

Integrated Science – 8th Weeks 1 & 2

Everything is energy and that's all there is to it. Match the frequency of the reality you want and you cannot help but get that reality. It can be no other way. This is not philosophy. This is physics.

— **Albert Einstein**

Overview

Movement involves one form of energy being transformed into another form systematic ways. Energy has the potential to exert a force over a distance. Waves transfer energy such as sound, heat, light, and earthquakes through different mediums. Sound and light waves allow organisms to “hear” and “see” the world around them. Energy is classified as either kinetic or potential energy.

Objects can store and transfer energy within systems. Energy can be transferred between objects, which involves changes in the object's energy. There is a direct relationship between an object's energy, mass, and velocity.



Essential questions:

- **How do the physical structures of objects effect change in energy and motion?**
- **How do you know that waves carry energy?**

_____ Participate in the MMA **Science Fair** (February 8th)

- _____ Topic chosen/Question to be asked
- _____ Background research and design complete and Hypothesis
- _____ Experiment or test complete/Data compiled and Interpreted
- _____ Presentation board complete
- _____ Presentation to judges practiced/Ready for interview

_____ **Culminating Individual/Group Project:** Create a Rube Goldberg machine! (**January 23-24: Intersession Week**)

Individually or in a group of 2-3 individuals create a Rube Goldberg machine and present it to the class. This is a complex but fun activity that requires time, so plan accordingly. Please follow the instructions on the handout and be sure to answer the 3 questions and 10-step design in Pt 1.

Week 1: Due Friday, December 2

_____ 1. Read the overview and quote with the class and mark them up.

_____ 2. Make vocabulary cards or fill out Marzano vocabulary sheets for the following unfamiliar words (are your definitions about the cycle's topic?): **potential energy, kinetic energy, force, gravity, complex machine, simple machine, wave, fetch, friction, amplitude, frequency, mass, weight.**

_____ 3. Review: Science Fair expectations, guidelines, procedure.

_____ 4. Participate in the lesson and quiz: Identifying variables.

_____ 5. Receive instructions for and begin work on: Rube Goldberg machine.

_____ 6. Participate and take notes on the lesson: Alfred Wegener, plate movements, and Faulting.

_____ 7. Complete the graphic organizer: Types of Faults and Folding

_____ 8. Participate in and take notes on the lesson: Waves: Electromagnetic and Mechanical.

_____ 9. Complete the worksheet: Parts of a Wave

_____ 10. Read and take notes on pp. 510-514 of the Prentice Hall Physical Science textbook.

_____ 11. Complete the Assessment questions (1-2) AND Writing in Science on p. 514 of the Prentice Hall Physical Science textbook. (20 pts) [please be sure you use complete sentences and correct grammar and punctuation in your Writing in Science essay for full points.]



Week 2: Due Friday, December 9

_____ 12. Visit the following website and watch the video on Ocean Waves:
<http://oceanexplorer.noaa.gov/edu/learning/player/lesson09.html>

_____ 13. In the above website, after viewing the video, click on the Activities link on the right titled "Breaking Waves". Complete "Measure a Wave" activity and questions A-D; self correct.

_____ 14. Complete the Lab Activity and accompanying Worksheet: Wind and Waves

Integrated Science – 8th Weeks 3 & 4

Everything is energy and that's all there is to it. Match the frequency of the reality you want and you cannot help but get that reality. It can be no other way. This is not philosophy. This is physics.

— *Albert Einstein*

Essential questions:

- How do the physical structures of objects effect change in energy and motion?
- How do you know that waves carry energy?



_____ Participate in the MMA **Science Fair**
(February 8th)

- _____ Topic chosen/Question to be asked
- _____ Background research and design complete and Hypothesis
- _____ Experiment or test complete/Data complied and Interpreted
- _____ Presentation board complete
- _____ Presentation to judges practiced/Ready for interview

_____ **Culminating Individual/Group Project:** Create a Rube Goldberg machine! (*January 23-24: Intersession Week*)

Individually or in a group of 2-3 individuals create a Rube Goldberg machine and present it to the class. This is a complex but fun activity that requires time, so plan accordingly. Please follow the instructions on the handout and be sure to answer the 3 questions and 10-step design in Pt 1.

Week 3: Due Friday, December 16

- _____ 15. Participate in and take notes on the lesson: The Relationship Between Speed, Wavelength, and Frequency.
- _____ 16. Complete the worksheet: Waves Worksheet
- _____ 17. Participate in the lesson on Heat Transfer: Radiation, Conduction, and Convection (ppt)
- _____ 18. Complete the Heat Transfer foldable
- _____ 19. Participate in the Lab Activity: Marble Rollercoaster
- _____ 20. Complete the lab write-up and questions for the Lab Activity: Marble Rollercoaster

Name _____ Period: _____

Cycle 2: Nov 28 – Jan 20

Week 4: Due Tuesday, December 20

_____ 18. Work Cycle: Make progress on your Science Fair project and/or work on the Rube Goldberg project.



... metallische Objekte im Wasser ortet ...

Integrated Science – 8th Weeks 5, 6, & 7

Everything is energy and that's all there is to it. Match the frequency of the reality you want and you cannot help but get that reality. It can be no other way. This is not philosophy. This is physics.

— *Albert Einstein*

Essential questions:

- How do the physical structures of objects effect change in energy and motion?
- How do you know that waves carry energy?

_____ Participate in the MMA **Science Fair**
(February 8th)

- _____ Topic chosen/Question to be asked
- _____ Background research and design complete and Hypothesis
- _____ Experiment or test complete/Data compiled and Interpreted
- _____ Presentation board complete
- _____ Presentation to judges practiced/Ready for interview



_____ **Culminating Individual/Group Project:** Create a Rube Goldberg machine! (*January 23-24: Intersession Week*)

Individually or in a group of 2-3 individuals create a Rube Goldberg machine and present it to the class. This is a complex but fun activity that requires time, so plan accordingly. Please follow the instructions on the handout and be sure to answer the 3 questions and 10-step design in Pt 1.

Week 5: Due Friday, January 6

- _____ 19. Participate in and take notes on the Lesson: Kinetic and Potential Energies
- _____ 31. Visit the following website and read the content and answer the 2 Analysis questions on Kinetic vs. Potential energy: <http://goo.gl/FfZRUZ>
- _____ 32. Complete the following worksheet: Potential vs. Kinetic Energy. [Note: please refer to the Prentice Hall Physical Science textbook pp. 442-446 if you need more knowledge]

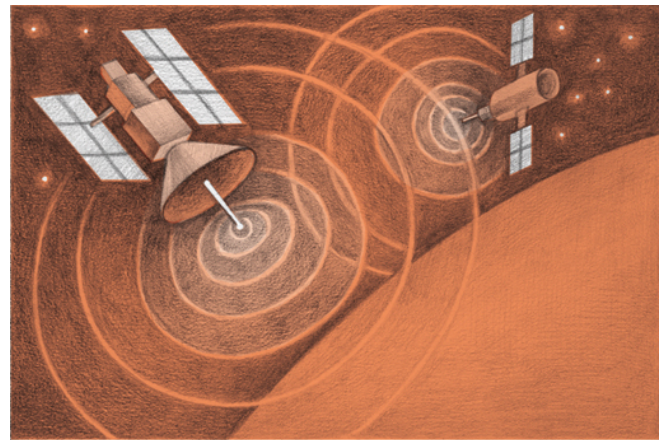
Week 6: Due Thursday, January 12

- _____ 21. Participate in the review lesson: Weight and Mass and gravity's effect

- _____ 22. Visit the following website: <http://goo.gl/Y1oPZV> and read about Weight and Mass, take notes, and **answer the 3 Analysis questions** at the bottom of the page.
- _____ 23. Visit the following website: <http://goo.gl/uPVm6a> and read The Gravity Way! Complete the activity then **answer the 3 Analysis questions**. Please also answer the following questions on the same sheet of paper: 4.) Do you have gravity? Explain why or why not. 5.) If you were an astronaut, and you go farther into space, why do you become weightless?
- _____ 24. Participate in and take notes on the lesson: Simple Machines
- _____ 25. Complete the Graphic Organizer/Sorting Activity on Simple Machines

Week 7: Due Friday, January 20

- _____ 27. Participate in the lesson: Classes of Levers and Calculating Mechanical Advantage of Levers.
- _____ 28. Complete the Graphic Organizer: Classes of Levers.
- _____ 29. Complete the handout: Mechanical Advantage of Levers



... nicht nur auf Erden, sondern auch im Weltraum...

- _____ 23. Review for the test and update all graphic organizers.
- _____ 24. Take the Theme Test for cycle 2.

Week 8: Intersession

- _____ Present your Rube Goldberg Machine to your peers at the invention convention!



...und alle Menschen der Welt miteinander verbindet.