


Activity Title	INPUT Bridges		
Learning Outcome(s)	Produce a stable and strong paper bridge. Appreciation of the role of Civil Engineers in society		
Activity Length	2 hours	Date	
Key Stage(s)	Year(s)	Class Organisation	Whole class in Groups of 4
Resources needed (provided by ICE)	200 No. M4 20mm bolts (slot head) and bolts (10 per group – bagged) 30 No. split A4 9mm rolling dowels (2 per group plus spare) 8 No. paper punches (1 per group) 8 No. rolls Masking Tape (1 per group) 200 No. sheets A4 plain paper (20 sheets per group plus spare) 8 No. Screwdrivers (1 per group) Laptop and projector (optional)		
Resources needed (to be provided by school)	1 No. screen or blank wall (optional for projector above)		
Space required	Classroom		
Activity Plan / Introduction	Short (5 to 10 min) introduction to Civil Engineering and the role it plays in the everyday life of society (use elements of “What is Civil Engineering?” presentation).		
Main Activity	<p>Show how paper can be strong under different conditions:</p> <ul style="list-style-type: none"> • Sheet vs. tube • Tension, compression & bending <p>Demonstrate how to roll the tubes. Construct a triangle and talk through geometry. Teams to assign roles (“taper”, “roller”, “puncher” and “fastener” and cf. Civ. Eng.) Develop into a 3 triangle element  Construct an exact replica Join together at top, adding bottom members and bracing to form rigid structure. Show why diagonal members are so critical. Talk about overuse of materials – not replicating top members. Bolts and nuts not to be fastened until entire structure complete.</p>		
Summary	Test strength with weights (either students own or a prepared model)		
Extension Activities	PowerPoint presentation of different types of bridges and demonstrate how they contain elements of the model the students have built. Increase span of bridge. Talk about deflection, reduced strength etc.		
Assessment Criteria	Were students able to construct a simple 3 triangle bridge? Do students have a better understanding of the Civil Engineering profession?		