



WebSights

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WebSights offers a selection of sites appropriate for teaching a standard topic year-long introductory physics survey course. This month presents some for teaching rotational motion and thermal physics; next month will feature sites for waves and introductory static electricity. All sites are copyrighted by the authors. This column is also available as a web page at <http://PhysicsEd.BuffaloState.Edu/pubs/WebSights/>. If you have successfully used a site to teach physics that you feel is outstanding and appropriate for *WebSights*, please email me the site and how you use it for possible inclusion in our column. The person submitting the best site monthly will receive a T-shirt.

Web Resources for Teaching Rotational Motion and Thermal Physics

The Mechanical Universe. Fifty-two half-hour university physics lessons streamed as video-on-demand free of charge, <http://www.learner.org/progdesc/series42.html>. Programs 9, 19, and 20 address rotation; 45 through 48 address thermal physics. A great reference for teachers before teaching a topic, or as enrichment or a makeup assignment for high-ability students. DOI: 10.1119/1.1828735

Rotational Motion Tutorials and Applets. Uniform circular motion was addressed in the October 2004 *WebSights* column. A recent suggestion for insightful animated UCM vectors for class projection is <http://www.physics.brocku.ca/faculty/sternin/120/applets/CircularMotion/>. A very rich set of tutorials and activities associated with the Knight text is at http://wps.aw.com/aw_knight_physics_1/, (select Part III), and a classic tutorial on torque and the cross product is <http://www.physics.uoguelph.ca/tutorials/torque/Q.torque.html>. DOI: 10.1119/1.1828736

Physics of Sport and Dance. Application of physical analysis to student lifestyles, useful as extended readings or for projects. Start with a simple rolling motion applet at <http://www.phy.ntnu.edu.tw/ntnujava/viewtopic.php?t=5>. More complex examples are the spinning Ping-Pong ball, <http://www.walburgcollege.nl/vakken/natuurkunde/ntnujava/rotateDisk/pingpong.html>, and bowling balls at <http://mrcla.com/bowling/bowling-pres/sld001.htm>. Dance is discussed at http://physics.dickinson.edu/~podance/podance_homepage.html, and http://web.hep.uiuc.edu/home/g-gollin/dance/dance_physics.html, with a skating analysis at <http://btc.montana.edu/olympics/physbio/biomechanics/cam-intro.html>. Gymnastics are discussed at <http://www.angelfire.com/sc2/physics212/> and http://www.geocities.com/bright_effect/physics.html. DOI: 10.1119/1.1828737

Video projector-ready applets conceptually illustrate the use of the ideal gas model in thermodynamics; start at <http://www.phy.ntnu.edu.tw/java/idealGas/idealGas.html>, with lengthier discussions under “LINKS TO THIS PAGE.”

An equilibrium-of-gases applet with printable lab manual is at <http://intro.chem.okstate.edu/1314F00/Laboratory/GLP.htm>; similar are the “virtual laboratory experiments” with online directions at <http://jersey.uoregon.edu/vlab/Thermodynamics/index.html> (play Maxwell’s demon in Exp. 7). DOI: 10.1119/1.1828738

Engines and Cycles. High-efficiency Stirling engines are discussed and sold from <http://www.stirlingengine.com/>, with string-and-sticky-tape instructions for inexpensive student versions at http://www.bekkoame.ne.jp/~khirata/english/mk_can.htm. The MERLOT collection of reviewed web resources for instruction is being assembled and welcomes your submissions and reviews; for the thermodynamics topics see <http://www.merlot.org/artifact/BrowseArtifacts.po?catcode=64&browsecat=63> (e.g., Carnot heat engine simulations and lessons). DOI: 10.1119/1.1828739

Music (Physics Songs and Raps). Students like music and physics teachers love performing. Some downloadable recordings are freely available online: “Moving Molecules” at <http://www.scientificjam.com/scijamsongs/songs.html> is an example of the subculture of alternative physics music. For a comprehensive but loosely organized collection of physics songs with suggestions for use worth browsing, see <http://www.haverford.edu/physics-astro/songs/>.

Suggested by K. Richelt. DOI: 10.1119/1.1828740

References for Students. A concept mapped overview of thermodynamics (and much more physics) popular with my students is HyperPhysics at <http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>. A historic timeline of events in statistical mechanics and thermodynamics is <http://history.hyperjeff.net/statmech.html>.

Suggested by N. Childs. DOI: 10.1119/1.1828741

Follow-up on Water Rockets (Nov. 2004 *WebSights* column). Also consider paper matchstick rockets, aka micro-rockets at <http://www.matchstickrockets.com/>, or http://physicsed.buffalostate.edu/courses/00/spring/sci420/misc/students/logan_jeffrey/. DOI: 10.1119/1.1828742