**Overview-Classroom Activities**

4th Grade Electricity, Circuits & Thermal Energy



**Electricity & Circuits**

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| Lesson | Lesson Materials | NEED Curriculum & Additional Resources |
| Lesson 1: Open & Closed Circuits | Energy Batons (5) | *Elementary Energy Infobook* |
| Lesson 2: Electricity Conductors & Insulators | Student Worksheet; Not included: Samples of electric insulators & conductors |  |
| Lesson 3: Circuits | Snap Circuits Jr. (5); Batteries for Snap Circuits (10); |  |
| Lesson 4: Circuit Design Challenge | Student Worksheet |  |

**Thermal Energy**

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| Lesson | Lessons & Activities | NEED Curriculum & Additional Resources |
| Save the Penguins Lesson 1: Introduction to Thermal Insulation | Student Worksheet; Digital Thermometers (6); Not included: Pop or water, samples of insulators, brown paper lunch bags, Handouts-Direction of Thermal Energy Transfer/Arrows, Insulation Samples | *EnergyWorks Teacher & Student Guides* |
| Save the Penguins Lesson 2: Thermal Transfer by Conduction | Student Worksheet; Metal spoons (10); Plastic spoons (10); Penguin Ice Cube Tray |  |
| Save the Penguins Lesson 3: Penguin Dwelling Design & Construction | Student Worksheet; Penguin Ice Cube Tray, Balance, Plastic Condiment Containers (10); Not included: Rulers, tape/glue, scissors, tongs, dwelling building materials |  |
| Lesson: Ice Melting Blocks | Melting Blocks |  |

Student Worksheets, Teacher Lesson Plans and Pre/Post Polls are available at:

[www.ohioenergy.org/educators](http://www.ohioenergy.org/educators/teachers)

NEED Curriculum in PDF format is available at:

www.need.org