Boundary Conditions Simulator

Website: <http://phet.colorado.edu/sims/wave-on-a-string/wave-on-a-string_en.html>

**Ensure the simulator is set on *no* end and *manual* motion. Set damping to zero.   
Set the tension to the middle to start.**

1. Adjusting *tension*
   1. How does the tension affect the *speed* of the wave?
   2. How does tension affect the *amplitude* of the wave?
   3. How does tension affect the *wavelength* of the wave?
2. Adjusting *damping* (rigidness of the rope) – set tension back to high
   1. How does the damping affect the *speed* of the wave?
   2. How does damping affect the *amplitude* of the wave?
   3. How does damping affect the *wavelength* of the wave?
   4. What other observations can you make about damping?
3. Adjusting the *frequency* – set damping back to zero and tension to high
   1. How does the frequency affect the *speed* of the wave?
   2. How does the frequency affect the *amplitude* of the wave?
   3. How does the frequency affect the *wavelength* of the wave?
4. Adjusting the *amplitude*
   1. How does the amplitude affect the *speed* of the wave?
   2. How does the amplitude affect the *frequency* of the wave?
   3. How does the amplitude affect the *wavelength* of the wave?
5. Set the end to FREE END or FIXED END. What happens when you send a wave pulse and it encounters another pulse that has been reflected and is on its way back?
6. Change the simulator to *pulse* mode. What do you notice about what happens when a pulse reflects off of a *fixed* end?
7. What do you notice about what happens when a pulse reflects off of a *loose* end?
8. What do you notice about what happens when a pulse encounters a *free* end?
9. Change the end to FIXED end. Can you create a standing wave? What are the conditions for a standing wave?

Switch to the next simulator: <http://www.surendranath.org/Applets/Waves/TWaveRefTran/TWRT.html>

1. Switch the simulator to ‘thicker to thinner’ mode. What do you notice about how a wave pulse is *transmitted* from a thicker (more dense) rope into a thinner (less dense) rope?
2. Switch the simulator to ‘thinner to thicker’ mode. What do you notice about how a wave pulse is transmitted from a thinner (less dense) rope into a thicker (more dense) rope?