Unit One addressed the big picture of labor market realities—which industries are growing, which are shrinking, and technology’s impact on the market. They learned about the different types of employers in Manufacturing and read about current issues that affect workers.

Unit Two addressed the inner workings of the job-seeker. What are her interests and passions? What kind of work environment will she enjoy? What careers should she consider based on what she knows about herself and what factors might influence someone making a career change? Students also learned to navigate career database websites, assess their own interests and conduct a group research project about careers in the Manufacturing sector.

In Unit Three, students’ research became personalized. They heard from Manufacturing workers themselves, through firsthand accounts and interviews from workers in text and video, and discussed what they learned. They also conducted further research on Manufacturing careers of interest.

In Unit Four, students considered what it takes to prepare for a career in Manufacturing. They learned about common career pathways in the industry and considered how career movement happens in Manufacturing careers as well as the kinds of training and education opportunities are available for someone interested in this field.

In Unit Five, students learned how to leverage their existing and potential professional networks for job seeking and explored the job search process, including analyzing help wanted ads. They also learned about workplace expectations and engaged with a panel of Manufacturing professionals. Finally, they explored what it means to become entrepreneurs, reading about Manufacturing workers who have started their own businesses and using online resources available to New Yorkers looking to become self-employed.
In **Unit Six**, students learn about the history of American Manufacturing, beginning with the production of stone implements by native peoples 11,000 years ago and ending with new eco-industries revitalizing Rust Belt cities, such as Buffalo, NY and Detroit, MI. Students also trace the origins of production of one product—the pencil—examining raw materials, assembling, packing and distribution. They examine their own use of products, considering what they buy, how they make purchasing decisions, how they discard of products, and local recycling options and initiatives.

NOTE: *This unit addresses much of the Social Studies content tested on the TASC, including Economics concepts such as Supply and Demand and the impact of geography on economics, World and American History such as World War II and its impact on the rise and fall of industry.*

1. **FACTORIES IN FRAMES**

   Students interpret a Diego Rivera mural about the auto industry in Detroit in the 1930s, relating it to the economic concept of supply and demand and setting it in the historical context of the Great Depression.

2. **A HISTORY OF AMERICAN MANUFACTURING: PEOPLE, PRODUCTION AND PLACES**

   Making connections to important events in American history, students learn about the history of the Manufacturing sector, beginning with the production of stone tools by native Americans through cotton production, the rise and decline of the automobile industry, the creation of the Rust Belt, and recent resurgence of renewable energy industries. Students conduct a jig-saw reading activity and use a timeline to connect events in Manufacturing history with U.S. and world history events.
Unit 6 • Summary

3 • THE LIFE CYCLE OF A PENCIL

Students read about the components and processes that go into the production of one product, a pencil. They learn about renewable and nonrenewable resources, both of which are used in pencils, and consider the resources needed to make other common products. They also consider what happens to products once they are used, whether they go to landfills, incinerators, are recycled or repurposed.

4 • RESEARCHING A PRODUCT: ECO-FRIENDLY INVENTIONS

Students conduct internet research to learn about an eco-friendly invention, and present their research to the class.

5 • WHY DO WE CHOOSE THE PRODUCTS WE BUY?

Students consider the factors that inform and influence their consumer choices of manufactured products, then read an article about the influence of emotions on consumer choice, and create their own quizzes to assess their classmate’s knowledge of the text.

5.1 • Visual Literacy: Supply and Demand

Students watch and discuss a brief movie clip that illustrates the law of supply and demand, and consider their own experiences with supply and demand as consumers and workers.
Factories in Frames

Students interpret a Diego Rivera mural about the auto industry in Detroit in the 1930s, relating it to the economic concept of supply and demand and setting it in the historical context of the Great Depression.

NOTE: Teachers may want to supplement this activity with lessons on supply and demand, the Great Depression, the New Deal and the rise of the assembly line.

PREP

- Spend a few minutes looking at the Detroit Industry murals in this activity. Develop an analysis of the murals that you use in discussion with students. Consider what the murals are trying to convey, taking into account the historical events of the early 1930s.
- Read the Press Release for Detroit Industry murals at Detroit Institute of Arts assignment. You may want to add writing elements to the assignment, such as the use of transitional sentences, for example.

MATERIALS

- Factories in Frames handout
- Excerpts from Detroit Industry murals handout
- Press Release for Detroit Industry murals at Detroit Institute of Arts assignment

EXPLAIN

1 Henry Ford, creator of Ford automobiles, is credited with creating the assembly line method of manufacturing, in which the production of, in this case a car, was divided into many small tasks, each task completed by one person. The assembly line revolutionized the speed at which products could be manufactured, taking only 90 minutes to create the Model T Ford, making cars affordable for many Americans for the first time. Although the stock market crash of 1929 and Great Depression of the 1930s devastated the United States, many factories were doing well.

The economic concept of supply and demand is a topic on the TASC exam. How does the production of the Model T Ford illustrate this concept?

> As the speed of automobile production increased, the cost decreased, and demand for the cars increased.
How do you think the increased production of the Model T Ford impacted the United States?

More and more people began to drive cars, creating more exchange and opportunity between people and businesses, leading to the creation of more highways which changed cities, rural areas and the country as a whole. It created lots of factory jobs including many union jobs. People who lived in rural areas could now work at jobs in the cities. These jobs led to homeownership for more families.

The famous Mexican muralist (painter), Diego Rivera, was commissioned by Henry Ford and the Detroit Institute of Arts to create murals about the Ford Motor Company. Rivera researched the Ford Motor Company at its factories in Dearborn, Michigan, and created his massive Detroit Industry murals depicting life in Ford’s factories and his perspective on the impacts and history of industrialization. These 27 larger-than-life murals are still exhibited today at the Detroit Institute of Arts.

Distribute Factories in Frames handout. Students should analyze the image and discuss it with a partner according to the discussion guide on the next page.

Distribute Excerpts from Detroit Industry murals. Ask students to analyze the images, and discuss them with a partner, using the same discussion guidelines from the previous image analysis.

Say: Imagine you work at the Detroit Institute of Arts in 1933 and are responsible for writing the press release describing the new Detroit Industry murals to museum-goers. Using the images on the following pages, write a two paragraph press release describing what viewers will see when they visit the museum. If students are unfamiliar with what a press release is, you may want to discuss the purpose of a press release first and what things they might want to include.

Distribute Press Release handout.
Factories in Frames

1. Take a few moments to look at the picture. Notice everything you can about it. Then close your eyes and open them and look at it again. What do you see? What else do you see? Use the questions below to discuss it with a partner.
   - What do you see in this picture?
   - What is going on in this picture?
   - What messages do you think the artist was trying to convey?
     Explain your reasons using evidence from the mural.

2. With your partner, write a title above the image that will tell the reader in a few words what they are going to see.

**TITLE:**
Section 1

Excerpts from *Detroit Industry* murals at Detroit Institute of Arts

Image from https://anotherwalkinthepark.files.wordpress.com/2015/08/detroit_pebblebeachontario_canon-009.jpg

Image from https://c1.staticflickr.com/3/2820/10944844794_9083e3f6b6_z.jpg
Diego Rivera

Considered one of the most important painters of the 20th Century, Diego Rivera was a Mexican artist whose large-scale murals that narrate historical events are displayed to this day in institutions such as the Detroit Institute of Arts and the National Palace of Mexico. He and his wife, Frida Kahlo, also an important artist recognized around the world, had close relationships with political figures such as Vladimir Lenin and Leon Trotsky. Diego and Frida held both communist and capitalist views, and were often repressed or censored for holding these two different beliefs.

Bottom: http://4.bp.blogspot.com/-PkQAq0JzSRI/T5-0nkG_gcI/AAAAAAAAMM/38SlJd9PXT0/s1600/Diego+rivera+1951.jpg
Press Release for *Detroit Industry* murals at the Detroit Institute of Arts

Imagine you work at the Detroit Institute of Arts in 1933 and are responsible for writing the press release describing the new Detroit Industry murals to museum-goers. Using the mural excerpts, write a two paragraph press release describing what viewers will see when they visit the museum.
A History of American Manufacturing: People, Production and Places

With connections to important events in American history, students learn about the history of the Manufacturing sector, beginning with the production of stone tools by native Americans through cotton production, the rise and decline of the automobile industry, the emergence of the Rust Belt, and the recent resurgence of renewable energy industries. Students conduct a jig-saw reading activity and use a timeline to connect events in Manufacturing history with U.S. and world history events. Many links can be made to topics on the TASC.

PREP

1. Orient the paper horizontally.

2. Draw a horizontal line through the center of the sheet as a timeline, and label it with the following dates from the history of Manufacturing readings:


3. Label it with any additional dates you would like students to discuss, such as dates surrounding World War I, the Great Depression, the New Deal and globalization.

MATERIALS

- Early American Manufacturing reading
- Manufacturing on the Move reading
- Is War Profitable? reading
- Reviving the Rust Belt reading
- Buffalo’s Solar City reading
- Talking Points handout
- Manufacturing History: From Arrowheads to Urban Ag handout
- Stickie notes—25 to each of four groups
- Butcher paper, 5-6 sheets (4 for use plus 1-2 extras) 3-5 feet long
- Markers
Today’s factories use complicated, automated machines that produce products quickly, efficiently and safely, but this wasn’t always the case. Manufacturing has a long history.

Divide students into five groups. Explain that each group will read about one period in Manufacturing history, and together the class will piece together a complete understanding of how Manufacturing evolved from the time of handmade stone implements to a time of 3-D printing and renewable resources. Explain that this type of reading is called a jig-saw reading. Like a jig-saw puzzle, the four groups will add their own piece of the puzzle to come to an understanding of the whole. Distribute one reading to each group—Early American Manufacturing, Manufacturing on the Move, Is War Profitable? and Reviving the Rust Belt—with each member of the group receiving a copy of that group’s assigned reading.

Distribute the Talking Points handout.

Say: In your group you will learn about one period in Manufacturing history, then you will join members from another group to teach them about what you learned. You’ll take notes about what you’ve read and discussed with your group that you can use when telling members from another group about your reading. You can use the worksheet to write down talking points that will help you remember what you want to share.

Talking points are usually written as key words, short phrases or a sentence that will help you remember an idea you want to talk about. Talking points are helpful when you have to give a presentation. If you write very detailed notes, you might get confused while presenting or it might appear that you are reading from a script. Talking points are a tool that can help you remember the main points you want to talk about.

First you’ll read and annotate the article, then discuss it as a group. What kinds of things are you going to want to discuss with your group?

- The main idea, what’s important, new terms, information that might be useful to students, anything surprising or interesting, any questions you might have.

Give students time to read, discuss, and write their talking points.

When students are finished, divide them into new groups that include at least one member from each original group. Ask each new member of the group to take turns teaching each other about what they learned from the reading in their original group, using their talking points. Groups should feel free to discuss the new information with each other and ask each other questions.
Groups should now discuss how each period in Manufacturing history led to the next. What historical events caused the Manufacturing sector to develop in the way that it did?

Distribute *Manufacturing History: From Arrowheads to Urban Ag* handout and ask all students to complete it, discussing the questions with their group, and exchanging information from the articles they read with their first group.

Discuss the answers to the handout as a class, asking students to provide evidence from the text.

Post one timeline on the wall near each group and distribute one set of 25 stickie notes to each group. Groups should write short descriptions of the events that took place during each year or time period on the timeline, then post them accordingly on the timeline.

Give groups the opportunity to write descriptions of any additional national or international events that might have impacted Manufacturing history and post the stickies according to their date on the timeline. You may want to highlight historical events you are currently or have previously studied as a class.

Each group presents their timeline, noting the events and their relationship to Manufacturing history.

Optional extension activity: Distribute the world map and ask groups to label important areas with the name of the city or country. On a stickie, they should write a brief description of the area’s importance in Manufacturing history, and place it on the map accordingly.

Optional Video activity: The following brief videos depict aspects of Manufacturing history as noted. These videos can be used to practice note-taking, paraphrasing, main idea, and other important literacy skills.
### Video Activity

- **I Love Lucy** in which Lucy and Ethel work on the assembly line of a chocolate factory. 3 minutes.
  [https://www.youtube.com/watch?v=WmAwcMNxGqM](https://www.youtube.com/watch?v=WmAwcMNxGqM)

- **Charlie Chaplin Modern Times** in which Charlie works on the assembly line. 3 minutes.
  [https://www.youtube.com/watch?v=DfGs2Y5WJ14](https://www.youtube.com/watch?v=DfGs2Y5WJ14)

- **TED Talk** about the cotton gin, including how it propelled slavery and the concept of unintended consequences of technological advances. 5 minutes.
  [https://www.youtube.com/watch?v=0SMNYivhGsc](https://www.youtube.com/watch?v=0SMNYivhGsc)

- **PBS American Experience** discusses the history and usage of the Erie Canal, including controversy of its construction and financing. 2 minutes.
  [https://www.youtube.com/watch?v=yix8IezVvcw](https://www.youtube.com/watch?v=yix8IezVvcw)

- **“The Real Rosie the Riveter”** interviews several women who worked in wartime factories. Discusses the opening of workplace opportunities for women as well as gender discrimination in the workplace. 5 minutes.
  [https://www.youtube.com/watch?v=xS3ReYgJ4Q](https://www.youtube.com/watch?v=xS3ReYgJ4Q)

- **“The Last Cast”** interviews workers from the Bethlehem, Pennsylvania steel factory about its closing in 1995. 5 minutes.
  [https://www.youtube.com/watch?v=byeCZVajDdl](https://www.youtube.com/watch?v=byeCZVajDdl)

- **Democracy Now** episode about D-Town Farms, the largest urban agriculture farm in Detroit. Discusses renewable resources, new uses for under-utilized land to benefit the community and creating a solution to the problem of a “food desert,” an area where healthy food is not available. 6 minutes.
  [https://www.youtube.com/watch?v=aP5fqqzv35g](https://www.youtube.com/watch?v=aP5fqqzv35g)

- **“Cultivating Community with Urban Agriculture.”** Food Shuttle is an organization in low-income Raleigh, North Carolina, that runs an urban farm and provides training for community members to learn how to grow and sell their own food. The video discusses the community gathering aspect of the farm as well as its food production. 5 minutes.
  [https://www.youtube.com/watch?v=Q15guDB-wo0](https://www.youtube.com/watch?v=Q15guDB-wo0)
Early American Manufacturing

Adapted from https://www.britannica.com/topic/Native-American/Prehistory
http://www.socialstudieshelp.com/eco_unionization.htm

Today we have high-tech factories that use digital machines, computerized laser cutters, 3-D printers, even robots, but Manufacturing underwent continual change to reach this point.

Some history books begin the story of American Manufacturing in the 1790s with Samuel Slater’s textile mills, but the story begins long before that. Archaeologists have found stone spearheads, believed to have come from indigenous American cultures from 11,000 years ago. They weren’t made in factories. They were items that individuals produced in order to make their lives better and easier, much like the goals of today’s manufacturing. 1,000 years ago, native peoples in the American Southwest were producing painted pottery, copper bells, and homes with walls 6 inches thick and ceiling beams able to withstand intense weight. Intricate cloth and blankets were also produced, used and traded.

In 1790, colonist, Sam Slater, built his water-powered textile factory in Pawtucket, Rhode Island, based on the methods of textile manufacturing he brought from England. At the time, local craftspeople provided for their communities producing goods either in their homes or in small shops. This new era introduced factories, with machines producing items to be shipped and sold elsewhere. Over the next decade, textile was the dominant industry in the country, with hundreds of companies created.

In the late 1700s, Eli Whitney shocked patent officials when he took apart ten guns and reassembled them using parts from each one. He lived at a time when a metalsmith would...
produce by hand each part of every gun. No two products were quite the same. Whitney's milling machine allowed workers to cut metal objects identically, making interchangeable parts. It was the start of the concept of mass production.

Whitney's techniques were used to make many other products, including the cotton gin, which separated the seeds of the cotton plant from the cotton fluff, spun into thread to make textiles. This invention played a major part in expanding slavery. Because the seeds could be removed more quickly, plantation owners expected higher and higher yields of cotton to sell, buying and using more and more slaves, and demanding more work from them than ever before. These two forces, the manufacturing of weaponry and the rise of slave labor, were major factors in the Civil War.

Many industries in the United States were able to thrive because of slavery. Enslaved Africans produced and processed America's top exports—cotton, sugar and tobacco—beginning with the arrival of the first ship of enslaved Africans in 1619. The slave trade itself was a big business as well. America became a wealthy nation on the lives and deaths of enslaved Africans in both the North and the South. By 1820, all of the northern states had outlawed slavery, but the rise of cotton made the enormous profits of the slave system irresistible to most white southerners. Not only did southern cotton feed northern textile mills, but northern insurers and transporters played a major part in the growth of the modern slave economy of the cotton South.

The labor union, American Federation of Labor (AFL) was founded by Samuel Gompers in 1886. Gompers, born in 1850, came as a boy with his parents to America from the Jewish slums of London; he entered the cigar-making trade and received much of his education as a reader (a worker who read books, newspaper stories, poetry and magazine articles to fellow employees to help break the monotony of their work in the shop) and became a leader of his local union and of the national Cigar Makers Union. In labor unions, workers joined together to fight for better working conditions and wages. It was unions that brought about 8-hour work days, a break from work on weekends, lunch breaks and barred children from working.

The Rise of Slavery and Plantation Culture

Cotton becomes the South's most lucrative cash crop.

Growers expand their holdings and plant more cotton.

More land under cultivation increases the demand for slaves.

1793: The invention of the cotton gin allows workers to clean 50 pounds of cotton a day.

Late 1790s: Profits from growing tobacco, rice, sugar cane, and cotton are moderate or declining.

Image from https://8-1coppersun2.wikispaces.com/file/view/1183586w.jpg/111753039/385x420/1183586w.jpg
Manufacturing on the Move


In the 1800s, water played a major role in Manufacturing. Factories were powered by inventions such as the water wheel and the steam engine. Finished products, raw materials and people were transported along the water much more easily and quickly than they could be on land. New York State had the good fortune of having many waterways from large lakes to fast flowing rivers, but without those waterways being connected, their utility was limited.

Begun in 1817 and completed in 1825, the Erie Canal is considered an engineering marvel of the 19th Century. Nearly four hundred miles long, almost every major city in New York, except for Binghamton and Elmira, falls along the trade route established by the Erie Canal, from New York City to Albany, through Schenectady, Utica and Syracuse, to Rochester and Buffalo. Nearly 80% of New York’s upstate population lives within 25 miles of the Erie Canal. It helped make New York the financial capital of the world, provided a critical supply line which helped the North win the Civil War, and precipitated a series of social and economic changes throughout a young America. Within 15 years of the Canal’s opening, New York was the busiest port in America, transporting more than Boston, Baltimore and New Orleans combined.

With the new canal, freight rates from Buffalo to New York cost $10 per ton, compared with $100 per ton by road. In 1829, there were 3,640 bushels of wheat transported down the Canal from Buffalo. By 1837 this figure had increased to 500,000 bushels; four years later it reached one million. In nine years, Canal tolls more than recovered the entire cost of construction.
Between 1835 and the turn of the century, this network of Canals was enlarged twice to accommodate heavier traffic. Between 1905 and 1918, the Canals were enlarged again. Dams were built to create long, navigable pools, and locks were built adjacent to the dams to allow the barges to pass from one pool to the next.

Besides the tremendous impact of the Erie Canal, it would be difficult to discuss the growth and development of New York (a State that increased in population from 1820 to 1900, from 1.4 million people to almost 11 million people) without highlighting the role played by railroads. Starting in the 1830s, throughout the length and breadth of the Empire State, railroads large and small tied together city and farm (later suburbs), bringing crops and raw materials toward the cities, and in turn, bringing manufactured goods and summer vacationers out to the country. Just about every major and most minor cities in the State were served by one or more railroads. For example, the small city of Elmira (Chemung County) was served at one time by four major railroads (Erie, Lackawanna, Lehigh Valley, and Pennsylvania). And even though New York, as other states, experienced railroad downgrades, much of the State (including all cities above 50,000 in population) is still served in some fashion by railroads.
Is War Profitable?
Adapted from https://www.pbs.org/thewar/at_home_war_production.htm

World War I was known as “The War of Production.” For the first time, steel helmets, tanks, fighter airplanes, chemical weapons, gas masks and X-ray machines were used. All of these new products had to be manufactured. Around this time, Henry Ford was popularizing the assembly line method of production, where workers each completed their own task on a factory line, then sent their piece of the product to the next person on the assembly line. This technique drastically sped up the rate of production. It jump-started automobile production, and during World War I, automobile workers were enlisted to produce war products, including planes, tanks, bombs and ammunition.

In World War II, just coming out of the Great Depression, many automobile companies began to manufacture engines, guns, trucks and tanks instead of cars. Many workers who had been previously unemployed due to the hard economic times of the Great Depression found work manufacturing weapons and war products. Many of these workers started earning more than they ever had before. While many men went off to fight the war, many women moved into factory jobs. Where previously many white, middle-class women stayed home caring for their children and households, World War II paved the way for many of these women to work outside of the home.

With good jobs to be found in factories, many rural black families from the South moved to Northern cities such as New York City, Philadelphia, Baltimore, and cities in the Midwest, such as Chicago, Detroit and Pittsburgh, which became booming Manufacturing centers. This movement north that took place between 1915 and 1960 is known as The Great Migration.

The artist, Jacob Lawrence, became well known for his Great Migration painting series. •

Image from https://static01.nyt.com/images/2016/02/14/opinion/sunday/14wilkerson/14wilkerson-master768.jpg

Image from http://cashmancuneo.net/pictures/flight%20ww2.jpg
The Decline of American Factories

Economic Commentary, 2013,
Urban Decline in Rust-Belt Cities, Daniel Hartley

Adapted from http://www.encyclopedia.com/places/united-states-and-canada/miscellaneous-us-geography/rust-belt

Many of the factories and steel mills that produced the “American economic miracle” during and after World War II (1939–1945) were locking their gates by the 1970s. This was more than a downward phase in the business cycle. It was a structural crisis brought about by the aging of a generation of factories, the relative decline of the Manufacturing sector, and increased global competition. Countries that had faced devastation during World War II and had to rebuild, developed modern, technologically advanced factories. Ultimately, U.S. factories could not keep up with this competition. Smaller industrial plants relocated to Mexico or to low-wage Southwestern U.S. areas. Big steel companies dating from the nineteenth century, like Bethlehem Steel and U.S. Steel Co., could not keep up with technological advances and competition from Japan and Germany (whose plants were built during the post-World War II period).

The term “Rust Belt” refers to the economic region roughly covering the states of Michigan, Wisconsin, Indiana, Illinois, Ohio, and Pennsylvania, known as the Manufacturing heartland of the nation. It also refers to a social crisis as well as a geographic region, mostly affecting urban areas. Due to the loss of jobs and closing of factories, rust belt cities experienced deepening unemployment, out-migration of...
population, loss of electoral votes (due to the declining population, which meant these areas had less say and representation in government), and an overall decline in industry and the economy.

All over the Rust Belt factories closed, and the cities that were once thriving because of them, emptied out. Not only did factories lie empty and rusting, but houses and neighborhoods emptied. Schools, theaters, shops and hotels were abandoned too.

Between 1970 and 2006, Cleveland, Detroit, Buffalo, and Pittsburgh lost 45% of their populations due in part to the decline of manufacturing. Incomes in some rust belt cities declined as much as 30%. And home prices remained level or even declined during these decades, despite inflation and the rising cost of living over a 35 year period.

![An abandoned church in Cleveland](http://sliptalk.s3.amazonaws.com/wp-content/uploads/2014/09/25165531/churchclevelandoh.jpg)

Rust belt stats, from Economic Commentary, 2013, Urban Decline in Rust-Belt Cities, Daniel Hartley
Reviving the Rust Belt


The area once considered the home of America’s progress fell to rust and decay when it couldn’t compete with factories in other countries that had more modern, technologically advanced factories. Once-thriving Manufacturing centers like Buffalo, NY, Camden, NJ and Detroit, MI suffered from the effects of the loss of Manufacturing. With low-cost real estate and small populations, opportunities have developed, however. In some areas, such as Detroit, inexpensive land has given rise to urban farming.

Detroit’s Lower East Side, which makes up about a quarter of the city, lost 40% of its population between 2000 and 2010, leaving what could have been a wasteland of vacant lots and boarded up homes. But almost simultaneously, the number of community gardens in Detroit blossomed from less than 100 to more than 1,400.

The people of Detroit suffer the effects of blight—only 19% of food stores carry the mix of foods recommended by the USDA, 56% of recipients redeem food stamps at liquor stores, 1 in 5 high school students is obese, and the number one cause of death is heart disease. But Detroit’s community gardens now produce 200 tons of fresh fruits and vegetables per year. Residents who work in those gardens eat 2.5 more servings per day of fruits of vegetables than their neighbors, and property values near the gardens are rising by up to 20%.

Even the automakers are helping. Last summer, General Motors began re-purposing 250 massive shipping crates into raised-bed planters, creating the Cadillac Urban Gardens. Last week, the corporation announced they’d expand

Urban farmer Olivia Hubert, co-owner of Brother Nature Produce, puts straw mulch around raspberry bushes on her one-acre urban farm in Detroit, Michigan.

Photo credit: http://www.msnbc.com/morning-joe/urban-farming-takes-hold-blighted-motor
the program with another 100 steel crates. Several hefty Ford grants have made their way into green initiatives, too.

Magnetic Sun, a 33-year-old, lifelong Detroit resident and now a farmer grew tired of seeing his friends struggle to feed their families, so he started gardening on a lot near his home. Now he grows corn, tomatoes, zucchini, yellow squash, kale, sunflowers, and more. Walking around his garden, he pulls an ear of corn off a plant, shucks it and takes a bite. “I feed the elderly people on the block, the youth come down, they help, they take food home, we sell a little bit at the market, and I feed myself and my family,” he said. “My aunty is 84 years old and has never seen a zucchini till last year. She’s 84 years old and she’s never seen the squash grow on the plant!” This summer, Magnetic Sun took a job working with the Greeing of Detroit. “They’ve taught me how to grow the biggest tomatoes I’ve ever seen—bigger than my fist!” Soon, he hopes to completely support himself and his family with his garden.

It’s no surprise that urban gardening has become so popular in Detroit: it’s a welcome contrast. Residential neighborhoods are still riddled with ruin. The city used to be home to 1.9 million, but is down to just 700,000 residents, leaving an estimated 30,000 acres of distressed land. So well-kept, carefully tended grounds are a welcome surprise. It’s a contrast that’s at the core of Detroit’s problems. With so much abandoned space, Detroit’s land has lost its value, eroding the city’s tax base and making it even harder for the city to maintain neighborhoods or keep empty lots from decaying further.

City planner, Rob Anderson, sees opportunity in Detroit’s blight. “The desirability of living on that block goes way up when you transform a vacant lot or a burned out building into a space like this. I mean, this is beautiful, this is a place people want to be,” he said. “People become more rooted in their place and that’s what we need in this town.”

Urban agriculture has become so popular with students that they’ve brought the farms to the schools. This fall, 45 Detroit public schools will begin integrating raised-bed gardens near the schools into their math, science, and economics curriculum and putting the food right back into the cafeterias. “We’re teaching them how eating the stuff that they’re growing is different than going to the gas station and buying Cheetos. People always talk about the difficulties of getting kids to eat vegetables. When they grow those vegetables, it’s not hard at all.”

Image from https://gathergreen.files.wordpress.com/2012/01/enrich-la-5.jpg
Buffalo’s SolarCity
Adapted from https://www.technologyreview.com/s/600770/10-breakthrough-technologies-2016-solarecitys-gigafactory/

In an industrial park near the shore of Lake Erie, the future of the solar power industry is under construction. Governor Cuomo gave SolarCity $1 billion to build its sprawling Buffalo factory, which will soon begin producing some of the most efficient solar panels available commercially. Capable of making 10,000 solar panels a day, or one gigawatt of solar capacity per year, it will be the largest solar manufacturing plant in North America and one of the biggest in the world.

When production begins, SolarCity, already the leading installer of residential solar panels in the United States, will become an integrated manufacturer and provider—doing everything from making the solar cells to putting them on rooftops. At a time when solar panels from China have never been cheaper, investing in a new type of solar technology is a risky undertaking. However, the potential benefits are huge. “The new factory,” says SolarCity chief technology officer Peter Rive, “could transform both SolarCity’s business, which has consistently lost money, and the economics of residential solar power.”

Solar panels installed by SolarCity cost the company $2.84 per watt (including sales and marketing plus overhead, in addition to the cost of the hardware), down from $4.73 in 2012. The combination of the new, highly efficient panels, the volume of product coming out of the new factory, and a simplified manufacturing process is a big reason why the company expects its costs for residential solar to fall well below $2.50 per watt by the end of 2017, when the Buffalo facility reaches full production.

Efficiency matters because the panels themselves represent only 15 to 20% of the cost of the full installation. Much of the rest comes in what’s known as balance-of-system costs: inverters to connect to the grid, materials to hold the equipment, nuts and bolts to attach it to the roof, the labor to install it, and so on. SolarCity’s installation, says the company, will require one-third fewer panels to produce the same amount of electricity as conventional installations. “Fewer panels means fewer bits and pieces, less wire, less days on the roof to install,” says Francis O’Sullivan, the director of research and analysis at the MIT Energy Initiative. The new manufacturing process reduces the number of steps required to make the cells from two dozen or more to just six. It also replaces silver, one of the most expensive elements of conventional solar cells, with less expensive copper.
MY TALKING POINTS

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Manufacturing History: From Arrowheads to Urban Ag

1. Describe how the inventions of Samuel Slater and Eli Whitney related to one another and changed the course of American history.

2. What product does the article cite as one of the earliest manufactured products? How do you think these products helped improve the lives of the people who produced them?

3. In the 1800s, products produced in New York state were transported by ____________ and ____________. What impact did these new modes of transportation have on the economy?

4. What is the assembly line and what impact did it have on the Manufacturing industry and on the American economy as a whole?
5. What is the Rust Belt and what historical events created it?

6. List three Rust Belt cities.

7. What economic and geographical factors have made urban agriculture successful in Detroit?

8. Why does the article on Solar City say, “Investing in a new type of solar technology is a risky undertaking?” If it is so risky, why did Governor Cuomo spend 1 billion taxpayer dollars on building the Solar City factory?
The Lifecycle of a Pencil*

Students work together to identify the natural resources from which a pencil is made and trace the lifecycle of a pencil from raw material to finished product. They conduct a jig-saw reading with each other to pool their knowledge about raw materials, fabrication, and distribution.

*This lesson is adapted from Project Learning Tree: https://www.plt.org/curriculum-offerings/ and http://www.econedlink.org/lessons/docs_lessons/397_pencil_resources2.pdf

PREP

- Read all materials and familiarize yourself with the fabrication steps to making a pencil.

MATERIALS

- Pencil: Behind the Scenes handout
- A Pencil: Behind the Scenes answer key
- A blank Behind the Scenes handout
- How a Pencil is Made reading
- Lifecycle of a Pencil handout

EXPLAIN

1. From cars to airplanes, plastic bags to television sets, every material used to manufacture a product, and every form of energy used in the fabrication of it comes from a renewable resource or a nonrenewable resource.

2. What is the difference between a renewable resource and a nonrenewable resource?

   - **Renewable resources**—like trees, plants, and wind—can be replenished through natural processes.
   
   - **Nonrenewable resources**—like graphite for pencils, gold for jewelry, steel for automobiles—are finite and cannot be replenished naturally. Once these materials are mined or taken from their points or origin, they cannot grow again naturally or replace themselves.
Students should form groups of three. Distribute A Pencil: Behind the Scenes handout and ask students to work in their group to complete it. They should use their existing knowledge to make educated guesses if they’re not sure of the answer.

Ask students to share the raw materials and sources they listed on their handouts. Fill in any gaps.

- Wood from trees; graphite from rocks (for pencils, powdered graphite is mixed with clay); steel or aluminum is mined from rocks and rubber is tapped from trees or manufactured from petroleum).

Provide clarification as needed, using the answer key for guidance.

Ask students to share the steps they listed in the fabrication of a pencil. This can be a general list of steps; it’s most important that students understand that each part of the pencil must be cut and shaped, then assembled and attached in some fashion.

Distribute the How a Pencil is Made handout. Ask students to read silently or aloud. Have students note the steps they had listed on their handout, and which steps they forgot or hadn’t considered.

Have students return to their Behind the Scenes handout and add any additional information they can, based on the reading.

Ask students to share the ideas they had about what might happen to a pencil once they’re finished with it. Provide other ideas if needed (sent to landfill; sent to incinerator; recycled, reused, or repurposed into other products).

Ask students to share the items they listed that have to be manufactured in order to get the raw materials, fabricate the pencil, distribute it, and dispose of it (machines for processing the wood, extracting the graphite, clay, metal, and rubber from the earth; vehicles for transporting materials to the factory; cutting, sanding, drilling, gluing, and assembly tools; paint and dye; packaging machines; trucks for transport to stores and then again to landfill, and machines for processing the used pencils. Again, it’s more important to have the students start to think about what’s involved in the manufacturing of a product than to list every single element involved in its manufacturing.).

Distribute the Lifecycle of a Pencil handout. Ask students to work in small groups to review the diagram and the list of steps involved in a pencil’s life.
11 Have each small group work together to identify another common product used at home, and to complete a “behind the scenes” handout for it as best they can, including what materials are needed, the resource from which they come, and fabrication steps.

12 When students are finished, create new small groups, where each new group is composed of at least one person from each of the former groups. They should bring their completed handout to the new group.

13 Together, groups share the product their former groups chose, the materials and resources needed, and fabrication steps. They can work together to fill any gaps or to correct possible misinformation.
A Pencil: Behind the Scenes

Work together as a group to write responses to the questions below. Before you write, share ideas and any background knowledge you have. Make some guesses if you’re not sure.

1. List the raw materials that you think are used to make a pencil and where they come from:

<table>
<thead>
<tr>
<th>Materials:</th>
<th>Resource it comes from:</th>
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2. List the steps you think are required to fabricate a pencil once the materials have been transported to the factory:
3. List the different things that might happen to a pencil after you are finished using it:

4. List as many items you can think of that need to be manufactured (tools, equipment, machines, vehicles, etc.) in order to acquire the raw materials, fabricate the pencil, distribute it to consumers, and process it once it's used up:
ANSWER KEY—A Pencil: Behind the Scenes

1. List the raw materials that are used to make a pencil and where they come from:

<table>
<thead>
<tr>
<th>Materials:</th>
<th>Resource it comes from:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood (usually cedar)</td>
<td>trees</td>
</tr>
<tr>
<td>Graphite</td>
<td>a form of carbon; mined from rocks</td>
</tr>
<tr>
<td>Clay</td>
<td>a type of soil; mined from quarries (mixed with the graphite to create the right consistency for writing)</td>
</tr>
<tr>
<td>Rubber</td>
<td>tapped from trees or fabricated from synthetic materials such as petroleum</td>
</tr>
<tr>
<td>Steel or aluminum</td>
<td>metals mined from rocks or out of the ground</td>
</tr>
<tr>
<td>Yellow color</td>
<td>castor oil (seeds from the castor plant)</td>
</tr>
<tr>
<td>Black lettering</td>
<td>carbon black dye</td>
</tr>
</tbody>
</table>

2. List the steps needed to fabricate a pencil once the materials have been transported to the factory:

A. The wood is painted, sawed into narrow strips, and planed to create a flat surface. The strips are cut in half so the pencil lead can be placed inside the two halves.

B. Graphite and clay are mixed together to create a paste. The paste is pressed into a mold to create long strings and cut to length.

C. The graphite string is sandwiched between two pieces of the planed, painted wood.

D. The “sandwiches” are cut and shaped into pencils, then sanded until smooth.

E. The erasers are attached to the pencil by a metal cylinder called a ferrule, which is glued to the eraser and the pencil, then clamped around it.

F. The logo is imprinted on the pencil.
3. List the different things that might happen to a pencil after you are finished with it:
   A. Sent to landfill
   B. Sent to incinerator
   C. Dismantled and recycled
   D. Reused or repurposed to make something else

4. List as many items you can think of that need to be manufactured (tools, equipment, machines, vehicles, etc.) in order to acquire the raw materials, fabricate the pencil, distribute it to consumers, and process it once it’s used up:
   A. Machines for extracting the graphite, clay, metal, and rubber from the earth
   B. Vehicles for transporting raw materials to the factory
   C. Cutting, sanding, drilling, filing, smoothing, gluing, printing and assembly tools and equipment
   D. Paint and dye
   E. Machines for packaging the finished pencils
   F. Boxes for packaging the pencils
   G. Trucks to transport the pencils
   H. Dump trucks to take used pencils to landfill
   I. Incinerators to burn used pencils
How a Pencil is Made

1. The raw lumber is cut into small, flat planks. The wood is painted, sawed into narrow strips, and planed to give them a flat surface. The strips are cut in half so the pencil lead can be placed inside.

2. The graphite and clay is mixed together to create a paste. The paste is forced through a mold to create long strings, or the paste is put into a mold and pressed into shape.

3. Two halves of the wood and the graphite string are placed together, to make a “sandwich”. The wood and graphite “sandwich” is glued together.

4. The “sandwiches” are cut and shaped into pencils, then sanded until smooth.

5. The erasers are attached to the pencil by a metal cylinder called a ferrule, which is glued to the eraser and the pencil, then clamped around it. The clamp crimps the edges of the metal, which holds both the pencil and the eraser in place.

6. The logo is imprinted on the pencil using a stamp with sharp edges that cuts a little into the wood, leaving the ink cut into the pencil’s surface. The pencil is ready for packaging and shipping.

Image from http://www.madehow.com/Volume-1/Pencil.html
A ________________: Behind the Scenes

Work together as a group to identify a manufactured product whose life cycle you want to explore. Then, write responses to the questions below. Before you write, share ideas and any background knowledge you have. Make some guesses if you’re not sure.

1. List the raw materials that are used to make a ____________________ and where they come from:

<table>
<thead>
<tr>
<th>Materials:</th>
<th>Resource it comes from:</th>
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</table>

2. List the steps needed to fabricate a ________________ once the materials have been transported to the factory:
3 List the different things that might happen to a _________________ after you are finished with it:

4 List as many things you can think of that need to be manufactured (tools, equipment, machines, vehicles, etc.) in order to get the raw materials, fabricate the _________________, distribute it to consumers, and process it once it’s used up:
The Lifecycle of a Pencil

1. Wood is harvested and shipped to a factory as raw lumber.

2. Pencil leads are a mix of graphite and clay, both of which are mined from the earth. Gum for erasers is removed (tapped, like maple syrup is) from trees, or produced from synthetic materials. Steel is mined from the earth.

3. Pencil parts are then shipped to a factory where they are manufactured. Molds are cut and the lead is inserted into the mold to fit the desired size. The lead is then put into the wooden part of the pencil, and steel is used to bind the eraser to the pencil.

4. The pencil is then shipped out to stores, purchased and then used.

5. The pencil is used, then it is thrown away. Eventually the wood and eraser will decompose. The steel and lead will not. Alternatively, the pencil is taken to an incinerator and burned. Or used for another purpose!

Researching a Product: Eco-Friendly Inventions

In groups, students research an eco-friendly invention and present their research to the class. This activity may be divided over several class periods to allow time for research and preparation of presentation.

PREP

- Be prepared to explain the following vocabulary:

  **Carbon footprint:** A carbon footprint is the total amount of carbon dioxide (CO2) and methane (CH4) emitted by a specific population, process, or system. These “greenhouse gases” trap heat in the earth’s atmosphere, contributing to the warming of the planet, including the melting of ice caps, contributing to worldwide weather catastrophes, such as floods, hurricanes and extreme temperatures. The carbon footprint is calculated using its potential impact on a 100-year global warming potential (GWP100). Carbon dioxide and methane are biproducts (unintentionally produced) of a lot of manufacturing processes. Eco-friendly manufacturing uses recycled and renewable materials as well as environmentally-friendly manufacturing processes, using machines, energy sources, and processes that emit as little pollution and waste as possible.

  **Sustainability:** Sustainability means the quality of not being harmful to the environment or depleting natural resources, and thereby supporting long-term ecological balance. In order to be sustainable, one must consider more than the bottom line when choosing a manufacturing process and materials. Sustainable manufacturing prioritizes a quality of life—of workers, consumers and the planet—by using renewable resources, and keeping in mind how our actions might affect other living things, including future generations. Sustainability relies on the interconnection and balance of ecology, economics, politics, and culture.

  You may want to write the guidelines from step #6 on the board ahead of time.

MATERIALS

- *Eco-Friendly Inventions* chart
- This lesson requires computer use.
**EXPLAIN**

1. Who knows what carbon footprint means?  
   - See definition in the prep section.

What does carbon footprint have to do with Manufacturing?
   - Our world needs to house, feed, clothe, transport, educate, and connect billions of people. That’s a lot of products! We also need to keep in mind the limited resources that we have, and the waste that these products produce. “Eco-friendly” products are those that use recycled materials, that produce little waste, that are energy efficient, and/or that produce their own energy.

More and more inventors, scientists, artists, and other innovators are developing eco-friendly products. Although some of these are still very expensive, the hope is that in time, they will be able to be mass-produced and will be affordable to large numbers of people. These products will lower the carbon footprint by using less energy to produce, creating lower amounts of waste, and re-using raw materials for production. These types of products are essential for the longterm sustainability of the planet.

2. Write the following categories on the board, leaving space to write underneath:

   - **Food**
   - **Clothing**
   - **Toys & Games**

   - **Housing**
   - **Transportation**
   - **Appliances & Tools**

What are some manufactured products that fall into these categories?  
As students name the products, write them on the board under the appropriate category.

3. In an effort to learn more about alternatives to traditional products, you are going to research an eco-friendly product that is making or has the potential to make an impact on the environment.

4. Divide students into groups of four. Ask each group to choose one category they would like to focus on. It’s okay if more than one group chooses the same category.

5. Now, you’re going to conduct internet research to identify an important eco-friendly invention that you would like to learn about.

6. Write the following guidelines on the board and discuss them with the class:
YOUR PRODUCT SHOULD INCLUDE ONE OR MORE OF THE FOLLOWING:

- be made of recycled materials and/or from renewable resources
- use a lower level of energy in their fabrication, distribution, and/or use than the traditional version does
- not pollute, or pollute very little while being used
- can be recycled, reused, or repurposed
- contribute to sustainability in some other way (created with environmental protection in mind)

7 Distribute the *Eco-Friendly Invention* chart and ask students to complete it based on the information they find. They should paraphrase and not copy text directly from what they read. They will use this chart when presenting their invention to the class.

8 **OPTIONAL:** As an additional step, teachers can have students transfer their chart into a Powerpoint presentation. A Powerpoint tutorial can be found here:

https://support.office.com/en-us/article/create-your-first-powerpoint-2010-presentation-50732ad4-49b3-44c1-9b4d-fa5e73eb47d1

9 Groups make presentations to the class, either Powerpoint presentations, or using photos or other images gathered in their research.

10 **ALTERNATIVE PRESENTATION FORMAT: Science Fair Format**

Groups may create posters including images and salient points about their chosen eco-friendly invention. To view, students travel from group to group viewing the poster presentations, while one group member stays behind to present the poster.
## Eco-Friendly Inventions

Complete the chart below paraphrasing the information you find out about the Eco-Friendly Invention.

<table>
<thead>
<tr>
<th>Invention— Describe the product</th>
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<tbody>
<tr>
<td>Name of person, people, or group that invented it</td>
<td></td>
</tr>
<tr>
<td>How did s/he get the idea for the invention?</td>
<td></td>
</tr>
<tr>
<td>What makes this an eco-friendly invention?</td>
<td></td>
</tr>
<tr>
<td>What makes you most interested in this invention?</td>
<td></td>
</tr>
<tr>
<td>Why I/we chose this invention</td>
<td></td>
</tr>
<tr>
<td>One question I would like to ask the inventors</td>
<td></td>
</tr>
<tr>
<td>Websites used</td>
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</tbody>
</table>
EXTENSION ACTIVITY:
Videos about sustainability and eco-inventions

Following are a number of videos that explore both the dangers of an over-reliance on disposable products and some new discoveries about how to make those products in more environmentally friendly ways. See “Video Narratives in Manufacturing” in Unit 3 for activity ideas to use with these videos.

1. **The Story of Stuff**
   *The Story of Stuff* began as a short animated movie about where products come from and where they end up, as well as toxic elements some products contain. It grew into an organization that includes over ten films, curricula for teachers, and citizen projects and campaigns. *Story of Stuff* titles include: *The Story of Microfibers; Our Water, Our Future; The Story of Electronics; The Story of Cosmetics; The Story of Bottled Water;* and more.
   http://storyofstuff.org/

2. **A plate made from leaves**
   A look into the production of a disposable plate made entirely of leaves. 100% biodegradable, and inexpensive. *(Run time 1:17)*
   https://www.youtube.com/watch?time_continue=4&v=IgDXyHsA4kU

3. **Bricks made from recycled plastic bags**
   An inventor in Cameroon has been making paving bricks from recycled plastic bags for 15 years. *(Run time 1 minute)*
   https://www.youtube.com/watch?time_continue=1&v=vmLsvl9WFhs

4. **Narayana Peesapaty**, a chemical researcher in India, invented edible cutlery: spoons, forks, and knives made of millet, wheat, and other natural materials. Not only are they biodegradable, they also offer nutritional value. *(Run time 3:41)*
   http://tinyurl.com/edible-spoon

5. **Philippino actor Illac Diaz** has invented a cheap, reliable, and eco-friendly light source that can be easily installed, runs on solar power, and has already brought light to millions of people. *(Run time 6:15)*
   http://tinyurl.com/solar-bottle-light
Why Do We Choose the Products We Buy?

Students consider the factors that inform and influence their consumer choices of manufactured products, then read an article about the influence of emotions on consumer choice, and create their own quizzes to assess their classmate’s knowledge of the text.

**VOCABULARY**
- Pavlovian response
- attributes
- paramount

**PREP**
- Be able to explain vocabulary: Pavlovian response, attributes, paramount

**MATERIALS**
- Apple vs. Samsung image
- How Emotions Influence What We Buy article
- Write Your Own Quiz: Emotions and Consumer Choice worksheet
- This activity is best with a computer and projector

**EXPLAIN**

1. Project or distribute Apple vs. Samsung image and ask students which product they would buy and why. It might be necessary to encourage students to imagine they are choosing between the most recent model of each phone. Be sure to ask students follow up questions until they begin to name specific reasons they would choose one over another, for example,

   - I trust/like the brand
   - One is cheaper than the other
   - It’s what I’m used to using/I had one before
   - You get more for the price
   - One phone has some features the other doesn’t
   - My family or friends use it

2. Turn to your partner and discuss the following question:
   How do you typically decide to buy the products you buy? In other words, why do you choose one type or brand of product over another?
When students are finished, ask them to share aloud highlights from their conversations. Make a list on the board of all the factors that could influence the products they buy. Encourage them to think broadly about the social and environmental factors that influence product choice such as family members, friends, community, marketing, television, movies, etc. If it hasn't already come up, ask students to discuss where they get information from about products they buy and how they determine which sources are credible.

Ask students whether they think most people make consumer decisions based more on facts about products or on how the product makes them feel? For example, someone might buy iPhones because they trust Apple or are used to Apple products so they feel safe and comfortable using them, even if another brand comes out with a phone that has better features.

Today we are going to read about what scientists have learned about why and how we choose the products in our lives. Distribute the article, *How Emotions Influence What We Buy* and ask students to read and annotate it, marking anything in the article they can add to the list on the board, as well as anything they think is interesting, important, surprising or confusing.

When students are finished, facilitate a discussion of the article in which students share their annotations, teacher clarifies any confusion or questions, and students relate the article back to the opening discussion and list on the board.

**Say:** One strategy for reading effectively and remembering new information, is to develop questions about what you just learned.

Distribute *Write Your Own Quiz: Emotions and Consumer Choice* worksheet. Ask students to create a quiz for their classmates to take using information from the article. All questions they create must be able to be answered using information from the article. They should not answer the questions once they have completed the worksheet.

When students are finished, ask them to exchange quizzes with a partner and complete their partner’s quiz. When they are finished, they can exchange papers back, correct the quiz they made and share their results.

Debrief the exercise with students and clarify any remaining questions.
Apple vs Samsung
Most people believe that the choices they make result from weighing the facts of a given situation and using logic to come to a conclusion. In reality, however, emotions greatly influence and, in many cases, even determine our decisions.

In his book, *Descartes Error*, Antonio Damasio, professor of neuroscience at the University of Southern California, argues that emotion is a necessary ingredient in almost all decisions. When we are confronted with a decision, emotions from previous, related experiences can influence how we see our current options. These emotions create preferences which lead to our decision. Damasio’s view is based on his studies of people whose connections between the “thinking” and “emotional” areas of the brain had been damaged. They were capable of rationally processing information about alternative choices, but were unable to make decisions because they lacked any sense of how they felt about the options.

The influential role of emotion in consumer behavior is well documented:

- Brain imaging technology shows that when evaluating brands, consumers primarily use emotions (personal feelings and experiences) rather than information (brand attributes, features, and facts).
- Advertising research reveals that emotional response to an ad has far greater influence on a consumer’s intent to buy a product than does the ad’s information about the product—by a factor of 3-to-1 for television commercials and 2-to-1 for print ads.
- Research conducted by the Advertising Research Foundation concluded that the emotion of “likeability” is the most important factor that determines whether an advertisement will increase a brand’s sales.
- Studies show that positive emotions toward a brand have far greater influence on whether customers consistently buy the same brand than do trust and other judgments which are based on what the brand has to offer.
Emotions are the primary reason why consumers prefer brand name products. After all, many of the products we buy are available as generic and store brands with the same ingredients at cheaper prices. Why do we decide to pay more for brand name products?

A nationally advertised brand has power in the marketplace because it creates an emotional connection to the consumer. A brand is nothing more than a mental representation of a product in the consumer’s mind. If the representation consists only of the product’s attributes, features, and other information, there are no emotional links to influence consumer preference and action. The richer the emotional content of a brand’s mental representation, the more likely the consumer will be a loyal user. In other words, the stronger a brand is able to make you feel about them, the more likely you are to consistently buy from them.

While emotion can be communicated effectively in a print ad or television commercial, there are other important components of a brand which have emotional dimensions. For example:

• Rich and powerful mental representations of a brand include its personality. Research reveals that consumers perceive the same type of personality characteristics in brands as they do in other people. And just like with people, they are attracted more to some personality types than others—attractions which are emotion based, not rational. Brand personality is communicated by marketers through packaging, visual imagery, and the types of words used to describe the brand. For example, Apple products have a sleek, hip, trendy and youthful personality. Customers are often attracted to their products because they want to feel sleek, hip, trendy and young or because the products make them feel this way.

• Another important foundation for a brand’s emotions can be found in its “narrative”—the story that communicates “who” it is, what it means to the consumer, and why the consumer should care. This narrative is the basis for brand advertising and promotion. For example, Apple sells itself as cutting edge technology that’s simple and friendly enough for the average user while also being sophisticated enough for high-tech creators.

But for consumers, perhaps the most important characteristic of emotions is that they push us toward action. In response to an emotion, humans are compelled to do something. In a physical confrontation, fear forces us to choose between fighting back or running away to insure our safety. In our daily social confrontations, insecurity may cause us to buy the latest iPhone because we want to feel youthful, hip, or part of a group.

An understanding of consumer purchase behavior must be based on knowledge of human emotion and include the most important influence on decision-making: emotions.
Write Your Own Quiz:
Emotions and Consumer Choice

Use the question stems below to create a quiz about the article for your classmate to take. The questions must be able to be answered with information from the article. Your goal is to challenge your classmate’s new knowledge. Do not answer the questions after you write them.

1. Why do you think consumers ____________________________?

2. In your own words, describe ____________________________.

3. Studies show that ____________________________. Why do you think that is?

4. What is the difference between ________________________ and ________________________?
5. Name three reasons people ________________________________.

6. Why do you think ________________________________ is important to consumers?

7. Do you agree that ________________________________? Why or why not?

8. When you make your own consumer choices, do you ________________________________? Why or why not?
Visual Literacy: Supply and Demand

Students watch and discuss a brief movie clip that illustrates the law of supply and demand, and consider their own experiences with supply and demand as consumers and workers.*

PREP

- View the video clip at https://www.youtube.com/watch?v=JpXKyo-ZeVI. Be prepared to discuss the concept of supply and demand, a fundamental economic concept that appears on the TASC exam.
- Be prepared to explain vocabulary: market, supply and demand, incentives

MATERIALS

- This activity requires a computer with projector or student computers with headphones.

EXPLAIN

1. The price of products is a major factor in our decisions as consumers.
   Ask: Have you ever considered how manufacturers or the retailers who sell their products decide how much to charge for those products? Do you think they try to figure out how much someone is willing to pay for their product or do you think they just take a guess?

2. The price of goods depends on something called the Law of Supply and Demand. It’s not a law that Congress voted on. It’s how economists think the market works most of the time. In this case, “market” does not mean a physical place like the supermarket. “Market” means the buying and selling of products or services. Economists use the term “supply” to refer to the availability of goods or services. “Demand” refers to people wanting a product or service. We can say, for instance, that there was a high demand for the iPhone7 when it came out. Product prices are determined by the interaction of supply and demand.

3. In order to understand how supply and demand works, we’re going to watch a clip from a movie called, Jingle all the Way, starring the actors Arnold Schwarzenegger and Sinbad. In the movie, the actors both play fathers who are desperate to get their children the hottest toy of the season for Christmas. The scene takes place in a store in a mall that has just received a shipment of the popular toy.

   Play the video clip: https://www.youtube.com/watch?v=JpXKyo-ZeVI.

* This lesson is adapted from https://www.frbatlanta.org and http://www.fldoe.org/core/fileparse.php/7531/urlt/supply-and-demand.pdf
DISCUSS

- Who are the main characters in the movie?
- What are the characters buying? Is it a need or want? Why?
- What happens in the movie?
- Why did the stores run out of Turbo Man?
- What happens to the price of a good when there is a limited supply such as this?
- Do you think the demand will always be high for this toy? What factors might affect this?
- What do you think will happen to the price of the toy when there is no longer a high demand for it? Why?
- What do you think will happen to the production of the toy when the price goes down? Will the manufacturer produce more or less? Why?

The Law of Supply and Demand says that if there is a high demand for something and a low supply, the price will be high. If there is a high supply of something and not much demand, the price will be low. At higher prices, consumers have an incentive to purchase less, while producers have an incentive to produce more. At lower prices, consumers purchase more, but producers have an incentive to produce less.

- Think back to your childhood. Was there a toy or other item that was in high demand around the holiday season? Describe how the media was involved in creating demand, and what happened as a result—to the store environment, the price of the item, its supply, and consumer demand.

- What effect do you think the law of supply and demand has on the products in your life today? Students should describe how supply and demand affects the prices of items they want, such as videogames, cell phones, clothes, even housing. Call on 3 to 5 students to share some of their thoughts with the class.

- Discuss the effect of supply and demand on the workplace. If there is a shortage of workers in a certain field, the demand will increase and competition between companies hiring may be fierce. Some companies may increase their wages for trained workers. Many companies may offer salary packages that include bonuses, higher than average salaries, payment of employee’s student school loans, assistance with purchasing home, etc. Discuss an example of careers such as teachers, Information Technology, lawyers, etc. and how supply and demand has impacted those careers.