

HISI - Lesson 5 Outline: Comparing Energy Efficiency of Light Bulbs

Module Title Making the Most of Energy: Insulate It! LS Team Crispin, Dedini, Haller, Hobba, Huschle, Stackhouse, Vack

Grade level: 6-8

Lesson # 5	Title: Thermal imaging intro	Number of Minutes:
Mathematical purpose: rates/percentages, construction of graphs		Scientific Purpose: Understanding energy transfer, conservation of energy, and efficiency, using data to make a claim
Materials needed: Incandescent, LED, and CFL light bulbs, IR thermometer, Kill-A-Watt meter, data recording sheet. This lesson and all the materials for it can be checked out from RCEA (Redwood Coast Energy Authority) in Eureka.		Academic vocabulary: watts, energy transfer, thermal energy, light energy, kWh,
Common Core Standards: 6RP3: Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. 7RP3: Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i>		Next Generation Science Standards: PS-3.b Conservation of energy and energy transfer Science and Engineering Practice Standard 3 - Planning and carrying out investigations

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<p>When students are finished they will understand:</p> <ul style="list-style-type: none">* How to use rates and percents to compare energy use of different light sources.* How energy is converted differently by different light bulbs.* The energy savings that can be achieved through the choice of light bulb.* The energy efficiency of different light bulbs.*	<p>What are teacher questions or prompts?</p> <ul style="list-style-type: none">• Which light bulb is best?• What does it mean that some light bulbs release more heat than others?• How much energy does each light bulb consume?• How can we compare these different bulbs?
<p>What are questions you anticipate students will have?</p> <ul style="list-style-type: none">• What is a watt?• How do we determine which bulb is best?• What does 'best' mean?• How can we tell how much energy the light bulb uses?	<p>What are misconceptions students might have?</p> <ul style="list-style-type: none">• They might try to determine the difference in brightness or color.• They might confuse watt and kWh.• They may not understand the conservation of energy as it applies to the heat loss.• They will confuse power and energy
<p>General outline of the lesson: Students will be asked to determine which is the best light bulb, why, and by how much. They will compare incandescent, CFL and LED bulbs by measuring energy use, temperature change, and electricity costs. They will compare the different bulbs using percentages, such as 50% less energy consumption, 80% more heat loss, etc. They will then use their collected data to make claims about which light bulb is the best.</p>	

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Supplemental files/resources will follow