

## Civil Engineering Teaching Materials for Grades 1-5

Activity Title	Activity Description	Area	Topic	Grade	Source	Required Time	Special Materials
<b>Busy as a Beaver</b>	Build 4 different types of dams using materials from nature, and test them.	Hydraulic, Hydrology & Water Resources	Dams	3-4	<a href="#">ASCEville</a>	45 min.	Large aluminum baking pans, Sand, Rocks, Pebbles
<b>Down the Drain</b>	Test a water filtration system and learn about wastewater management.	Hydraulic, Hydrology & Water Resources	Water Systems	3-4	<a href="#">ASCEville</a>	45 min.	
<b>Water, Water Everywhere</b>	Learn about water pollution, design water filters, and investigate the properties of filter materials.	Hydraulic, Hydrology & Water Resources	Water Filter	1-5	<a href="#">EiE</a>	Designed for multiple class sessions	
<b>Bury Your Trash!</b>	Bury various pieces of trash, and investigate what types of materials biodegrade in soil.	Environmental	Landfills	2-5	<a href="#">Teach Engineering</a>	Two 60-min sessions, three months apart	Digging tools such as small shovels or trowels, and gloves
<b>Recycling Paper</b>	Use water and cornstarch, to turn your old paper into new reusable forms.	Environmental	Recycling	4-5	<a href="#">ASCEville</a>	1 day	
<b>A Slick Solution</b>	Test water quality and the oil-absorbing properties of different materials in a process for cleaning up an oil spill.	Environmental	Ecosystems	1-5	<a href="#">EiE</a>	n/a	Gravel, Vials, Pans, Oil, Pantyhose, Oil-based food coloring, Yarn, Rubber bands
<b>A Stick in the Mud: Evaluate a Landscape</b>	Study soil properties at a model river bank, assess the potential for erosion at different sites along the river, and factor in the villagers' preferences for a special cable bridge location.	Geotechnical	Landforms	1-5	<a href="#">EiE</a>	Designed for multiple class sessions	Plastic containers, Dowel, Gravel, Sand, Soil, Playing dough
<b>Carve That Mountain</b>	Build models of landscapes, depicting several of major landforms such as mountains, rivers, oceans and hills; and then design and build roads through these landscapes.	Transportation	Roadway Construction	3-5	<a href="#">Teach Engineering</a>	Two 50-min. sessions	Construction paper, Paper-mache or clay
<b>The Attraction is Obvious: Design Maglev Systems</b>	Design, test, and improve your own tabletop maglev transportation systems	Transportation	MagLev Trains (Magnetic Levitation)	1-5	<a href="#">EiE</a>	n/a	Magnets (bar, disc, ring, strip), Clay, Manila, Superglue, Hole-punch
<b>Shape It Up!</b>	Discover which shapes are the strongest and most stable for building bridges.	Structural & Construction	Bridges and Forces	3-4	<a href="#">ASCEville</a>	45 min.	
<b>To Get to the Other Side: Designing Bridges</b>	Learn about balance and "push" and "pull" forces and create different types of bridges (beam, arch and deep beam) out of index cards and test each type to see how much weight it can support.	Structural & Construction	Bridges and Forces	1-5	<a href="#">EiE</a>	Designed for multiple class sessions	
<b>What Gives?</b>	Can you build a suspension bridge out of cardboard that wouldn't collapse under the weight of a pile of books?	Structural & Construction	Suspension Bridge	3-4	<a href="#">FETCH!</a>	45 min.	
<b>Canine House of Cards</b>	Build a two-story paper building out of index cards strong enough to support a jumbo dog biscuit on top!	Structural & Construction	Buildings and Loads	3-4	<a href="#">FETCH!</a>	45 min.	
<b>Shapes of Strength</b>	Using only paper, straws, tape, and paper clips, create structures that can support the weight of at least one book.	Structural & Construction	Shapes & Strength	3-5	<a href="#">Teach Engineering</a>	40 min.	
<b>Under Pressure: Support a book with a sheet of paper?</b>	Paper doesn't need to go to the gym to get stronger. All you need to do is change its shape. Give your paper a workout and make it stronger!	Structural & Construction	Shapes & Strength	1-5	<a href="#">FETCH!</a>	45 min.	
<b>Stack Them Up!</b>	Build a tower as high as you can just out of cups.	Structural & Construction	Towers	1-5	<a href="#">FETCH!</a>	45 min.	
<b>Thrill Ride</b>	Design a crazy roller coaster ride for a marble, but make sure it doesn't fly off the track!	Structural & Construction	General Construction	1-4	<a href="#">FETCH!</a>	45 min.	
<b>Earthquake in the Classroom</b>	Test earthquake-proof buildings on a pan of Jell-O.	Structural & Construction	Earthquake-proofing	3-5	<a href="#">Teach Engineering</a>	50 min.	Needs a stove, water and pan to make Jell-O in advance.
<b>Engineering for the Three Little Pigs</b>	Build three different sand castles and test them for strength and resistance to weathering, to discover the right materials for the right job.	Structural & Construction	Construction Materials	3-6	<a href="#">Teach Engineering</a>	90 min.	Sand, Bricks, Non-stick cooking-spray, Safety glasses