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**CODE/MOE/UOIT Makerspaces Project**

**Lesson Plan: Grade 1 Science: Making a device that uses energy**

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| **Big Ideas :**1. Everything that happens in the world around us is the result of the use of a form of energy.
2. Humans need to be responsible for the way in which we use energy.

**Curriculum Overall Expectations :*** Assess uses of energy at home, at school, and in the community, and suggest ways to use less energy;
* Investigate how different types of energy are used in daily life;
* Demonstrate an understanding that energy is something that is needed to make things happen.
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| **Learning Goals :**“We are learning to… “* Come up with and make a device that uses energy to work (for example a kite that uses wind energy to soar; an instrument that uses muscular energy to emit a sound)
 | **Success Criteria :** “We will be successful when…”* We research and choose a device to make
* We plan our making based on the type of energy we want to use
* We make our device
* We use appropriate unit vocabulary to describe the ways in which we researched, explored, and made observations during the making phase
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| **Lesson Overview:****During this series of lessons, the student will :*** Identify common objects that use energy (for example flashlights, light bulbs, computers, cars, video games)
* Make a device that is powered by an energy source (for example a kite that uses wind energy to soar; an instrument that uses muscular energy to emit a sound)
* Follow the technological problem-solving steps
* Use appropriate vocabulary
* Use Augmented Reality 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 devices
* Lego
* Wood
* Plastic
* Glass
* Cardboard
* Cotton
* Aluminum foil, cans, etc.
* Paper towel rolls
* Glue sticks
* Glue guns
* Yoghurt tubs
* Balloons
* Modeling clay
* Marshmallows
* Wire or string
* Scissors
* ipads
* Cameras
* Laptops
* Augmented Reality and apps (Aurasma, WeDo 2)
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| **Adaptations /Modifications :** * Provide students with examples and models of devices that use energy (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 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 : * Show videos on types of energy and conduct a discussion
* Model a think-pair-share and have the students conduct one
* Ask open-ended questions on the differences and similarities of different types of energy

  | During this phase, the students will : * Do a think-pair-share
* Fill out a KWL chart
* Ask any questions they may have

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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?** Diagnostic Information: the KWL chart*Challenge : We can make music using muscular energy. Invent a device that uses some sort of energy (for example muscular energy, wind energy, elastic energy, electric energy etc.).*In teams of 2 or 3, students will make a device that uses energy to work. |
| **ACTION: Working on it** |
| During this phase, the teacher will :* Provide students with materials
* Remind students of the different types of energy
* Ask questions
* Observe students and give them formative feedback
* 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 device
* 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 device that is more complex
* Make a device that uses several sources of energy
* Integrate renewable energy sources
* Use another technology to communicate their results
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| **Consolidation: Reflectiing 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?
* Does your device use other types of energy?
* Review key concepts and vocabulary
 | The student will :* Present their project : students will explain to the class the types of energy their device uses
* Use Augmented Reality to communicate results
* Do a self-evaluation 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.  |