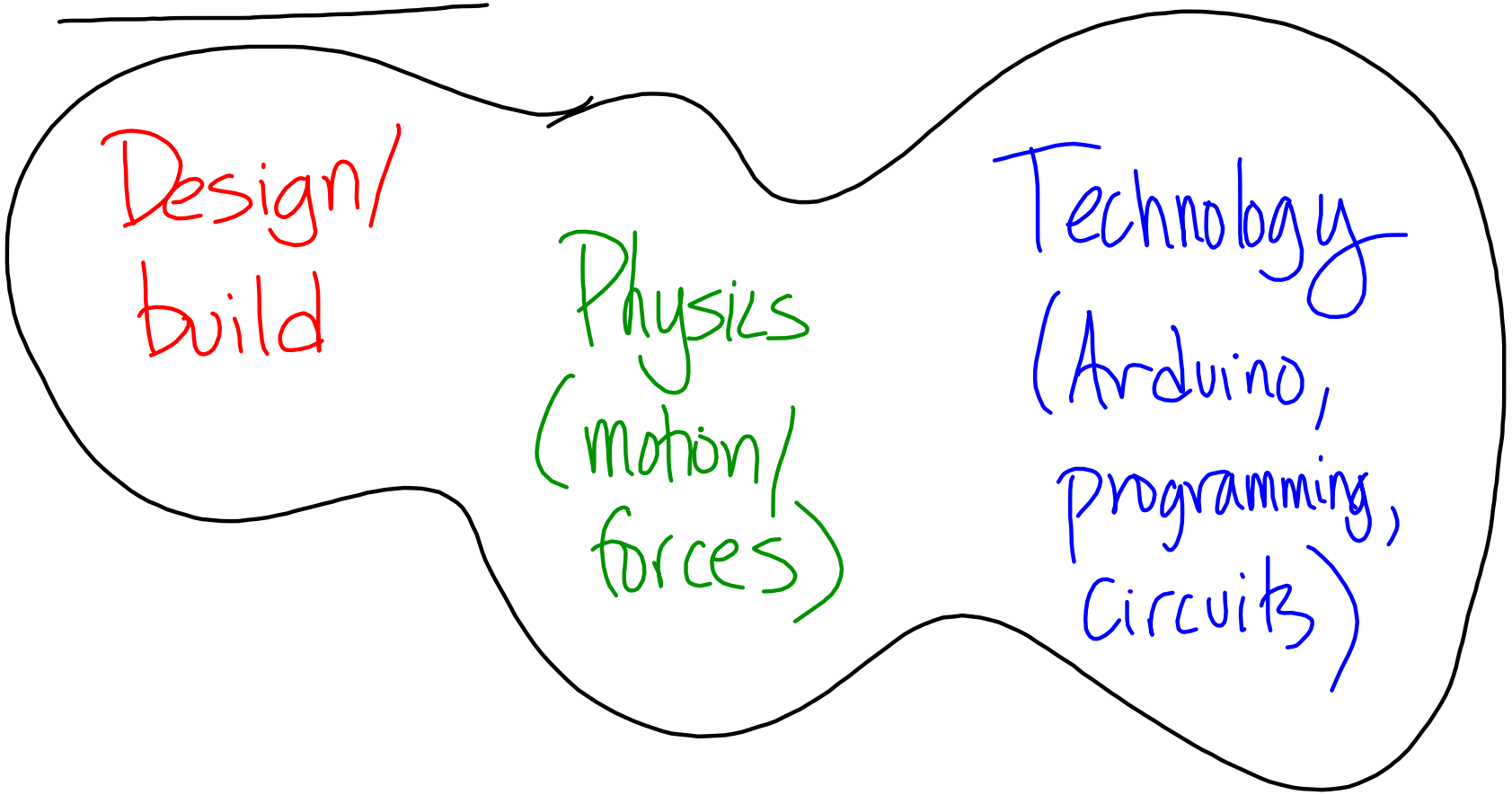
Overview:


Design/
build
Physics
(motion/
forces)
Technology
(Arduino,
programming,
circuits)

Basics of motion:

How far?

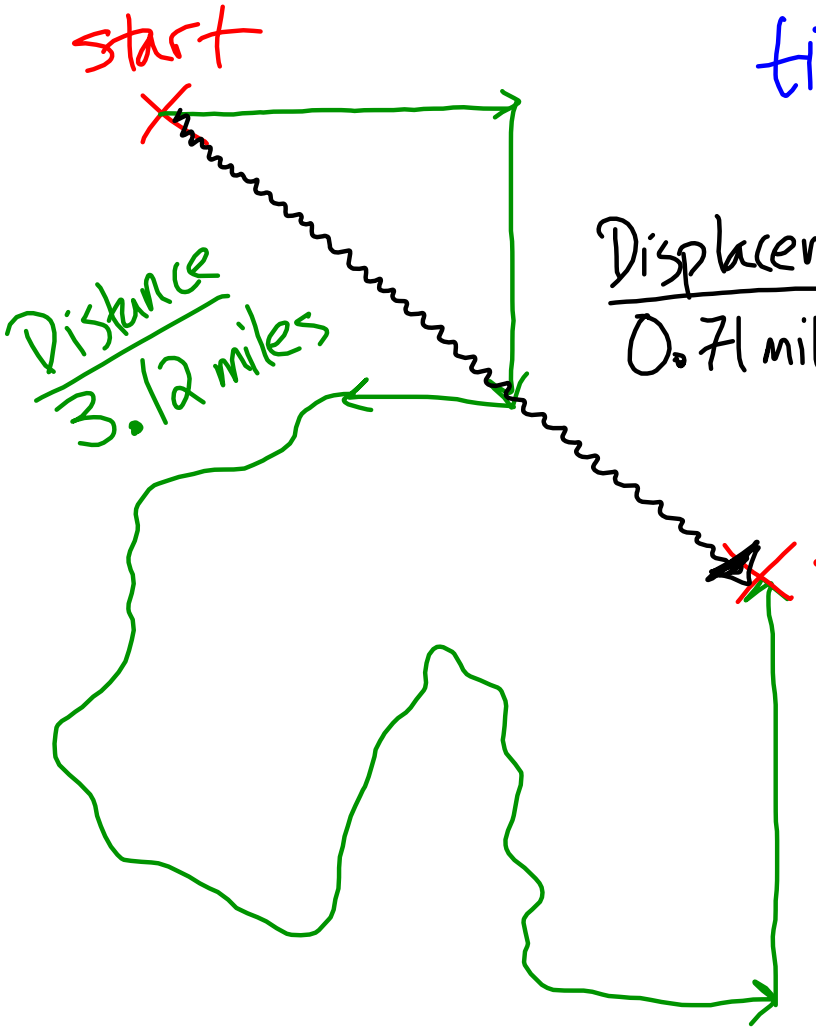
Distance: length of the path of a moving object

Displacement: How far an object has moved from a starting point - and in what direction

How fast?

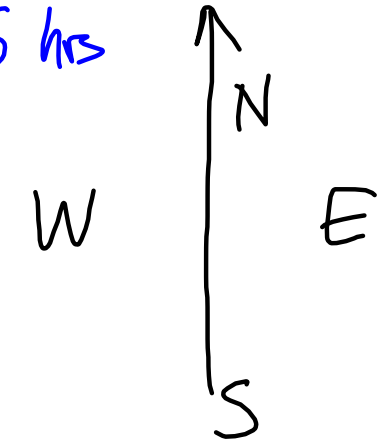
Speed: how far an object travels (distance) in a certain time

Velocity: an object's displacement in a certain amount of time - includes direction



time = $1\frac{3}{4} = 1.75$ hrs

Displacement:
0.71 miles SE



Speed: $\frac{3.12 \text{ miles}}{1.75 \text{ hrs}}$

$= 1.78 \frac{\text{miles}}{\text{hr}}$

Velocity: $\frac{0.71 \text{ miles SE}}{1.75 \text{ hrs}}$

$= 0.41 \frac{\text{miles}}{\text{hr}}$ SE

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$s = \frac{d}{t} \quad \text{(no direction)}$$

$$\text{Velocity} = \frac{\text{displacement}}{\text{time}}$$

$$v = \frac{d}{t} \quad \text{(include direction)}$$

For our next project, you'll be designing & building a gravity-powered racecar.

- It will hold an Arduino that you will program
- You'll make measurements and calculations to find displacement, velocity, and acceleration