



Automobiles

Additional Information:

Internal-combustion engine: You have already read a short history of the automobile and Henry Ford. You have also had a chance to learn some of the parts of the automobile. What you might not have had a chance to study is the special kind of engine that makes the automobile run. The engine used in the automobile is an *internal-combustion engine*. Let's look at a very basic overview of the way this engine works. The internal-combustion engine used in automobiles takes fuel into a small space and uses the explosion of the fuel when it is ignited to power the engine. You see the engine has valves called pistons. When the pistons move down, a small amount of fuel goes into the chamber where the piston located call a cylinder. The piston then moves up and the fuel is compressed. The spark plugs then provide a small spark to ignite the fuel. This makes a small explosion forcing the piston back down. This happens hundreds of times in a minute and as the pistons move up and down they are connected to gears that move the automobile forward. (Instructor might want to find visuals to illustrate.)

Additional Maintenance Activity - How To Change Your Oil In 4 Easy Steps

Changing the oil in your automobile's engine can help keep it running for a long time. Most automobile manufacturers recommend that you change the oil in your car once every 3,000 to 7,500 miles. Before you try to do this, you should always have an adult with you.

1. This can be a very messy job so you will want to wear some old clothes and have some rags and soap around to clean your hands after your done. The first thing you want to do is make sure the car is on a level ground and that you place blocks behind the wheels so the car does not roll.
2. Be careful the oil may be hot, especially if the car has just been running. You will have to crawl under the engine and find the oil plug. The oil plug is located under the oil pan which is on the bottom of the engine block, and is usually at the bottom diagonal side of the oil pan. You will want to place a drain pan under the plug as you unscrew it counter-clockwise with a wrench. The oil will drain pretty quickly. Don't worry if the plug falls into the drain pan, you can get it later. When the oil has finished draining, find the plug and screw it back in tight.
3. You should always change the oil filter when you change your oil. You will need a special tool called an *oil filter wrench*. The oil filter wrench will tighten automatically as

you turn the wrench counter-clockwise to remove the filter. You may need an adult to help you if the filter is on too tight. When you take oil filter off be careful to keep it upside down until you place it in the drain pan, it will be filled with oil. Take some oil on your fingertip and rub it around where the metal edge of the new oil filter and the engine connect. Finally screw on the new filter by hand and tighten it without using the wrench.

4. Pour new oil in the engine. You will find a knob on top of the engine marked "oil". Fill the engine with the amount and grade recommended by the car manufacturer. Screw the oil knob back on and clean engine of any oil that may have spilled while you were filling the engine. Save the empty oil bottles so you can pour the old oil into them. Most gas stations will take old used oil for recycling.

Additional Service Project:

Now that you know how to change the oil try this: Sponsor a oil change day at your corps set it up the same way you might do a car wash. You could even use it as a fundraiser.

Additional Devotionals:

Fill 'Er Up - Ephesians 5:15-18

When you fill your car up with gas it will run. You can put other things in your car's engine but most likely if you do they will clog up your engine and the car will break down. Paul talks to us here about what we fill our lives with. We can put many different things into our lives, but not everything is good for us. Paul suggests that we fill our lives with the Holy Spirit. This is like putting the Super-High Octane Gasoline in our car engine!

Starting Up With Faith - Hebrews 11:1

Even though we've been learning about cars, we probably still don't know everything there is to know about what makes a car work. For most of us, when we see an adult put the keys in the ignition and turn, we take for granted the car will start. We might not know how or why, but we know when you turn the keys-- the car starts. You could say we have faith, although we don't know exactly how, we believe the car will start. The writer of Hebrews says that faith is being sure of what we hope for and certain of what we do not see. The same way we hope the car will start even though we might not understand, that's how our faith in God works. We know when we accept Christ we will be given eternal life with God, even though we might not understand how it all works. We believe it by faith because that is what He says in His Word.

Staying On the Road - Galatians 1:6-9

When you are traveling in your car, maybe on a long trip and you have a set of directions you are following, if you are not careful to follow the directions exactly the way you have them, the chances are you will get lost. You might end up following a road that takes you in

the wrong direction or even on a dead end street that leads no where. Paul is writing to Christians that he has spent some time with showing them the right way to eternal life. That was to follow his teachings about Jesus Christ. Now some of them were not paying close attention to Paul's directions and they were getting lost following a gospel that was not the Gospel of Jesus Christ. These teachings were not going to lead them to heaven. Paul warns them to get back on the right road which will lead them to eternal life.

Having an Engine That Purrs - Galatians 5:16-26

If you take care of your car really well, always changing the oil on time, having regular tune-ups and treating it right. These things will help keep your engine in tune and in good shape. When you have an engine like that you can tell because it runs smooth and quite like a cat that purrs. You can tell right away an engine that is taken care of from one that has not been taken care of, even by the way it sounds. Our lives will be like that. Paul writes that if we keep our lives in Christ and His Spirit it will be obvious to everyone around. They will easily see the difference between those who live in Christ and those who do not. Paul lists the difference in this portion of scripture. He says the life in Christ purrs like a finely tuned engine!

