On the Newtonian Revolution

"Nature and nature's laws lay hid in night; God said **Let Newton be!** and all was light."

-- Alexander Pope, "*Epitaph intended for Sir Isaac Newton"*

Announcements 1/2

- Xiaolu (Lulu) Yu is here for questions
- MP Problem Set Chapts 1 – 4 due today by 5 PM
- MP Problem Set Chapts 5 – 6 due Friday, Sept. 30 by 5 PM
- Pre-Class Quiz Chapts 7 – 8 released. Due one week today by 10 AM
- Dr. Savaria (MP129E) does all administrative stuff
- I do the Physics of this quarter

Announcements 2/2

- As already mentioned, I am suggesting problems from the end of the chapters
  - Available from the class summaries
  - I choose questions I like, regardless of whether they are even or odd numbered
- Your tutor has the answers for the even numbered questions

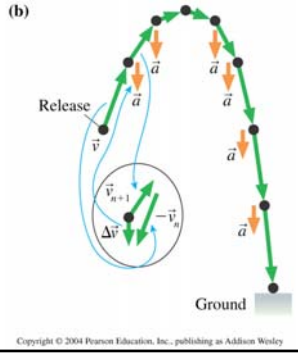
About the Problem Sets and Pre-Class Quizzes

- They will help you to learn Physics
- Your knowledge of Physics is demonstrated on Tests and the Final Exam
  - Tests and Final Exam count for 65% of your mark in the course
- If you do not do the Problem Sets and Pre-Class Quizzes *yourself*, you will not learn nearly as much Physics
  - Then, you will not do as well in the course.

Writing is a "Good Thing"

- Gets hand-eye-brain coordinated
- Reading a textbook
  - Fiction: a page a minute
  - Any textbook: this is much too fast
  - Taking detailed notes slows you down
  - Also helps you to concentrate
  - Copy figures, definitions, equations
  - Fill in missing steps of derivations
  - Your choice: keep the notes or not

Figure 1.22 (b) [for the 3rd time]



"Good Thing" continued

- In class, taking notes is good for most students for the same reasons
  - This is one reason why I use a Tablet PC
- MP Problem Sets
  - Don't just scribble on scrap paper, solve it carefully on paper
  - Use the recommended Problem Solving Strategy

Last Time:

- Inclined plane
- Vectors and Cartesian components
  - Unit vectors
- Described forces
  - "Contact forces" don't really exist.
- Operational defn. of mass: one over the slope of an **a** vs. **F** graph
- Newton's 2nd Law: $\mathbf{a} = \mathbf{F}_{net}/m$

Today

- Finish Chapter 4
  - This completes our introductory conceptual overview
- Chapter 5: Dynamics in One Dimension
  - Equilibrium
  - Using Newton's 2nd Law
  - Mass and Weight

Note: §5.4 Friction and §5.5 Drag are omitted

Newton's First Law

- "In the absence of external forces, an object at rest remains at rest and an object in motion continues in motion with constant velocity." (1687 AD)
- From the **Mo Ching** ("Pulse Classic"): "The cessation of motion is due to the opposing force … If there is no opposing force … the motion will never stop."
  - 3rd century BC? Certainly by 3rd century AD.

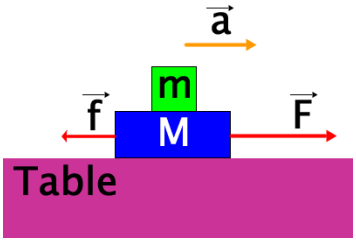
Newton

- "Absolute space, in its own nature, without relation to anything external, remains always similar and immovable."

Problem Solving (cf. pg. 24)

- Model
- Visualise
  - Pictorial, physical & graphical
- Guess the answer
- Solve
  - If numeric, put in numbers last
- Assess

Friction Question from Last Time



$a_x = (F - f) / (m + M)$