
ENERGY MONITOR ACTIVITY TEACHER LESSON OVERVIEW

TEP BRIGHT STUDENTS: THE CONSERVATION GENERATION

Learning Objectives/Goals:

- To accurately calibrate and set the temperature of a refrigerator to U.S. Department of Energy recommendations.
- To better understand the actual energy consumption of select common appliances and devices in students' homes.
- To run a basic analysis of the savings possible by using more efficient devices and appliances (if applicable)



Tucson Electric Power

General Energy Efficiency Overview

To meet ever-increasing energy demands, energy efficiency (that is, reducing overall consumption without sacrificing comfort or quality) is significantly less expensive and easier to achieve than other non-renewable and renewable methods of generating more electricity. Becoming more energy efficient at home has many benefits, including prolonging the lifespan of appliances and increasing comfort. Of course, the biggest benefit of energy efficiency is reducing overall energy consumption, which lowers monthly energy bills. There are many easy ways to become more energy efficient at home including: replacing incandescent light bulbs with CFLs or LEDs, regularly changing/cleaning the air filter on central heating/AC units, ensuring that refrigerators and freezers are set to the appropriate temperature, and properly sealing doors and windows with weather stripping.

Large appliances such as central heating/AC units, refrigerators, water heaters, dishwashers, washers, dryers, and pool pumps use the majority of total household energy. When purchasing a new appliance, look for the EnergyStar label, which demonstrates that it has met federal energy efficiency standards. Finally, some appliances and other home improvements qualify for TEP rebates; more information can be found at <https://www.tep.com/efficiency/home/efficienthome/>.

Lesson Overview

The classroom teacher will have in his/her possession a TrickleStar Home Energy Monitor. This monitor plugs into a standard 120V three-pronged outlet and has the same outlet on the monitor itself. To use, the student will need to unplug the device that he/she is testing, plug the monitor into the wall outlet, and then plug the device directly into the monitor. The monitor has an external display, which modulates between daily, monthly, and annual consumption data. The monitor can also display consumption data in dollar figures.

The Energy Monitor Activity is available for teachers to distribute to their students at their discretion. Because there is only one monitor per teacher, only one student at a time can proceed with the activity. We recommend that teachers use the Energy Monitor Activity as an extra credit assignment for students.

Lesson Overview:

The student will check out the energy monitor from his/her teacher. Upon checkout, the teacher will give the student the following documents:

- Energy Monitor Activity Worksheets
- Energy Monitor Instructions, to be returned to teacher. Alternately, the teacher can email to the student's parents a digital copy of the Energy Monitor Instructions
- Explanation Letter for Parents

Lesson Overview *(Continued)*

The teacher will remind the student of the following:

- Be careful with the energy monitor...this is the only one for the entire class.
- In order for the activity to be successful, students must remember to check the monitor as appropriate (for example, many of the questions ask students to determine the energy used in one day...this means that if the student plugs a device in at 5 pm on a Tuesday, he/she must check it again at 5 pm on Wednesday).
- The energy monitor is simple to use, but students/families can refer to the instructions as needed.
- It is important for the students to contextualize the activity to their parents so that their parents understand why the students need to make some temperature adjustments to the refrigerator and other appliances, if applicable. Students can and should be able to relay this information to their parents, but there is also a separate letter for parents that should go home with the students as well.

Lesson Steps:

1. Give student appropriate paperwork and energy monitor.
2. Suggested step – Call or email the student’s family to let them know the student will be borrowing a valuable piece of equipment that **MUST** be returned to the classroom.
3. Give student between 4-7 (adjust this timespan as needed at your discretion) days to take the monitor home and gather data, depending on both your level of expectation and student’s level of commitment to gather data from multiple sources.
4. Receive energy monitor and completed paperwork from student.