# MODIFIED UBD LESSON PLAN



**COURSE: MIDDLE SCHOOL** 

UNIT: STRUCTURES EXERCISE: BALSA BRIDGE TIME FRAME: 3-4 Hours



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.

## S 1

## **DESIRED RESULTS:**

## **ESTABLISHED GOALS:**

Problem Solving Techniques and Applications Standards:

### TRANSFER:

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



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S2 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

S3 LEARNING PLAN: Summary of Key Learning Events and Instruction

### 1. Introduce Activity

a. Design and build a bridge that will hold as much weight as possible

### 2. Brainstorm

a. Research different bridge designs and develop a solution

### 3. Construct

Build the structure based on sketches in the engineering notebook

## 4. Test

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

### 5. Communicate Results

a. 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.

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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 <a href="http://www.bls.gov/ooh">http://www.bls.gov/ooh</a>

The National Career Clusters® Framework <a href="http://www.careertech.org/career-clusters">http://www.careertech.org/career-clusters</a>



KEYWORDS: Please Insert Keywords from this Lesson with their Definitions

Use resources like dictionary.com to find definitions to your keywords

