



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 momentum conservation and work and energy; next month will feature sites for rotational motion and thermodynamics. 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 the column. The best site monthly will receive a T-shirt.

Web Resources for Teaching Impulse and Momentum Conservation, Work, and Energy

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 13–15 address momentum and energy. A great reference for teachers before teaching a topic, or as enrichment or a makeup assignment for high-ability students.

Roller Coaster/Amusement Park Physics. A number of web-site and downloadable curricular activities exist, particularly for conservation of energy. See Tony Wayne's electronic book *Roller Coaster Physics* and activities online at <http://www.vast.org/vip/book/HOME.HTM>. AAPT publishes a paperback book, *Amusement Park Physics*, at <http://www.aapt.org/Store/products.cfm>. An interactive roller coaster applet is <http://www.funderstanding.com/k12/coaster>, with others at <http://www.learner.org/exhibits/parkphysics/> (conceptually analyzes several different rides). *Suggested by:* K. Benson, S. DeWyer, D. Doty, F. Nochese, K. Richelt, and N. Stenz.

Water Rocket Physics. <http://ourworld.compuserve.com/homepages/pagrosse/h2oRocketIndex.htm> is a comprehensive site of water rocket physics, design, construction, FAQs, specialty launchers, competitions, bibliographies, mailing lists, etc. Also see NASA's aerospace activities and lessons, <http://www.grc.nasa.gov/WWW/K-12/aeroact.htm>, a very popular and widely used HS student design/competition project. See also the simpler film-canister, seltzer, or pop rocket project for elementary students at <http://spaceplace.nasa.gov/en/kids/rocket.shtml>, which I have also done with my daughter's elementary-school-age birthday party guests, and for children's physics outreach. *Suggested by:* C. Gosling.

Car Crashes and Auto Accident Reconstruction. A topic of great and timely interest to HS students appropriate for momentum and impulse. There are many insightful videos online; I show <http://regentsprep.org/Regents/physics/phys01/accident/>. Some lesson plans, activities, and freely downloadable worksheets at <http://www.ihs.org/videos>.

[htm](#) can be used with or without the video product. Also hyperphysics in car crashes at <http://hyperphysics.phy-astr.gsu.edu/hbase/carc.html> and <http://www.nhtsa.dot.gov/index.html>. <http://www.tarorigin.com/art/Lmartinez/>, where a downloadable accident investigation manual for patrol investigators is available. *Suggested by:* N. Childs.

Collisions Simulations/Animation Applets. <http://zebu.uoregon.edu/nsf/mo.html> is a nice and simple (clean) 1-D introduction to this topic, with <http://www.phy.ntnu.edu.tw/java/collision1D/collision1D.html> introducing the coefficient of restitution and c.m./lab frames. Collision details in two dimension (reference frames, impact parameters) are explored at http://galileo.phys.virginia.edu/classes/109N/more_stuff/Applets/Collision/applet.html and <http://www.scar.utoronto.ca/~pat/fun/fun.html>. *Suggested by:* E. Fooks and C. Olszewski.

Compelling and popular animated basic tutorials of energy conservation and momenta suitable for enrichment, in-class projection, or as absence makeup/review are found at <http://www.physicsclassroom.com/mmedia/momentum/cba.html> and <http://library.thinkquest.org/3042/>. *Suggested by:* C. Olszewski.

Popular topical sites on energy and power include the physics of archery sites <http://www.stortford-archers.org.uk/medieval.htm>, <http://mrfizzix.com/archery/>, and <http://www.student.utwente.nl/%7Eesagi/artikel/>. Another pair of sites discusses sport/biological mechanical energy, power, and work—a set of lecture notes at <http://www.nu.ac.za/physics/1M2002/Energy%20work%20and%20power.htm> (includes the infamous running-up-the-stairs activity and a nice discussion of metabolism) and the physics of body building/weight lifting site at <http://www.bodybuilding.com/fun/beck2.htm> provide more athletically relevant analyses.

Follow up on Spacecraft Piloting Games (Oct. 2004 *WebSights* column): Inertia Games at St. Albans' School, <http://staweb.sta.cathedral.org/departments/science/physics/inertiagames/>. Programmed by Bob Morse, St. Albans' Physics Master; includes learning research literature citations.