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|  | Preparation: *Summary of “to do’s” that the teacher should understand and prepare before bringing this lesson to the classroom.* |
| Teachers will need to ensure that the proper supplies are available for students to build their solutions. You will need these items:**Materials:*** 1/8” x 1/8” Balsa
* Chip board
* Adhesive. Wood glue, Hot glue, Gorilla glue, etc…
* Graph paper (11 x 17)
* Wax paper
* 5-gallon bucket
* Sand

**Tools:*** Test plate assembly
* Kitchen scale
* Bathroom scale
* Ruler
* Hobby knife; Balsa cutter
* Cutting mat
* Hot glue gun
* Scissors
* Pencil

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|  | Safety: *Summary of safety strategies in the lesson.* |
| Hot glue guns are very hot. Avoid touching the tip of the hot glue gun. Allow gun to cool before putting away. |
|  | Desired Results:  |
| Established Goals: |  | Transfer: |
| *Problem Solving Techniques and Applications Standards:*  | *Students will be able to independently use their learning to…** Better understand civil engineering and bridge structures
 |
| Meaning: |
| Understandings*Students will understand that...** A well-built balsa bridge comes from following a design process and not just using trial and error
 | Essential Questions*Students will keep considering...** Better bridge designs and solutions
 |
| Acquisition OF KNOWLEDGE AND SKILL: |
| *Students will know...** The design process
* How different bridge designs affect the strength of the bridge
* Proper joinery
 | *Students will be skilled at...** Construction of a bridge
* Designing
* Prototyping
* Testing
 |
|  | Evidence:  |
| Evaluative Criteria: |  | Assessment Evidence: |
| * Placeholder
 | *Performance Task(s):* **The design and construction of the student’s bridge will be assessed based on ratio of the weight of the bridge to the weight the bridge holds before failing** |
| *Other Evidence:* * End of unit test
 |
|  | Learning Plan: *Summary of Key Learning Events and Instruction* |
| **1. Introduce Activity**1. Design and build a bridge that will hold as much weight as possible

**2. Brainstorm**1. Research different bridge designs and develop a solution

**3. Construct**1. Build the structure based on sketches in the engineering notebook

**4. Test**1. Test solution by placing as much weight on the bridge until it fails. Add the sand to the bucket slowly

 **5. Communicate Results**1. Submit all documentation to instructor

**Progress Monitoring:**Teacher should observe students and provide on-going feedback during the activity. While introducing the unit, the teacher will pause and ask for questions to make sure everyone understands.Students will complete self-assessment and brainstorm how they could improve their skills in the future. At the end of the unit, there will be a quiz to measure their overall understanding. |
|  | Differentiation: *Summary of Key Differentiation Techniques* |
| The ASCD Study Guide for Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.by Carol Ann Tomlinson, Jay McTigheIntegrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.by Carol Ann Tomlinson, Jay McTigheISBN-13: 978-1416602842 ISBN-10: 1416602844Differentiating Reading Instruction*by Laura Robb.*ISBN13: 9780545022989A Teacher's Guide to Differentiating InstructionThe Center for Comprehensive School Reform and Improvement |

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|  | career Connections: *Summary of Career Opportunities Associated with this Lesson* |
| Good sources for career connections:Occupational Outlook Handbook<http://www.bls.gov/ooh>The National Career Clusters® Framework<http://www.careertech.org/career-clusters> |
|  | Keywords: *Please Insert Keywords from this Lesson with their Definitions* |
| Use resources like [dictionary.com](http://dictionary.reference.com/) to find definitions to your keywords |