EXPLORE
THE NEW MANUFACTURING

Lesson 1

Session Title: Math Building Activity

Grade Level: 3rd – 6th Grade

Focus: Math

Objectives: As a result of this lesson, the student will:

- Watch "What's So Cool About Manufacturing" videos that demonstrate history and manufacturing.
- Follow instructions to create a finished product.
- Create their own structure using building blocks.
- Answer questions that require critical thinking skills and math skills.
- Compare and contrast how items were created in the past vs how they are created in today's society.
- Journal their discoveries and lingering questions.

PA Standards	
Career Education and Work	• 13.1.3. A Recognize that individuals have unique interests. • 13.1.3. B Identify current personal interests. • 13.1.3. C Recognize that the roles of individuals at home, in the workplace and in the community are constantly changing • 13.1.3. D Identify the range of jobs available in the community. • 13.1.3. E. Describe the work done by school personnel and other individuals in the community. • 13.1.3. F. Explore how people prepare for careers. • 13.1.3. G. Explain why education and training plans are important to careers. • 13.1.3. H. Explain how workers in their careers use what is learned in the classroom. • 13.1.3. E. Discuss the importance of the essential workplace skills, such as, but not limited to: Dependability, Health/safety, Team building, Technology • 13.3.3. A. Identify attitudes and work habits that contribute to success at home and school. • 13.3.3. C. Explain effective group interaction terms, such as, but not limited to: Compliment, Cooperate, Encourage, Participate
Math	• 2.1.3.B. Represent equivalent forms of the same number through the use of concrete objects, drawings, word names, and symbols. • 2.1.3.E. Apply number patterns even and odd, factors and multiples to represent numbers in various ways. • 2.1.3.F. Understand the concepts of addition and subtraction and use the inverse relationships between addition and subtraction to determine unknown quantities in equations. • 2.1.3.G. Use concrete objects to count, order and group. • 2.1.3.H. Demonstrate an understanding of one-to-one correspondence. • 2.3.3.A. Demonstrate an understanding of measurable characteristics and the need to quantify those characteristics. • 2.3.3.B. Identify a measurable characteristic of an object, select an appropriate standard or non-standard unit of measure and tool, and determine the measurement to a specified level of accuracy. • 2.8.3.C. Recognize, describe, extend, create, and replicate a variety of patterns including attribute, activity, number, and geometric patterns. • 2.9.3.A. Name, describe and draw/build 2- and 3- dimensional shapes • 2.11.3.A. Identify whole number quantities and measurements from least to most and greatest value. ▪ 2.11.3.D. Continue a pattern of numbers or objects that could be extended infinitely.

Artifact Opportunity	• The Journal Worksheet can be used as an artifact.
Videos	• Norwin - Intervala: https://www.youtube.com/watch?time_continue=71&v=9RkuLY3kwBo • Mount Lebanon - Seegrid: https://www.youtube.com/watch?time_continue=101&v=qwLk82Qc07o • Ligonier Valley - L&S Machine Company: https://www.youtube.com/watch?time_continue=72&v=KcZ3pDfBpYE • Somerset - Global SFC Valve: https://www.youtube.com/watch?time_continue=137&v=WoGZTS2Igho

Lesson Plan

Materials Needed

- ☐ Building blocks/cubes (can be small or large)
- ☐ Whiteboards
- ☐ Markers
- ☐ Journal Worksheet
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- ☐ Internet access
- ☐ "What's So Cool About Manufacturing?" videos

Prior Knowledge

Overview: We can create new structures using building blocks, all while developing our math skills! Much like in manufacturing, we have to follow a list of steps in order to create our finished product. We will make discoveries about manufacturing in addition to creating our own structures. Many food products, toys, and materials are made through the process of manufacturing.

Procedures and Activities

Guiding Questions

- What are some other ways you could build your structure?
- What is manufacturing?
- How is math used in manufacturing?
- What other products use manufacturing?
- How can math be used in the real world?

Directions

Step 1: Allow students time to create their own structure using the blocks/cubes

Step 2: Once they have completed their creation, ask the students the following questions (have them write their answers down on their whiteboards)

- How many pieces are there total in your structure?
- How many sets of 10 are in the structure?
- How many sets of 5 are in the structure?

Step 3: Have students pair up with one another

Step 4: Once they are in their groups, have the students compare their answers and ask the following questions

- Who has more pieces in their structure?
- Who has less?
- How do we represent this? (using greater or less than signs)

Step 5: Culminating Activity:

Students will:

- Journal their discoveries
- Revisit the guiding questions
- Journal any remaining questions they have about the activity and manufacturing

Journal Worksheet

Sketch a draft of your structure	

Journal any remaining questions about the activity and manufacturing	

Photo of final product: