Name _____

Lab: The Wave Machine

Objective: Now that you know a little about waves, let's explore what happens when waves strike a barrier or have obstacles to overcome.

Supplies:

10 Flat Sticks
20 Gum Drops
Masking tape
Ruler

Part 1- Build a Gum Drop Wave Machine:

- Lay out a piece of masking tape that is 55 cm long with the sticky side up.
- Measure in 5 cm from the left side and place a stick vertically centered on the tape.
- Continue to place sticks every 5 cm until you have used all 10 sticks.
- Lay another piece of masking tape on top of the sticks with the sticky side down.
- It should look similar to the picture to the right, but just shorter.

Have 2 group members hold the gum drop wave machine by the excess tape so it is off the lab table. A 3rd group member will send a wave down the gummy wave machine by pushing quickly down on the first gum drop that you are NOT holding. Do this several times to observe what happens

1. **Draw the wave that the gum drop wave machine created and label the parts of the wave (crest, trough, amplitude & wavelength).**

2. **What type of wave did this form? (longitudinal/transverse)**

3. **What did the wave do as it came to the opposite side of the wave machine?**

Part 2- Test the Gum Drop Wave Machine

Have 2 group members pick the wave machine up again, then have a 3rd group member start a wave by pushing **gently** on the first gum drop that you are NOT holding. Observe for a moment, and then have the 3rd group member push down **harder** on the first gumdrop that you are NOT holding (**without breaking it**).

4. **How was the wave different between the two trials (gentle push versus harder push)?**

5. **How did this affect the amplitude of the wave?**

6. **How did this affect the wavelength?**

Set the gum drop wave machine on the table and remove 7 **random** gum drops anywhere from the wave machine.

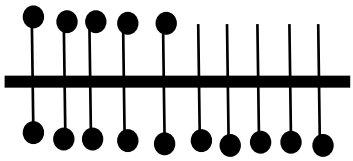
Have 2 group members pick the wave machine up again, then have a 3rd group member start a wave by pushing down quickly on the first gum drop that you are NOT holding.

7. **How was this different than the first wave you created with the wave machine?**

8. **How did the amplitude change compared to the first wave you created? Explain your answer.**

Set the gum drop wave machine back onto the table and replace the 7 random gum drops back onto the wave machine.

Remove the front half of the gum drops on the right side of the wave machine.



Have 2 group members pick the wave machine up again, then have a 3rd group member start a wave by pushing down quickly on the first gum drop that you are NOT holding.

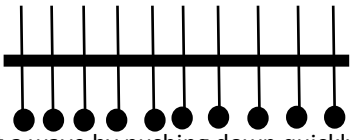
9. **How is this wave different that the other waves created with the wave machine?**

10. **How did this affect the amplitude of the wave?**

11. **How did this affect the energy of the wave?**

Set the gum drop wave machine on the table, and replace all of the gum drops back onto the wave machine.

Remove the top half of all of the gum drops from the wave machine.



Have 2 group members pick the wave machine up again, then have a 3rd group member start a wave by pushing down quickly on the first gum drop that you are NOT holding.

12. **How is this wave different that the other waves you created with the wave machine?**

13. **How did this affect the amplitude of the wave?**

14. **How did this affect the energy of the wave?**

Clean up: You may eat the gum drops if you like. Throw away the sticks and tape. Clean your table with a wet paper towel or cleaning spray. Raise your hand when the area is cleaned so your group can be excused to go back to class.