

Grade 7: Science/STEAM Program

Inquiry Design Problem: Heat, Ecosystems & Structures and Mechanism **UNITS**

Learning Goal:

To learn how to plan, design and build a habitat/dwelling to keep Antarctic Penguins cool during nesting season and in their natural environment which is currently under threat by global warming.

Success Criteria:

Utilizing the “Engineering Design Process”

Questioning

- Producing 10-15 inquisitive questions needed to solve this problem as they relate to penguins, climate change and habitat (e.g. shape, size, materials etc.).

Co-created Success Criteria Checklist

- Collaborating to develop a set of criteria to analyse the overall success of the final product.

Planning, Designing and Building

- Utilizing their knowledge and application skills to co-create a product to meet the needs of this project.

Testing and Analysis

- Using their data analysis skills to collect, measure and assess the success of their product.

BIG IDEAS:

Heat is a form of energy that can be transformed and transferred. These processes can be explained using the particle theory of matter. There are many sources of heat. Heat has both positive and negative effects on the environment.

Overall Curriculum Expectation(s):

(1) Assess the costs and benefits of technologies that reduce heat loss or heat-related impacts on the environment.

(2) Investigate ways in which heat changes substances, and describe how heat is transferred.

Project Outcome(s):

This project is ongoing and should culminate in a Literacy Media project to showcase their final product in front of a “Board of Directors” (comprised of fictitious Engineers, Environmental Groups, Biologists, and members of the community). The project should effectively develop and cultivate 21st learning skills (communication, collaboration, critical thinking/problem solving, learning to learn/self-directed learning, innovation/creativity/entrepreneurship, global citizenship).

