



Contextualized Math Video Descriptions



The activities below were created through an NSF ATE Grant titled "Welding: Wisconsin's Ultimate Rural STEM Pathway" to be utilized in Math Trades 1. For additional activities like these see <http://newmfgalliance.org/educators-students/get-real-math-videos/>

Competency	Video Title	Video Summary	Website
1. Perform operations involving whole numbers	What Does Steel Rectangular Tubing Have to do with Math?	In this lesson, students need to determine the total amount of tubing needed to produce a riser that will be used in a robotic welding enclosure. Students will be challenged to understand a two-dimensional figure (blueprint) that represents a three-dimensional object. They will also look at the loss of material from cutting.	https://www.youtube.com/watch?v=oQwluJoYCS8
2. Perform operations involving fractions and mixed numbers	What Does Weld Inspection Have to do with Math?	When the strength of a weld is inspected, the measurements of discontinuities need to be added. In this video, students will look at the criteria for passing a weld inspection test and combine fractional inch measurements to determine if the specimen being tested would pass.	https://www.youtube.com/watch?v=n-aFi7kbg-M
3. Perform operations involving decimals	What Does a Press Brake Have to do with Math?	In order to operate many machines in the manufacturing industry, dimensions need to be entered a certain way. In this video the dimensions on a blueprint to make a box are in fractions of an inch, but when the sides of the sheet metal are bent using a press brake, the dimensions need to be entered in decimal form. Students will need to convert fractional inches into decimals.	https://www.youtube.com/watch?v=e544waetKNA
4. Perform operations involving measurement (converting units)	What Do Robots Have to do with Math?	In this video students look at needing to change dimensions in order to determine the proper robotic arm to order for a new welding enclosure. A blueprint is provided for students to measure a needed dimension which then needs to be turned into a real world dimension using the blueprint scale. The dimensions then need to be converted from inches to millimeters in order to determine the type of robotic arm to order.	https://www.youtube.com/watch?v=BY2nK4B3qtk

5. Perform operations involving integers	What Does Temperature Have to do with Math?	In this lesson, students will see a material's strength being tested using the Charpy Impact Test. In this particular situation, the material is to be tested under very cold temperatures and to do so, the temperature at which the material needs to be tested needs to be converted from Fahrenheit to Celsius.	https://www.youtube.com/watch?v=lvX0Oncxnss
6. Solve equations	What Does Rigging Have to do with Math?	Understanding the weight of different things is very important for many reasons – safety being one of the main reasons. In this task, students learn how to calculate the weight of a table in order to determine the appropriate straps to use for rigging the table to move it properly and safely.	https://www.youtube.com/watch?v=Nrf-47IB-Tw
7. Perform operations involving practical plane geometry	What Does a Cylindrical Tank Have to do with Math?	In this video specifications for a set of tanks that are ordered are given in regards to the volume in gallons and the diameter of the tank. The height of the tank needs to be determined using some conversions and the formula for volume of a cylinder. The process of how the tank is produced is discussed and shown.	https://www.youtube.com/watch?v=-5naDjodNls
8. Perform operations involving trigonometry	What Does a Tank Reducer Have to do with Math?	A part needs to be welded onto an exterior part of a tank reducer. Exactly where the part is to be attached needs to be determined first, based on a blueprint. In this activity, students need to determine the correct length from the top of the tank to place the object.	https://www.youtube.com/watch?v=LLEFeEV-3ko
	What Does the Load Capacity of a Cart Have to do with Math?	In this video, students are challenged to determine the length of a cross brace for a cart. They also need to determine the angle to set the cross brace at. The Pythagorean Theorem and right triangle trigonometry is needed to determine these dimensions. The importance of a strong weld is also discussed as the load the cart may need to carry could be very heavy and a solid cross brace put on securely is necessary.	https://www.youtube.com/watch?v=MAS8htdbH4Y

This material is based on work supported by the National Science Foundation under Grant No. DUE-1406857. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

