#MFGDAY15

Manufacturing Day
Educator Tool Kit

Download this kit for information and activities you can use with students and parents to prepare them for upcoming MFG Day events.

Including student activities built around short video content from:

- The Science Channel's "How It's Made" television series
- *American Made Movie* feature documentary

Co-produced by: FMA Fabricators & Manufacturers Association, International® · MEP • MANUFACTURING EXTENSION PARTNERSHIP · Manufacturing Institute · National Association of Manufacturers

Guest producer: ISM INDUSTRIAL STRENGTH MARKETING

Media partners: science channel · EDGE FACTOR

Movie partner: AMERICAN MADE MOVIE

What is the Purpose of Manufacturing Day?

Manufacturing Day has been designed to expand knowledge about and improve general public perception of manufacturing careers and manufacturing's value to the U.S. economy. It is a way for students, parents and educators to connect with manufacturers to explore how they can be involved in the growing number of manufacturing-related careers across the country.

On MFG Day, manufacturers across the country open their doors to the community to show what really goes on in today's manufacturing sector and dispel myths that may exist among people who are not involved in manufacturing. As a facility visitor, you will learn about real career opportunities, training and resources. In addition, educators will learn how to engage their students to consider the career possibilities in their future. This is your opportunity to:

- **Learn the truth** about manufacturing and manufacturing careers
- **Inspire a new generation** of manufacturers
- **Connect** with business leaders in your community
- **Learn what is being made** in your community

Why are Students and Parents Important to the Conversation?

One of the main challenges facing manufacturers today is a growing gap in skilled labor. More than 82 percent of manufacturers report a moderate or serious shortage in skilled production workers. More than 75 percent of manufacturers say the skill shortage has negatively impacted their ability to expand. To address this issue, more young people must be inspired to pursue manufacturing careers. Having students participate in Manufacturing Day events is a wonderful opportunity to start this conversation and begin ensuring the future of manufacturing in the U.S.

Why Participate in MFG Day?

The core element to Manufacturing Day is the schedule of manufacturers' open houses. Manufacturing Day will promote the open house schedule to alert thousands of people to the opportunity to visit manufacturers and see for themselves that manufacturing is alive and well in America and needs skilled employees.

If your school has not already been invited to participate in a MFG Day event, look for events in your area or reach out to local manufacturers and ask that they consider hosting an event at their facility!

View a list of events currently scheduled for your community here. This list is updated daily so check back regularly to view additions.

Thank you in advance for your interest in attending a Manufacturing Day event!

THE MANUFACTURING DAY EDUCATOR TOOLKIT

The Manufacturing Day Educator Toolkit has been designed to aid educators in fostering conversations in the classroom about manufacturing careers. Parents and students will also find the Toolkit a useful resource for their discussions at home and amongst peers.

Use the Educator Toolkit to:	Plus the Educator Toolkit is full of student activities that include short video content from:
Help students and parents understand the importance of participating in Manufacturing Day events	The Science Channel's "How It's Made" television series
Offer compelling reasons for young people to pursue manufacturing careers	*American Made Movie* feature documentary
Underscore the need for STEM (Science, Technology, Engineering, and Mathematics) education	

If your school has not already been invited to participate in a MFG Day event, look for events in your area or reach out to local manufacturers and ask that they consider hosting an event at their facility!

Check the current list of events in your area **here**. This list is updated daily, so check frequently for the latest information.

STUDENT ACTIVITY #1: What is Manufacturing?

Share THIS clip from American Made Movie with your students to understand the nature of manufacturing why it is important to the U.S.

"During the height of American manufacturing there were clusters of factories producing anything and everything possible. Eighty percent of the world's automobiles were made in cities like Detroit. Cities like Pittsburgh were churning out heavy equipment and materials like steel for new construction. Maine was known for its shoe production. The south was a haven for textiles and furniture. Appliances like refrigerators, ovens and washing machines came out of the heartland while the west coast was filling the skies with airplanes and commercial jet liners.

All across the US, these sectors and more provide the world with some of the highest quality goods ever made.

At its peak in 1979, manufacturing employed over 19 million workers. However, in that same year the manufacturing sector began a decline that would last several decades. By 2009, manufacturing reached its lowest numbers since before World War II, at just under twelve million workers.

But recently a focus on bringing American manufacturing back to the forefront of the U.S. economy has engaged everyone from manufacturing employers and workers, to legislators, educational facilities and even consumers as being a part of the solution. By understanding where and how products are made in the United States, and supporting American manufacturers, individuals have contributed to a resurgence of American manufacturing. While manufacturing employment levels remain steadily increasing, there is hope once again that America can return to the manufacturing greatness it once held!"

Engagement Questions:

1. What kind of products do you think your area/state manufactures?
2. Have you or your family ever purchased one of these locally-made products yourself?
3. Where do you think most of these products go?

STUDENT ACTIVITY #2: The Manufacturing Process

Watch the "How It's Made" segment found at this link (#2 – "Baseball Gloves") and answer the following questions:

1. Have you ever considered where a baseball glove is made?
2. Did you ever consider making a baseball glove yourself?
3. Based on the video, would you say that it is easy or difficult to make a baseball glove?

Why Manufacturing?

Manufacturing continues to be an economic driver in the United States. It is what we do. We invent things and we make things that are sold all over the world.

These following facts and extension activities can be used as part of a presentation to the students prior to Manufacturing Day to reinforce the importance of manufacturing and why young people should consider it as a potential career pathway.

Manufacturing Facts

1. Every $1.00 in manufactured goods generates an additional $1.32 worth of additional economic activity – higher than any other economic sector.
2. In 2012, the average manufacturing worker in the United States earned $77,505 annually, including pay and benefits. The average worker in all industries earned $62,063.
3. U.S. manufacturers are responsible for 47 percent of total U.S. exports.
4. Taken alone, manufacturing in the United States would be the 8th largest economy in the world.
5. Over 12 million Americans (or 9 percent of the workforce) are employed directly in manufacturing.

STUDENT ACTIVITY #3: Manufacturing in Your Community

Click HERE to explore the manufacturing statistics in your state!

1. How does your state compare to other states in manufacturing?
2. What are some of the top manufacturing sectors in your state?
   Are there any of these that look interesting to you?
3. Do you know anyone who has a career in manufacturing-related industries?

STUDENT ACTIVITY #4: Could I Be a Manufacturer?

Meet Mark Andol, owner of General Welding and Fabrication, an entrepreneur who found that he could start a small business by doing what he loved – building things!

1. Does it seem possible in your state that you could eventually start your own small manufacturing business?
2. What do you think you can do right now to prepare yourself for a manufacturing-related career?

The Importance of STEM Education

The demands of manufacturing require increased knowledge of STEM (Science, Technology, Engineering, and Math) areas and the skills of problem solving, critical thinking, communication, and team work. The growing use of technology and innovations require skilled workers and educational programs that address the demand for a highly skilled workforce.

Students must be introduced to the career opportunities that are available in manufacturing and encouraged to pursue the STEM courses early on in their high school curriculum. The importance of STEM courses as well team building and communication skills must be presented to youth if we are to address the future workforce challenges facing the manufacturing industry. As the economy improves, those jobs will grow and young people need to begin now to pursue these career paths so as to be prepared when they complete their education.

Face-to-face experiences provide students with a chance to see the application of STEM subjects come to life in a high tech world. Modern manufacturing industry tours can be especially important for high school students, where they have the opportunity to see, hear, and learn about different jobs and careers that people have in high-tech industries. For high school students, plant tours have the potential to provide a "spark" to set off a future high tech career and give them a point of contact for summer jobs and internships. Industry employers hosting the tour have the chance to make a connection not only with the teacher and students, but with the touring school for recruiting, job shadowing and externship opportunities.

STUDENT ACTIVITY #5:
What is Required to Play the Game of Baseball?

To build the connection between the classroom and the practical manufacturing career opportunities that are available to students with a sound foundation in STEM areas, use the following activity based on videos provided from the Science Channel's "How It's Made" series.

"Baseball Season"

Ask students to do the following:

1. List as many items as you can think that would be used by players to play a game of baseball.
2. List as many items as you can think that would be available for you to purchase if you attended the game (including food, beverage, merchandise, etc.)

Show the following clips: Baseballs (2:59), Baseball Gloves (2:57), Popcorn (2:50), Hot Dogs (5:07), Aluminum Baseball Bats (5:07)

Follow-Up Questions:

1. How many jobs are related to manufacturing each of the following items:
   a. Baseballs
   b. Baseball gloves
   c. Popcorn
   d. Hot dogs
   e. Aluminum Baseball Bats
2. Look back at your list of all equipment and supplies needed for a baseball game. How many jobs are related to manufacturing each of the remaining items.

STUDENT ACTIVITY #6:
Additional Activities from *American Made Movie*

By illustrating the successes of companies that have prospered without adopting the practices of their competitors, *American Made Movie* shows the positive impact of domestic manufacturing jobs on national and local economies in the face of great challenges.

Depending on the age of your students and the level of their prior knowledge, you can choose any number of five (5) additional lesson plans developed to engage students in a classroom setting. Taken from the *American Made Movie* Educational Edition & Supplemental Curriculum, these lessons will allow you to involve students in entertaining and practical ways that stimulate initial interest in manufacturing-related careers and act as an example of how *American Made Movie* can be a part of Manufacturing Day Events.

Click here for exclusive access to the Sample Lessons.

Thank you for your interest in attending a Manufacturing Day Event!

Remember, if your school has not already been invited to participate in a MFG Day event, look for events in your area or reach out to local manufacturers and ask that they consider hosting an event at their facility!

Letter from Students and Teachers

To the right is a sample letter you can use to thank your Manufacturing Day host. Please personalize the letter to reflect your group's experience; it would be particularly meaningful if all of the students who participated in the event also sign the letter. This letter should be sent as soon as possible after the tour – but *no more than* three or four days after the event.

Download the letter here as a Word document and you can easily customize it to suit your school and your tour.

SCHOOL LETTERHEAD

Date

NAME
TITLE
COMPANY
ADDRESS
CITY, STATE, ZIP

Dear NAME:

On behalf of the class from SCHOOL NAME, my students and I want to thank you for taking the time to visit with us on DATE. We are still excited about our tour of COMPANY NAME, and I want to personally express how much of an impact the tour has had on our class.

It is amazing how much we packed into this visit. Your stories and the ability to see what the company manufactures up-close-and-personal were phenomenal. Your ability to relate to the students and engage them was greatly appreciated. We learned so much from you and had a great time too.

[FEEL FREE TO ADD ANY RELEVANT COMMENTS HERE ABOUTH THE SPECIFICS OF YOUR VISIT]

Again, thank you very much for opening your doors and sharing your story.

Sincerely,

NAME(s)

What If You Want to Learn More About Manufacturing Skills and Careers?

Where Can You Find Resources?

What's It All About

Manufacturing has always been the backbone of America. Over the past century the industry has grown. And trust us, your grandparents, and maybe even your parents, would not recognize today's manufacturing. Today's manufacturing is about advanced technologies, state of the art facilities, and fast paced work environments. But most of all, manufacturing is about those people who like to see the product of a hard day's work.

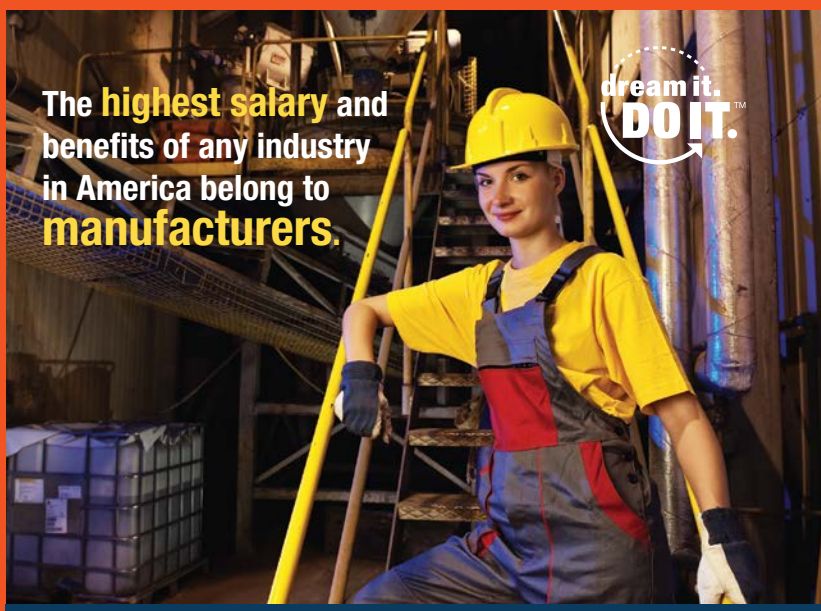
Made In America

Airplanes, medicines, MP3 players, snowboards, guitars, and candy. All are very different items with a common trait. They are produced by an American manufacturer. You can develop medicine that saves someone's life, or construct a massive airliner to fly home to your family, or create the instruments played at a concert by some of the world's greatest artists. Not many people can say that of their job.

Facts and Figures

Manufacturing is about skills. It doesn't require a four year degree and a mountain of debt to begin a manufacturing career. It requires hard work, dedication, and an industry certification to get the job done. And most of those certifications can be earned in two years or less. After that you could have a career as a machinist, or metalworker and be making more than your friends. An average of 18% more than your friends. Manufacturers have the highest combined salaries and benefits of any industry in the United States.

"SAVING LIVES, BUILDING PLANES, AND PLAYING MUSIC. ALL IN A DAY'S WORK."



Your Job is Waiting

You owe it to yourself to learn more about the opportunities that manufacturing has to offer. Here's what you do:

- Visit www.mfgday.com and learn about manufacturing events and plant tours in your state.
- Check out www.usmanufacturingpipeline.com to take the career assessment and find the right path for you.
- Speak to your guidance counselor and ask to learn more about manufacturing or connect them with your local Dream It. Do It. program.
- Participate in your local SkillsUSA or FIRST Robotics competition.
- Check out the Manufacturing Institute's M-List to find a school where you can obtain manufacturing certifications.

Where Can You Go From Here?

If your students visited a manufacturing company or two on MFG DAY and are hungry for more information what can you do? There is a whole educational package on manufacturing and careers and how manufacturers change the world every day. It is available from Edge Factor, one of the MFG DAY media partners.

The package is called EDU Factor and it is available to schools on an annual subscription basis. The subscription can be subsidized by a grant from Purdue University and applying for the grant is a simple process.

Log-on to Edge Factor and Edu Factor here to learn about this educational package.

Learn about the M-Stem grant from Purdue here. If you apply and receive a grant, the one year subscription rate for the basic educator package is just $99.

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