

## Station 3 – Speed Measurement – Bonus

### From Time to Speed

Who remembers the formula for speed from physics class?

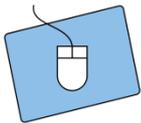
**Speed** = \_\_\_\_\_

To calculate speed from time you need the distance, which has been covered. Of course, you can measure it. Or, you can make use of the fact, that the contact distance on the breadboard is standardized with exactly 2.54 mm. From the distance, and the time, you can then calculate the speed.

### Float Variables

So far, you only know variable types, which can store integers. However, if you divide two integers, the result is often a decimal number. To be able to store the result anyway, you can use a `float` variable. This stands for floating point number. For example, a division could look like this:

```
float variable = variable1/number1 / variable2/number2;
```



1. Measure or calculate the distance between your two light barriers, and note it. Make sure to specify the distance in millimeters.  
distance: \_\_\_\_\_ mm
2. Declare a `float` variable to store speed.
3. From your measured values, you can calculate the speed by using the given formula. Extend your sketch accordingly.  
**speed = distance / time**
4. Done? Wonderful! Now, you have output the speed in millimeters per millisecond or meters per second.  
**Hint:** 1000 mm = 1 m and 1000 ms = 1 s.
5. The conversion into a meaningful unit is still missing. For the speed, you normally use the unit kilometer per hour (km/h). How can you convert your result to this unit, if 1 mm/ms (= 1 m/s) corresponds exactly to 3.6 km/h?  
**Hint:** In your program, you have to enter the decimal number as 3.6.



*Once you have done this, you are pros in measuring speed. Congratulations! Have fun with your next projects!*

### List of references:

 ,  – Source: InfoSphere