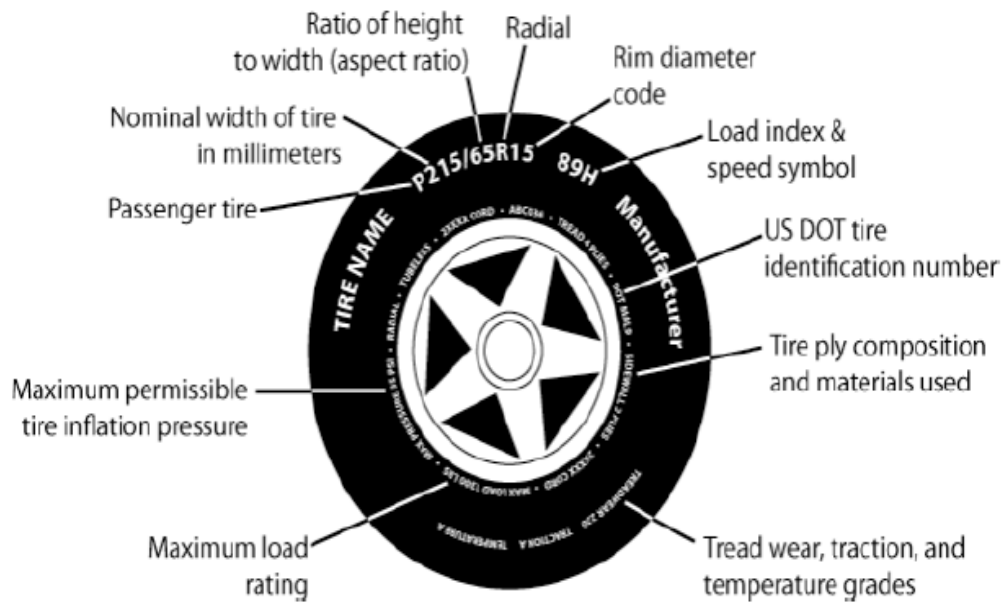## Analyzing Numerical Data: Using Ratios
I.B Student Activity Sheet 5: Changing Tires

You have just purchased a new vehicle equipped with factory-installed P245/70R16 tires. You think these tires look too small, so you replace them with P285/75R16 tires. How does this change in tire size affect the accuracy of speedometer and odometer readings? Specifically, your goal is to complete the following statements:

If your odometer reading is 2 0 0 0 0 *, you have actually traveled* ____ *miles.*

If your speedometer reading is 60, your actual speed is ____ *miles per hour.*

The calibration of a vehicle's speedometer and odometer is based on the circumference of the vehicle's factory-installed tires. For the P245/70R16 tires,

- *P* means passenger tire;
- *245* specifies the tire's width in millimeters;
- *70* is the tire's aspect ratio—that is, the ratio of the tire's height to its width reported as a percent; and
- *16* is the diameter of the tire's rim in inches.

1. Fill in the missing information for each tire size. Find the circumference of each tire.

Tire	P245/70R16	P285/75R16
Width (mm)		
Aspect Ration (%)		
Height (in.)		
Diameter of rim (in.)		
Diameter of entire tire rim plus the rubber (in.)		
Circumference (in.)		

2. After one rotation of the wheel, how many inches further has the truck with the larger tires traveled than the truck with the factory-installed tires?

3. After one rotation of the wheel, the truck with the larger tires has traveled _____ times further than the truck with the factory-installed tires.

4. If your odomoter says you have traveled 2,000 miles, how far have you actually traveled?

5. If your speedometer says you are going 60 mph, how fast are you actually going?

6. If your speedometer says you are going 70 mph, how fast are you actually going?

7. If your speedometer says you were going 70, could you get a ticket for speeding?

On your new small car, you replace the factory installed P 205/60R14 tires with slightly larger P230/70R14 times

Tire	P205/60R14	P230/70R14
Width (mm)		
Aspect Ration (%)		
Height (in.)		
Diameter of rim (in.)		
Diameter of entire tire rim plus the rubber (in.)		
Circumference (in.)		

What is the differences in the circumferences?

What is the circumference of the new divided by the circumference of the old?

If you thought you went 100 miles, how many miles did you really go?

Tire	P180/65R14	P205/75R14
Width (mm)		
Aspect Ration (%)		
Height (in.)		
Diameter of rim (in.)		
Diameter of entire tire rim plus the rubber (in.)		
Circumference (in.)		

What is the differences in the circumferences?

What is the circumference of the new divided by the circumference of the old?

If you thought you went 15 miles, how many miles did you really go?

Name: _____

Date: _____

Tire	P150/45R15	P190/65R15
Width (mm)		
Aspect Ration (%)		
Height (in.)		
Diameter of rim (in.)		
Diameter of entire tire rim plus the rubber (in.)		
Circumference (in.)		

What is the differences in the circumferences?

What is the circumference of the new divided by the circumference of the old?

If you thought you went 30 miles per hour, how fast did you really go?

The odometer reading is 21,550; yet what is the actual reading?