



# CRAFTING MODELS OF EFFICIENCY

Laura Honda, Manor School  
Ross Valley School District, California



**Overview:** Allowing students to use their knowledge on energy and creativity to build energy efficient and non-energy efficient cardboard classroom models. Thus, providing a visual comparison between energy efficient and non-energy efficient classroom models.

## Objectives:

1. Encourage students to apply their background knowledge of energy with creativity
2. Entice curriculum by integrating art and energy efficiency/conservation subjects together
3. Demonstrate a creative way to utilize recycled items

**Subjects:** Energy Efficiency/Conservation and Art

**Suggested Grade Level:** 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grades

## California Standards Addressed:

- 3<sup>rd</sup> grade:
  - Science: Investigation and Experimentation 5.c. Students use numerical data in describing and comparing objects, events, and measurements.
  - Science: Investigation and Experimentation 5.e. Students collect data in an investigation and analyze those data to develop a logical conclusion.
- 4th grade:
  - Science: Investigation and Experimentation 6.a. Students differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.
- 5th grade:
  - Science: Investigation and Experimentation 6.f.

*Funding for this lesson plan is provided by California utility ratepayers under the auspices of the California Public Utilities Commission.*

Students select appropriate tools (e.g. thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.

- Science: Investigation and Experimentation 6.h.  
Students draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.

**Time:** 4-6 one-hour class periods

**Materials:**

- Solar-House Kit
- Recycled Items: Pizza boxes, paper & plastic scraps, T.P. rolls etc.
- Art Materials: Paint, scissors, glue etc.
- Green Schools Materials

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**PREPARATION AND BACKGROUND:** The objective of the lesson is to allow students to apply their energy knowledge to a hands-on project. Students will then learn the differences between energy efficient homes and non-energy efficient homes visually.

**Procedure/Activities:**

1. Lead a discussion with student about what to include in the energy efficient classroom and the energy inefficient classroom.
2. Record their responses on board.
3. Instruct the students that two of them together will develop their own models. Tell them they have the following recycled materials to use: pizza boxes, paint, paper and plastic scraps, T.P. rolls and mini solar cells with fans.
4. Once the models are constructed, have the students take them outside to see if the solar fan works
5. Temperature Experiment - have students place a thermometer inside the efficient model (with light colored roof) and the inefficient model to see if there is a temperature difference.
6. Students share their models with other classes and explain why having insulation, thermal reflective barrier, double paned windows, shade trees, etc. save energy.

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7. Make presentation about models for PTA and at staff meeting

**For Discussion:**

1. The initial discussion is important because it helps students remember and review what they learned about energy efficiency.
2. After the students test out their models, have them discuss what they found when they took the models out into the sun. If the fan turned, why did that happen?

**Extensions/Evaluations:** Students can explain about every detail of our energy efficient and non-energy efficient models. Have them present their models to the PTA, to the School Board, to other classes in the school.

**Resources:**

1. Solar House Kit - mini photovoltaic cell with solar powered ceiling fan, light bulb, and principle of sun heated water from NEED
2. Energy Color Experiment from Green Schools



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Empowering Schools through Energy Efficiency