

How much electricity do we use?

WebQuest Description: Students will access different websites to collect data on U.S. residents and the cost of electricity in their homes. Then, use the information gathered to create a bar/pie graph. This lesson will take two class periods.

Grade Level: 3-5

Curriculum: Math

Keywords: electric use, data, residents, bar graph, pie chart, calculate

Published On:

Last Modified: 2018-03-28 16:09:42

WebQuest URL: <http://zunal.com/webquest.php?w=376219>

Introduction

In this quest each student will be accessing the internet to gather information and collect data from a table to generate a bar graph and a pie chart of the amount of electricity used by residents of the U.S. You will have to measure the data and calculate the numbers to draw a conclusion to the amount of electricity used per state. Then you will choose five devices you use in your home and measure the amount of hours and the cost of electricity used by determining which device uses the most and least electricity.

Tasks

The amount of energy Americans use has doubled in the past twenty years. All of that energy adds up, and much of it is wasted by using too much or not wisely. The students in this webquest will engage in web-based inquiry to answer questions and to perform the tasks required. These tasks will require a computer, access to the web and links provided for each quest. Let the light guide you.

Process

Day One: 1. Begin by asking students all of the different ways we get our electricity. Be sure they mention coal and other fossil fuels as well as renewable sources like solar, wind, water, etc. 2. Then ask them how much they think electricity costs. How is that measured? 3. Direct them to this website that lists the cost of electricity per state: <https://www.eia.gov/electricity/monthly/epm/table/grapher.cfm> 4. As a whole group, show the students how to read this table, and that there are different rates depending on if the electricity is used by a residence, a company, for industrial purposes, or by transportation. 5. There are several ways this data can be used to generate a bar graph. One bar graph generator can be found here: <https://nces.ed.gov/nceskids/graphing/classic/bar.asp> 6. Discuss the required information for the bar graph. What information should be on the x axis? The y axis? What is a good title? What units of measurement are required? Guide them to set up their graph properly. 7. Using the column for the residential rates for the most recent year available, have them locate the 10 states that have the lowest cost of electricity. A reminder about reading decimals might be needed. 8. Have students generate a bar graph for the 10 states with the lowest cost of electricity. 9. Then, show them the bar graph (the second one on this website): <https://www.washingtonpost.com/graphics/national/power-plants/>. Compare the states with the lowest cost of electricity with the states that use the most coal to generate their electricity. Discuss the correlations the students notice Day Two: 1. Review the lesson from yesterday. 2. Today, students will look at data about use of energy by various devices: <http://energyusecalculator.com/calculate/electrical/usage.htm> 3. Have students choose 5 devices that they use in their daily life. Use the energy calculator to estimate the number of hours each day they use that device, then calculate the amount of electricity used. They should make a list of the 5 devices and the cost, including the unit. The calculator will give you the option of Cost Per Hour, Cost Per Day, Cost Per Month, Cost Per Year, or kWh Per Day. You will want to choose one and have them use that consistently across their devices for a consistent comparison. 4. Then show them the pie chart generator: <https://nces.ed.gov/nceskids/graphing/classic/pie.asp>. Discuss how to set it up correctly. 5. Have the students input the data for the devices they chose. 6. Once their pie chart is generated, they should interpret them by answering these questions: a. Which device uses the most electricity? Why? b. Which one uses the least? Why?

Evaluation

The criteria for evaluation of your webquest can be found below:

Category and Score	Beginning	Developing	Accomplished	Exemplary	Score
Website Access	The student had difficulty navigating internet to find correct website	The student found the website needed some assistance from teacher	The student accessed website without any assistance from teacher	The student independently accessed website	25%

Category and Score	Beginning	Developing	Accomplished	Exemplary	Score
Read/Interpret Data	The student had difficulty understanding how to read the data collected	The student could read the data but not interpret what was collected	The student can read and interpret the data	The student can easily read and interpret data collected	25%
Create Bar Graph/Pie Chart	The student cannot independently create a bar graph/pie chart without help	The student can create a bar graph /pie chart but needs assistance with labeling	The student is able to create a bar graph/pie chart, title, and labeling	The student can easily create a bar graph/pie chart as well as title and labeling	25%
Bar Graph Pie Chart Questions	The student has difficulty answering questions without direct assistance from teacher	The student can complete the questions with some assistance from teacher	The student can complete the questions	The student can easily complete the questions	25%
				Total Score	100%

Conclusion

Now that you successfully completed the steps to creating a bar graph and pie chart, hopefully you have learned the importance of why we make bar graphs/pie charts and how useful they are for presenting information. This is a lesson you can take with you as being a valuable experience. Congrats!

Teacher Page

The goal of this assignment was to have students independently collect data, create bar graphs/ pie charts, be able to interpret the information and answer questions about the graphs/charts. The total completion time is 120 minutes which is two class periods. This is a great way for students to gain experience creating graphs and interpreting the data from the graphs as well as integrating the use of technology within a skill.

Standards

Common Core Standards:CCSS.Math.Content.5.MD.B.3 Graphing and Interpreting Data

Credits

The following websites were used:Zunal.comGoogle images

Other