



Everyday Energy Consumption

AUTHOR

Unknown

GRADE LEVEL

6
7
8

CONTENT TOPICS

Math
Physics
Science

DESCRIPTION

Bring the reality of energy consumption to your students by having them measure and calculate the cost of using energy to power things they use everyday. How much does it cost to charge your phone? Run a fan? Why is energy conservation important? Use the Kill-A-Watt Power Meter to measure and record appliance power consumption. It can also calculate the power cost based on local power companies price per kilowatt.

SUGGESTED STANDARDS CONNECTIONS

Common Core Math	CCSS.MATH.CONTENT.EE Expressions and Equations CCSS.MATH.CONTENT.NS Number System CCSS.MATH.CONTENT.RP Ratios and Proportional Relationships
NGSS	MS-PS3 Energy

Name:

Date:

Period:

Watts Up?!

Common Core Standards

7.RP.3 Use proportional relationships to solve multistep ratio and percent problems

7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers

7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related

7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate

Common Core Mathematical Practice Standards

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
5. Use appropriate tools strategically
6. Attend to precision

Hawaii Content and Performance Standards III

Benchmark SC.7.1.1	Design and safely conduct a scientific investigation to answer a question or test a hypothesis
Benchmark SC.7.1.3	Explain the need to revise conclusions and explanations based on new scientific evidence

Introduction: You will be using a watt meter to test different electronic devices to determine energy increase or decrease. You will be using the % change formula to find out the change in electricity.

Formula: % of change = $\text{Difference} / \text{Original}$

Hypothesis: If _____ then,
_____ because
_____.

Procedures:

1. Create your hypothesis and rank your devices from highest to lowest highest % change.
1= high 8= low
2. Decide which of the 3 jobs each person will be responsible for: turning device on, read watts meter, and record data on table. You can change jobs when you get to a different station.
3. Use the internet to look up the Watt reading for each device when it is off. Record this in your table.
4. Plug watts meter into outlet. This should be zero.
5. Plug electronic device into outlet and into watt meter, record this in your table under original meter.
6. Turn on the device and record number in your table.
7. Repeat steps 3 and 4 for each device you have.
8. Use your information to solve the % change for each device and write this down in your table.
9. After you calculate your % change, use this information to rank your devices from high to low. 1= high 8=low

Device	Ranking	Watt Reading (device OFF)	Watt Reading (device ON)	% change in electricity	Actual Ranking
Coffee Grinder					
TV					
Pencil Sharpener					
Microwave					
Computer					
Blender					
Coffee Maker					
Radio					

Results: Explain your data in a paragraph.

Conclusion: Was your hypothesis rejected or confirmed? What did you learn from this lab? What would you change?

Rubric:

	3	2	1
Correlation between hypothesis and ranking	Student's ranking reflects upon the hypothesis and student explains the ranking	Student's ranking reflects upon the hypothesis but does not use data	Student does not use data to reflect on hypothesis or ranking
% of change calculated correctly	All correct	Some correct	None correct
Actual Ranking 1-8	All items are properly ranked	Completes half of the rankings or incorrectly ranked	Does not complete ranking
Data Analysis	Student uses data from the table to explain or assign rankings	Student does not use data	
Conclusion	Hypothesis is confirmed or rejected and explained why using data	Hypothesis is mentioned but not supported with data	Student's conclusion is weak and does not use data or hypothesis