Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PHET waves intro

<https://phet.colorado.edu/en/simulation/waves-intro>

Click on the above link. Start simulation. Choose **Water**

**Click Side View, (bottom left) Choose the multi wave.**

Set Frequency and Amplitude in the middle. Click the Graph.

Click on the green dot on the faucet and start the water flowing. Observe the waves. Compare what you see with the water to the waves on the graphs.

1. Now increase the frequency. What happens with the number of waves?

What happens to the distance between waves (wavelength)?

1. Increase the amplitude. What happens with waves?
2. Decrease the frequency, What happens with the number of waves?

What happens to the distance between waves (wavelength)?

1. Decrease the Amplitude, What happens with the waves?

**Now choose the Speaker (sound) the bottom. Set to side view and the multiple waves. Put Frequency and Amplitude in the middle (just like you did with the water) Choose Play Tone and Waves.**

1. You can have your sound on - but don’t have it extremely loud. Push the green button for sound. What do you notice about the waves?
2. What do you notice about the speaker?
3. Now **increase** the frequency. How does the speaker movement change?
4. What happens with the pitch of the sound? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the number of waves? \_\_\_\_\_\_\_\_\_\_

 What happens to the distance between waves (wavelength)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Now **decrease**  the frequency. How does the speaker movement change?
2. What happens with the pitch of the sound? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the number of waves? \_\_\_\_\_\_\_\_\_\_

What happens to the distance between waves (wavelength)?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Increase** the amplitude. How does the speaker movement change?
2. Does the pitch change? \_\_\_\_\_\_\_\_\_\_ What happens to the volume? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. **Decrease**  the amplitude. How does the speaker movement change?
4. Does the pitch change? \_\_\_\_\_\_\_\_\_\_ What happens to the volume? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Turn off the Tone. Click on BOTH (for particles and waves)** Move the Frequency and Amplitude sliders side to side (high to low) Watch the particles, especially the red dots.

1. Describe how the particles move wave energy.

 **Now choose Light at the bottom. Set the Frequency and Amplitude sliders in the middle.**

1. What color is the light?
2. Slide the frequency to the left (so a lower frequency). What happens to the color?

 What happens to the number of waves?

 What happens to the distance between the waves (wavelength)?

1. Slide the frequency to the right (so a Higher frequency). What happens to the color?

 What happens to the number of waves?\_\_\_\_\_\_\_\_\_\_\_\_\_

 What happens to the distance between the waves (wavelength)?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Choose one color (frequency).  **Increase the Amplitude**

Does the color (frequency) change?

 Does the Brightness change? How?

1. Choose one color (frequency).  **Decrease the Amplitude**

Does the color (frequency) change?

 Does the Brightness change? How

**SUMMARY: Describe what you see (or hear) for each situation (the first column is filled in for you)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | High Amplitude | Low Amplitude | High Frequency | Low Frequency | ShortWavelength | LongWavelength |
| Water | Tall waves |  |  |  |  |  |
| Sound | Loud Sound |  |  |  |  |  |
| Light | Bright Light |  |  |  |  |  |