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**CODE/MOE/UOIT Makerspaces Project**

**Lesson Plan: Grade 6 Science**

 **Flight: Balsa Wood Airplane Project**

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| **BIG IDEAS:*** **Flight occurs when the characteristics of structures take advantage of certain properties of air.**
* **Air has many properties that can be used for flight and for other purposes.**

**Lesson Objectives:** * **To allow students to build open important life skills through collaboration, creativity and innovation**
* **To allow students to be involved within inquiry and problem based learning**
* **To allow students to encourage application of new and prior knowledge and skills to further develop their interests and engagement through learning**

**Curriculum Expectations:****Overall Science and Technology Expectations*** **investigate ways in which flying devices make use of properties of air**

**Specific Science and Technology Expectations*** 1. **- identify the properties of air that make flight possible**
	2. **- identify common applications of the properties of air, such as its compressibility and insulating qualities**
	3. **- identify and describe the four forces of flight – lift, weight, drag, and thrust**
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| **Learning Goals:**We are learning how the four forces of flight (lift, weight, drag and thrust) interact and work | **Success Criteria:** I can identify properties that make flight possible |
| **Lesson Overview:****As you construct your balsa wood plane, you must continually investigate the uses of the four forces of flight (lift, weight, drag, and thrust) to enable the plane to fly.**  |
| **Materials and Technology:** 1. Balsa Wood
2. Elastic Band
3. Propeller
4. Tape
5. Glue Gun
6. Toothpicks
7. Tissue Paper
8. Rubber Band
9. Paper clip
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| **Student Accommodations/Modifications:** * **Supplied Materials**
* **Assistance when necessary**
* **Can challenge students to try to make the plane fly for longer than five seconds, or for a certain amount of distance**
 | **Lesson will be differentiated by:*** **Content, specifically:**
* **Process, specifically:**
* **Product, specifically:**
* **Environment, specifically: Cafeteria (no wind to affect the plane)**
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| **MINDS ON: Getting Started** |
| Design and Planning:* Is the plane aerodynamic?
* Can the student identify how each of the four forces work within the plane?
 | During this phase, students may: • participate in discussions; • question the teacher and their classmates;  |
| 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? * Show videos demonstrating on how to build a balsa wood plane
* **Then demonstrate how to build a balsa wood plane**
* Equal distribution of aforementioned materials such as balsa wood, propeller, etc…
* Assigned into groups
* **Allotted time to finish the task**
* **Test**
* **Reflection**

**Assessment may be done through observation, conversations and/or rubric/checklist for the final product.** |
| **ACTION: Working on it** |
| During this phase, the teacher may: • ask probing questions; • answer students’ questions (but avoid providing a solution to the problem);  | During this phase, students may: • represent their thinking (using numbers, pictures, words, manipulatives, actions, etc.);   |
| 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? * Challenge students to be innovative, and creative
* Question why it works, and if you change something, why it will or will not continue to work
* Question which of the four forces are failing to work, and which are working within the plane?
* Question the design of the plane?
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| **CONSOLIDATION: Reflecting and Connecting** |
| During this phase, the teacher may: • encourage students to explain a variety of learning strategies; • ask students to defend their procedures and justify their answers;  | During this phase, students may: • share their findings; • justify and explain their thinking;  |
| 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? * Questioning the practicality of their balsa wood plane involving its success or failure
* What they should have changed to make the balsa wood plane better, or make it work?
* What were other factors that the students did not think of (amount of elastic needed, etc…)
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