energy = 0.5 mv^2 with 100% accuracy on homework assignments and the unit quiz.
- Students will be able to solve problems involving the conversion of elastic potential energy to kinetic energy by using the energy flow diagram approach with 100% accuracy on the lab report, homework, and unit quiz.

Learning Objective(s) for Academic Language

Students will be able to effectively communicate their ideas in the classroom setting with their peers using the standards conventions of oral English. The "Whiteboarding Rubric"contains the criteria for evaluating student performance

Prerequisite Knowledge and Skills

- Students must understand how to draw and set up basic energy flow diagrams similar to those found on homework assignment #1.
- 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 should have attempted to complete homework assignment #3 and #4 and be familiar with the problems.

LEARNING ACTIVITIES, ASSESSMENT, AND RESOURCES

Sequence of Activities

- Students will take out their homework and silently work on the warm up problem that will be shown on the projector.
- The teacher will check student homework for completeness and effort while students continue to work on the warm up problem. The teacher will "stamp" homework the meet these criteria.
- Students will whiteboard problems 2, 4,7, and 8 from homework assignment #3 and problems 1, 4, 11, and 12. For each problem, the teacher will select a group to lead a discussions of the problem. During this time, the teacher will using formative assessment to determine what students do not understand. The teacher will ask students leading questions to help guide them through the problems that some students can not yet solve.
- Finally the teacher will review what material will be on the quiz and clarify any questions students may still have.

Differentiated Instruction

Whiteboarding provide excellent opportunities for differentiated instruction. The teacher can quickly uses the whiteboards to tell which students are not understanding the information. The teacher can then address the needs of these specific students. In many cases, the students are able to differentiate the instruction for each other. Many of the students provide excellent explanations in the whiteboard discussions that their peers can

relate to

Monitoring and Assessing Learning

The teacher will assess learning by observing student whiteboards, asking them questions, and facilitating the classroom discussion. The whiteboard rubric will be used to assess student learning during the whiteboard discussion.

Rubrics (if applicable)

Students will be able to effectively communicate their ideas in the classroom setting with their peers using the standards conventions of oral English. The "Whiteboarding Rubric"contains the criteria for evaluating student performance.

Rubrics:

1. Whiteboarding Rubric

Resources and Materials

Attachments:

1. **Homework Assignment #3**
2. **Homework Assignment #4**

REFLECTION

Reflection

Directing Learning Tasks

Students are familiar with the procedure for working problems in groups, writing solutions on white boards, and discussion problem solving strategies. No additional instruction was required in this lesson plan. No student confusion was observed.

Inquiry Skills

Problem solving skills were disused throughout the period. Students discussed the strategies they used. Different methods were compared and contrasted so students could see different ways of approaching the same problems.
All students expressed confidence on understanding the problems on worksheet #3. However, students struggled to approach the problems on worksheet #4. I think that some of the students would benefit from additional practice.

Time Management / Summary

The worksheets contained far much information to discuss and review in a single day. I would have liked to push the quiz back to Monday, but my master teacher wanted to keep the sync with his other honors physics class, so the quiz date will remain unchanged.

Summary

Worksheet #4 attempted to integrated the concepts taught in this unit with prior knowledge. However, this added a level of complexity that obscured

the new content being taught. It also created a level of frustration and confusion for students. Working out these problems on the whiteboards was tremendously helpful, and served as a good review of previous material taught in the class. I felt that students would benefit from an additional day of discussing and working through these problems.