DERBY RACER

Design/build:

- Gravity powered car
- Go down a ramp
- Carry an Arduino

Science:

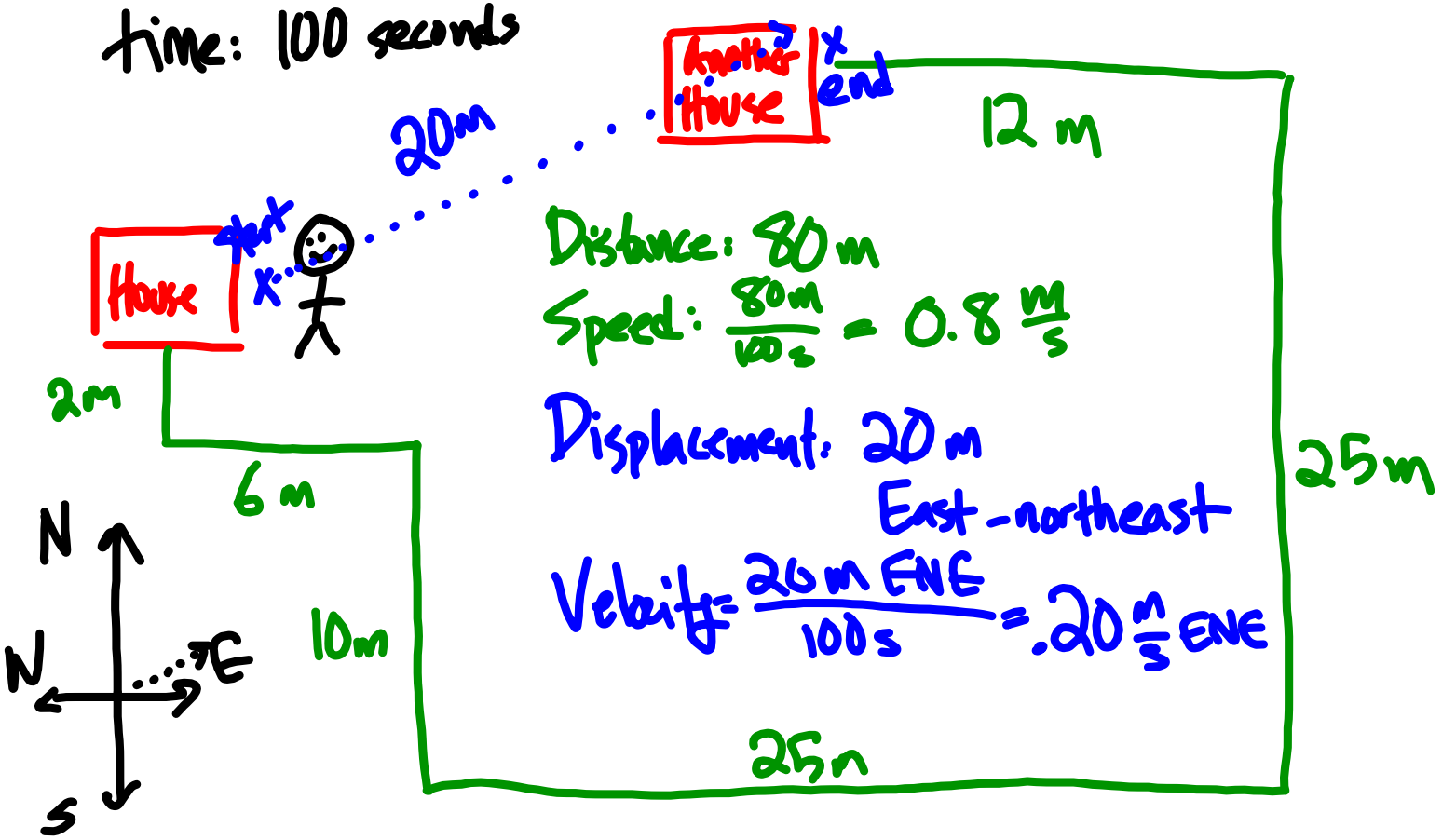
- Physics of motion
- Distance/displacement
- Speed/velocity
- Acceleration

Technology:

- Arduino
- Blinking lights (LEDs)
- Synchronized with motion of your racer

Physics of Motion:

- Distance: How far something has moved (the length of an object's path of travel). Typically measured in meters (~3 feet).
- Displacement: The length between where an object starts and where it ends. Includes direction (like North, South, 47°, left, up).


time: 100 seconds
Another House
end
20m
12 m
House
start
2m
6 m
10m
25m
25m
N
N
E
S
Distance: 80 m
Speed: 80m / 100s = 0.8 m/s
Displacement: 20 m
East-northeast
Velocity: 20m ENE / 100s = .20 m/s ENE

Speed: Measures how fast something is going. A rate: how far something goes (distance) in a certain amount of time. Typically measured in meters per second $\left(\frac{m}{s}\right)$.

Velocity: Tells us an object's rate of displacement: how far it moves away from its starting point each second. Includes direction.

Acceleration: How quickly an object's velocity is changing. Includes direction.

Typically measured in metres per second squared $\left(\frac{m}{s^2}\right)$. "Each second, the object's velocity changes by X $\frac{m}{s}$."

- Something speeds up (its velocity gets bigger)
- Something slows down (its velocity gets smaller)
- Something changes direction