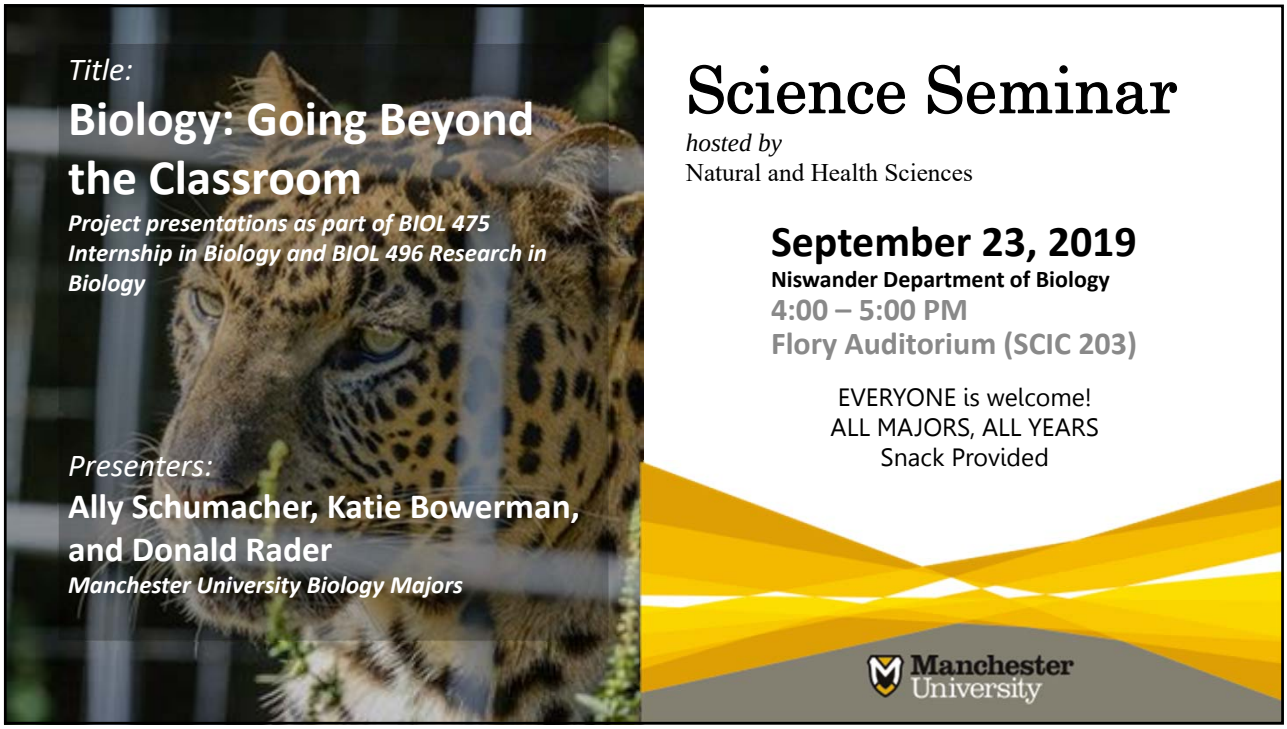
PHYS 210 - General Physics I

- Base Groups
- Motion at a constant acceleration
- Projectiles

Base Groups

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



Equations for constant acceleration

x or y for distances

$$v_{fx} = v_{ix} + a_x \Delta t \qquad v_{fy} = v_{iy} + a_y \Delta t$$

$$v_{fx}^2 = v_{ix}^2 + 2a_x \Delta x \qquad v_{fy}^2 = v_{iy}^2 + 2a_y \Delta y$$

$$x_f = x_i + v_{ix}\Delta t + \frac{1}{2}a_x(\Delta t)^2 \qquad y_f = y_i + v_{iy}\Delta t + \frac{1}{2}a_y(\Delta t)^2$$

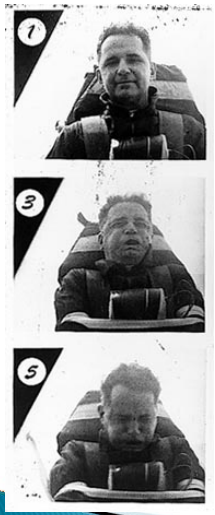
$$x_f = x_i + \frac{1}{2}(v_{fx} + v_{ix})\Delta t \qquad y_f = y_i + \frac{1}{2}(v_{fy} + v_{iy})\Delta t$$

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

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 Pl 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=6fuERphIlJk

Constant acceleration

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

$g = 9.8\ m/s^2$, 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!