



Human Designed Equitable Warming Shirts

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ABSTRACT

Our project is to create a STEM based lesson plan that requires students to design a thermal shirt that is effective in keeping people warm by testing different insulators.

STUDENTS

We planned these lessons with 10th or 11th grade science students in mind, though the math concepts covered are usually taught in Algebra 1.

We are also connecting our content to students' community by highlighting how it can be used to help the homeless.

STEM INTEGRATION

Science

- Thermochemistry
- Exo/endothermic reactions
- Specific heat capacity

Technology

- Insulators/warmers

Engineering

- Designing something the homeless can use to keep warm

Math

- Solving linear equations
- Proportions

SOCIAL JUSTICE

Our unit's connection to social justice is most evident in our final lesson, in which we challenge students to design something that the homeless can use to keep warm in the winter, and to verify experimentally that their design works.

MODELS

$$q = mc\Delta T$$

q = heat transferred

m = mass

c = specific heat capacity

ΔT = change in temperature