Wave labs

1. Pendulum
2. The Slinky®
3. Sound Stations
4. Resonance

Lab: Just a Swingin’

November 12

- Obj: Experimentally determine whether the period of a pendulum is affected by its (1) initial energy, (2) mass, and (3) length
- Data: 5 equal intervals of each independent variable; measure the pendulum’s time for 10 swings each time.
- Calculations: Period from data. Show proof for one and record all results.
- Graphs: one for each independent variable, use the same scale for period on each graph and no scale breaks
- Discussion: The usual: be sure you *use the graphs to answer the objective; wait for additional task after class review of lab on next slide…*

Lab: Just a Swingin’

November 12

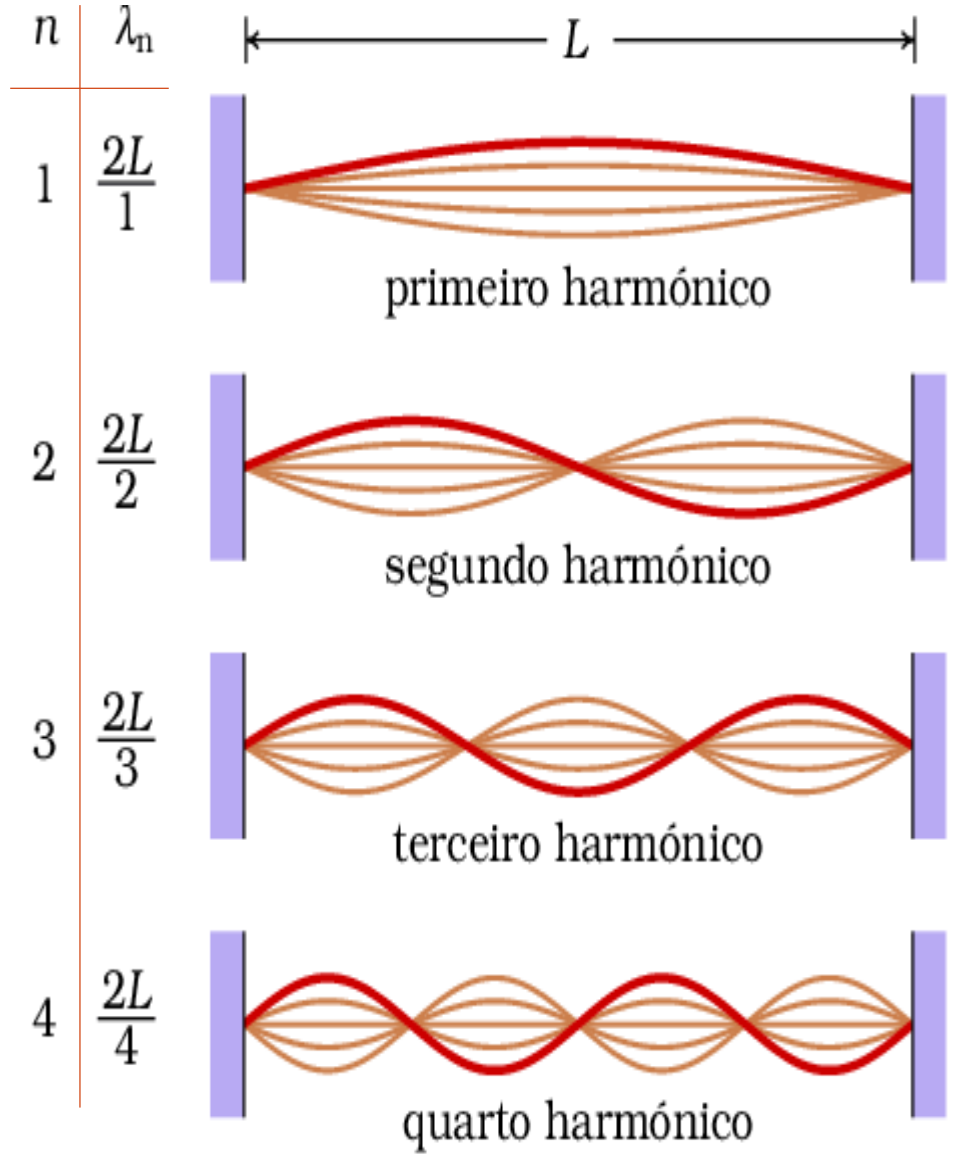
- Discussion: The usual: be sure you *use the graphs to answer the objective and*

  - Use your pendulum data to calculate the theoretical period of two different length pendulums.
  - Use the theoretical and measured period to calculate your %error for each of the two pendulums selected.

LAB: THE SLINKY®

November 15

- Obj: (a) Determine the **period , frequency, wavelength and speed** of 4 different standing waves (b) determine the mathematical relationship between the number of anti-nodes and the frequency of a standing wave
- Safety notes: Keep Slinky® away from face, do not use in a moving vehicle, do not throw out a window…as a matter of fact don't throw it or any part of it…ever.
- Data: collect in sets of 10 waves, use table length as L, n = # of anti-nodes
- Calculations: show all equations and work for one standing wave
- Graph the relationship between frequency and wavelength
- Discussion



Lab: Sound Stations

November 20

- No separate lab sheet needed…Follow the provided lab procedures and complete on the lab sheet
- Click to download the lab procedures
- No discussion, just answer the questions on the lab sheet

Lab: Sound Resonance

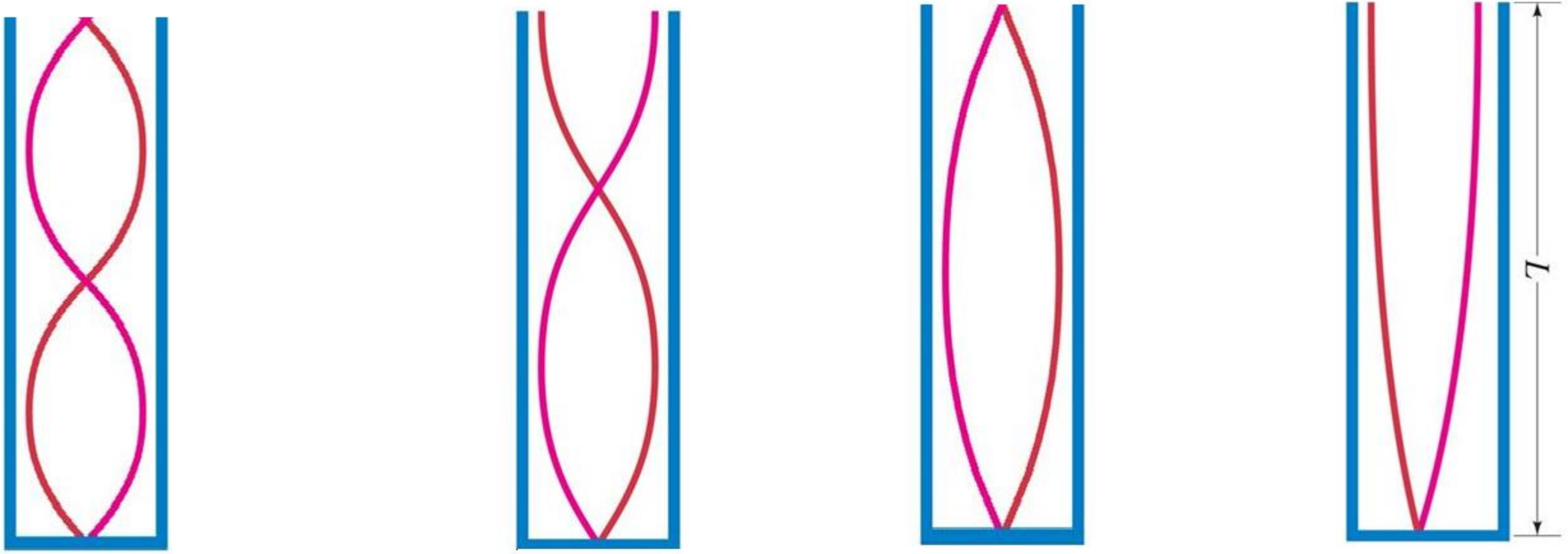
nope

- Obj: Experimentally determine the relationship between wavelength and length of a resonating column of air in a closed pipe.
- Data: Frequency, resonance pipe length, room temperature (°F), speed of sound (provide source)
- Calculations: Wavelength. Show proof for one wavelength and record all results.
- Graph: wavelength v. resonance length
- Discussion: the usual and use the graph to determine the relationship (write an equation) between wavelength and resonance length

Lab: Sound Resonance

November 30

The correct relationship between wavelength and resonance length should match one of these examples



Light labs

1. Law of Reflection
2. Law of Refraction

Lab: Law of Reflection

nope

Objective: To verify the law of reflection and to determine the distance of a virtual image behind the mirror.

Complete the procedures on the provided lab sheet.

Analysis questions:

1. What is the law of reflection? How do your measurements of the incident and reflected angles relate to this?
2. What is the definition of a normal line?
3. How did the image appear inside the mirror? Bigger or smaller or same size? Right side up or upside down? (When you look inside a flat mirror, how does your image appear?)
4. Given the choice, real or virtual…do you think the image of the block is real or virtual? Why?
5. How does the distance from the block to the mirror and the distance from the image to the mirror compare?
6. What would be some examples of experimental error (or uncertainties in your measurements) in performing this experiment?

Lab: Index of Refraction

May 10

- Follow the provided lab procedures and complete on one group paper
- Write data and calculations on your own paper to turn in.
- One group member should attach the actual drawing when turning in the calculations
- Click to download the lab procedures

No discussion

Physics Labs

Labs are due no later than one week after last class day of lab. Feedback is based on accuracy. Grade is based on completion.

- Title (Provided) (0.5)
- Objective (Provided) (0.5)
- Diagram(s) of setup/procedure (0.5)
- Data (tables); minimum* of 5 data points consisting of trials* (1)

Physics Labs

- Graph(s) (1)
  - use to show relationships between variables
  - General shape of data: line, curve, none
  - Best fit of shape; determine slope if linear, identify relation if not linear (quadratic, inverse, square root,…)
- Calculations (1)– must show work for one, record all results
- Written Discussion
  - What, why, how (procedure) (0.5)
  - Results: “answer” to objective using data, calculations, and graphs to support (0.5)
  - Experimental error: procedural difficulties, variables that can’t be or were not controlled, “human error”…no, never calculations (0.5)