

# STEM Education



"If the plan doesn't work, change the *plan*, but never the *goal*." - Unknown

## What is STEM?

STEM focuses on four main subject content areas:

- Science
- Technology
- Engineering
- Mathematics

STEM curriculum is introduced to students at a young age. The curriculum blends the four content areas to give students tools that will help prepare them for success in their future. (According to Engineering for Kids)

## Be a STEM Thinker at Home: Sink or Float?

### Materials:

- 1 Orange
- 1 Container (large cup, glass bowl, small pail)
- Water

### Procedure:

Step 1– Fill up the container with water (about 3/4 full).

Step 2– Have the child examine the orange and make a prediction.  
Question to ask: Do you think the orange will sink or float? Explain.

Step 3– Time to test! Drop the orange in the water and observe what happens.  
Answer: The orange should float.

Step 4– Have the child peel the orange, (with adult help or guidance if necessary). Make a new prediction.  
Question to ask: Do you think the orange will still float or will it sink? Explain.

Step 5– Time to test! Drop the orange in the water and observe what happens.  
Answer: The orange should sink.

### WHY?:

"Buoyancy is the tendency of an object to float or sink in water or any other fluid.

When the orange is placed in water there are two forces working upon it in opposite directions:

Gravitational force pulls the orange down while buoyant force pushes it upwards. Gravity pulls the orange down with a force equal to the weight of the orange.

While making the orange weigh slightly more, the peel of an orange helps displace enough water to make the unpeeled orange buoyant. When you remove the peel the orange no longer displaces enough water to overcome gravitational force, the orange becomes more dense than water, and it sinks.

To really make this experiment relevant to my kiddos, I explained that the peeled orange was similar to them in a pool: they sink. But once they put their life jacket on, which is made of foam and contains tons of air pockets, they displace more water while becoming less dense, and they float."

According to Orange Buoyancy Science Experiment

Works Cited: "Orange Buoyancy Science Experiment." *Playdough To Plato*, 25 Mar. 2020, [www.playdoughtoplato.com/orange-buoyancy-science-experiment/](http://www.playdoughtoplato.com/orange-buoyancy-science-experiment/).

## STEM Career Ladder East Central Michigan Region Manufacturing

Today there are many paths to success that can be obtained right here in East Central Michigan. Fortunately, careers that previously could only be achieved in a straight line path through the university can now be realized on a very fulfilling, efficient road that has a few curves, but the end result can still be a Bachelor's Degree if that is the desire!

A young person who wants to explore manufacturing before investing time and finances in a long-term education might start while in high school with area CTE (Career and Technical Education) courses. These courses currently offer a great foundation and Industry-Recognized Certifications to students before they even graduate from high school. Multiple certifications increase a young person's job prospects and earning potential while he/she continues the educational path to an Associates Degree. Associates Degrees are available in Welding, CNC Machining, Human Resources, and Management. From there, a career path can branch to positions such as a Welding or Product Inspector, Manufacturing Management, Shipping, Receiving and Packaging, Quality Control, and even Engineering.

# STEM Career Ladder East Central Michigan Region



Hmmm.. What to do now?



I have a great foundation from my school and Career & Technical Education courses, but what to do now?

## How to become a Welder/Machinist:

- Certificates at: Delta College, Merrill Institute, or Mid-Michigan College

## How to become a Robotics or Machine Specialist, Shipping Coordinator, or Human Resources

- Gain experience in Manufacturing
- Take Business courses
- Associates Degree at Mid-Michigan College or Delta College
- Bachelors Degree at Central Michigan, Northwood, and Saginaw Valley Universities

## How to become a Factory Manager, Manufacture, or Quality Control

- Experience
- Associates Degree at Delta or Mid-Michigan College
- Bachelors Degree at Central Michigan, Northwood, and Saginaw Valley State Universities



### Welder:

I join pieces of metal together using heat.



### Machinist:

I use machine tools to create precision parts



### Shipping Coordinator:

I manage shipping and receiving of materials.



### Human Resources:

I hire and manage employees.



### Robotics/ Machine Specialist:

I operate, program, or problem solve with technical equipment.



### Manufacturing:

I design and develop production systems like machine tools, Robots, and computers.



### Factory Manager:

I supervise and oversee the factory operations.



### Quality Control:

I make sure that everyone follows rules and guidelines.

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