Salting Roads in Winter

Cross-Disciplinary Extensions

Connect to Math
- Have students calculate the percentage of salt by volume in the solutions that they made. Note that they will first need to convert units from Tablespoons to Cups or Cups to Tablespoons.

Connect to Reading
- Have students research the impact of salting roads on the environment and write an essay to communicate their results. *How does the salt affect grass and other plants near the road? Animals? Local streams? Bodies of water farther away? Are the benefits of salting roads worth the risks to the environment?*

Connect to Writing
- Have students imagine that the budget for road salt has been cut: the city will no longer buy any road salt. Students can then either
  - Write a short story in which they imagine what a winter in a cold city would be like without road salt
  - Write a persuasive letter to the city council against or in support of this decision

Connect to Social Studies
- Have students research and communicate about the use of salt in their area. *What kind of salt is used in your state to clear roads during the winter months? Where does the salt come from? How is it transported to your area?*

Next Generation Science Standards
This lesson supports the following:

Practices of Science and Engineering
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Crosscutting Concepts
- Cause and Effect: Mechanism and Explanation
- Systems and System Models
- Energy and Matter: Flows, Cycles, and Conservation
- Stability and Change
Disciplinary Core Ideas, Grades 3-5

Physical science
- Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects. (5-PS1-1)

- The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2)

- When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)

Earth science
- Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)

- Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1)

Engineering Design
- Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1) (secondary to 4-PS3-4)