MODIFIED UBD LESSON PLAN

STEM 101

COURSE: Introduction to Engineering

UNIT: Teamwork and Concurrent Engineering	EXERCISE: Airplane in a Box	TIME FRAME: 1 Hour

TREPARATION: 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.

Materials:

- Paper copy 8.5"x11" white
- Tape magic transparent .5"x800"
- Pencils No 2 pk/12

Tools:

• Scissors safety point 7"

Information

Before starting this exercise: students should have an understanding of material covered in:

✓ Reading: Teamwork and Concurrent Engineering

SAFETY: Summary of safety strategies in the lesson.

Please use this space to describe safety procedures or highlights for this lesson.

DESIRED RESULTS:				
ESTABLISHED GOALS:	TRANSFER:			
Problem Solving Techniques and	Students will be able to independently use the	eir learning to		
Applications Standards:	Understand the importance of communication and teamwork.			
Teachers should use the STEM Academy	MEA	NING:		
Standards Correlation System available in	UNDERSTANDINGS	ESSENTIAL QUESTIONS		
the STEM Connections area of a unit to	Students will understand that	Students will keep considering		
extract specific standards and insert these	 Effective communication is vital when 	How their teamwork can be improved		
standards here.	working in a group and wanting to accomplish tasks.	 How communication can be improved How group dynamic can be improved 		



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	ACQUISITION OF <i>Students will know</i> How a lack of communication can lead mistakes; How important intergroup communication	KNOWLEDGE A Students with to Constru Working on. Commu	AND SKILL: <i>ill be skilled at</i> ncting paper structures; g in a team; inication with team members.
S2 EVIDENCE:			
EVALUATIVE CRITERIA:	ASSESSMENT EVIDENCE:		
Constructed wellPlane not tested	Performance Task(s): Airplane in a Box In this exercise, students will build either a paper airplane or a box while using teamwork and beir in a team environment Other Evidence:		ox while using teamwork and being
	Completion grade		

3 LEARNING PLAN: Summary of Key Learning Events and Instruction

1. Set Introduction

This activity will take one classroom day to complete. Spend the first portion of the class period talking about concurrent engineering and teamwork and then introduce the case study. This should take about ten to fifteen minutes after you have covered the information at the beginning of the class.

2. Assign Groups

This activity provides students an example of what happens when not using teamwork and concurrent engineering techniques. DO NOT tell them they are going to use the objects they are designing. Split the class in half and put students in two different rooms or one half in the hallway. Assign each group one object and give them five to eight minutes to built it (they all build their own). You will want to supervise the students who are building the airplane. However, students who are building the boxes tend to need more time, and always need your help. If they need a few pieces of tape, make those available in the same location as the scissors.

3. Bring Groups Together

After the time expires, have the students form outside the classroom come in the room and stand next to one of the students from the other group. NO TALKING. You should remind them that this day's purpose was teaching about concurrent engineering. Ask them: WITHOUT ALERTING EITHER OBJECT, to put the airplane in the box. Most student teams will not be able to do this and a few may jam it or fold the airplane to fir it in. Occasionally, a student will fit into the box. Then ask them these questions:

- Would you have designed the airplane differently if you knew it had to fit into a box made from a sheet of copy paper?
- Would you have designed the box differently if you knew a paper airplane made from a piece of copy paper had to fit into it?

Progress Monitoring:

- The instructor will need to monitor the classroom, checking student's work and ensuring students are on task and following directions.
- Ensure students store their projects at the end of class and leave all materials in the room.
- At the end of the activity, post student projects in the room and provide appropriate feedback.

DIFFERENTIATION: Summary of Key Differentiation Techniques

Please use this space to insert your differentiation techniques. Depending on the needs of students, various techniques might be needed in a classroom, therefore use the information below and experts in the area needed to design your plan for differentiation.

The ASCD Study Guide for Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids. by Carol Ann Tomlinson, Jay McTighe



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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

CAREER CONNECTIONS: Summary of Career Opportunities Associated with this Lesson

Engineer

Engineers work in teams constantly.

Scientist

Scientists work in teams constantly as well.

Technician

Technicians also work in teams constantly.

KEYWORDS: Please Insert Keywords from this Lesson with their Definitions

TEAMWORK—the combination action of a group of people, especially when effective and efficient.

CONTINUITY—the unbroken and consistent existence or operation of something over a period of time.

EFFICIENT—working in a well-organized and competent way.

