

# Derby Racer Time Trial

Collect data

1. How far does your derby racer go?  $\rightarrow$  displacement
2. How long is it moving?  $\rightarrow$  time

Just  
the  
ramp

Trial	Displacement	Time	$v$
1	2.5 m	1.6 s	$\frac{2.5}{1.6}$
2	2.5 m	1.9 s	$\frac{2.5}{1.9}$
3	1.3 m	1.4 s	$\frac{2.5}{1.4}$
4	1.2 m	0.8 s	$\frac{2.5}{0.8}$
5	0.81 m	0.9 s	$\frac{2.5}{0.9}$

$$\bar{v} = \frac{d}{t}$$

$$\bar{v} = \frac{v_0 + v}{2}$$

(when a is constant)

$$\frac{v_0 + v}{2} = \frac{d}{t}$$

$$\frac{v}{2} = \frac{d}{t}$$

$$\boxed{v = \frac{2d}{t}}$$

## Tasks for today:

1. Get code approved
2. Get drawing approved
3. Wire up & test Arduino
4. Set up Arduino with vehicle
5. Collect time trial data
6. Complete write up (web site)