**Alternative Energy Generating System and Simple Machine Powered by your Alternative Energy System**

The Challenge begins!! You and your partners will design and build a machine/building that is powered by Alternative Energy or you will build an Alternative Energy System that will accomplish a task. You will design an experiment that will demonstrate that your design works, and how your machine/building operates. **Each student** in the group is expected to hand in his/her own report that consists of **ALL** of the following items:

**GOAL:** Your goal is to design and build a combination of an Alternative Energy Generating System and a simple machine that maximizes a measurable performance objective of the machine subject to the agreed upon constraints of the classroom materials and the teacher.

1. **Initial Drawing:** This is a reasonably scaled, neatly labeled sketch of your machine on an **UNLINED** 8.5x11 piece of paper. Designate this drawing as your **INITIAL DRAWING.** You may not begin to build without this. **Each Partner** will submit a drawing that you will use later as you reflect on the changes you made to your original design.
2. **Building the Machine:** During the building process, each student will need to keep a written record of their progress in their science composition books. You will designate this area of your notebook by a tab we will give you.

**JOURNAL** – You are required to keep a written journal of your **DAILY** progress towards the completion of this project. You will need to date your entries. Discuss your progress, any challenges you encountered, how you solved them, the reason behind your solution and if it worked well. This can be in the form of a drawing that captures the change in your design, or explanations discussing the suggested prompts. Remember that the more detailed your journals are, the more complete and thoughtful your final explanations and reflections will be.

**QUANTITATIVE /QUALITATIVE DATA – TABLE -** You will need to develop adata table that will record the data from the mini experiment that you design to collect data that you analyze to demonstrate how you know your machine/building works.

**IMPORTANT** – Understand that you will need to work hard, collaborate, problem-solve and be persistent! Your machine needs to accomplish a task that your group agrees upon. Realize that this task may change during construction and that modification often occurs as part of the engineering design, and problem solving process.

1. **Final Drawing**: It is likely that your initial design changed during the construction of your machine. Draw your new reasonably scaled, neatly labeled sketch of your machine on an **UNLINED** 8.5x11 piece of paper. Designate this drawing as your **FINAL DRAWING**.
2. **Analysis/Discussion:** One and one-half to two pages, word-processed, double-spaced paper that addresses the following prompts into your discussion. Discuss how your alternative energy source works to power your machine. Was your design successful? How do you know? What were the challenges of implementing your initial idea? If you changed your initial design, how did you change them and why? What other problems did you need to overcome? How did you overcome them? What if anything would you do differently next time?

5. **Final Reflection:** This a half to one page reflection of this project discussing the thoughts you have about the process, your journey, the impact it made on you as the culminating experience for the year.

1. **Bibliography:** Include all of your sources for information, ideas and people you have consulted for the completion of this project. At least 3 sources are required.
2. **Presentation:** You and your group partner(s) will prepare a presentation to explain and demonstrate how your building/ machine works.