



Connecting Industry to Mathematics Instruction

NSF ATE Award # 1954291

Bill of Materials

A Solidify Understanding Task

Purpose: In this lesson students will be able to operate with matrices. Operations include addition, subtraction, scalar multiplication and multiplication.

Career Field: Supply Chain

IBM -International Business Machine

WTCC Associate Program of Study and Contact Person:

Data Science and Programming Support Services

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NC Math 4 Standards:

NC.M4.N.2: Apply properties and operations with matrices and vectors.

Unit Alignment:

NC Math 4 - ACT Unit

Common Core State Standards for Mathematical Practice

4. Model with mathematics.
7. Look for and make use of structure.

Prerequisite Skills

These skills could be reviewed in a warm-up and are addressed in the Desmos Activity

- Students will need to be comfortable with basic matrix operations

Specific Uses for Matrix in Business

- Managing large supply chains
- Small business inventory
- Making the best use of assets (whether capital or labor)
- Optimization of problems

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WAKE COUNTY
PUBLIC SCHOOL SYSTEM



Time Required

The time required to complete this activity is approximately 60-90 minutes.

Materials Needed

- Student Activity Sheet
- Calculator
- Access to the launch video

The Teaching Cycle:

Launch: Have students read through the task. You may want to use the 3 Reads protocol, reading once to understand the “story”, reading a second time to identify unknown words, and a third time to determine what they are being asked to do. Make sure the students can read the data table. The activity can be done individually, in partners or in groups no larger than 3. Working with another student may encourage more participation and richer mathematical discourse.

Depending on the level of your students, teachers may choose to give the assignment in its entirety or may choose to scaffold into smaller sections. If the task is broken down then mini discussion should occur after each section. Have students complete the Desmos Launch Activity ([opens in a new window](#)).

Additionally, [here](#) is a link to an article about the bill of materials. You may want to share this with your class to give more background on the material or to better familiarize yourself with it.

Explore: Students will work in pairs to sort the data into matrices, answering the questions on pages 2 – 5 of the student activity sheet. While the students work, the teacher serves as a facilitator and circulates the room to note any misconception, key ideas for discussion, and answer questions. It is expected that some students may struggle to correctly organize the data into matrices. When this happens, redirect them to how a matrix is organized.

Discuss: Have selected groups come up and discuss their reasoning to the following questions. We want students to note that the dimensions of a matrix are important.

1. Why are you able to add disc enclosure 1 and disc enclosure 2 but not the drawer components and bases? (Answer because mismatched dimension)
2. Is there a benefit to organizing the data in the matrix the way you chose to do it?
3. Given Horizontal and Vertical orientation of the matrix which way is easier?
4. What are the benefits of having different size matrices?
5. Other than using matrix operations what else did you think about using?

Note for teacher: Students can have different sizes for their matrices. The numbers should all be the same.

Extensions: [Importance of Matrices Video](#) this video is 25 minutes and can be shown on a short day. It connects matrices and vectors in the real world.

Exit Ticket: The exit ticket is a Quizizz as a game in class or as a homework assignment

<https://quizizz.com/admin/quiz/5f19d4e8153195001d52cb48>

Questions on the Quizizz

1. Multiplication of matrices
2. Multiplication of matrices
3. Identifying elements
4. Addition of Matrices
5. Identifying dimension