

PHYS 210 - General Physics I

- Base Groups
- Motion at a constant acceleration
- Projectiles

Base Groups

- ▶ BGDG: Name one of your heroes/heroines!
- ▶ BGWS
- ▶ RQ



Title:

Biology: Going Beyond the Classroom

Project presentations as part of BIOL 475
Internship in Biology and BIOL 496 Research in Biology

Presenters:

**Ally Schumacher, Katie Bowerman,
and Donald Rader**

Manchester University Biology Majors

Science Seminar

hosted by
Natural and Health Sciences

September 23, 2019

Niswander Department of Biology

4:00 – 5:00 PM

Flory Auditorium (SCIC 203)

EVERYONE is welcome!
ALL MAJORS, ALL YEARS
Snack Provided



Equations for constant acceleration

x or y for distances

$$v_{fx} = v_{ix} + a_x \Delta t$$

$$v_{fy} = v_{iy} + a_y \Delta t$$

$$v_{fx}^2 = v_{ix}^2 + 2a_x \Delta x$$

$$v_{fy}^2 = v_{iy}^2 + 2a_y \Delta y$$

$$x_f = x_i + v_{ix} \Delta t + \frac{1}{2} a_x (\Delta t)^2$$

$$y_f = y_i + v_{iy} \Delta t + \frac{1}{2} a_y (\Delta t)^2$$

$$x_f = x_i + \frac{1}{2} (v_{fx} + v_{ix}) \Delta t$$

$$y_f = y_i + \frac{1}{2} (v_{fy} + v_{iy}) \Delta t$$

$$x_f = x_i + v_{fx} \Delta t - \frac{1}{2} a_x (\Delta t)^2$$

$$y_f = y_i + v_{fy} \Delta t - \frac{1}{2} a_y (\Delta t)^2$$

BUT NOT ALWAYS!

x often for horizontal, y for vertical

You try! Pair up!



<https://www.youtube.com/watch?v=XztU1bhQD7M>

- ▶ Set up and solve:
- ▶ A world's land speed record was set by Colonel John P. Stapp when in March 1954 he rode a rocket-propelled sled that moved along a track at 1020 km/hr (=284 m/s). He and the sled were brought to a stop in 1.4 s. In terms of g , what acceleration did he experience while stopping?



<https://www.youtube.com/watch?v=6fuERphIJk>

Constant acceleration

- ▶ What does it really mean?
- ▶ What if an object is truly in **free fall**?

$$g = 9.8 \text{ m/s}^2, \text{ down}$$

Sign depends on the coordinate system!!

EX: P2.19

- ▶ A student standing on the ground throws a ball straight up. The ball leaves the student's hand with a speed of 15 m/s when the hand is 2.0 m above the ground. How long is the ball in the air before it hits the ground? (The student moves her hand out of the way.)

Go 2 Seminar!

