Grade 7: Temperature Rising (Understanding Earth and Space Systems)

Science and Technology Curriculum Connections	Mathematics Curriculum Connections
Lesson 1: The Mini-Research Station **2.1** follow established safety procedures for using heating appliances and handling hot materials **2.4** use scientific inquiry/experimentation skills to investigate heat transfer through conduction, convection and radiation **2.5** use appropriate science and technology vocabulary including *heat, temperature, conduction, convection* and *radiation*, in oral and written communication **3.2** identify ways in which heat is produced (e.g., burning fossil and renewable fuels, electrical resistance, physical activity)	**Lesson 1: The Mini-Research Station** **Measurement** - determine through investigation using a variety of tools and strategies, the relationship between the height, the area of the base, and the volume of right prisms with simple polygonal bases, and generalize to develop the formula

Science and Technology Curriculum Connections	Mathematics Curriculum Connections
Lesson 2: Heat It Up – The Particle Theory **2.1** follow established safety procedures for using heating appliances and handling hot materials **2.5** use appropriate science and technology vocabulary including *heat, temperature, conduction, convection* and *radiation*, in oral and written communication **2.6** use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., using the conventions of science, create a labelled diagram to illustrate convection in a liquid or a gas) **3.1** use the particle theory to compare how heat affects the motion of particles in a solid, liquid, and a gas	

Grade 7: Temperature Rising (Understanding Earth and Space Systems)

Science and Technology Curriculum Connections	Mathematics Curriculum Connections
Lesson 3: Heat Transfer Investigations **2.1** follow established safety procedures for using heating appliances and handling hot materials **2.4** use scientific inquiry/experimentation skills to investigate heat transfer through conduction, convection and radiation **2.5** use appropriate science and technology vocabulary including *heat, temperature, conduction, convection* and *radiation*, in oral and written communication **2.6** use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., using the conventions of science, create a labelled diagram to illustrate convection in a liquid or a gas) **3.4** explain how heat is transmitted through conduction (e.g., the transmission of heat from a stove burner to a pot and from the pot to the pot handle), and describe natural processes that are affected by conduction (e.g., the formation of igneous and metamorphic rocks and diamonds) **3.5** explain how heat is transmitted through convection, and describe the natural processes that depend on convection (e.g., thunderstorms, land and sea breezes)	**Lesson 3: Heat Transfer Investigations** **Data Management and Probability** - collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject and record observations or measurements - read, interpret and draw conclusions from primary data and from secondary data presented in charts, tables, and graphs - make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs

Grade 7: Temperature Rising (Understanding Earth and Space Systems)

Science and Technology Curriculum Connections	Mathematics Curriculum Connections
Lesson 4: Radiant Connections **2.1** follow established safety procedures for using heating appliances and handling hot materials **2.4** use scientific inquiry/experimentation skills to investigate heat transfer through conduction, convection and radiation **2.5** use appropriate science and technology vocabulary including *heat, temperature, conduction, convection* and *radiation*, in oral and written communication **2.6** use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., using the conventions of science, create a labelled diagram to illustrate convection in a liquid or a gas) **3.6** explain how heat is transmitted through radiation, and describe the effects of radiation from the sun on different kinds of surfaces (e.g., an ice-covered lake, a forest, an ocean, an asphalt road)	

Grade 7: Temperature Rising (Understanding Earth and Space Systems)

Science and Technology Curriculum Connections	Mathematics Curriculum Connections
Lesson 5: The Future of Our Hot Earth **1.1** assess the social and environmental benefits of technologies that reduce heat loss or transfer (e.g., insulated clothing, building insulation, green roofs, energy-efficient buildings **1.2** assess the environmental and economic impacts of using conventional (e.g., fossil fuel, nuclear) and alternate forms of energy (e.g., geothermal, solar, wind, wave, biofuel) **2.3** use technological problem solving skills to identify ways to minimize heat loss **2.5** use appropriate science and technology vocabulary *including heat, temperature, conduction, convection and radiation*, in oral and written communication **3.8** identify common sources of greenhouse gases (e.g., carbon dioxide comes from plans and animal respiration an the burning of fossil fuels; methane comes from wetlands, grazing livestock, termites, fossil fuel extraction, and landfills; nitrous oxide comes from soils and nitrogen fertilizers), and describe ways of reducing emissions of these gases	

Grade 7: Temperature Rising (Understanding Earth and Space Systems)

Science and Technology Curriculum Connections	Mathematics Curriculum Connections
Lesson 6: Parts per Million **1.1** assess the social and environmental benefits of technologies that reduce heat loss or transfer (e.g., insulated clothing, building insulation, green roofs, energy-efficient buildings **1.2** assess the environmental and economic impacts of using conventional (e.g., fossil fuel, nuclear) and alternate forms of energy (e.g., geothermal, solar, wind, wave, biofuel) **2.5** use appropriate science and technology vocabulary including *heat, temperature, conduction, convection* and *radiation*, in oral and written communication	**Lesson 6: Parts per Million** **Number Sense and Numeration** - determine, through investigation, the relationships among fractions, decimals, percents and ratios - demonstrate rate as a comparison, or ratio, of two measurements with different units (e.g., speed is a rate that compares distance to time and that can be expressed as kilometres per hour) - solve problems involving the calculation of unit rates **Data Management and Probability** - read, interpret and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., temperature data or community data in the newspaper, data from the Internet about populations) presented in charts, tables, and graphs (including relative frequency tables and circle graphs)

Science and Technology Curriculum Connections	Mathematics Curriculum Connections
Lesson 7: Climate Data **1.1** assess the social and environmental benefits of technologies that reduce heat loss or transfer (e.g., insulated clothing, building insulation, green roofs, energy-efficient buildings **1.2** assess the environmental and economic impacts of using conventional (e.g., fossil fuel, nuclear) and alternate forms of energy (e.g., geothermal, solar, wind, wave, biofuel) **2.5** use appropriate science and technology vocabulary including *heat, temperature, conduction, convection* and *radiation*, in oral and written communication	**Lesson 7: Climate Data** **Data Management and Probability** - read, interpret and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., temperature data or community data in the newspaper, data from the Internet about populations) presented in charts, tables, and graphs (including relative frequency tables and circle graphs) - identify, through investigation, graphs that present data in misleading ways (e.g., line graphs that exaggerate change by starting the vertical axis at a point greater than zero) - identify and describe trends, based on the distribution of the data presented in tables and graphs, using informal language

Grade 7: Temperature Rising (Understanding Earth and Space Systems)

Science and Technology Curriculum Connections	Mathematics Curriculum Connections
	Lesson 8: That Data is Not Fair **Number Sense and Numeration** - solve problems that involve determining whole number percents, using a variety of tools (e.g., base ten materials, paper and pencil, calculators) **Data Management and Probability** - collect and organize categorical, discrete, or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools) and display the data in charts, tables, and graphs (including relative frequency tables and circle graphs) the have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software) - identify bias in data collection methods