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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
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| ENDURING UNDERSTANDINGS |
| * Insulating properties are a part of all materials
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| 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;
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| 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?
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|  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.
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| PERFORMANCE TASK(S) |
| * Insulation Device built as a team
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| LEARNING EXPERIENCES(ACTIVITIES) |
| * Recycled Insulation project in SW
* Initial measurements
* First prototype as individuals
* Team build
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| RESOURCES |
| * myDAQ
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