Physics applets for Mechanical Waves and Light (All URLs correct as of 12/19/04)

These URLs have many applets on many topics:
1. Walter Fendt: http://www.walter-fendt.de/ph11e/

Simple harmonic motion, oscillations
1. Shows horizontal spring with a mass, position, velocity and acceleration graphs
   On Christian and Belloni Physlet CD:
   \applets\physletprob\NCAT\oscillations\is_spring_with_all_graphs.htm
2. Shows relationship between mass at end of horizontal spring and object on wheel going in circle
   On Christian and Belloni Physlet CD:
   \applets\physletprob\NCAT\oscillations\is_circle.htm
3. Oscillation and waves using single Hookean spring
   http://www.phy.ntnu.edu.tw/java/springWave/springWave.html
4. Shows relationship between mass at end of horizontal spring and object on wheel going in circle
   http://www.phy.ntnu.edu.tw/java/shm/shm.html

Pulses
1. Reflection of pulses at boundaries, fixed, free, two different density strings
   http://www.kettering.edu/~drussell/Demos/reflect/reflect.html
2. Superposition of pulses (same or opposite side)
   http://www.phy.ntnu.edu.tw/java/wave/impulse.html
3. Build the shape of your pulse and drag to see superposition
   http://mysite.verizon.net/vzeoacw1/wave_interference.html

Wave motion
1. Excellent for showing motion of longitudinal wave, water wave particle moving in circle
   http://www.kettering.edu/~drussell/Demos/waves/wavemotion.html
2. Transverse, longitudinal wave mixture
   http://www.physics.nwu.edu/ugrad/vpl/waves/wavetypes.html
3. Shows longitudinal waves, can vary frequency and amplitude
   http://surendranath.tripod.com/Applets/Waves/Lwave01/Lwave01Applet.html

Superposition, standing waves and resonance
1. Combining two waves together to produce a standing wave
   http://www.cabrillo.edu/~jmccullough/physlets/waves/waves_4.html
2. Superposition of waves
   http://www.phy.ntnu.edu.tw/java/waveSuperposition/waveSuperposition.html
3. Superposition of waves
   http://www.kettering.edu/~drussell/Demos/superposition/superposition.html
4. Two strings, each with one wave on it. The waves can be added on a third string. Can vary type of
   wave, speed, amplitude, direction and frequency.
   http://www.phys.ksu.edu/perg/vqmorig/programs/java/makewave/Pulse/vq_mwp.htm
5. Standing longitudinal waves. Very good, shows standing waves in tubes closed on one end, open
   on both ends and closed on both ends. Can vary harmonics from 1st to 6th.
   http://www.walter-fendt.de/ph11e/stlwaves.htm
   http://www.walter-fendt.de/ph14e/stlwaves.htm
6. Can show fundamental and first 3 overtones of instruments with two fixed end, one fixed end or no
   fixed ends. Can also add all four frequencies together and see resulting pattern.
   http://mysite.verizon.net/vzeoacw1/harmonics.html
7. Reflection of sin wave fixed ends or free end setting up good 3 antinode standing wave
   http://www2.biglobe.ne.jp/~norimari/science/JavaEd/e-wave5.html
8. This one has wave trains from opposite directions. You can change the frequency and amplitude of each train (go to the bottom of the page) VERY GOOD
   http://cspar181.uah.edu/PHY113/QZ_B.html
9. Two strings, each with one wave on it. The waves can be added on a third string. Can vary type of wave, speed, amplitude, direction and frequency.
10. Triangle wave superposition
    http://www2.biglobe.ne.jp/~norimari/science/JavaEd/e-wave3.html
11. Resonance applet
    http://www.swgc.mun.ca/physics/physlets/resonance.html
12. How a standing wave is propagated (wave shape not the best)
    http://www2.biglobe.ne.jp/~norimari/science/JavaEd/e-wave4.html
13. Adjust frequency of a wave driver to get string to resonate in first 6 modes
14. Transverse standing waves, two fixed ends or one free and one fixed, can vary from fundamental to 6th harmonic. http://www.ngsir.netfirms.com/englishhtm/TwaveStatA.htm
15. Site trying to sell a video of people causing a bridge to resonate by jumping on it
    http://www.messiah.edu/hpages/facstaff/barrett/video2.htm

Beats
1. Superposition adding to beats
   http://www.physics.nwu.edu/ugrad/vpl/waves/superposition2.html

Doppler Effect
1. Doppler shift
   http://webphysics.davidson.edu/Applets/Applets.html
2. Doppler shift simulation. Ambulance gong by person
   http://www.walter-fendt.de/ph11e/dopplereff.htm

Interference
1. Ripple tank simulation, will allow one to get the coordinates of any location.
   http://www.phas.ucalgary.ca/physlets/ripple.htm
2. Colored ripple tank simulation, can vary many parameters, one source, two source, one slit, two slits.
   http://www.falstad.com/ripple/
3. Very nice for showing the effect of distance between slits and wavelength. Will calculate the path difference in wavelengths at any location.
   http://webphysics.ph.msstate.edu/javamirror/ntnujava/doubleSlit/doubleSlit.html
   http://www.walter-fendt.de/ph11e/interference.htm
5. A two source circular interference pattern. Can vary wavelength, separation and phase. Has moiré look to it.
7. Diffraction around an obstacle in a ripple tank. Can vary wavelength and size of obstacle.
8. A two source interference pattern representing water waves. Can vary wavelength, separation and phase.
   http://www.ngsir.netfirms.com/englishhtm/Interference.htm
10. Shows two slit interference pattern. Not the greatest, but emphasizes how the pattern appears on a screen.
    http://www.control.co.kr/java1/mason/twoslit.html
Refraction and Reflection

1. Shows a plane wave both reflecting and refracting at a boundary. Can vary indexes and incident angle. [http://www.walter-fendt.de/ph11e/huygenspr.htm](http://www.walter-fendt.de/ph11e/huygenspr.htm)

2. A flashlight beam that can be rotated 360 degrees. The beam travels through your choice of 5 media. Shows only refraction. [http://www.geocities.com/thesciencefiles/refraction/refraction2.html](http://www.geocities.com/thesciencefiles/refraction/refraction2.html)

3. A flashlight has a beam that travels from air to water or water to air. Can move flashlight to vary angle. Shows both reflection and refraction. Nice for critical angle. [http://www.phy.ntnu.edu.tw/java/light/flashLight.html](http://www.phy.ntnu.edu.tw/java/light/flashLight.html)