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**CODE/MOE/UOIT Makerspaces Project**

**Lesson Plan: Grade 1 Science: Materials**

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| **Big Ideas:**1. All objects are made of materials with specific properties
2. The structure of an object is what allows it to keep its parts together

**Overall Curriculum Expectations:*** Demonstrate an understanding of the fact that objects and structures have observable characteristics and that the materials with which they are created have specific properties that determine their use (Big Ideas A, B and D)
* Explore structures with a specific function and made with a variety of materials (Big Ideas B and C)
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| **Learning Goals:**“We are learning to …”* Make an everyday structure
* Make a structure of the future
 | **Success Criteria:** “We will have success when…”* We can recognize common structures
* We know common properties of different materials
* We choose appropriate materials
* We make a stable structure
* We can describe the function of a structure
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| **Lesson Overview:****During this series of lessons, the student will :*** Identify a variety of materials that aid in making objects and structures
* Make a stable structure using a variety of appropriate materials
* Determine the function of a structure
* Follow the technological problem-solving steps
* Use appropriate vocabulary
* Use Green Screen technology (and other technologies) to communicate results

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| **Materials and Technology to be used :*** Raw material that students need to combine to make structures
* Wood
* Plastic
* Glass
* Cardboard
* Cotton
* Aluminum foil, cans, etc.
* Paper towel rolls
* Glue sticks
* Glue guns
* Modeling clay
* Marshmallows
* Wire or string
* Scissors
* ipads
* Cameras
* Laptops
* Apps and software for Green Screen
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| **Adaptations /Modifications:** * Provide students with examples and models of structures (when required by students)
* Use visual aids
* Students can choose how they will communicate their results/present
* Give more time to certain students for the task
* Have students who are creative/strong in Science to build more complex structures
* Suggest that students identify a problem that needs to be solved
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| **MINDS ON: Getting Started** |
| During this phase, the teacher will : * Expose the students to a variety of real-life structures such as the Eiffel or CN tower, a bird’s next, etc.
* Read the textbook chapter so that students learn appropriate unit vocabulary
* Show videos of structures that have failed to stay up and have a discussion
* Model a think-pair-share and have the students conduct one
* Ask open-ended questions regarding differences and similarities between different structures, maximum charges that structures can support
 | During this phase, the students will :* Do a think-pair-share
* Fill out a KWL chart
* Ask any nagging questions

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| **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?** In the future, there won’t be bus drivers. You need to make and program a school bus that takes kids from their homes to school. Each group can make a different route from point A to point B. |
| **ACTION: Working on it** |
| During this phase, the teacher will :* Provide students with materials
* Teach students how to program robots
* Ask questions
* Observe and give feedback to students
* Organize student-teacher conferences to give students descriptive feedback
 | During this phase, students will :* Make prototype sketches
* Choose appropriate materials
* Follow their “roadmaps”
* Make their structure
* Verify that their structure is stable
* Program their robot
* Verify that their robot follows a straight line
* Make their robot turn right or left
* Participate in student-teacher conferences to get descriptive feedback from the teacher
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| **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?** * “Evaluation by triangulation”
* Conversations
* Observation sheet
* Peer evaluation
* Assessed on what was made

**Extension Activities :*** Make a complex structure
* Program a more complex pathway for the robot to follow
* Program the robot to solve a complex problem
* Integrate electricity in their structure
* Use Sphero or Lego Mindstorm to communicate their results
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| **Consolidation: Reflecting and Connecting** |
| During this phase, the teacher will : * Ask students the following questions:
* What did you find difficult?
* What could you have changed to improve your project?
* Would other materials have been a better choice? Other attachment methods?
* Review key concepts and vocabulary
 | During this phase, students will :* Present their project
* Use Green Screen technology to communicate their results
* Self and peer-evaluate themselves based on the success criteria
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| 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? All students have to share their discoveries and what they learned.  |