Science Vocabulary – meanings are different than everyday life

- **Velocity** – speed **AND** direction
- **Acceleration** – any change in velocity
  - Changing speed (getting faster OR slower)
  - OR Changing direction
- Your body feels **acceleration**, **not velocity**.
- We’ll focus mostly on accelerations caused by **gravity** (falling down or falling around)

Calif. Science Standards for motion

- From California Science Standards, grade 2:
  - Students know the **way to change how something is moving** is by giving it a **push or a pull**. The **size of the change** is related to the strength, or the **amount of force**, of the push or pull.
- And from grade 8:
  - Students know the **velocity** of an object must be described by specifying **both the direction and the speed** of the object.
  - Students know **changes in velocity** may be due to **changes in speed, direction, or both**.
Science Vocabulary – part 2

- Matter =
  - stuff
- Mass =
  - the amount of stuff
- Force – interaction between 2 bodies:
  - push or pull.
  - Forces make objects accelerate.
  - All accelerations are caused by a force.
- Weight =
  - the force of gravity pulling two objects together*
  - *Your book (P. 123) and I disagree on this. See “weightlessness” slide.
- Which objects are involved in the force of gravity?
  - Ask neighbor: what’s the second object for pencil falling down?

Gravity near ground

- Free fall
  - Toss something up, what happens on way up?
  - Drop something, what happens on way down?
- When things fall, measure same accel. for:
  - speeding up
  - slowing down.
- Paper/pen experiment; See For Yourself p. 122.
- SAME GRAVITATIONAL ACCELERATION for ALL objects, all masses, everywhere near ground.
- Galileo observed this (in Pisa). Galileo’s observations helped Newton formulate ideas.
From Apollo 15 mission
Men on the Moon

• Show the hammer-feather movie