What is Newtonian physics?

What is a physical science?

- **Look at multiple example situations** (snapshots and video recordings)
  - to **point out** and name experimentally **measurable quantities** of interest and
  - to **look for patterns** involving quantities:
    - "It seems, reviewing these pictures, that that variable X is non-zero precisely in the same situations when variable Y is non-zero."

	$y = 0$	$y \neq 0$
$x = 0$	Possible	Does not happen
$x \neq 0$	Does not happen	Possible

    - "In this pair of pictures, increasing X resulted in increasing Y."

Situation 1	Both x and y had non-zero values
Situation 2	$\uparrow x$ and $\uparrow y$

- **State possible patterns using math**ematical relationships. You might state multiple, conflicting patterns.
- Apply mathematical reasoning to different patterns and their corresponding mathematical relationships to **make testable predictions** about how quantities in different situations might be the same or might be the same.

	Hypothesis 1	Hypothesis 2	
Experiment A	Prediction 1A	Prediction 2A	Observation A
Experiment B	Prediction 1B	Prediction 2B	Observation B

  - "After some time, X will increase because . . ."
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- **Reject patterns and mathematical representations** when needed.

Gray items: Emphasized in readings in Etkina

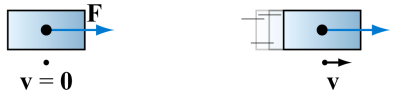
What is Newtonian mechanics?

- We want to understand how to get objects from somewhere in an environment to somewhere else

Kinematics

- What **vocabulary** and **defining mathematical expressions** can we develop to **describe motion**?
- **How** are mathematical **measures of aspects of motion relate**d to each other?

Dynamics



- What features of a system and/or its environment can be adjusted to **influence a system's motion**?
  - Can we answer the above question in more than one way?
  - If we can, can we use one answer to derive the others?

Why do we do take AP Physics 1?

Most people do not perform physics calculations in their daily lives, but the **reasoning and writing** skills that we learn in physics will help us to **figure out solutions to questions we have not seen before**. This will help us in other fields such as biology, chemistry, engineering, math, economics, psychology, and law.