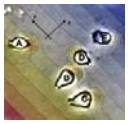
Physics 131- Fundamentals of Physics for Biologists I



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9/17/2012

-How can we describe motion (Kinematics)

- What is responsible for motion (Dynamics

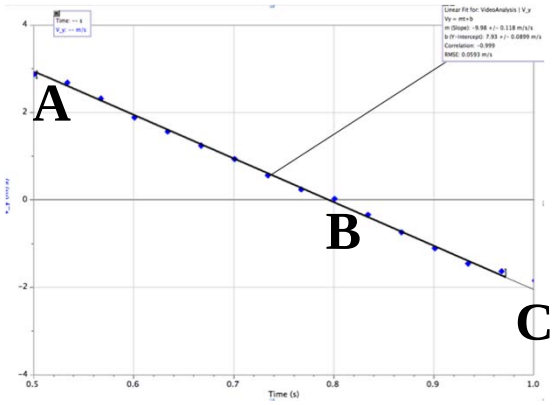
Movie of the Day
Grad student flying on the "vomit comet"

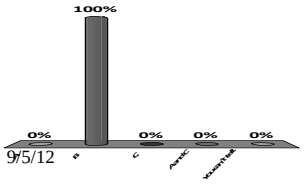
Outline

- Quiz 2
- What is responsible for motion (Dynamics)
  - Newton's Laws

This graph shows the **velocity** of one of balls in the juggler video after he has relased it and before he touches it again. Where is the ball at its highest point?

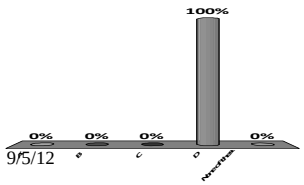
1. A.
2. B.
3. C.
4. A and C
5. You can't tell.

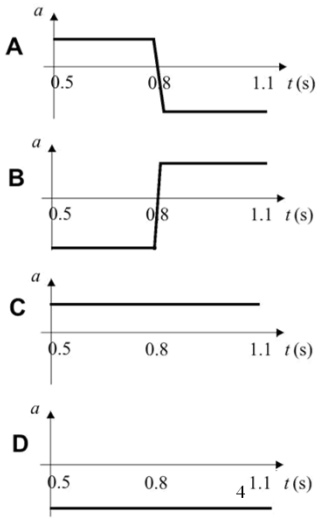




Which of these graphs looks like the acceleration curve for the situation shown on the previous two slides?

1. A
2. B
3. C
4. D
5. None of these





What does the previous result tell us about the force the ball feels when nothing is touching it?

Discuss

A More Familiar Form

- If the object that is causing the change of velocity by touching our object doesnt "tap" it but touches it continually, it's more convenient to extract a time by writing

$$\mathscr{I} = F\Delta t$$

- then we get

$$\Delta v = \left(\frac{F}{m}\right)\Delta t \quad \Delta x = v\,\Delta t \quad \rightarrow \quad \frac{dv}{dt} = \frac{F}{m} \quad \frac{dx}{dt} = v \quad \rightarrow \quad a = F/m$$

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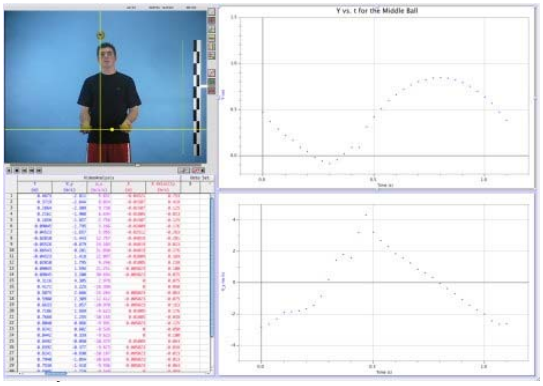
Multiple taps / forces

- Need to add the force vectors



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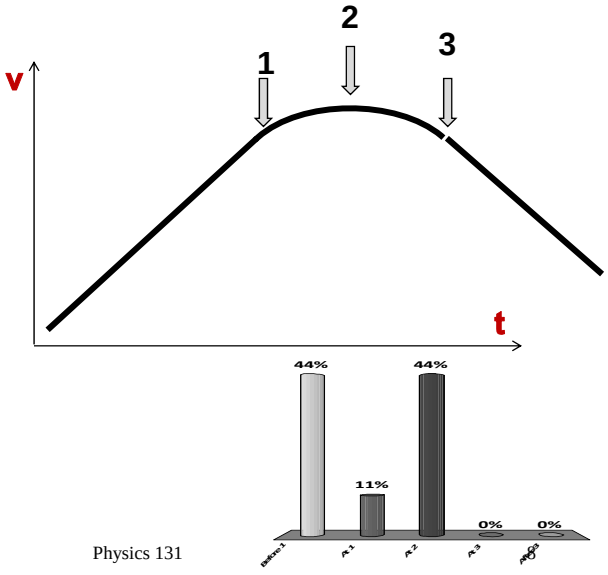
Looking at the velocity vs time graph, where does the juggler let go of the ball?

1. Before 1
2. At 1
3. At 2
4. At 3
5. After 3



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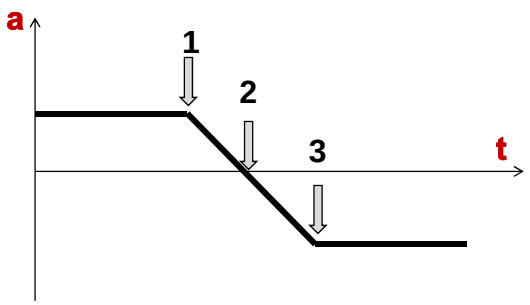
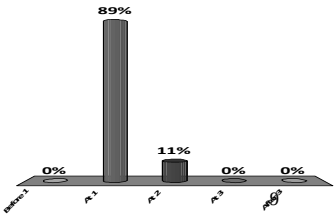
Looking at the acceleration vs time graph, where does the juggler let go of the ball?

1. Before 1
2. At 1
3. At 2
4. At 3
5. After 3





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