

Power and Energy in the Home - Academic Standards in Math and Science

| Educational Objective  | Science Standards<br>from <i>National science education standards</i> , National Research Council,<br>National Academy Press, 1996 |  | Math Standards<br>from <i>Principles and standards for school mathematics</i> , National<br>Council of Teachers of Mathematics, 2000 |   |
|--|--|--|--|---|
|  | Grade level  | Description  | Grade level  | Description   |
| 1. Energy is delivered from the distribution network to the various loads throughout the home. | K-4  | Content Standard D, Physical Science - Fundamentals of electricity   | 6-8  | Geometry - Use visual tools such as networks to represent and solve problems  |
|  | 5-8  | Content Standard B, Physical Science - Transfer of energy  |  |   |
|  | 5-8  | Content Standard E, Science and Technology - Studying technological products and systems                   |  |   |
|  | 9-12   | Content Standard B, Physical Science - Conservation of energy  |  |   |
| 2. Different electrical loads vary greatly in their power demands.                             | K-4  | Content Standard D, Physical Science - Fundamentals of electricity   | 3-12   | Measurement - Understand measurable attributes and the units, systems, and processes of measurement   |
|  | 5-8  | Content Standard B, Physical Science - Transfer of energy  |  |   |
|  | 9-12   | Content Standard B, Physical Science - Conservation of energy  |  |   |
| 3. The relationship between power and energy, terms that are often confused.                   | 9-12   | Content Standard E, Science and Technology - Understandings about science and technology                   | 3-5  | Algebra - Investigate how a change in one variable relates to a change in a second variable   |
|  |  |  | 6-8  | Algebra - Use graphs to analyze the nature of changes in quantities in linear relationships   |
|  |  |  | 9-12   | Algebra - Understand relations and functions  |
| 4. Energy is metered and priced over time in units of kilowatt-hours.                          | 9-12   | Content Standard E, Science and Technology - Understandings about science and technology                   | 3-5  | Algebra - Identify and describe situations with constant or varying rates of change and compare them  |
|  |  |  | 6-8  | Algebra - Model and solve contextualized problems using various representations, such as graphs, tables, and equations  |
|  |  |  | 9-12   | Algebra - Interpret representations of functions of two variables   |
| 5. Energy (and money) can be conserved by using more energy-efficient loads.                   | K-4  | Content Standard F, Science in Personal and Social Perspectives - Environmental issues                     | 3-5  | Data Analysis and Probability - Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions |
|  | 5-8  | Content Standard F, Science in Personal and Social Perspectives - Science and technology in society        | 6-8  | Measurement - Solve simple problems involving rates and derived measurements  |
|  | 9-12   | Content Standard B, Physical Science - Conservation of energy  | 9-12   | Algebra - Draw reasonable conclusions about a situation being modeled   |
|  | 9-12   | Content Standard F, Science in Personal and Social Perspectives - Natural resources, environmental quality |  |   |