## Multitasking Mania!

**Lesson 5: Scratch Advanced Blocks**

**Problem Statement:**

Your task is to create both a computer-based task and non-computer-based task that helps employees evaluate the effectiveness of multitasking and helps them plan their work efficiently.

**Lesson Overview:**

Students are now expected to have a basic understanding of programming in Scratch. In this lesson, advanced programming tools will be introduced.

**Learning objectives:**

* Use advanced features of Scratch including conditional statements and sensing blocks
* Students will be able to: Apply knowledge of the coordinate grid to the Scratch programming environment

**Lesson standards (NGSS, CCSS, CTE):**

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| Computer Science (CTE) | |
| CTE 2-A-5-6 | Develop programs, both independently and collaboratively, that include sequences with nested loops and multiple branches. [Clarification: At this level, students may use block-based and/or text-based programming languages.] |
| Science (NGSS) | |
| MS-ETS1-1. | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| Mathematics (CCSS) | |
| 6.NS.C.8 | Apply and extend previous understandings of numbers to the system of rational numbers. |

**Soft skills (21st Century Skills):**

* Technology literature
* Learning and Innovation
* Life and Career

**Locally and/or personally relevant for students:**

* Many students play video games and use apps that are built on programming
* Many current and future jobs require programming skills

**Connections to Career and Educational Pathways:**

* Introduction video from code.org (shown in Lesson 3) details career opportunities in programming

**Materials:**

* Computers - ideally 1:1, but could be 1:2 computer:student ratio
* Scratch Teacher Account with Student Scratch Accounts
* A copy of Conditional and Sensing Blocks Scratch Project instructions for each student/pair
* A copy of the Scratch Exit Ticket for each student

**Lesson preparation:**

* Knowledge of the Scratch Platform (see appendix for more information)

**Time required:** 45 minutes at a minimum

* 10 minutes: Mini-Lesson on Advanced Blocks
* 30 minutes: Practice with Scratch Coding
* 5 minutes: Exit Ticket

**Grouping of students for instruction:**

Students will ideally have their own computer, but if not, you can pair students with mixed ability levels. OPTION: Let students “self-select” out of the mini-lesson if they have prior experience with Scratch; they can independently code during that time (i.e. start the “practice session” early).

**Understanding the Problem**

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| **Teacher** | **Student** |
| Introduce the concept of “If \_\_\_, then \_\_\_\_” statements. Demonstrate the conditional and sensing programming Scratch blocks. | Complete an “If, then” flowchart. |

1. Review common blocks from Lesson 3: Scratch Introduction.
2. Introduce the concept of process flow maps (“If \_\_\_, then \_\_\_\_” statements).
3. Introduce conditional programming and sensing blocks using the following video: <https://www.youtube.com/watch?v=miVAZKzToqU> (6:31 minutes).

**Exploring the Problem**

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| **Teacher** | **Student** |
| Support students as they explore advanced blocks within the Scratch programming language | Demonstrate their ability to use conditional and sending programming Scratch blocks. |

1. Release students to computers to complete the assigned Conditional and Sensing Blocks Scratch Project.
2. Administer Exit Ticket-Student Self-Assessment of the Conditional and Sensing Blocks Scratch Project.
3. Review Student Scratch Programs. Reteach this lesson if needed before teaching the next Scratch lesson (Lesson 7).

**Accommodations:** If needed, you can partner students to work with one computer in order to support learning.

**Extensions:** Students who have prior knowledge of Scratch/movement blocks will be exempt for the mini-lesson so they can use that time to independently develop their programming skills. Those students will have a differentiated Exit Ticket which will require them to move two sprites.

**Assessment:**

Exit Ticket-Student Self-Assessment of the Conditional and Sensing Blocks Scratch Project

Standard: Finish all steps in the Conditional and Sensing Blocks Scratch Project

Extension Group: Demonstrate that they met their individually set goal

**References/Resources:**

N/A