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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 | | | | |
|  | 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 McTighe  Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.  by Carol Ann Tomlinson, Jay McTighe  ISBN-13: 978-1416602842  ISBN-10: 1416602844  Differentiating Reading Instruction  *by Laura Robb.*  ISBN13: 9780545022989  A Teacher's Guide to Differentiating Instruction  The 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 | |