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| TRANSFER GOALS |
| *Students will be able to independently use their learning to…*   * Logically identify and organize data to analyze and implement possible solutions with the goal of achieving the most efficient and effective combination of steps and resources. * Represent data through abstractions, such as models and simulations. * Generalize and transfer a problem-solving process to a wide variety of problems. * use the appropriate digital/analog tools to effectively and efficiently complete the stated objective and communicate the results to stakeholders and other interested parties. * apply appropriate statistical methods to the ongoing evaluation of a project. * apply the appropriate science and engineering processes to an activity. * effectively utilize design processes in activities * work safely and ethically |
| ENDURING UNDERSTANDINGS |
| * Insulating properties are a part of all materials |
| STANDARDS |
| * Principles C1A - apply mathematics to problems arising in everyday life, society, and the workplace; * Principles C1D - communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate; * Principles C2E - demonstrate appropriate oral, written, and visual forms of technical communication. * Principles C3A - solve design problems individually and in a team; * Principles C3D - use communication to achieve a desired goal within a team; and * Principles C3E - work as a member of a team to conduct research to develop a knowledge base, stimulate creative ideas, and make informed decisions. * Principles C6E - explain how thermal energy is transferred via convection, conduction, and radiation and complete calculations for conduction, R-values, and radiation; and * Principles C6F - calculate resistance, energy transfer, and material conductivity. * Principles C9A - use a design process and mathematical formulas to solve and document design problems; * Principles C9B - obtain measurements of material samples; |
| ESSENTIAL QUESTIONS |
| Overarching   * What’s the problem? * What’s a useful solution? * How do I get from the problem to the solution? * What is data? * What is the value added?   Topical   * What is the relationship between science and engineering? * What are the strengths of a mathematical model? * How do models improve design? |
| FOCUS AREAS/CRITICAL CONTENT |
| *Students will know…*   * the three main forms of heat transfer. * how to measure temperature.   *Students will be able to…*   * design an insulating device. * measure the rate of heat loss. |
| PERFORMANCE TASK(S) |
| * Insulation Device built as a team |
| LEARNING EXPERIENCES(ACTIVITIES) |
| * Recycled Insulation project in SW * Initial measurements * First prototype as individuals * Team build |
| RESOURCES |
| * myDAQ |