

## Science Cycle 2--INDIVIDUAL WORK Checklist: Change

# TO EVERY ACTION THERE IS ALWAYS OPPOSED AN EQUAL REACTION

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PICTUREQUOTES.COM

This is your Trimester 2 Group Work Checklist. As you turn things in this trimester mark them off here. Use your agenda/planner to keep track of daily work. Check out the key at the bottom to help you know which items need checked and which items need turned into the IN BOX.

### GUIDING QUESTIONS:

- 1: Use Newton's Laws of motion to discover simple and compound machines. (7.PS.4-7.PS.7)
- 2: What are the different types of energy and how is energy transferred from one form to another? Is energy lost when this happens? (7.PS.8)
- 3: What are some alternative energy forms?
- 4: How can we design and construct a device that converts energy from one form to another to perform work? This device should have a practical use in your everyday life on the farm/land at Oak Farm and should explore alternative energy forms (6-8.E.1, 6-8.E.2, 6-8.E.3, 6-8.E.).

### INDIVIDUAL WORK

★ 1. **Vocabulary words:** You will each get a word(s) to research and contribute to the class list. Have your group teacher approve your definition and then add it to the class list. There will be an authentic assessment required. MANY OF THESE WORDS WILL REQUIRE A SCIENCE TEXT, RATHER THAN A DICTIONARY. **Please record your sources per definition.**

- |                                  |                                 |                                |
|----------------------------------|---------------------------------|--------------------------------|
| ❖ Energy                         | ❖ Radiation                     | ❖ Newton's Third Law of Motion |
| ❖ Kinetic energy                 | ❖ Heat                          | ❖ Non-renewable resources      |
| ❖ Potential energy               | ❖ Temperature                   | ❖ Electrical energy            |
| ❖ Mechanical energy              | ❖ Catalyst                      | ❖ Wind energy                  |
| ❖ Law of Conservation of Energy  | ❖ Endothermic reaction          | ❖ Specific heat                |
| ❖ Elastic potential energy       | ❖ Exothermic reaction           | ❖ Electromagnetic energy       |
| ❖ Chemical potential energy      | ❖ Renewable resources           | ❖ Nuclear energy               |
| ❖ Gravitational potential energy | ❖ Newton's First Law of Motion  | ❖ Neutrons                     |
| ❖ Conduction                     | ❖ Newton's Second Law of Motion | ❖ Protons                      |
| ❖ Convection                     |                                 | ❖ Electrons                    |

X Connection   X Silence & solitude   X Meaning & purpose   X Joy   X Creativity   X Transcendence   X Initiation

Key: ★ = Turn in   ✓ = Get checked



2. **Choice Projects:** Choose three (7<sup>th</sup>) & four (8<sup>th</sup>) topics to explore from different GQs. 1 page (7<sup>th</sup>) & 2 pages (8<sup>th</sup>) of handwritten notes and a high quality, meaningful product are required for your work to be ready for a teacher conference. Please be sure to properly site all sources in your notes. Source starters are provided. You need a total of 3 sources. Please vary your product types.

**Guiding Question 1: Use Newton's Laws of motion to discover simple and compound machines. ( 7.PS.4-7.PS.7)**

- a) Newton's First Law (define and create a product to explain)--  
<http://www.physicsclassroom.com/Physics-Tutorial/Newton-s-Laws>
- b) Newton's Second Law (define and create a product to explain)--  
<http://www.physicsclassroom.com/Physics-Tutorial/Newton-s-Laws>
- c) Newton's Third Law (define and create a product to explain)--  
<http://www.physicsclassroom.com/Physics-Tutorial/Newton-s-Laws>
- d) Sir Isaac Newton-- <https://www.britannica.com/biography/Isaac-Newton>
- e) Simple Machines-- <https://www.vexrobotics.com/vexiq/education/iq-curriculum/simple-machines-and-motion/six-types-of-simple-machines>
- f) Compound Machines-- <https://www.ck12.org/book/CK-12-Physical-Science-For-Middle-School/r1/section/15.4/>

**Guiding Question 2: What are the different types of energy and how is energy transferred from one form to another? Is energy lost when this happens? (7.PS.8)**

- g) Calculating Potential Energy with real life examples of your own--  
<http://www.physicsclassroom.com/class/energy/u5l1b.cfm>
- h) Momentum and Its Conservation--  
<http://www.physicsclassroom.com/class/momentum>
- i) Vectors-- <http://www.physicsclassroom.com/class/vectors>
- j) Work, Energy, and Power-- <http://www.physicsclassroom.com/class/energy>
- k) The Science of Rollercoasters-- <https://wonderopolis.org/wonder/how-do-roller-coasters-work>
- l) Energy and Change-- <https://phet.colorado.edu/en/simulation/energy-forms-and-changes>

**Guiding Question 3: What are some alternative energy forms?**

- a) Wind Energy Basics-- <http://windeis.anl.gov/guide/basics/>
- b) Solar Energy Basics--  
<http://environment.nationalgeographic.com/environment/global-warming/solar-power-profile/>
- c) Renewable vs. Nonrenewable Resources--  
<http://ww2.kqed.org/quest/2014/02/13/nonrenewable-and-renewable-energy-resources-2/>
- d) Biomass Basics-- [http://www.nrel.gov/learning/re\\_biomass.html](http://www.nrel.gov/learning/re_biomass.html)
- e) Geothermal Energy-- <http://geo-energy.org/Basics.aspx>
- f) Hydro Power!-- <http://water.usgs.gov/edu/hyhowworks.html>

**Guiding Question 4: How can we design and create a device that converts energy from 1 form to another to perform work? (6-8.E.1, 6-8.E.2, 6-8.E.3, 6-8.E.)**

- a) Energy Conversion-- <http://www.britannica.com/technology/energy-conversion>
- b) Alternative Energy Powering Vehicles--  
<http://webecoist.momtastic.com/2009/01/31/7-alternative-fuels-and-alternative-fuel-powered-vehicles/>
- c) Rube Goldberg Machines-- <https://www.rubegoldberg.com/>
- d) Kinetic Contraptions--  
[http://www.exploratorium.edu/pie/downloads/Kinetic\\_Contraptions.pdf](http://www.exploratorium.edu/pie/downloads/Kinetic_Contraptions.pdf)
- e) Simple Machines that do WORK--  
[https://www.teachengineering.org/view\\_lesson.php?url=collection/cub\\_/lessons/cub\\_simple/cub\\_simple\\_lesson05.xml](https://www.teachengineering.org/view_lesson.php?url=collection/cub_/lessons/cub_simple/cub_simple_lesson05.xml)
- f) Compound Machines that do WORK--  
[http://www.classzone.com/science\\_book/mls\\_grade6\\_FL/170\\_175.pdf](http://www.classzone.com/science_book/mls_grade6_FL/170_175.pdf)