# Energy Consumption in Home Building Lesson Plan: 6th & 7th Grades

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**Overview:**

Students will learn about energy usage in building homes and how that relates to lifestyle. They will use math to compare appliance energy efficiency in homes.

**Purpose:**

Students will understand why energy efficiency is important, and its effect on the life cycle costs of different appliances in a home.

**Materials:**

* PowerPoint presentation
* Worksheet (2 pages)

**Discussion:** Using the PowerPoint presentation, ask the questions prompted on each slide and lead a discussion on how energy and building are related. Ask follow up questions to the students to assess their understanding of each slide. You may want to even ask them to tell them in their own words what the slide is telling them. Use your knowledge and experience in homebuilding to illustrate and engage the students (how using different materials and methods to build homes changes the initial cost of the home and the life cycle cost of the home). Remember to explain vocabulary.

**Activity:**

1. After slide 5, “WHAT DO YOU THINK AFFECTS THESE DECISIONS,” pass out the worksheets, then use slides 6-8 (Stop at the “CALCULATING ENERGY SAVINGS WORKSHEET” slide) and explain how to calculate electricity usage for homes. You will want to use a couple of examples and show them how this will be done (write on board, or use a smartboard to fill in worksheet).
2. After explaining and showing your examples, explain that they will be breaking up into groups of 3-4. They will then be working together to calculate energy costs for their home.
3. Have students pick one student to give the information about their home (what appliances, if they are high efficient etc.) If students are struggling to pick one student. Have them pick the student that has their birthday closest to the 4th of July).
4. Students will get together and work together in their groups to complete the worksheet.
5. Give them about 20-30 minutes to finish this activity, or whenever the class seems to have completed it. Remember to wander around observing what is occurring in the group and help if there is confusion.

**Closure Discussion:**

When the groups have finished their worksheet, show the next slide (9). Explain the graph to them, making sure they understand that energy efficient appliances will pay for themselves after X number of years. Depending upon time, you may ask one group to bring up their worksheet and as a class, they can help you graph their data on the whiteboard.

Show slide 10 time permitting. If the students assume all of their appliances are standard appliances, how many years would it take to break even? End by discussing how life cycle costs of building materials can and will be more beneficial to the environment and cost less money in the long run. Make sure to answer any questions the students have.

**Assessment:**

Students will be assessed upon their participation during the PowerPoint presentation. They will also be assessed on their worksheet and calculations.

**Curriculum:**

Common Core standards:

* 6.N.4. Number and Operations, and science classes, MS-ES3-3 Earth and Human Activity
* 6.MP.1 Make sense of problems and persevere in solving them
* 6.EE.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem

**Energy Consumption in Homebuilding Activity Script**

Go through the slides and worksheet prior to going to the classroom and familiarize yourself with the activity.

**Activity:**

1. Pull up the lesson slides and introduce yourself to the class.
2. Go through the slides 2-5 with the class, inserting your own knowledge and experience with homebuilding - mainly how using different materials and methods to build home changes the initial cost of the home and the life cycle cost of the home.
3. After the ‘HOW THIS AFFECTS HOMEBUILDERS’ slide, pass out the worksheets and have them break in to groups of three or four.
4. Explain and go through the example problem with them on the next slide, showing them how to do the calculations.
5. Stop at the ‘CALCULATING ENERGY SAVINGS WORKSHEET’ slide.
6. Have them do the calculations based on their own homes, assuming the amount of energy their families’ use for each appliance.
7. Give them about 20-30 minutes to finish this activity, or whenever the class seems to be completed with it.
8. Move on to the next slide and explain the graph to them with the main theme of: the life cycle of energy efficient appliances will pay for itself after X number of years. After this, you are saving money.
9. Ask a student from the class to come up and you can graph his data on the white board, time permitting.
10. Slide number 10 is optional time permitting. If the students assume all of their appliances are standard appliances, how many years would it take to break even?

**Closure:**

End by discussing how life cycle costs of building materials can and will be more beneficial to the environment and cost less money in the long run.