**Function Builder**

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**OVERVIEW:**

**Prerequisite Skills:**

* **Be able to apply the distributive property**
* **Divided rectangles**
* **Combining like terms**

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**Learning Goal:** Students will use the Function Builder sim to predict rules for one, two, and three step functions.

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**Common Core Standards:**

* **CCSS.MATH.CONTENT.8.F.A.1**: Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
* **CCSS.MATH.CONTENT.8.F.A.2**: Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

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**Materials:**

* **PhET  *Function Builder* simulation**
* [**https://phet.colorado.edu/sims/html/function-builder/latest/function-builder\_en.html**](https://phet.colorado.edu/sims/html/function-builder/latest/function-builder_en.html)
* **Activity Sheet(s)**
* **Device**

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**Estimated Time: 1 Day - 45 minutes**

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**Warmup:**

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| **Teacher Will . . . . .** | **Students Will . . . . .** | **Time** |
| Post questions, take attendance | Develop definitions for the following vocabulary words:   * Function * Input / Output * Linear relationship | 5 minutes |

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**Simulation Introduction: Open play / Exploration**

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| **Teacher Will . . . . .** | **Students Will . . . . .** | **Time** |
| Circulate around classroom listening in on conversations, asking clarifying questions. | Openly explore sim - working through steps explore and play with two options of the Function Builder Simulation:  **NUMBERS & EQUATIONS**  **(See page 1 of activity sheet)** | 15 minutes |

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| Ask for volunteers / Choose students to share (use random name picker app) | Share discoveries (project and explain findings) | 5 minutes |

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**Guided Exploration:**

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| **Teacher Will . . . . .** | **Students Will . . . . .** | **Time** |
| Circulate throughout the classroom, asking students for clarification / explanation of work. Encouraging students to “hold that thought” - and “be ready to share with the class” | Work with table partners on Activity Sheet #1, problems 1-4. | 10 minutes |

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**Discussion and Summary:**

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| **Teacher Will . . . . .** | **Students Will . . . . .** | **Time** |
| Facilitate switch and identify timekeeper | Switch tables - discuss answers with new table group. | 5 minutes |

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**Informal Assessment:**

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| **Teacher Will . . . . .** | **Students Will . . . . .** | **Time** |
|  | Write 3 questions in your journal that you have about today’s lesson. What would you like to know? What worked well? What did you struggle with? | 5 minutes |

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**Going Forward:**

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| **Teacher Will . . . . .** | **Students Will . . . . .** | **Time** |
| N/A | Complete question #6-8 & bonus for homework. | N/A |