

LESSON PLAN

Ford Vehicles Are Made Of What?(Grades 2-4)

Estimated Time

2 - 45-minute activities

Purpose

This lesson will teach about the history of Henry Ford and the Model T. And how Ford has progressed to use sustainable materials in the making of their vehicles.

Materials

Activity 1: Who was Henry Ford?

Activity 2: What's in your Ford Vehicle?

Activity 3: What is Agave?

Activity 4: Bamboo

VIDEO TO PLAY:

Agave By-Products Get a Second Chance at Ford | Innovation | Ford

<https://www.youtube.com/watch?v=tN32wUwo2xc>

Activity 1: The History of Henry Ford

1. Henry Ford was born July 30, 1863, on a farm in [Greenfield Township, Michigan](#) and died in 1947. Founder of the Ford Motor Company and helped develop the assembly line for mass production. Did you know Henry Ford grew up on a Farm?
2. Henry Ford is most famous for founding the Ford Motor Company. Ford is still one of the world's largest producers of cars including brands such as Ford, Lincoln, Mercury, Volvo, Mazda, and Land Rover. Ford was a pioneer in manufacturing using the assembly line. This enabled his company to manufacture cars on a large scale at a cheap price. For the first time, cars were affordable for the average American family.

What did Henry Ford invent?

The Assembly Line - It is often stated that Henry Ford invented the assembly line. This is where a large number of products are made one step at a time as they pass down a line. Using an assembly line allows for the mass production of products at a cheaper price than trying to build an entire product one at a time. What Henry Ford did was apply this concept to the automobile and perfect it for the mass production of cars at a much lower price than current production methods. Ford's work in streamlining the assembly line for cars was an example of just how powerful an assembly line could be in mass producing products.



1908 Ford Model T
by Ford Motor Company

The Model T Ford - This was the original car that Ford manufactured using the assembly line process. It was revolutionary in many ways, but primarily in its cost. It was very cheap compared to competitive cars and it was easy to drive and to repair. These features made it perfect for the middle class American. Over 15 million Model T cars

were made and, by 1918, over 50% of the cars in America were Model Ts.

Procedures

Ask your students to think about what they would invent and present it to the class. Encourage them to work in small groups.

Facilitate by suggesting what they think would help people (similar to how Cars help people get places)

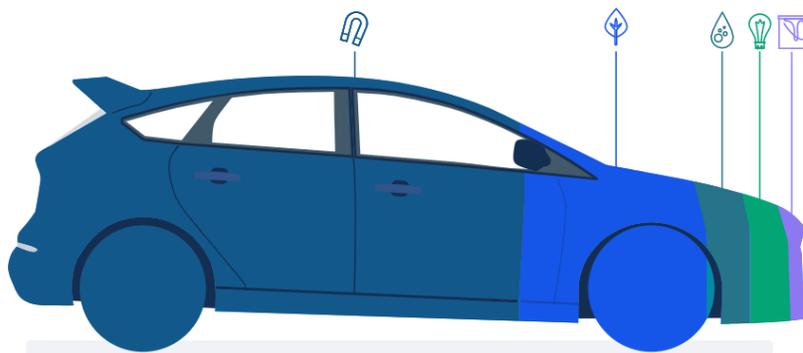
Activity 2: How Ford uses materials especially by-products from farms

Ask the students to name a few things that farmers produce. Allow the students to raise their hands and name a few items. Once the students are actively thinking about what farmers grow/produce, tell them that you are going to play a guessing game and that you are going to give them some clues. Inform them that Ford Motor Company uses items farmers produce to build their vehicles. Make a list of all the items that they can think of and put aside

1. Play video Farm to Car | <https://www.youtube.com/watch?v=Aa9d77hNN-0>
2. After video talk about the different items in a car
3. Money/Wheat Straw/Corn/Plastic Bottles/Rice/Soybeans
4. <https://corporate.ford.com/microsites/sustainability-report-2017-18/customers-products/sustainable-materials/index.html>

What's in a Typical Vehicle?

Up to **40,000** parts...**1,000** different materials...**10,000** chemical substances...



 **75%** Metals (steel, aluminum, magnesium and titanium)

 **17%** Plastics, Elastomers, Textiles and Natural Materials

 **4%** Fuels and Consumable Liquids (engine oil, lubricants)

 **3%** Electronics, Ceramics, Glass and Other Compounds

 **1%** Miscellaneous (paint, adhesives, sealants, etc.)

5. Cut out a large car outline and some of the items that are found in a car. (Dollar Bills, Wheat, Corn, Soybeans)
6. Bring in items that show the items- Foam seats, Water Bottles, Jeans, Cotton Shirts, etc..

Activity 3: What is Agave? Ford Motor Company and Jose Cuervo are giving leftover agave fibers a second chance to shine – as plant-based plastic. Come along to see how this strong plant can go from farm to car.

1. Show your students a picture of an Agave Plant and ask if what it is. Chances are, they won't know it. Talk about Agave and where it's grown and what it's usually grown for.
2. Talk about the process of harvesting Agave.
 - Agave plants grow strong for seven to ten years before destiny calls. On harvest day, farmers carefully unearth each plant, cutting leaves bare to the hearty inner core, or piña.



- Every day, the agave oven deck receives 200 to 300 tons of agave for tequila production. After roasting for three days, the agave piñas are shredded, pressed, fermented and distilled to make tequila. But the agave's story is far from over.
- Leftover agave fibers find new life at Ford in Dearborn, MI, where the biomaterials team has been making sustainable, plant-based plastics to use in cars since 2000. With uses from cupholders to storage bins or more, an agave composite could help reduce vehicle weight, lower energy consumption, and potentially reduce the use of petroleum.

3.



Play short video showing how Ford discovered Agave can be used in vehicles

Agave By-Products Get a Second Chance at Ford | Innovation | Ford
<https://www.youtube.com/watch?v=tN32wUwo2xc>

1. Try to find a real Agave to show class.
2. Think about an activity that the class might do with Agave.

Activity 4: What is Bamboo?

It can grow a meter in a day, it's compostable and has the tensile strength of steel. And in recent years, we've been working with suppliers to evaluate the viability of using bamboo in vehicle interiors. Some surfaces inside our vehicles could be made from a combination of bamboo and plastic, making them particularly strong.

Bamboo is amazing," said Janet Yin, Ford materials engineering supervisor. "It's strong, flexible, totally renewable, and plentiful."

The team at the Nanjing Research and Engineering Centre has found that bamboo performs better than many other synthetic and natural fibers across a range of materials tests. It has also been heated to more than 212 degrees Fahrenheit to ensure it can maintain its integrity.

The benefits of bamboo have long been recognized, from its tensile strength – known to rival or even better some types of metal – to its speed of growth, reaching maturity in two to five years.

1. Create an activity sheet outlining facts on Bamboo with "blank spaces" for students to fill in the blanks with their learned facts.
2. Have students play Bamboo Trivia in their small groups (6 students). Have one member be the host asking the questions (provide cards to read from) and one student be the moderator who confirms if answer correct with remaining 4 students split up in 2 teams. The students can have fun with this creating a score board.

Below are trivia facts questions

BAMBOO TRIVIA:

- The origin of the word bamboo comes from the Malay word "Mambu"
- Bamboo is actually a grass, not a tree
- Bamboo grows natively on 5 continents: Africa, Asia, South America, North America and Australia – but not Europe
- There are more than 1,500 different species of bamboo
- Some varieties can grow by almost one meter per day



- The largest species reach up to 40m high and are 30cm wide
- 'Lucky' bamboo isn't actually bamboo
- Bamboo releases 30 per cent more oxygen into the atmosphere than other plants
- It reaches maturity after 2 to 5 years
- Some species survive more than 120 years in the wild