Elementary School

Let's Have Fun with Manufacturing

Teacher Lesson

Created by Florida Advanced Technological Education Center, FLATE
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NATURE OF EXPERIENCE	GRADE LEVELS
• To understand and apply the theory behind manufacturing • Students are challenged to engineer and manufacture a new invention using manufacturing process	3-5
TARGETED SUBJECT AREA/S	**MANUFACTURING LEVEL**
Manufacturing	Design, Innovation, Fabrication, Testing, Marketing, Distribution
LEARNING OBJECTIVES – The Students Will….	**TIME FRAME**
• Understand concepts of manufacturing • Be able to apply manufacturing process • Develop manufacturing skills: innovate, design, build, test • Understand that technology is closely linked to creativity, which has resulted in innovation	Minimum 60 minutes

STANDARDS ADDRESSED

Standards for Technological Literacy ITEEA-TIDE

01.0 - Characteristics of technology: usefulness and development of technology, human creativity and motivation
02.0 - Core concepts of technology: systems, resources, processes, controls.
03.0 - Relationships among technologies and the connections between technology and the other fields of study.
04.0 - Effects of technology on the environment, such as management of waste.
05.0 - Role of society in the development and use of technology: inventions and innovations
08.0 - Demonstrate an understanding of the attributes of design and criteria and constraints.
09.0 - Develop an understanding of research, development, innovation and experimentation in problem solving.
10.0 - Problem solving: troubleshooting, invention and innovation, experimentation
11.0 - Apply design process: identify criteria and constraints, model a solution to a problem, test and evaluate a product.

Florida Department of Education 2014 Mathematics Florida Standards

MAFS.3.OA.1.1-1.3. Represent and solve problems involving multiplication and division
MAFS.3.NF.1.1-1.3. Develop understanding of fractions as numbers.
MAFS.3.MD.1.1-3.7. Solve problems involving measurement, volumes and masses of objects. Represent and interpret data. Geometric measurement: area and relate area to multiplication and to addition.
MAFS.3.G.1.1- 1.2. Reason with shapes and their attributes.

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REQUIREMENTS

Basic concepts of manufacturing & manufacturing process (show "Let's have Fun with Manufacturing" presentation)

MATERIALS

Teacher: power point presentation "Let's have Fun with Manufacturing," flip chart (paper size recommended 27 in x 34 in), color markers. Per Group of students: ruler, scissors, scotch tape, color pencils or markers, minimum 6 paper sheets (recommended 27 in x 34 in).

KEY TERMS

Design, distribute, fabricate, innovate, manufacture, manufacturing cycle, manufacturing sectors, market, materials, products, test.

Teacher Activities	Notes
Get familiar with the activity and review reference material for theory and vocabulary	Review presentation
Lesson Activity Instructions Brainstorm Pre-Activity – Introducing Manufacturing. Brainstorm about "What is Manufacturing. "Encourage students to describe any objects in the classroom and ask them how they were manufactured. Show "Let's have Fun with Manufacturing" presentation. Make sure students understand what manufacturing means, manufacturing cycle and different sectors of manufacturing. Part A – Let's Have Fun with Manufacturing! Divide the class into groups (recommended 4 students per group). Each group should provide a name for their factory. Ask students to discuss and agree on a new invention. Students should sketch out the new invention using the manufacturing process. 1. Design & Innovate: ask students to think about what they want to make (Remind them it should be a new invention.) and which Manufacturing sector the product belongs to. What will it do? What will it look like? How it will perform? How it could be built? 2. Fabricate & Test: students should think about how they can make their product. What they need? Materials? Skills? Technology? How they will make it faster? Does it works? Why not? Quality control? 3. Market & Distribute: students should list the ways to market (how & who is buying), how many and where they can sell their product. Part B – Presentations by Manufacturing Teams Presentations should include: name of their factory, name of the new invention with a drawing, manufacturing sector, what the new invention will do, what is new about it, why people should buy it, and summary of its fabrication, test, market and distribution plans.	Provide any additional resources you consider necessary. Remind students about team work and communication Make sure students understand concepts. Presentation should follow manufacturing cycle.
Assessment Assess the level of understanding of the topics covered throughout the lesson.	Use grading rubric template

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