

Wheels and Tires

Explorers will be introduced to the basics of wheel construction and tire maintenance and repair.

CATEGORY

- Auto Technology
- Wheels and Tires

OBJECTIVES

By the end of this session, participants will be able to:

- Check tire wear patterns and identify potential causes.
- Explain tire specifications.
- Explain camber, caster, and toe.

SUPPLIES

- Activity 1
 - Tape to outline an area (“alley”) on the ground or floor
 - Two identical balls such as a basketball, volleyball, or playground ball; one should be properly inflated and the other partially flat
 - 10 “bowling pins”; these can be empty bottles, paper towel rolls, soda cans, or something similar
- Activity 2
 - Proper safety equipment for each participant (i.e., eye and ear protection, gloves)
 - Tires set up at three different stations
 - **Tire Wear Patterns** chart
 - Compressor and inflation gauge (optional but recommended)

ADVISOR NOTE: Text in italics should be read aloud to participants. As you engage your post in activities each week, please include comments, discussions, and feedback to the group relating to **Character, Leadership, and Ethics**. These are important attributes that make a difference in the success of youth in the workplace and in life.

ACTIVITY 1

Bowling

This activity is intended to get your Explorers engaged and to serve as a lead-in to the main event.

Set up a small bowling alley in your meeting place. It doesn’t need to be more than 12 feet long, but it should be clearly defined using tape or other markers. Set up 10 “pins” using empty bottles, paper towel rolls, soda cans, or anything similar that might suffice.

Divide Explorers into two teams. Instruct them that they will be competing in a bowling contest and will take turns trying to knock down as many of the “pins” as possible. Each team, however, must use only its assigned ball.

Give one team the ball that has been properly inflated and rolls well. Give the other team the ball that is partially flat.

Before they begin, tell participants that their ball must roll along the ground while in the alley and may not be thrown or tossed at the pins.

ACTIVITY 2

Main Event

Begin the main event by asking the following questions:

- *How difficult was it to knock down your pins?*
- *Was one of the balls easier to roll than the other?*
- *What could have been done to even out the results between the teams?*

Try to guide the discussion toward the conclusion that inflating a ball isn't difficult and it seems like a rather obvious thing to do in the case of this game. Just like with this game, many people ignore the small and simple things when it comes to maintaining their vehicles and yet expect everything to run smoothly. Tell them that this meeting will focus on one of those seemingly simple things that can make a big difference.

It is important that your Explorers have the opportunity to get their hands dirty and actually experience the workings of wheels and tires. Find ways in which each participant can touch and work directly with wheels and tires.

Talk about the difference between the wheel and the tire. While this is a basic discussion, use this as a teaching opportunity to address proper terminology and industry accepted nomenclature. Point out that using proper terminology and language will increase the feeling of professionalism and trust that your customers have for you as a technician.

This activity may be completed in a round-robin if there are enough adults available to help. The following are suggested stations and learning points. Make sure each activity is not simply a lecture but that the Explorers have the opportunity to physically engage in the diagnosis and handling of the tires.

- **Tire Specifications**—Have Explorers examine a tire and discuss the various markings. Explain why this information is important and how installing a tire that is not a proper fit will affect the operation of the vehicle. Explorers should be able to identify the following:
 - Whether the tire is for passenger vehicle or truck use
 - The tire's width
 - The tire's height
 - The radial ply
 - The wheel's diameter
- **Tire Design**—After engaging in the activities at this station, Explorers should be able to do the following:
 - Identify the sidewall, tread, and bead of the tire.
 - Identify the materials used in construction of the tire (i.e., rubber, steel, other).
 - Understand the terms ply, radial, bias, and belted.

- Tire Alignment and Wear—This station will take the longest to complete and is the most physically engaging. Have Explorers do the following:
 - Check a tire for signs of wear (penny test).
 - Rotate the tires on a vehicle. Discuss the difference between bias ply and radial ply rotation patterns.
 - Observe and discuss the terms caster, camber, and toe-in/toe-out. Have Explorers make a needed adjustment to correct one of these aspects.
 - Using the **Tire Wear Patterns** chart, have Explorers identify the wear patterns of a few cars in your shop. See if they can identify the proper action to correct any abnormal wear.

When you are done, give each participant an opportunity to identify each of the parts you have worked on and explain their function. Allow time for questions.

ADVISOR NOTE

Some sample questions are below. They are designed to help the participants apply what they have learned to their own interests. You are welcome to use these questions or develop your own questions that relate to your post or specific focus area.

REFLECTION

Focusing Questions

- *What did you learn about tires and wheels that you didn't know before?*
- *How are tires more or less complicated than you thought?*

Analysis Questions

- *What could you do to help your customers get the most from their tires?*
- *How can a thorough understanding of tire design and construction make you a better technician?*

Generalization Questions

- *As a technician, what could you do to teach the importance of proper tire care to your customers?*
- *What subjects in school do you believe would be relevant to gaining a better understanding of the function of tires and wheels?*

ADVISOR'S PARTING THOUGHT

Share the following thought:

Tires are a pretty simple concept, yet they are critical to the movement of a vehicle. Imagine trying to drive on square blocks or flat tires. You just wouldn't get very far.

It's often true that the seemingly mundane or simple things in life make the biggest difference. Simply saying "I'm sorry" or "Thank you," or smiling at somebody who's had a rough day may not seem like a big deal, but to others it can make all the difference in the world. It can turn a day of drudgery into one of hope and happiness.

Don't underestimate the importance of simple things and extending little or big acts of kindness to others each day.

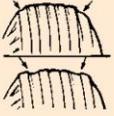
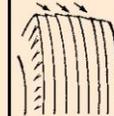
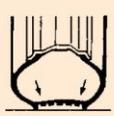
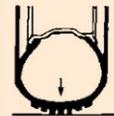
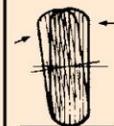
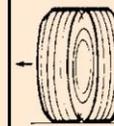
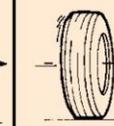
After the meeting, address the following:

- Identify what was successful about the meeting.
- Identify what needed improvement.
- Schedule an officer and Advisor planning meeting to prepare for the next post meeting or activity.

RESOURCES

Activity 2

Tire Wear Patterns

Tire Wear Patterns							
Condition	Rapid Wear at Shoulders	Rapid Wear at Center	Cracked Treads	Wear on One Side	Feathered Edge	Bald Spots	Scalloped Wear
Effect							
Cause	Under-inflation or lack of rotation	Overinflation or lack of rotation	Under-inflation or excessive speed	Excessive camber	Incorrect toe	Unbalanced wheel	Lack of rotation of tires or worn or out-of-alignment suspension
							
Correction	Adjust pressure to specifications when tires are cool; rotate tires.			Adjust camber to specifications.	Adjust toe-in to specifications.	Dynamic or static balance wheels.	Rotate tires and inspect suspension.

(Source: John McDearmon)