

Balance and Forces

To Get to the Other Side: Designing Bridges

INTERACTIVES FOR STUDENTS

Building Big

BUILDING BIG™ is a five-part PBS television series and website from WGBH Boston. The main features of the site are online activities for grades 5 - 8, a "wonders of the world" database, and articles that feature interviews with civil engineers.

<http://www.pbs.org/wgbh/buildingbig/index.html>

Forces Lab

This interactive, designed by BUILDING BIG™, has students exploring forces, loads, materials, and shapes in a virtual lab. Students can click on various demos to see how they react under force.

<http://www.pbs.org/wgbh/buildingbig/lab/forces.html>

WEBSITES FOR TEACHERS

Why the Bridges Failed

This PBS site provides 10 images of bridge collapses and explains the causes behind each collapse. Note: this site mentions casualties as the result of some of the bridge failures.

<http://www.pbs.org/wgbh/nova/tech/bridge-collapse.html>

What Are Balanced and Unbalanced Forces?

Textbook excerpt from Project Based Inquiry Science. Includes text, teacher tips, and related classroom activities.

http://its-about-time.com/htmls/pbis/move/mbt_te_ls1_1_4.pdf

VIDEOS FOR STUDENTS

Understanding Bridge Design

This video clip from *HowStuffWorks* introduces the parts of bridges, some types of bridges, and how the load is distributed in each bridge. The video highlights the building of the bridge connecting Oakland and San Francisco. (2:07)

<http://science.howstuffworks.com/understanding-bridges-videos-playlist.htm>

Bridge Design (and Destruction!)

This video from MIT-K12 shows how bridges have evolved as designs have become more diverse and available materials have expanded. The video describes the advantages and limitations of each type of bridge and covers technical concepts including tension, compression, bending, span, force balances, material selection, and beam/cable design. (5:09)

<http://www.youtube.com/watch?v=IBP7739C83s>

Arch Bridge

This video clip explains how force is distributed in an arch bridge using animation. Requires free registration with PBS LearningMedia™. (1:47)

http://mass.pbslearningmedia.org/resource/phy03_sci.phys.mfw.bbarch/arch-bridge/

Structures

In this 'Structures' collection from PBS LearningMedia™, find videos, interactives, and lesson plans to examine different types of bridges, explore concepts of tension and compression, and discover various shapes used to make strong structures. Requires free registration with PBS LearningMedia™.

<http://www.pbslearningmedia.org/collection/structures/>