Interpreting Linear Functions with Programming:

a. Use AgentCubes to tell a story and program it according to that story.
   i. Ex: Jimmy the Butterfly is trying to reach his favorite petunia bush. However, he first has to journey from his current location in the shrubs to the bush. He first flies rapidly in a direction where he encounters a forest on a mountaintop. He has to slow down to dodge trees. He then makes it out of the forest to where he stops to smell the flowers (not the ones he wants though!) He then sees his favorite petunia bush and races to it!

b. Make a corresponding graph that models that story.

Ex: **Jimmy’s Journey**

![Graph of Jimmy's Journey]

C. Interpret the slopes of parts A (in red), B (in blue) and C (in green) of your graph. Make sure to label your x and y axis with whatever units you think make sense!
   i. What are the slopes of line segments A, B and C?
   ii. Write linear equations that could model each of the three line segments A, B, C.
   iii. Describe an appropriate domain for each of the linear equations you wrote in part ii.
Part 2:
    a. Monica is on a mountain bike ride. The graph above shows her mapping the
distance of her trip and the elevation she gained during the ride. Design another
graph that showing how the speed might change over the course of the nine
miles.
    ● Think about what your x and y units will be.
      i. X will be distance in miles
      ii. Y will be miles per hour.
    ● Make sure to describe appropriate domains for each part of your story.
      i. During the first two miles, I am hold
B. Program a story in AgentCubes associated with your graph.
    ● Include agents that fit the characters and objects of your story.

    Related Activities: Interpreting Linear Functions:

Part 1:
    a. Interpret the slopes of parts A, B and C. Make sure to label your x and y axis with
whatever units you think make sense!
      iv. What are the slopes of line segments A, B and C?
v. Write linear equations that could model each of the three line segments A, B, C.
vi. Describe an appropriate domain for each of the linear equations you wrote in part ii.
vii. Include a table of values for your function.
b. Write a story that could be represented by this graph.
i. Ex: Sally is 16 today! Her dad takes her to test drive a brand new red convertible. At a stoplight, Sally quickly accelerates to 100 miles per hour and maintains that speed for a while to the horror of her father! She sees the dealership in sight and skids to a halt. Dad decides that Sally is not ready for a new car.
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<th></th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>6.5</th>
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<tbody>
<tr>
<td><strong>Functions and</strong></td>
<td>Data is accurately modeled by linear functions</td>
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<td>Uses at least three linear functions for each graph.</td>
<td>Uses at least two linear functions</td>
<td>Only uses one linear function</td>
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<td><strong>Mathematical</strong></td>
<td>Appropriate domain specified for each linear function</td>
<td>Appropriate domain specified for most linear functions</td>
<td>Some errors in modeling data</td>
<td>Several modeling errors</td>
<td>Inaccurate modeling of data</td>
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<td><strong>Accuracy</strong></td>
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<td>Appropriate domain specified for some linear functions</td>
<td>Appropriate domain specified for one linear function</td>
<td>No domain specified for any functions</td>
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|                      | All material is clearly presented with colored graphs, organized linear functions, written stories, and a neat table. | All material is clearly presented with graphs, linear functions, written stories, and a table. | Most material is presented with: graphs, linear functions, written stories, and a table. | Some material is presented with graphs, a table, functions and written stories. | Material is not presented clearly |
| **Clarity and**     | Creative and original story topics | Creative and original story topics | Topics have some originality and creativity | Topics lack originality and creativity | Topics lack originality and creativity |
| **Creativity**      |                           |                             |                             |                           |                             |

**Part 2:**

Work in Agent Cubes and design a function that represents a real life problem or story.

- Think about what your x and y units will be.
- Make sure to describe appropriate domains for each part of your story.
- Write the functions that could model each part of your function.
- Include a table of values for your function.
- Write the story associated with your function.
- Include agents that fit the characters and objects of your story.
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