Math-in-CTE Lesson Plan:
Transportation, Distribution, and Logistics (Automotive)

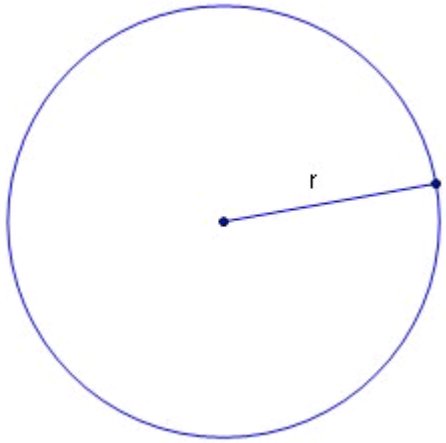
Lesson Title:	**Tire and Wheel Assemblies**	*Lesson 01*
Occupational Area:	Transportation Automotive Technology	
CTE Concept(s):	Tire Sizes and Designations	
Math Concepts:	Creating and using formulas to solve problems, diameter, unit conversions, percent	
Lesson Objective:	The students will be able to create and use formulas to calculate the diameter of a tire and wheel assembly.	
Supplies Needed:	Handouts Power Point	

THE "7 ELEMENTS"	**TEACHER NOTES (and answer key)**
1. Introduce the CTE lesson. Grandma wants to customize her 1965 Lincoln and replace the original equipment 15 inch wheels with some bigger custom wheels. Teacher asks students if they know someone who replaced their original wheels with bigger wheels. Teacher asks students "Why would someone want to do this?" We will use a variety of math skills to calculate diameters of wheel tire assemblies with various wheel and tire sizes. We will need to do conversions, find percents and use basic algebra formulas.	Teacher introduces PowerPoint slide of Grandma's ride. Some reasons for replacing wheels: Appearance Change in performance

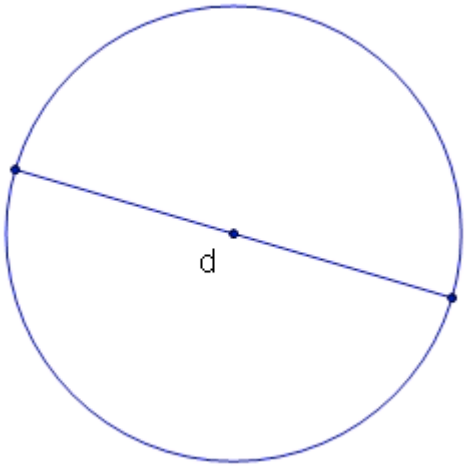
2. Assess students' math awareness as it relates to the CTE lesson.

What is the difference between a radius and diameter of a circle? How do you convert mm to inches? How do you convert a percent to a decimal? Why is it important to keep the diameter of the tire equal if you're changing the wheel/tire sizes?

Radius = a segment connecting the center of a circle to any point on the circle



Diameter = a segment connecting two points on the circle and passing through the center



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	1 inch = 25.4 mm 1 mm = .039 inches Decimal to percent – move decimal point two (2) places to the right Percent to decimal – move decimal point two (2) places to the left If the tire is a larger diameter, will it turn faster or slower at the same speed? It will turn slower; therefore the speedometer will read slower than the actual speed.
3. Work through the math example embedded in the CTE lesson. Display a model of a **255/70 R 15** tire. 1.) Convert a measurement. 2.) Calculate the height of the sidewall of the tire. 3.) Find the diameter of the tire. Put it all together in a formula.	See model on PowerPoint Answers: 1. To convert mm to inches, divide the mm by 25.4. Round to the nearest tenth. 255 mm = 10.0 inch 2. To convert to a percent, move the decimal point two places to the left. 70% = .70 Height of the sidewall of the tire = aspect ratio (as a decimal) • the section width (in inches) Height of the sidewall of the tire = .70 • 10 inches Height of the sidewall of the tire = 7 inches 3. To find the diameter of the tire, you add the diameter of the wheel and two times the sidewall height. 15 inches + 2(7 inches) = 15 inches + 14 inches = 29

	inches
4. Work through related, contextual math-in-CTE examples. You have measured the thickness of a brake lining at .25 inch. The original thickness of the brake lining was 13 mm. What percent of the brake lining do you have left?	**In inches:** Problem worked out on Power Point slide.
5. Work through traditional math examples. Provide students with the Conversions and Percents worksheet. Student will do several conversions and calculate missing values involving percents.	Conversions and Percents Worksheet and Answer key provided. (Worksheet B)
6. Students demonstrate their understanding. Students will complete the Tire and Wheel Diameters worksheet provided finding diameters of wheel and tire assemblies.	Tire and Wheel Diameters Worksheet and Answer key provided. (Worksheet A)
7. Formal assessment. End of unit assessment will include questions where students will do conversions and find missing values involving percents.	No assessment is attached: teacher will include questions finding diameters on final assessment of tire unit.

NOTES: