How fast am I?

Ever wanted to know how fast you actually can run? Ever wondered how your running speed compares to a turtle, an orangutan or a squirrel? This is your chance to find out! All you need is access to google maps and a stopwatch!

What is speed?
Speed is, at its simplest, how far you can go in a period of time. If you think about speed limits in cars, those are given in Km/h, or how many kilometers the car can travel in one hour. Another way of measuring speed is how many meters you can go in a second.

Speed vs. Velocity
If you don't like science, skip this section! Maybe you've heard the word velocity used before to describe how fast something is going. Maybe someone told you that velocity is just a science-y word for speed. I'm here to tell you that velocity and speed are related concepts, but they actually mean different things! Velocity is what scientists call a **"Vector Quantity,"** or a quantity that has both **magnitude** (how big it is or how fast it goes) and a **direction** (what way it's going). If you are running in a straight line, you could say your speed is 4 m/s, but you would have to say your velocity is 4 m/s [forward] or +4 m/s. What's more, if you run somewhere, and end up in the same place you started, no matter how fast you ran, your average velocity is going to be 0, because you are in the same position as you started!

Enough talk! Let's do the experiment already!

Materials:
-A place to run
-A way to measure (I recommend google maps)
-A way to time (a watch, stopwatch or phone will work great!)
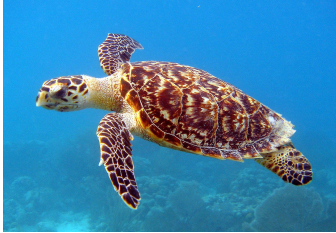-A calculator (a phone or computer works too!)

Procedure
1. First, find a place to run. I recommend starting with a distance between 50 m and 100 m. Go to a sidewalk that isn't very busy, or a nearby park. Use 2 markers, like a tree or a crack in the sidewalk so you know where to start and stop.

2. Second, measure the distance between the start and the finish. The easiest way to measure this is using google maps. Find your starting point on the map, then right click and select "measure distance" at the bottom of the popup menu. Then, click on your end point. This will tell you exactly how far you are going to run. Make sure this is in meters, not kilometers. If it's in kilometers, you need to multiply it by 1000. Don't forget to write this down!

3. Next, you run! You can time yourself, or get a friend or parent to time for you. Start the time when you start running, and stop it when you get to the finish line. Make sure the time is in seconds. If it's in minutes, you need to multiply it by 60. Don't forget to write this down as well!

4. Now, for some maths. I promise, it isn't hard, and you get to use a calculator. The formula is speed is equal to the distance divided by the time, or $V = \Delta d/t$. Translation: divide the distance you ran by the time. Type the distance number into your calculator, press the division sign ($\div$ or /), type in the time number and press the equals sign (=). And that will give you your speed!

5. Now that you know your speed, you use the chart below to compare how fast you ran to various animals. Could you outrun a cockroach? How about a turtle? For an extra challenge, try doing this a few times, and see how your speeds change. Do you run slower if you run a longer distance? What about if you do it a few times in a row, or run up or down a hill? What if you rollerblade, bike or scooter?

Bonus:
If you want to convert your speed to kilometers/hour, all you need to do is multiply it by 3.6! (Did you break the speed limit in the place where you ran?)

Table 1: Animal speeds!

Animal	Picture	Speed
Snail		0.01 m/s
Turtle		0.4 m/s
Cockroach		1.5 m/s
Orangutan		1.7 m/s
Squirrel		9 m/s