Simcalc Activity Worksheet

We'll be using GSP to make graphs of the functions.

1. If a fish travels at 4 meters per second for one second, how far does he go?
If he travels 4 meters per second hour for 8 seconds how far does he go?
Can you make a graph of the fish's speed over time? (Not his distance traveled)

2. What if traveled at miles per hour 2 m/s the first 4 seconds, then 6 m/s for the next four seconds? How far did he go? (Whoa! An instantaneous jump in speed!)

Can you graph the fish's speed over time? (Remember the Simcalc's ability to work with piecewise functions! How could the table of values to the right of the graph be helpful for this?)

3. What if he travels at .5 m/s the first second, and increases his pace by one meter per second each second, so that his 2nd second he goes 1.5 m/s and his third he goes 2.5 m/s and so on for a total of 8 seconds? Can you show a speed graph for this fish? For this question, students should reflect and speculate on the answer and what the graph would look like before using simcalc.

4. (Bonus question) What if his speed increases at a constant rate from zero to 8 m/s over the eight seconds. What would we expect to be the behavior of the graph? Intuitive arguments are okay!

For the following questions we will be exploring the *distance* graphs for the fish.

5. SimCalc gives the distance graph for when the fish travels 4 meters per second over 8 seconds. What is it? What domain and what is the range of this graph?

Simcalc allows you to create a piecewise function. You simply make the green fish's domain end where the blue fish's domain begins!

6. Can you use Simcalc to create a piecewise distance graph for a fishy that travels at 2 m/s for 4 seconds and then 6 m/s for the next four seconds? (How might the table of values on the right be helpful for this?)

7. What if he travels at .5 m/s the first second, and increases his pace by one meter per second each second, so that his 2nd second he goes 1.5 m/s and his third he goes 2.5 m/s and so on for a total of 8 seconds? Can you show the distance graph for this fish? What shape does this graph look like?

   Can you develop the piecewise equation for this graph? What pattern(s) do you see in the relations that make up the piecewise equation?

8. (Bonus question) Based on the last question and your own intuition, what do you think the distance graph would look like for a fish that increased in speed linearly over 8 seconds, from zero m/s to 8m/s?