Save the Penguins
Heat Energy

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In this unit, we will address the following Maine Learning Results:
B2a – g: Students use a systematic process, tools, equipment, and a variety of materials to design and produce a solution or product to meet a specified need, using established criteria
C2b Explain how constraints and consequences impact scientific inquiry and *technological design*.
C3a. Describe how science and technology can help address societal challenges related to population, natural hazards, sustainability, personal health and safety, and environmental quality
C3c. Identify factors that influence the development and use of science and technology.
D3h. Describe several different types of energy forms including heat energy
D3j. Describe how *heat* is transferred from one object to another by conduction, convection, and/or radiation.

…and take a stab at these new Next Generation Science Standards:
MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
MS-PS3-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.

Key terms:

conduction	convection	radiation	heat
temperature	fluid	insulation	iteration
constraint			

By the end of this unit, you should be able to…

- Describe conduction, convection and radiation.
- Explain how heat is transferred between objects.
- Explain why heat is sometimes not transferred between objects.
- Describe the difference between heat and temperature.
- Design, build, test and rebuild a product that solves a problem (keeping a “penguin egg” cool).
- Share your learning and design process in a storyboard format