

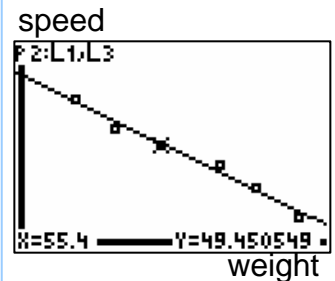
The Science of Racing Time Laps

Activity 1: Time Laps additional assessment



Assessment:

- What is velocity? How did you calculate velocity or speed?
- What happens if you make the car ridiculously heavy?
- What happens when there are NO weights on the car?
- What is represented by numbers on the X axis? Y axis?
- What story is being told by this data?
- How will you decide the optimal weight?
- What is your understanding of a math model and how might it help you to be able to create these models?



```
Plot1 2102 Plot3
\Y1 = -.6186652785
9025X+84.7290682
42766
\Y2 =
\Y3 =
\Y4 =
```

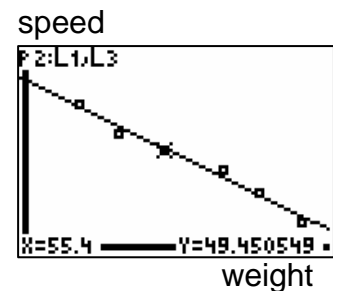
The Science of Racing Time Laps

Activity 1: Time Laps additional assessment Key



Assessment:

- What is velocity? How did you calculate velocity or speed?
 - *Velocity=Speed in some direction.*
 - *Speed = Distance traveled in some amount of time or speed = d / t*
- What happens if you make the car ridiculously heavy?
 - *Speed goes to 0 since the car does not move*
- What happens when there are NO weights on the car?
 - *If the car will move in a straight line the time is small and speed is large.*
 - *On many surfaces, time is huge because the car does not travel in a straight line due to lack of traction between the wheels and the floor. Adding a bit of weight onto the front makes the front wheels steer and the car arrive at the finish line faster.*
- What is represented by numbers on the X axis? Y axis?
 - *X is weight of the vehicle with added weights attached*
 - *Y is the speed of the vehicle*
- What story is being told by this data?
 - *As weight increases, speed decreases and Time increases.*
 - *Quantitatively you can draw a best fit line (a linear regression) through the points, calculate its linear equation that describes the line and use this equation as an explanation of the relationship between speed and weight for this vehicle on this surface.*
- What is your understanding of a math model and how might it help you to be able to create these models?
 - *By creating a math model in the form of a graph, you can predict the speed of objects you have not yet tested.*



```
P1ot1  P1ot2  P1ot3
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9025X+84.7290682
4.2766
\Y2 =
\Y3 =
\Y4 =
```