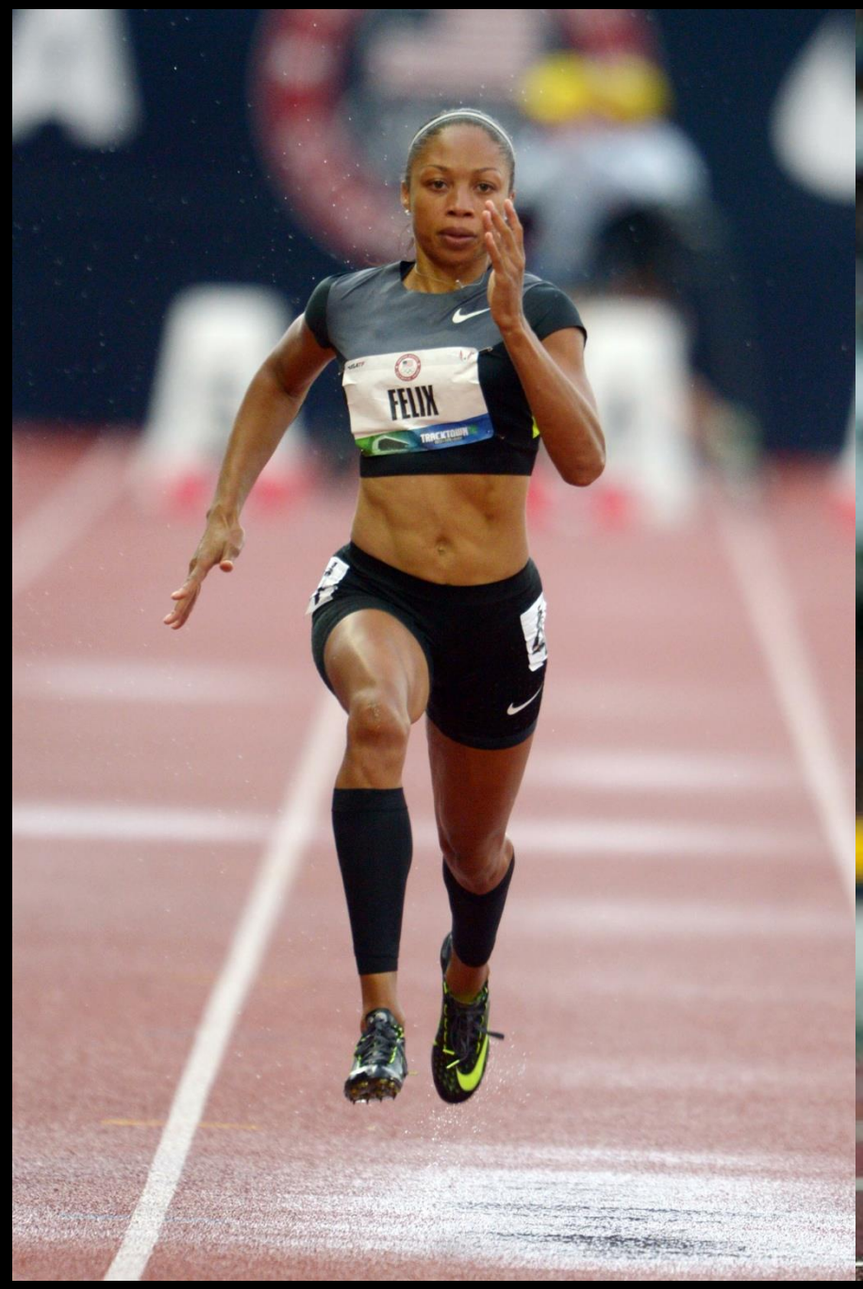
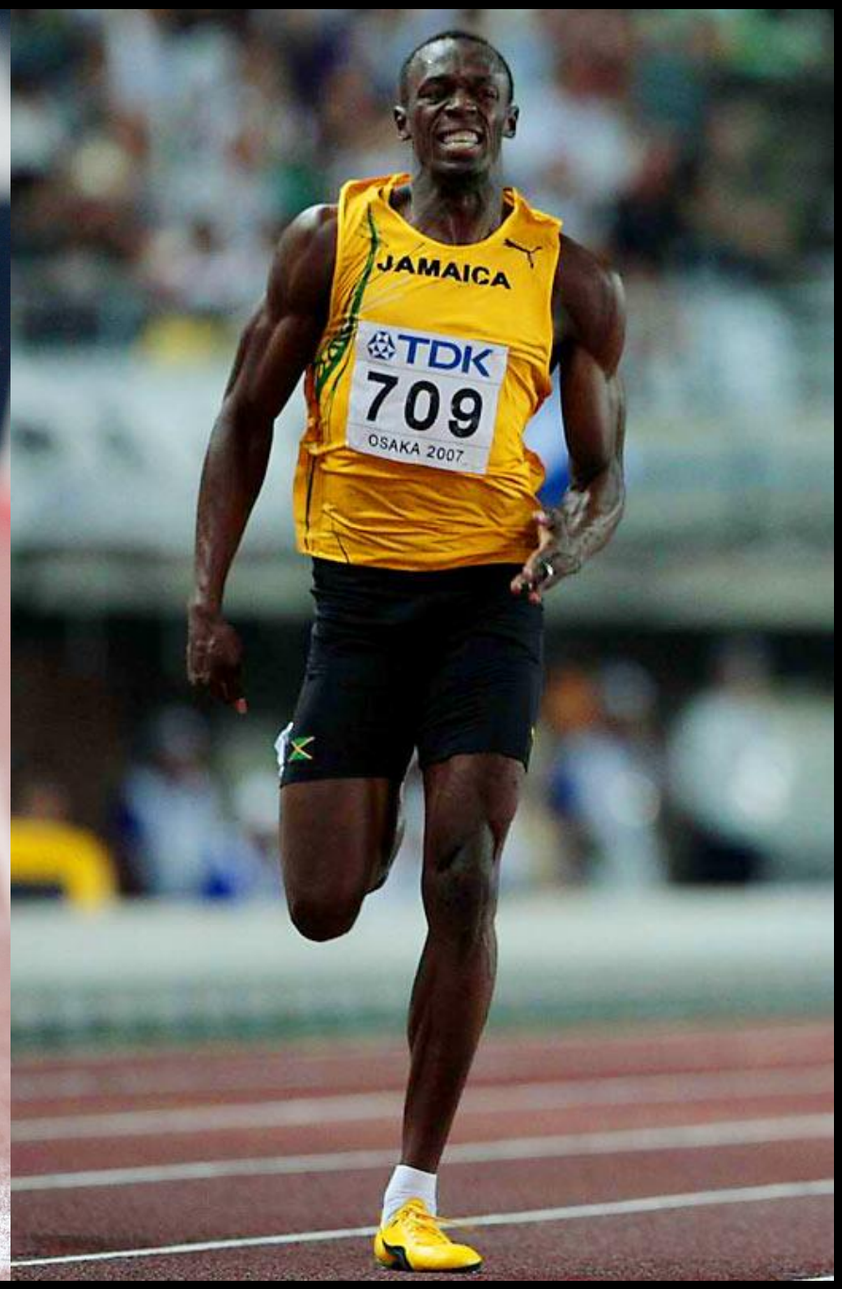
Run / Walk - Speed Lab





Drexel STEM GK-12 Program

David Rosen

Problem:

How can we figure out the speed of an Olympic athlete (or you) if we don’t have a radar gun?

When else might we want to know the speed of an object?

Usually, only the times are reported for races.

Example:
Usain Bolt ran the 100 meter dash in 9.58 seconds
(currently the world record)

Goal:

In this activity, we are going to learn how to calculate and graph your running speed, given the *distance* and *time*.

We can even compare your speed to Usain Bolt's (*9.58 seconds*) or even a cheetah's (5.95 seconds) time in the 100 meter dash.

Formulas:

Speed = Distance / Time

Can you figure out the formulas for distance and time?

Distance = Speed x Time

Time = Distance / Speed

Practice:

The video said that it took Usain Bolt 9.58 seconds and a cheetah 5.95 seconds to run the 100 meter dash.

Text

What was their speed in meters per second (m/s)?

Usain Bolt:

Speed = Distance / Time

Speed = 100 meters / 9.58 sec.

Speed = 10.44 m/s

Cheetah:

Speed = Distance / Time

Speed = 100 meters / 5.95 sec.

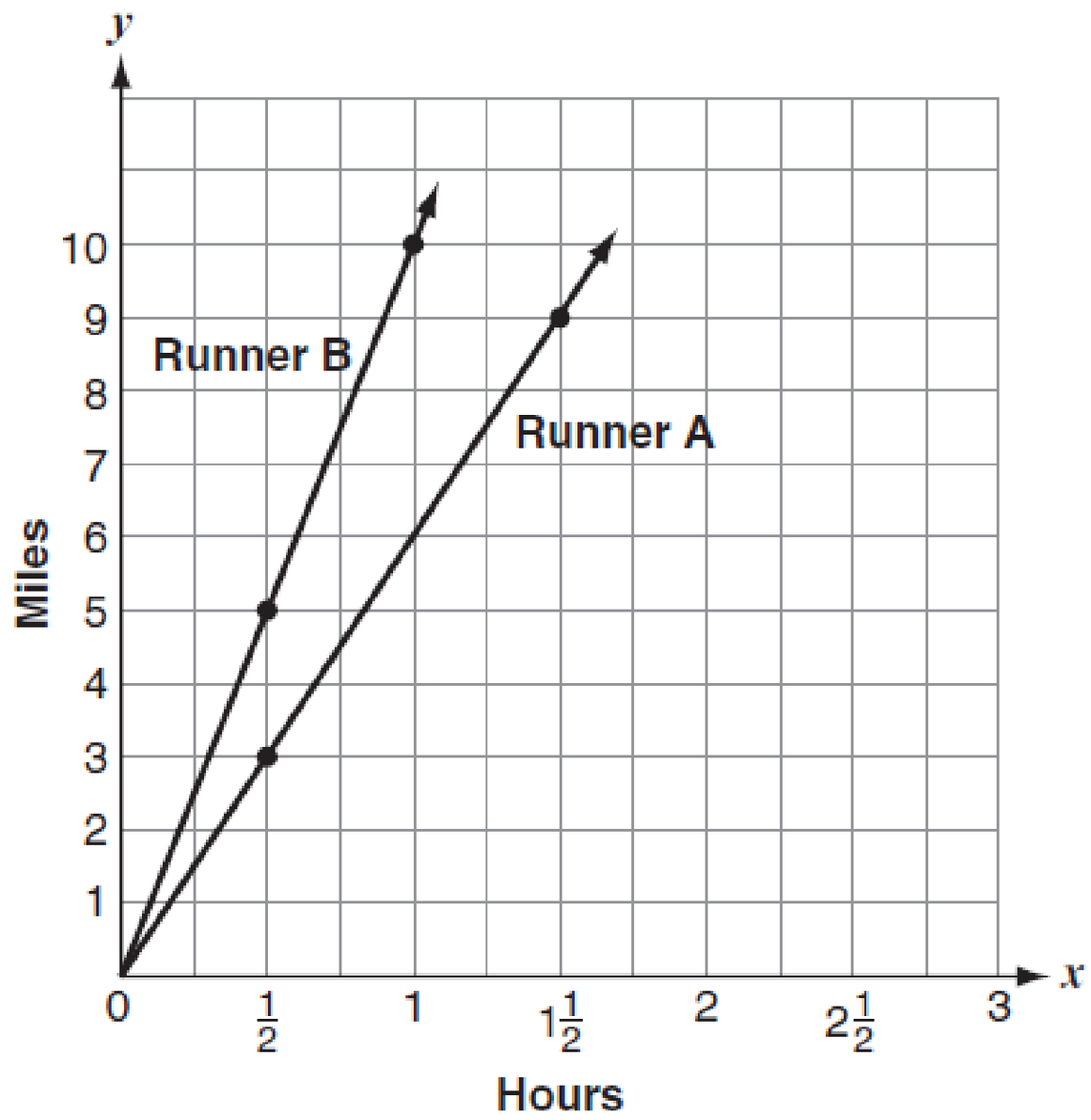
Speed = 16.81 m/s

Graphing:

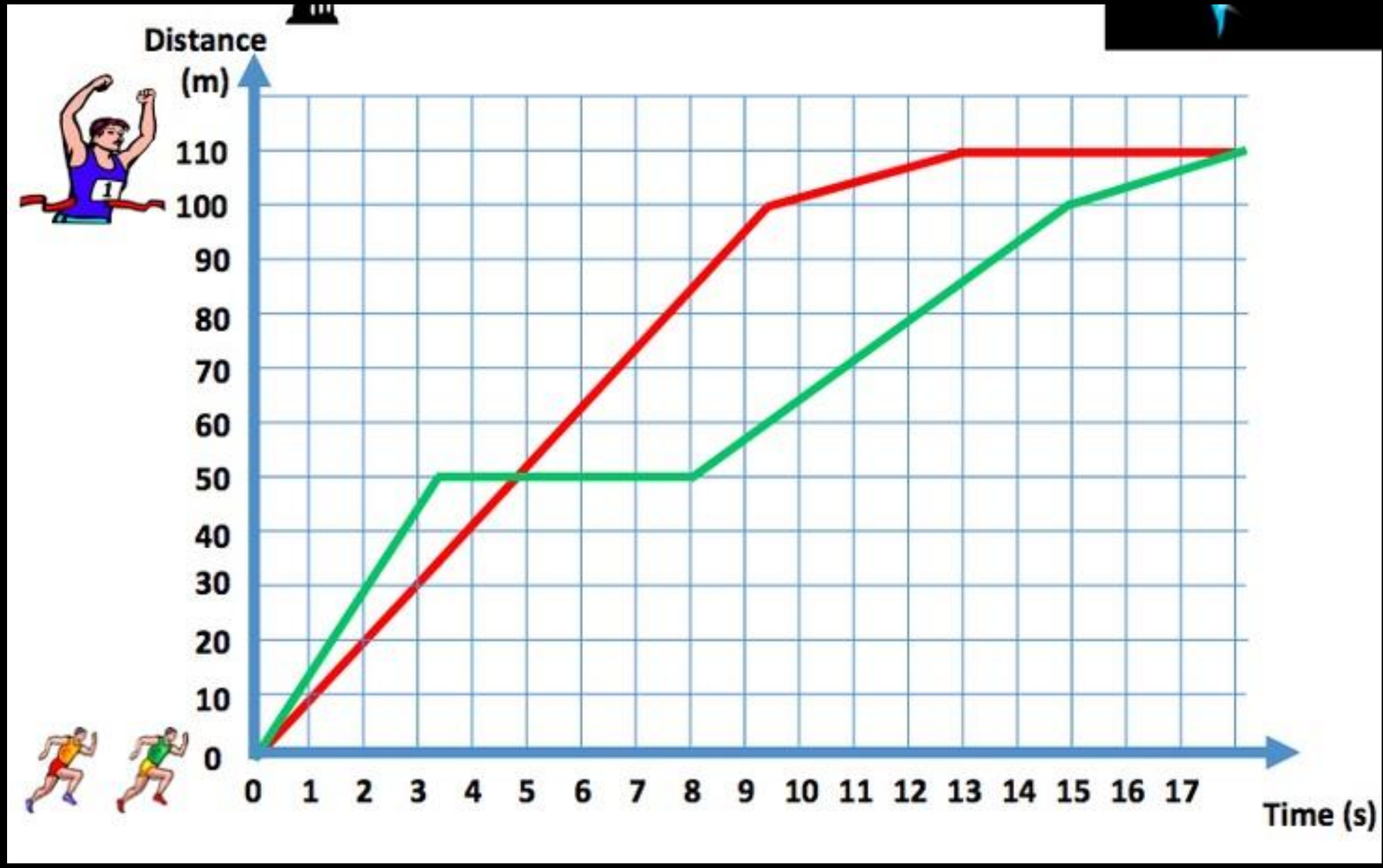
Which runner is faster? Why?

How long does it take Runner B to run 10 miles?

About how long will it take Runner A to run 10 miles?



***The steeper the slope of the line, the faster the runner is.*



If we collect more times and distances than the start and finish, we can make a more accurate graph.

When is green winning? When is red winning? When are the tied?

Activity:

Students will choose partners and time one another in the 100 meter dash.

Each student will run, walk, and choose a different mode of travel.

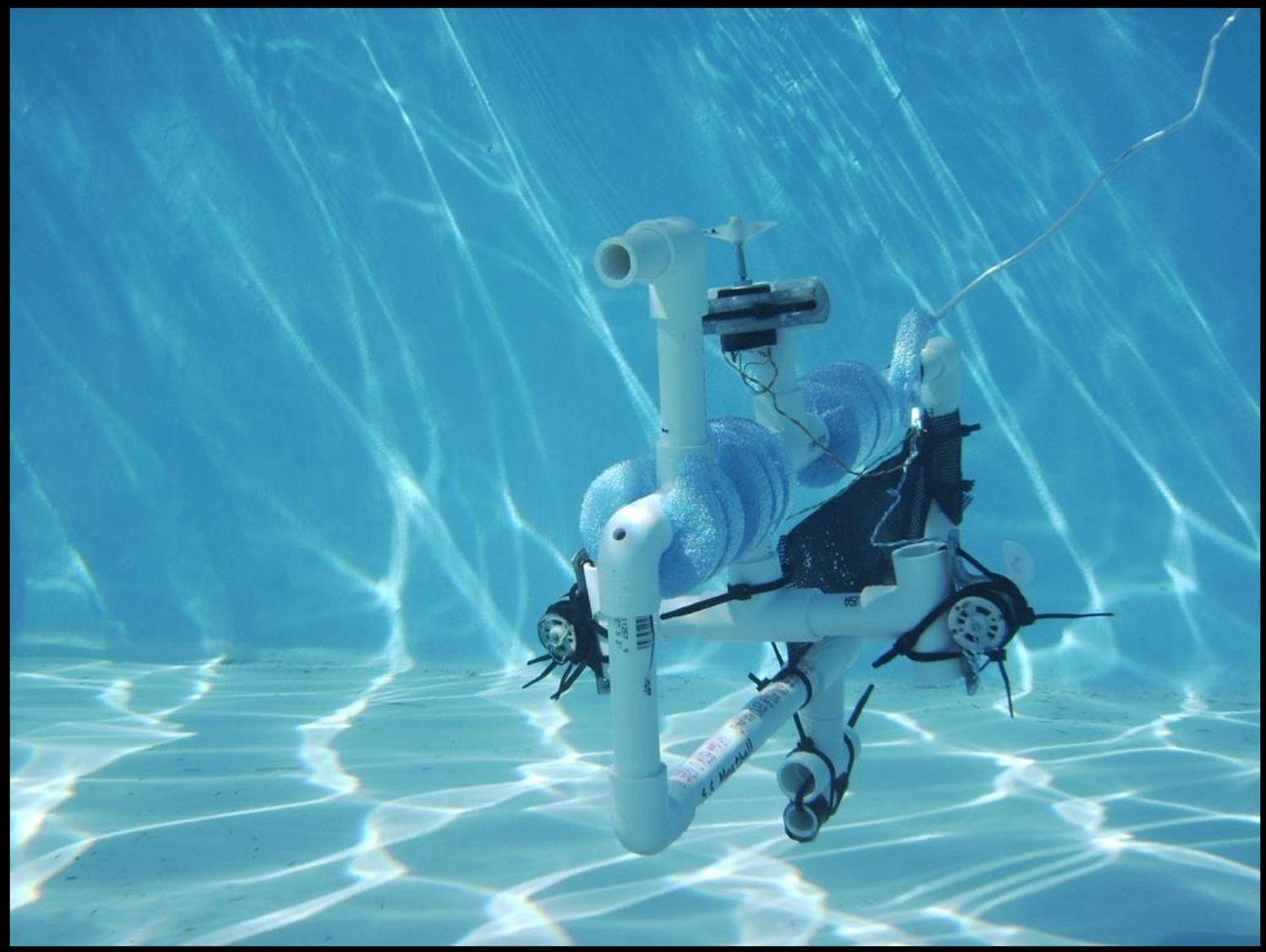
Your partner will time each trial (3 trials for each mode of travel)

Complete “Run-Walk Speed Lab” Activity Sheet

Connections - Seaperch: Underwater Robotics Competition

Why might it be important to know the speed of your SeaPerch?

In the next part of this lab, you will used what you learned to figure out your SeaPerch's speed.



Vocabulary:

Speed: how fast something travels (miles / hour, meters/ sec., etc.)
Distance: how far something travels (meters, miles, feet, etc)
Time: how long it takes
Slope of a line: the direction and steepness of a line
Mean / Average: the average; add up values and divide by the number of values (ex: 5 + 4 + 3 + 4 =16 and 16 / 4 = 4)
Formula: a way to express information in math or science
x-axis: the horizontal (bottom) part of a graph
y-axis: the vertical (side) part of a graph
Constant: staying the same, unchanging