

**CODE/MOE/UOIT Makerspaces Project--Lesson Planning Template**

**School Board: Grand Erie District School Board**

**Grade(s): Grade 8**

**Subject(s): Science--Water Cycle**

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| **BIG IDEAS:**  Water systems influence climate and weather patterns.  **Curriculum Expectations:**  **OVERALL:**  3. demonstrate an understanding of the characteristics of the earth’s water systems and the influence of water systems on a specific region.  **SPECIFIC:**  3.1 identify the various states of water on the earth’s surface, their distribution, relative amounts, and circulation, and the conditions under which they exist (e.g., water is a solid in glaciers, snow, and polar ice-caps; a liquid in oceans, lakes, rivers, and aquifers; and a gas in the atmosphere)  3.5 explain changes in atmospheric conditions caused by the presence of bodies of water (e.g., differences in temperature near large bodies of water; microclimates; storms off coastal areas) | |
| **Learning Goals: We are learning...**  ...about the earth’s water cycle.  ...to understand that the water cycle is controlled by heat and the movement of their particles. | **Success Criteria: We will know we are successful when...**  ...we can map the water cycle across different terrains.  ...we can show the particle movement and state changes that occur. |
| **Lesson Overview: Students will use ozobots to map out the water cycle. The students will choose the terrain they want to map and will either use markers to draw the map or code the route for the ozobots. Students will write a response to show their understanding.** | |
| **Materials and Technology:**   * Maps/ Diagrams of different terrains (to show run off from mountains, evaporation from lakes, melting of glaciers) * Ozobots * Markers * Computers to code * Personal devices/iPads with Flipgrid | |
| **Student Accommodations/Modifications:**  Accommodations will range from:   * Oral output for students instead of writing- using flipgrod for response   Modifications will range from:   * Pre-fabricated maps for students * Checklists for sets in the water cycle | **Lesson will be differentiated by:**   * **Content, specifically:** Students will have maps that have text clues (such as mountains will have run off) * **Process, specifically**: Students have the choice to code or use markers to show their understanding * **Product, specifically:** Students can work in small groups if need be and can orally explain what is happening, instead of writing the output * **Environment, specifically: N/A** |
| **MINDS ON: Getting Started** | |
| During this phase, the teacher may:  • activate students’ prior knowledge;  • engage students by posing thought-provoking questions;  • gather diagnostic and/or formative assessment data through observation and questioning;  • discuss and clarify the task(s). | During this phase, students may:  • participate in discussions;  • propose strategies;  • question the teacher and their classmates;  • make connections to and reflect on prior learning. |
| **Describe how you will introduce the learning activity to your students.**  Discuss our prior knowledge specifically from Grade 7 where particle theory is heavily stressed. Have the activity in which students act as particles around the room to show how particles more differently in different states.  **What key questions will you ask?**  How are particle theory and state changes related to the water cycle (both are cyclical)?  How does heat impact the water cycle?  **How will you gather diagnostic or formative data about the students’ current levels of understanding?**  KWL chart x 2- about water cycle and particle theory  **How will students be grouped? How will materials be distributed?**  Whole Group discussion  Students will return to their table groups (no more than 4) for materials to be distributed | |
| **ACTION: Working on it** | |
| During this phase, the teacher may:  • ask probing questions;  • clarify misconceptions, as needed, by redirecting students through questioning;  • answer students’ questions (but avoid providing a solution to the problem);  • observe and assess;  • encourage students to represent their thinking concretely and/or pictorially;  • encourage students to clarify ideas and to pose questions to other students. | During this phase, students may:  • represent their thinking (using numbers, pictures, words, manipulatives, actions, etc.);  • participate actively in whole group, small group, or independent settings;  • explain their thinking to the teacher and their classmates;  • explore and develop strategies and concepts. |
| **Describe the task(s) in which your students will be engaged.**  Students will have the maps/ diagrams provided to them. The students will use the ozobots to show the water cycle. The ozobots should have a start point and an end point. Students will either provide a write up of the cycle and what the ozobot is doing, or why.  **What misconceptions or difficulties do you think they might experience?**  Students may not show the start point and the end point (which should be the same).  Students may not show how the particles should move faster or slower depending on their state.  Students may not choose a suitable start point.  **How will they demonstrate their understanding of the concept?**  They will orally or in written form discuss the cycle that they are showing depending on the map/diagram.  **How will you gather your assessment data (e.g., checklist, anecdotal records)?**  Success Criteria Checklist (co created with students).  **What extension activities will you provide?**  Students will discuss how the cycle is affected by the different maps. What are the different aspects that need to be considered (ice-caps, oceans, rivers?) | |
| **CONSOLIDATION: Reflecting and Connecting** | |
| During this phase, the teacher may:  • bring students back together to share and analyse strategies;  • encourage students to explain a variety of learning strategies;  • ask students to defend their procedures and justify their answers;  • clarify misunderstandings;  • relate strategies and solutions to similar types of problems in order to help students generalize concepts;  • summarize the discussion and emphasize key points or concepts. | During this phase, students may:  • share their findings;  • use a variety of concrete, pictorial, and numerical representations to demonstrate their understandings;  • justify and explain their thinking;  • reflect on their learning. |
| **How will you select the individual students or groups of students who are to share their work with the class (i.e., to demonstrate a variety of strategies, to show different types of representations, to illustrate a key concept)?**  The students will display their ozobot cycles. They will have a stay and stray “show and tell” in which some members can go to see other cycles while one member stays to explain their cycle to others.  **What key questions will you ask during the debriefing?**  Why did you choose your specific start point?  How do climates affect the water cycle? | |