copy this URL: <http://www.animations.physics.unsw.edu.au/mechanics/index.html>

This is the entrance to the Univ of New South Wales , School Of Physics exceptionally thorough and concise MECHANICS site.

There are many nice open source videos abailable from popular MIT lecturers, with great demonstrations and analysis. The topic list and links can be found at the following URL. My suggestion is you copy the URL into a new browser window so it doesn't have to go through the ANGLE server. Select the topic most relevant to your interest.

<http://ocw.mit.edu/courses/physics/8-01-physics-i-classical-mechanics-fall-1999/video-lectures/>

Many interesting Demonstrations of physics phenomena recorded by the pros at MIT.

**The collection:** URL: http://ttv.mit.edu/collections/physicsdemos

Recommended for class by Title of Video in the Physics Demos Collection

(Assign for students outside of class, use in lectures. Ask students to make up a problem based on the video. You can copy the URL iinto a new browser window.)

**Inertia**: "Pulling Cloth from Under Beaker" URL http://ttv.mit.edu/collections/physicsdemos/videos/10738-pulling-a-cloth-from-under-a-beaker

**Inertia:** "Plate Sliding Under Soda Can" URL http://ttv.mit.edu/collections/physicsdemos/videos/10043-plate-sliding-under-a-soda-can

**Relative Motion:**  "Moving Sand Cart over a Rotating Surface" URL http://ttv.mit.edu/collections/physicsdemos/videos/3722-moving-sand-cart-over-a-rotating-surface

**Relative Motion:**  "The Coriolis Effect" URL http://ttv.mit.edu/collections/physicsdemos/videos/3714-the-coriolis-effect

**Relative Motion & Projectiles:** "Relative Motion Gun " URL http://ttv.mit.edu/collections/physicsdemos/videos/3221-relative-motion-gun

**Monkey & Gun Projectile (classic):** "Monkey and a Gun " URL http://ttv.mit.edu/collections/physicsdemos/videos/735-monkey-and-a-gun

**Free Fall of ball:**  "Strobe of Falling Ball" URL http://ttv.mit.edu/collections/physicsdemos/videos/831-strobe-of-a-falling-ball

* excellent for capturing real time free fall position vs. time data: strobe rate = 15Hz.
* g approx 2d/t^2

**Inertia and Rotation:** "Hinged Stick and Falling Ball" URL http://ttv.mit.edu/collections/physicsdemos/videos/8164-hinged-stick-and-a-falling-ball

* a good video to use to ask students to predict where the ball lands on the board before you show the video.
* ask to explain before the slow motion part of the video is shown.

**NII & Thrust by exhaust gas:** " Fire Extinguisher on a Tricycle " URL http://ttv.mit.edu/collections/physicsdemos/videos/1067-fire-extinguisher-on-a-tricycle

**Momentum conservation collisions:**  "Two Dimensional Collisions " URL http://ttv.mit.edu/collections/physicsdemos/videos/3098-two-dimensional-collisions

* Ask students to print a screen shot of any 2 of the long-exposure images, and determine the ratio of the puck masses.

**Center of Mass motion is constant with no friction:** "Push me, Pull you" URL http://ttv.mit.edu/collections/physicsdemos/videos/674-push-me-pull-you

* Recommend having students create a VIEWING MASK (3x5 card with small viewing hole cut out of the middle to block their view of the carts). They can view the illuminated CM (2nd half of video) through their screen, and they will notice that they move their screen at a constant speed to keep up with the motion of the CM.

**Simple Atwood Machine:** " Low Friction Atwood Machine" URL http://ttv.mit.edu/collections/physicsdemos/videos/818-mit-physics-demo----low-friction-atwood-machine

* Excellent for students to collect real displacement and time data, to calculate the actual acceleration and compare to the theoretical.
* Theoretical a = (M-m)g/(M+m) from NII = (560-550)\*9.8/1110=0.088 m/s2
* Kinematics: a=2d/(time)2 = 2/(4.81)2 = 0.086m/s2

Vectors

<http://ocw.mit.edu/courses/physics/8-01-physics-i-classical-mechanics-fall-1999/video-lectures/lecture-3/>

Frictional forces

<http://ocw.mit.edu/courses/physics/8-01-physics-i-classical-mechanics-fall-1999/video-lectures/lecture-8/>

**Deformation of matter at collision interface**: "Rubber Ball Bounce " copy or click URL <http://ttv.mit.edu/tags/545-edgerton/videos/921-rubber-ball-bounce>

**Extremely high speed** Edgerton video: Arrow misses fruit, and they **begin free fall.** "Arrow and Fruit " Copy or Click URL<http://ttv.mit.edu/videos/4649-edgerton-center-hsv-arrows-and-fruit>

* 10,000 frames per second viewed at about 30 fps shows exceptionally clearly the start up from rest of three pieces of fruit as they free fall. Stunning photography.
* start video at 0:41 sec to see the missed shot and the fruit falling.