Studio 2: Representations of Motion

Choose your own seats today (still at tables 2, 3, 6, 7).

Project Information

- Demonstrate and synthesize what you have learned over many weeks.
- Many possible forms, such as written, visual, or video.
- Milestones due Fridays at 8pm (almost) every week:
  - Setting group expectations (Week 2)
    - Once you have your group, you will work with them in lecture and studio.
  - Project proposal (Week 3)
  - Rough draft (Week 5)
  - Peer review (Week 6)
  - Final draft (Week 7)

What to Expect in PH 212

- 10-15 minute video presentation by group (usually 3 students)
- Solution to a physics problem, or presentation on self-taught topic (such as buoyant force or drag force)
- Calculation, sensemaking, and reflection

Your Options

- 212 format (get used to it for 212)
- Some other idea that excites you!
  - Educational video or report
  - Research
  - Melding physics with something artistic
  - Surprise me!
- If it doesn't involve enough calculation, sensemaking, and reflection, I may request modifications.

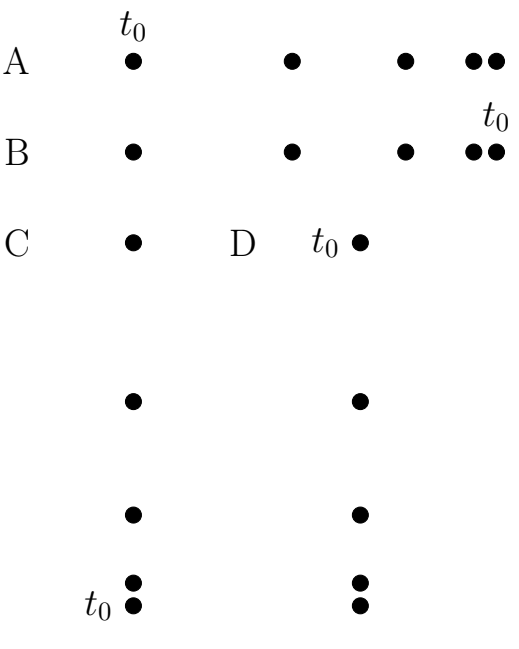
Project Brainstorm

- With your neighbors, come up with as many creative ideas for projects as you can.
  - A proposed problem should relate to motion and things that affect motion.
  - Basic formats include written work and videos. Can you suggest an interesting subcategory of either of those formats, or perhaps a new format entirely?
- I will write as many ideas of yours as I can on this slide, along with the names of the people who came up with them.

S2-1: Strobes and Origins

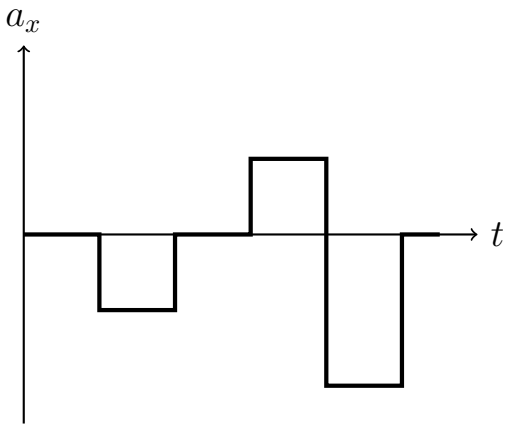
The initial position in each strobe diagram is labeled t_0. For each case:

- Choose a coordinate system (use the same system for all cases).
- Sketch velocity vectors for each point.
- Sketch acceleration vectors for each point.
- Identify whether each of the following is positive or negative:
  - Position
  - Velocity
  - Acceleration



S2-2: Graphing Acceleration, Velocity, Position

Below is a graph of a vs. t for a car. Draw and label graphs of v vs. t and x vs. t for the car.



Main Ideas

- Speed increases when velocity and acceleration are in the same direction. Speed decreases when velocity and acceleration are in opposite directions.
- Position depends on the choice of origin.
- Acceleration tells you about the slope of the velocity graph and the concavity of the position graph, but it does not tell you about their initial values.
- Velocity tells you about the slope of the position graph. Changing the initial velocity shifts all of the values of velocity, which changes the overall shape of the position graph.