UNIT PLANNING

|  | **Unit Topic / Guiding Question: Thermal Energy - grade 3** | | | | | | |
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|  | **Rationale:**  **This unit will help students understand the basic concepts of energy transfer through conduction, convection, and radiation. Students will develop an understanding of how thermal energy affects the world around them.** | | | | | | |
|  | **STAGE 1: Desired Results** | | | | | | |
|  | **UNDERSTAND** | **Big Ideas** | | | **Essential Questions** | | |
| [Thermal energy can be produced and transferred](https://curriculum.gov.bc.ca/curriculum/science/3/core#). | | | How does Thermal Energy move and affect the world around us? | | |
|  | **DO** | **Core Competencies:** | | | | | |
| **Communication** | **Thinking** | | | **Personal & Social** | |
| * Communicating * Collaborating * oral communication during discussions, observations and experiments * written communication during worksheets time and experiment observations * students will work together during experiments, share ideas, and share ideas | * Creative Thinking * Critical & Reflective Thinking * students analyze experiments results, make predictions, and find conclusions | | | * Personal Awareness & Responsibility * Positive Personal & Cultural Identity * Social Awareness & Responsibility * students will understand thermal energy and where it can come from in the environment * students will have to collaborate respectfully during class time and experiment time | |
|  | **Learning Standards – Curricular Competencies:** Make observations about living and non-living things in the local environmentCollect simple data **Make predictions based on prior knowledge** | | | | | |
|  | **KNOW** | **Learning Standards - Content:**  [**sources**](https://curriculum.gov.bc.ca/curriculum/science/3/core#;) **of** [**thermal energy**](https://curriculum.gov.bc.ca/curriculum/science/3/core#;)  [**transfer of thermal energy**](https://curriculum.gov.bc.ca/curriculum/science/3/core#) | | | | | |
|  | **First Peoples Principles of Learning** | * *Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.* * *Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).* * *Learning involves recognizing the consequences of one’s actions.* * *Learning involves generational roles and responsibilities.* * *Learning recognizes the role of indigenous knowledge.* * *Learning is embedded in memory, history, and story.* * *Learning involves patience and time.* * *Learning requires exploration of one’s identity.* * *Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.* | | | | | **Comments on how you will address the FPPL:**   * **students will engage in hands-on experiments and observations** * **students will need time to explore and learn thermal energy concepts, make observations, and have discussions** |
|  | **STAGE 2: Assessment Plan** | | | | | | |
|  | **Formative Assessment (Assessment as Learning and Assessment for Learning):** | | | | | | |
|  | * worksheets * discussions * activities * observations from teacher * participation in experiments * exit slips | | | | | | |
|  | **Summative Assessment (Assessment of Learning):** | | | | | | |
|  | * final unit quiz | | | | | | |
|  | **Stage 3: Learning Plan** | | | | | | |
| **Date/Lesson** | **Learning Intentions** | | | **Instructional Activities**  **(brief description here – lesson plans will be used to flesh out each lesson)** | | | |
| *Lesson 1* | *Understand solids, liquids, and gases and their properties* | | | **Introduction to States of Matter (25 min)**   * **Find out what they know, review states of matter** * **watch a video on states of matter** * [**https://youtu.be/JQ4WduVp9k4?si=UvXh0OK1xQMc75Yl**](https://youtu.be/JQ4WduVp9k4?si=UvXh0OK1xQMc75Yl) * **go through worksheet as a whole class** | | | |
| *Lesson 2* | *Define thermal energy and understand how it affects matter* | | | **Introduction to Thermal Energy**   * **Review states of matter** * **Define thermal energy (energy that comes from heat) and provide examples (sun, stovetop)** * **watch a video on thermal energy (only play till 2:30 min)** * **<https://youtu.be/dQGcBirS7zI>** * **fill in worksheet as a whole class** | | | |
| *Lesson 3* | *Introduce 3 methods of heat transfer, define conduction* | | | **Overview of conduction, convection, and radiation overview. Define conduction**   * **Review of thermal energy** * **watch video to start on 3 methods of heat transfer** * [**https://youtu.be/Me60Ti0E\_rY?si=UCAbsECB8pIL8wW3**](https://youtu.be/Me60Ti0E_rY?si=UCAbsECB8pIL8wW3) * **define conduction (heat through solids) (metal spoon in hot soup)** * **read through heat transfer - conduction sheet** * **do worksheet as a whole class** | | | |
| *lesson 4* | *Define convection* | | | **Define convection**   * **review of conduction** * **define convection (heat through liquids or gases) (boiling water)** * **read heat transfer - convection sheet** * **do worksheet as a whole class** | | | |
| *Lesson 5* | *Define Radiation* | | | **Define Radiation**   * **review of convection** * **define radiation (heat through empty space (sunlight)** * **read heat transfer - radiation sheet** * **do worksheet as a whole class** | | | |
| *Lesson 6* | *Observe convection in motion* | | | **Experiment with Convection**   * **students will observe an experiment in Mrs. Hamming** | | | |
| *Lesson 7* | *Observe conduction in motion* | | | **Experiment with Conduction**   * **students will observe an experiment with Ms. Wilkinson** | | | |
| *Lesson 8* | *Review all key concepts (states of matter, thermal energy, conduction, convection, radiation)* | | | **Review**   * **Thermal energy trivia game** * **Labelling worksheet** * **Exit slip (write one thing you learned about heat transfer)** | | | |
| *Lesson 9* | *Assess students understanding of thermal energy* | | | **Summative Assessment**   * **multiple choice quiz** | | | |
|  | **Resources needed:** | | | | | | |
|  | * **TPT** * **videos** * **worksheets** * **exit slips** * **thermal energy trivia game** * **conduction experiment equipment**   + **water**   + **food colouring**   + **tube**   + **observation sheets** | | | | | | |
|  | **Interdisciplinary connections:**  (e.g. How did you weave ELA, Social Studies, Science, Math, Fine Arts, and/or ADST together in this instructional sequence?) | | | | | | |
|  | **English Language Arts**   * **Reading and Research** * **Writing assignments** * **oral communications during discussions** | | | | | | |
|  | **Reflection** | | | | | | |
|  | **How did the unit go? How do I know?** | | | | | | |
|  | **Where to next?** | | | | | | |