**Fathom Activity Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Modeling Quadratic Functions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Using your computers, open Fathom2 from your dock. If you are unable to locate it, please look in your applications. Also, please check your battery life. If you are low, I do have chargers, but remember I have a limited number of chargers, so we will have to share.

**Exercise:**

|  |  |
| --- | --- |
| Time (seconds) | Distance (feet) |
| 0 | 50 |
| 2 | 15 |
| 4 | -5 |
| 6 | 2 |

A professional diver is standing on a diving board 50 feet in the air. As the diver jumps, a judge records the diver’s distance to the water every two seconds. The data that the judge collected is shown in the table.

1. Click on “Collection” in the tool bar. Drag down a Collection into the white space.
2. Click on the Collection Box so that it is highlighted, then click on “Table” in the tool bar and drag down a table.
3. Click on the table so it is highlighted, then click on “Graph” in the tool bar and drag down a graph.
4. In the Table, label the independent and dependent quantities from the table above. Enter all the data from the table above into your table in Fathom.
5. Click on the heading “Time” in the table and drag and drop it to the independent axis on the graph, where it says “Drop an attribute here”.
6. Click on the heading “Distance” in the table and drag it to the dependent axis on the graph, where it says “Drop an attribute here.”
7. Analyze the graph you have created. Using complete sentences, describe the graph.
8. Using complete sentences explain what the negative distance value represents in the context of this problem.
9. Click on “Slider” in the tool bar. Drag down a Slider and change the label from V1 to a.
10. Click on “Slider” in the tool bar. Drag down a Slider and change the label from V1 to b.
11. Click on “Slider” in the tool bar. Drag down a Slider and change the label from V1 to c.
12. Click on the graph you have created and then click on “Graph” at the top of your screen. Go down to “Plot Function”. In the box that appears, enter a (Time + b)2 + c, then click “Apply” and “OK”.
13. Manipulate the sliders until you have a model that best fits the data.
14. What does moving the slider labeled “a” do to the function?
15. What does moving the slider labeled “b” do to the function?
16. What does moving the slider labeled “c” do to the function?
17. Write the quadratic model for the data. Distance = \_\_\_\_\_ (Time + \_\_\_\_\_ )2 + \_\_\_\_\_

1. Using the model you created, or the graph, predict the divers distance to the water after one second. In complete sentences, justify your reasoning for your conclusion.
2. Predict the time in which the diver first enters the water and justify your response using complete sentences.
3. Predict the time in which the diver resurfaces and justify your response using complete sentences.
4. Using the model, are you able to calculate the lowest depth that the diver reaches? If so, what would this depth be? Justify your response using complete sentences.

1. Using the model, calculate the divers distance after nine seconds. Is this a possible distance? Explain your thoughts using complete sentences.
2. Save your Fathom file as Diver\_YourLastNamePartnerLastName on your desktop then AirDrop the file to me.