

## Examples of web experiments

<i>Name of experiment</i>	<i>Description</i>	<i>Pedagogical value</i>
Robotic telescopes <a href="http://www.skywatch.org">http://www.skywatch.org</a>	Telescopes are operated remotely, and digital images (CCD format) are taken of the astronomical objects. The user then receives the images, and they are also stored in the image database.	Powerful telescopes as well as good quality astronomical CCD cameras are expensive and beyond the financial scope of a school. Remote controls mean that schools can observe the night sky via a distant telescope, even during the daytime.
Optical interference <a href="http://131.246.237.56/startseite.html">http://131.246.237.56/startseite.html</a>	For physics, this site proposes interference experiments on grids and slits. The documentation is in German.	Numerical analysis is easily carried out on the images shown by the webcam. Free software for analysis is also available. Every student can get their own data set.
Electron diffraction <a href="http://131.246.237.97/r1ab/web/index.shtml">http://131.246.237.97/r1ab/web/index.shtml</a>	An electron beam is fired at graphite foil. The diffraction pattern is observed on a screen. The documentation is in German.	The result is a digital image, which is easy to analyse using free software. Every student can get their own data set.
GAMMA-spectroscopy <a href="http://electron5.phys.utk.edu/Gamma/">http://electron5.phys.utk.edu/Gamma/</a>	This experiment involves measuring the Gamma-spectrum of several radioactive sources. The documentation is in English.	The experiment is too expensive to set up at school, and handling radioactive sources is problematic. The resulting data file is easy to analyse in all spreadsheet programs or data analysis software. Every student can get their own data set.
Tele-garden <a href="http://queue.ieor.berkeley.edu/~goldberg/garden/Ars">http://queue.ieor.berkeley.edu/~goldberg/garden/Ars</a>	Users can plant plants, water them and watch them growing. The documentation is in English.	Plants grow under constantly-controlled conditions. The experimental setup was closed after 9 years of operation. It is kept in this list to give an unusual example.
Remote microscopes <a href="http://www.itg.uiuc.edu/technology/remote_microscopy/">http://www.itg.uiuc.edu/technology/remote_microscopy/</a>	This experiment involves remote operation of expensive electronic microscopes. The documentation is in English.	Electron microscopes and raster tunnel microscopes are normally not within the reach of schools, and can give students an insight into advanced microscopy.
Optical tweezers <a href="http://www.remote-lab.de/labor/01/spiel/en.html">http://www.remote-lab.de/labor/01/spiel/en.html</a>	A laser beam is used to move microscopic bodies in the view field of an optical microscope. The documentation is in German and English.	The experiment gives involves handling complicated and expensive apparatus, used in micromanipulation, but in a simplified way.
Robot in a maze <a href="http://www.remote-lab.de/en/labor/02/spielen.html">http://www.remote-lab.de/en/labor/02/spielen.html</a>	The user can control the moves of a robot in a maze. The documentation is in German and English.	Students can learn to control a robot.
Water cycle <a href="http://www.h2-lab.com/">http://www.h2-lab.com/</a>	A suite of three experiments from wind energy via electrolysis of water to hydrogen cells. The	Pupils can learn, play and carry out the experiments.

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Damped harmonic mechanic oscillation <a href="http://dynamics.soe.stevens-tech.edu/exp01/exp-01a.html">http://dynamics.soe.stevens-tech.edu/exp01/exp-01a.html</a>	A damped harmonic oscillation is triggered. The data is sent to the user. A video file of the experiment can be requested. The documentation is in English.	Every student can get their own data set. The data can be fed into a spreadsheet or data analysis program for further investigation.
Frequency response of harmonic oscillator to external excitation <a href="http://dynamics.soe.stevens-tech.edu/exp01/exp-01c.html">http://dynamics.soe.stevens-tech.edu/exp01/exp-01c.html</a>	Forced harmonic oscillation is recorded. Pupils may repeat this experiment at several frequencies to construct a resonance curve. The documentation is in English.	Every student can take his own set of frequency responses to construct his/her own version of the resonance curve of this oscillating object. All pupils finally should get a similar shaped curve.
Teleroboter <a href="http://telerobot.mech.uwa.edu.au/">http://telerobot.mech.uwa.edu.au/</a>	An industrial robot can be controlled by the pupil. The documentation is in English.	"Hands on" practice with industrial robots.