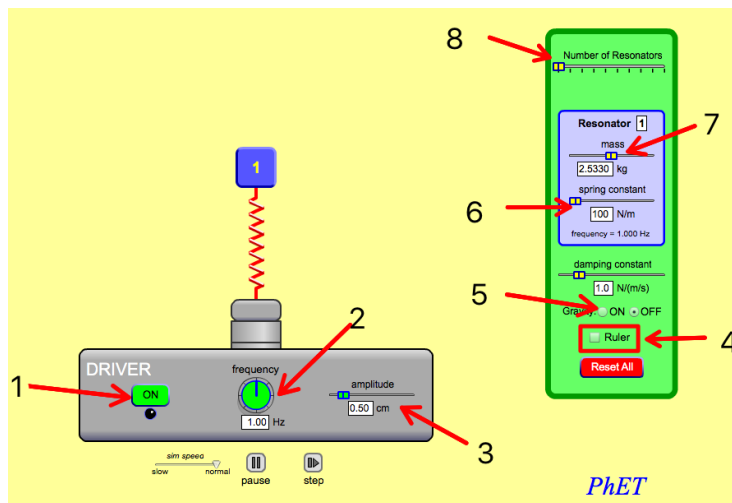


ACTIVITY NO. 1: RESONANCE

- I. Objective: To determine what are the factors affecting resonance.
- II. Materials:
 - PhET Simulation on Resonance
 - Laptop
 - Activity sheet
 - Pen
- III. Procedure:
 1. Open the PhET Simulation on Resonance distributed last week.
 2. Explore the sim and play around with the functionalities.




Function:

1. Turns On/Off the frequency driver.
2. Increase/decrease the frequency.
3. Increase/decrease the amplitude.
4. Includes ruler on the screen.
5. Toggles gravity On/Off.
6. Increase/decrease spring constant.
7. Increase/decrease mass.
8. Increase/decrease number of resonators

3. Activity proper:

PART I. Varying *spring constant*

- A. Click Reset All to reset all values.
- B. Add three (3) resonators Number of Resonators and click the down scroll named "mixed m and k" and choose "**same mass m**".
- C. Include ruler Ruler and adjust the position of the ruler so that all resonators start at 0 cm .
- D. Click each resonator number 1 2 3 4 5
v v v v v and record the spring constant spring constant on Table 1 below.
- E. Turn on ON the frequency generator and observe the amplitude of each resonator.

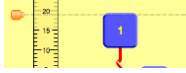
- F. Record the maximum amplitude of each resonator on Table 1. Adjust the ruler's horizontal line to record the amplitude accurately .
- G. Now adjust the frequency to 1.5 Hz and record again the amplitude of each resonator.
- H. Adjust again the frequency to 2.0 Hz and record the amplitude of each resonator.

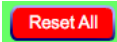
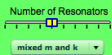

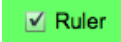

Table 1. Spring constant vs. resonating frequency

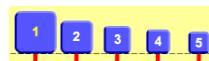
Resonators	Spring constant	Amplitude (cm)		
		1.0 Hz	1.5 Hz	2.0 Hz
1				
2				
3				

- I. Follow-up questions:
- In table 1, which of the resonators has higher amplitude at:
 - frequency of 1.0 Hz? _____. What is its amplitude? _____.
 - frequency of 1.5 Hz? _____. What is its amplitude? _____.
 - frequency of 2.0 Hz? _____. What is its amplitude? _____.
 - What happens to the resonating frequency when the spring constant is increased?

- What happens to the amplitude when the spring constant is increased?

PART II. Varying *mass*

- A. Click  to reset all values.
- B. Add three (3) resonators , click the down scroll and choose "same spring k" .
- C. Include ruler  and adjust the position of the ruler so that all resonators start at 0 cm .



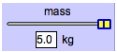
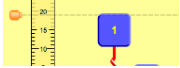
- D. Click each resonator number _____ and record the mass  on Table 2 below.
- E. Turn on _____ the frequency generator and observe the amplitude of each resonator.
- F. Record the maximum amplitude of each resonator on Table 2. Adjust the ruler's horizontal line to record the amplitude accurately .
- G. Now adjust the frequency to 1.5 Hz and record again the amplitude of each resonator.
- H. Adjust again the frequency to 2.0 and record the amplitude of each resonator.

Table 2. Mass vs. resonating frequency

Resonators	Mass (Kg)	Amplitude (cm)		
		1.0 Hz	1.5 Hz	2.0 Hz
1				
2				
3				

- I. Follow-up questions:
- In table 2, which of the resonators has higher amplitude at:
 - frequency of 1.0 Hz? _____. What is its amplitude? _____.
 - frequency of 1.5 Hz? _____. What is its amplitude? _____.
 - frequency of 2.0 Hz? _____. What is its amplitude? _____.
 - What happens to the resonating frequency when the spring constant is increased?

 - What happens to the amplitude when the spring constant is increased?

