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Activities

Wiggling a Virtual String

Name: _____ Date: _____

Wave properties are easier to visualize when you can see them. In this Planet Diary activity, you'll wiggle a virtual string to explore wave properties.

Directions

- Visit this Wave on a String simulation. Click *Run Now* to open the window. The first property you'll explore is amplitude. Select *No End, Oscillate, and Rulers* in the controls. Set the other controls as follows:
  - Tension: *high*
  - Damping: *8*
  - Amplitude and Frequency: *50*
- Watch what happens to the wave. Notice how its height changes as the wave moves down the spring. Use the *Pause/Play* control to stop it at any time. Then set Amplitude at *100* and run it again. Notice the wave height on the ruler. Experiment with other amplitudes. Answer Workspace question 1.
- What happens if you don't use damping? Set Damping to *0* and Amplitude to *50* and run it again. Answer question 2.
- Next, you'll explore frequency. Reset the controls to the original settings for this activity. Start the simulation, then click *Pause*. Count the number of waves between the oscillator on the left and the window on the right. Count each wave from crest (the top of the "hill") to crest. Then change Frequency to *100* and run it again. Try other frequencies, then answer questions 3 and 4.
- How are frequency and wavelength related? Set Frequency to *50*. Run the simulation and click *Pause*. Use the onscreen ruler to measure the distance (in cm) from one crest to the next. Change Frequency to *100* and repeat. Answer the last two questions.

Workspace

1. How does changing the amplitude change the appearance of the wave?

2. What happens to amplitude when damping is removed?

3. How many waves fit on the string when frequency is 50? When it's 100?

4. How does the number of waves change as you increase or decrease frequency?

5. What is wavelength when frequency is 50? When it's 100?

6. How are wavelength and frequency of a wave related?

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