NYU Physics 1

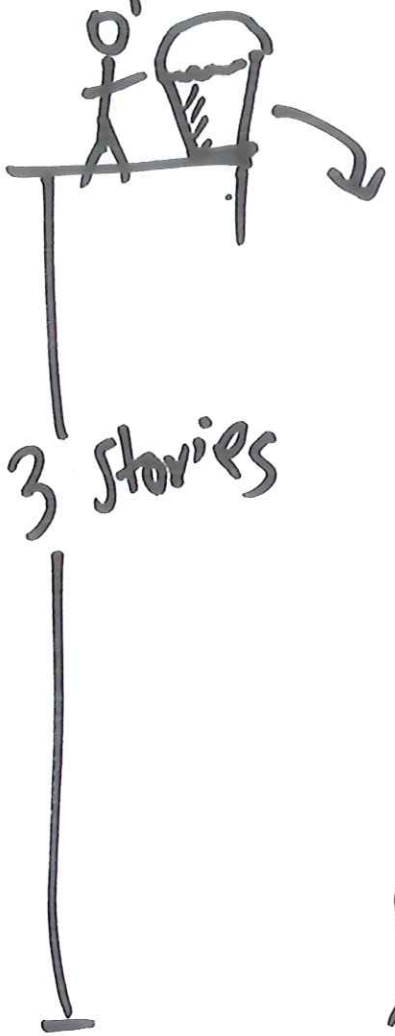
2017-09-05

Agenda:

- Introductions.
- Tutoring.
- Dropped bucket.

David W. Hogg

http://cosmo.nyu.edu/hogg/physics1/



how long does it take to fall?

~ few seconds ! ✓

What matters?

- gravity - $9.8\ ms^{-2}$ - S.I.
- height. ~ 15 m.
- air! ~ 1 $kg\ m^{-3}$
- mass of bucket.
- initial conditions
- size & shape
- contents of bucket
- internal dynamics
- additional forces
  - contact - bicycles, birds
  - wind
  - E & M

guess: "only" gravity matters.

$g = 9.8\ m s^{-2}$

$h \approx 15\ m$

$|\vec{v}_0| = 0\ \frac{m}{s}$

$m \approx 10\ kg$

$\frac{h}{g} = \frac{15}{10} \cdot s^2$

$t \sim \sqrt{\frac{h}{g}} \approx 1.25\ s$

$t = ☺ \sqrt{\frac{h}{g}}$

??

$$E = mc^2 \qquad E^2 = m^2c^4 + p^2c^2$$

$$\vec{F} = m\vec{a}$$

$$\vdots$$