

**CODE/MOE/UOIT Makerspaces Project**

**Lesson Plan: Grade 6 Science:**

**Pond Study**

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| **BIG IDEAS:**  **Grade 6 Science and Technology: Understanding Life Systems Biodiversity**  **Overall Expectation**  2. investigate the characteristics of living things, and classify diverse organisms according to specific characteristics;  3. demonstrate an understanding of biodiversity, its contributions to the stability of natural systems, and its benefits to humans.  **Science and Technology Specific Curriculum Expectations:**  2.1 follow established safety procedures for outdoor activities and field work (e.g., stay with a partner when exploring habitats; wash hands after exploring a habitat)  2.2 investigate the organisms found in a specific habitat and classify them according to a classification system  2.3 use scientific inquiry/research skills (see page 15) to compare the characteristics of organisms within the plant or animal kingdoms  3.1 identify and describe the distinguishing characteristics of different groups of plants and animals (e.g., invertebrates have no spinal column; insects have three basic body parts; flowering plants produce flowers and fruits), and use these characteristics to further classify various kinds of plants and animals (e.g., invertebrates – arthropods – insects; vertebrates – mammals – primates; seed plants – flowering plants – grasses) | |
| **Learning Goals:**  “We are learning to…”  -introduce students to pond organisms  -use a rainbow easi microscope to get a close up look of pond life  -identify pond organisms using a dichotomous/ scientific key | **Success Criteria:**  “We will be successful when…”  -able to use the microscope to identify features of organisms  -sketches and observations have been recorded for an organism on a recording sheet  (recording could be done in a nature journal, worksheet or documented with photographs and described in a google doc)  -students are able to identify at least three organisms (provided there are enough different types that have been found)  -identification of the organism has been confirmed  -a slide show will be created documenting the organisms found and identified |
| **Lesson Overview:**  -this lesson is to provide students an opportunity to visit a wetland area and collect organisms that can be found in the water  -organisms will be collected using dip nets and stored in basins until brought back for viewing with the rainbow easi microscopes (any digital microscope) in the classroom or work area near the wetland (teacher discretion)  -students will try to identify organisms using a dichotomous key  -sketches and observations will be recorded for an organism on a recording sheet.  (recording could be done in a nature journal, worksheet or documented with photographs and described in a google doc)  -students will create a slideshow showcasing the organisms they have documented using google slides | |
| **Materials and Technology:**  -dip nets  -petri dishes  -plastic spoons  -pipettes or turkey baster  -pond guides or dichotomous key  -pond water  -live pond invertebrates  -basins  -pencils  -journal  -digital microscope (rainbow easi microscope) | |
| **Student Accommodations/Modifications:**  -partners  -google read/ write app  -provide additional time | **Lesson will be differentiated by:**   * Content, specifically: * limited number of organisms on scientific key * Process, specifically: * detailed explanation of microscope use * could have been made slide for students to view * Product, specifically: * limit the length of the slide show product * Environment, specifically: * quiet work environment for documenting pond organism |
| **MINDS ON: Getting Started** | |
| During this phase, the teacher may:  Begin with a quick discussion:  -we are going to a wetland today. Does anyone know what a wetland is or what we might find there?  -continue on discussing that there is life in the water and that today the students will be investigating and identifying organisms  -show the dichotomous key or pond guide to the students to show them what kind of organisms they might expect to find  -inform the students that they will be creating a slideshow documenting the pond life they have found and identified  -to gather the information for the slide show the students will be using the digital microscopes that will record pictures of the organisms  -(if the microscopes have never been used take the time to demonstrate how they work and how to capture a picture)  • 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. What key questions will you ask? How will you gather diagnostic or formative data about the students’ current levels of understanding? How will students be grouped? How will materials be distributed?  -teacher observation of discussion about wetlands to determine students comfort level with pond life  -students may work in partners to gather pond organisms while dipnetting  -they will be required to individually submit slideshows of their identification process  -materials will be distributed to partner groups that include: a dip net, and basin for the outdoor portion  -when ready to use microscopes petri dishes, plastic spoons and pipettes will be available at their workstation to isolate invertebrates for viewing  -safety around pond and expectations of behaviour to be discussed prior to leaving | |
| **ACTION: Working on it** | |
| During this phase, the teacher may:  -when at the wetland show students where they should situate themselves for dip netting  -demonstrate the proper technique to catch organisms ( we will not be catching amphibians or reptiles)  -swipe the net through the water and down into the muddy bottom if possible  - bring the net up towards the basin and look for movement  -place any invertebrates or organisms into the basin for further investigation  -once enough has been caught transport basins to area where microscopes have been set up  -use the microscope the zoom in on features of the organism to help identify  -have the scientific keys available to use for identification  -document through the use of a photograph  -these photographs can be used in the slideshow that will document what students have found and what they were able to identify  • 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:  -document their organisms and information of study to use for slide show  • 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. What misconceptions or difficulties do you think they might experience? How will they demonstrate their understanding of the concept? How will you gather your assessment data (e.g., checklist, anecdotal records)? What extension activities will you provide?  -students will be dipnetting for invertebrates at a wetland  -students may have difficulty finding organisms  -students may have difficulty identifying organisms or operating the microscopes  -understanding will be demonstrated through proper identification of organisms when viewing specific features  -teacher will have a checklist to ensure all students have gathered organisms for viewing  -teacher will observe that students are able to operate microscopes to view their organisms  Extension activities could include:  -students could try to create a food web including their found invertebrates to add into their slide shows | |
| **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)? What key questions will you ask during the debriefing?  -use the end time to view one or two organisms and go through the identification process to see if everyone gets to the same organism  -zoom in on some features that may be interesting to discuss  -Some questions you might want to ask for wrap-up:  What things indicate to you that this is a healthy wetland?  -students will begin to work on their slide shows using the information they gathered  -the length of the slideshow will depend on how many organisms were viewed and identifies (three are expected)  -final product may be assessed using a rubric or checklist | |