

# Class Starters & Enders

## Making the Most of Instructional Time Five Minute Lessons

Class Starters and Enders help utilize the last minutes of class when a lesson ends but there is not enough time to start another, or for an interest approach at the beginning of class. Mini-lessons correlate to GPS in the programs areas below.

### Tractors

**Program Areas:** Agriculture, Business, Marketing, and Engineering

**Instructions:** Read the material and make notes of important points, answer the questions, and be ready to discuss this topic.



Modern day tractors maintain the classic look with the cab in the middle and engine in front, but have an enclosed cab and can have one of several different wheel styles.

What do you get when you combine **traction** and power? A tractor, of course!

The term “tractor” was coined in 1901 by Charles W. Hart and Charles H. Parr, two inventors who created a two-cylinder gasoline engine for the farm vehicle. The word “traction” comes from the Latin word meaning “to pull.” A tractor is specifically designed to deliver a high **torque** at slow speeds for the purposes of hauling or powering a trailer or machinery.

The first powered farm **implements** in the early 1800s were **portable engines** – steam engines on wheels that could be used to drive mechanical farm machinery by way of a flexible belt. Around 1850, **traction engines** were developed from these and were widely adopted for agricultural use. The traction engines were used in pairs – one was placed on either side of a field to haul a plow using a wire cable. These engines remained in use well into the 20th century until reliable **internal combustion engines** were developed.

In 1892, an Iowa inventor created the first gasoline powered tractor and developed a production company for them. The company failed three years later. By 1903, however, Hart and Parr designed their **two-cylinder engine** and built 15 tractors. Their 14,000 pound #3 is the country’s oldest surviving internal combustion engine. The first mass-produced tractor was the Fordson, developed by Henry Ford in 1917. These were built in the U.S., England, Ireland, and Russia and helped make internal combustion engines the norm.

Tractors can be two- or four-wheel drive or track tractors. The classic look of a farm tractor is an open vehicle with two large driving wheels on an axle below and slightly behind the seat, and the engine in front of the driver. Though the basic design has not changed much over the years, the driver seat area is now enclosed in most modern tractor models.

During the 1930s, the **caterpillar-style tractor** gained popularity because of its excellent traction. These tractors were driven using turning brake pedals and levers instead of a steering wheel. The 1960s brought the advent of the four-wheel drive tractor, which could have either two large and two small wheels or four large powered wheels. Nowadays, farm tractors have four- or eight-wheel drive units with power units steered by hydraulic clutches or pumps. They can also have crawler-type tracks instead of wheels, but still maintain the traditional tractor look.

#### Review

1. Where did the word “tractor” come from?
2. What is a tractor designed to do?
3. What were the first powered farm implements?
4. How were traction engines used?
5. Who designed the two-cylinder engine?
6. What type of tractor was developed by Henry Ford?
7. What was the big change in the design of modern tractors?

#### Language Connection

Define the following terms.

Caterpillar-Style Tractor	Torque
Implements	Traction
Internal Combustion Engine	Traction Engine
Portable Engines	Two-Cylinder Engine