

Introduction

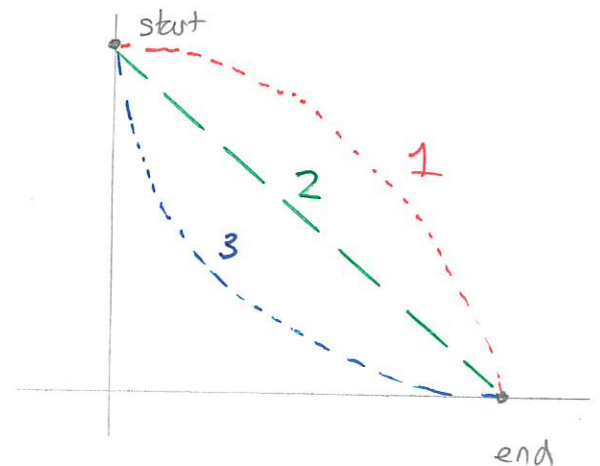
- \* Name and contact .
- \* Handouts - syllabus  
- intro survey
- \* My background
- \* Student introductions - first name  
- major.
- \* Attendance

Physics / science situations

Imagine an object that can slide along a ramp that connects two locations. This ramp could take various shapes

- straight
- curved, etc,...

For a given pair of start/end points what shape results in the shortest travel time?

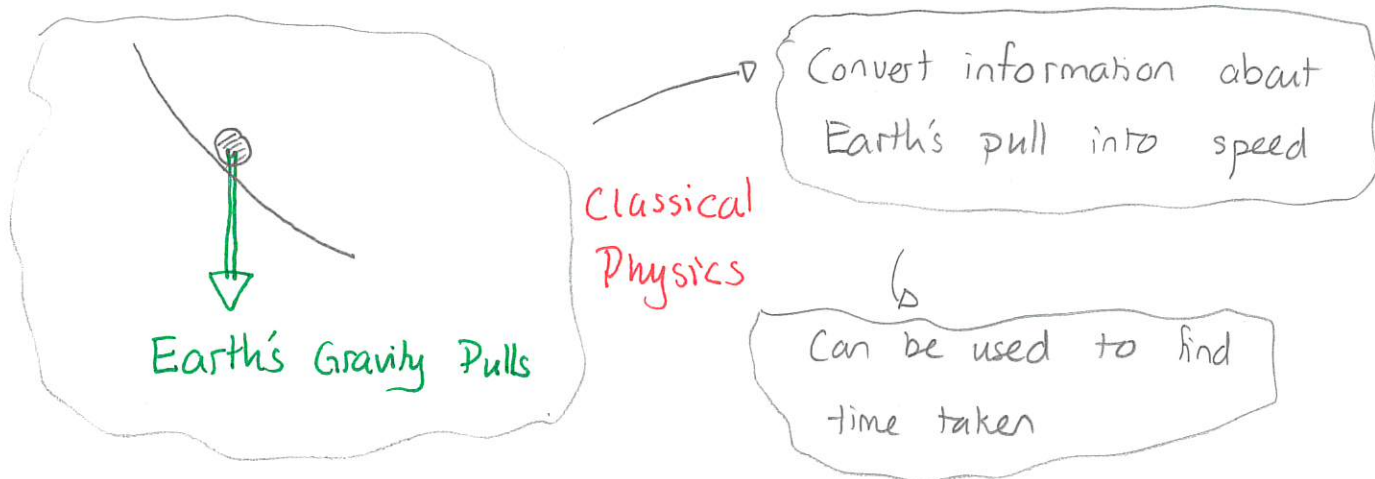


- \* Introduce yourself to neighbor
- \* Discuss the question
  - 1) what do you think? What factors are important?
  - 2) what reasoning supports your answer?

## Demo: \* Brachistochrone demonstration

\* Brachistochrone video.

The answer to this question comes from physics that was initially developed by Newton in 1687. The basic ideas are



Remarkably using this plus mathematics, one can answer exactly the question of which curve results in the fastest times. This was first done by Newton and the Bernoullis in 1697. The methods for solving this kind of problem still find wide use.

## Variety of physics situations

The same basic physics framework can be applied to a wide range of situations

Demo: Rotating sticks

Demo: Oil / Anise video

Cheerios effect video

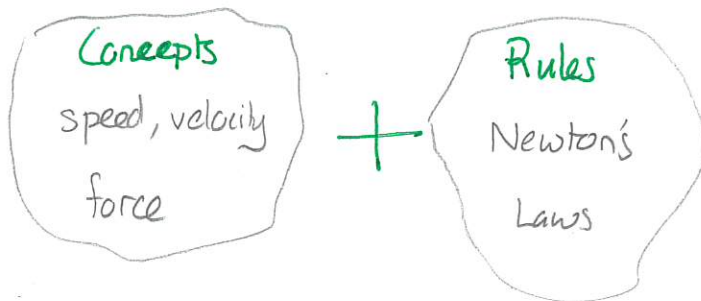
Physics addresses questions about such phenomena and the material world in general:

1) what basic concepts are useful to understand + describe the physical world? - forces, energy

2) what are the basic rules that govern the physical world? → Newton's Laws

3) what do the basic rules say about particular situations? → Quantum Th.

The first truly generally useful physics framework emerged in the late 1600s. This is (Newton's) classical mechanics



→ Which curve is fastest?

→ Which stick is easier?

→ Cheerio behavior.

### Scope + goals of Phys 100

Phys 100 offers an introductory survey of physics, including

- 1) solar system
- 2) atomic physics
- 3) classical mechanics
- 4) energy
- 5) electricity + magnetism
- 6) light
- 7) quantum physics

The goals of this course are:

- 1) introduce you to the phenomena of the physical world
- 2) introduce you to concepts, laws and frameworks for understanding the physical world
- 3) introduce you to the methods of thinking used to understand physical situations.
- 4) show you that there is a systematic way to understand the physical world.

Background needed:

- 1) no knowledge of physics is needed
- 2) some arithmetic and substitution into (word) formulas.

### Course details

- 1) syllabus - contact info  
- CMU email
- 2) website - course page  
- materials page
- 3) assignments
- 4) exam dates
- 5) intro survey - Wednesday

Other Physics courses.