**Science Department**

Name:

Class:

 **Waves on a string (PhEt)**

**A- Goal of the experiment:** To understand & explore wave properties and its behaviors.

**B- Needed materials:** Computer with up to date Flash player and calculator.

**Step one - Access to the simulation:** Go to the website below to access the simulation.
<https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html>
Either run on the browser or download.

**Step two - Test the simulation and start the lab activity:** Select “oscillate” on left top menu and “no end” on right top menu.



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| **Change the amplitude and explain its effect with drawings below:**  |
| **Low** | **High** |
| **Change the frequency and explain its effect with drawings below:**  |
| **Low** | **High** |
| **Change the damping and explain its effect with drawings below:**  |
| **Low** | **High** |

**Step three - Reflections:** Change the selection to “pulse” and “loose end” . Send one pulse and observe the reflection and then compare to the reflection on “fixed end”. Draw below, before and after the reflection shapes.

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| --- | --- |
| **Loose End** | **Fixed End** |
|  |  |  |  |

**Step four - Interactions:** Set “pulse” and “fixed” options to have two pulses in reverse directions. Name this interaction and draw below with numerical values at the instant of mid points meeting.. Tip: Click “frame” to clearly see the interaction. Lower pulse width to 20. Repeat for “loose” end.

Use backside for results and comments

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**Step five - Result and commentary: Explain the experiment step by step what you did. Describe the improvements if any applicable.**

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**Question 1: Two pulses are sent in same direction on a string, 3 seconds gap in between. Pulses have 2 cm width, 10 cm
height. String is connected to a fix-end rod.**

1. **Draw the first interaction and calculate merged amplitude and width.**
2. **Now the end is loose. Draw the first interaction and calculate merged amplitude and width.
(Hint: You may use simulation to check your answer)**

**Question 2: A child is throwing stones at the center of a pool and would like to find the travelling speed of waves
in water. Write an experimental design where the child can calculate the speed of wave. Hint: Pool floor is built with foot
long tiles.**