

GED 2002 Teachers' Handbook of Lesson Plans

Area/Skill - Mathematics	Cognitive Skill Level - Application	Correlation to Framework - 05.04/05.16	Lesson Number - 18
<p>Activity Title - How to Weigh a Car with a Tire Gauge</p> <p>Goal/Objective</p> <p>Apply mathematical principals to workplace/life situations.</p> <p>Lesson Outline</p> <p>Introduction</p> <p>Calculating the weight of a motor vehicle seems impossible without a large scale. It is possible to determine the weight of your car fairly accurately using only some graph paper and a tire air pressure gauge.</p> <p>Activity</p> <p>Provide each student with four pieces of 1-inch graph paper, a pencil or sharpie type marker and a tire gauge calibrated in pounds per inch (ppi). Place a sheet of graph paper beneath the four tires of an automobile and gently roll the vehicle onto the papers. Carefully outline the print of each tire on the graph paper. Measure the air pressure in each tire when it is outlined and make a note of the pressure. Carefully remove the graph paper and count the total number of inch squares in the outline of the print. Multiple the pressure measurement you made of each tire by the total inches in the outline. Add the four totals and the weight will be determined.</p> <p>Debriefing/Evaluation Activity</p> <p>Have students evaluate the correctness of their answers by comparing their figure to the gross vehicle weight (gvw) listed on the vehicle registration.</p>			<p>Materials/Texts/Realia/Handouts</p> <ul style="list-style-type: none"> • Graph paper (inch square) • Sharpie style marker or pencils • Tire gauge calibrated in pounds per inch • Calculators
			<p>Extension Activity</p> <p>Have students develop their own activities utilizing other objects that contain measurable pressurized air such as bikes tires and inflatable balls. These items may be weighed using the activity and also can be weighed on a home scale to determine if the activity is accurate.</p>
			<p>ESE/ESOL Accommodations</p> <ul style="list-style-type: none"> • Provide students with fill-in-the blank type worksheets. • Allow students to use a calculator for all calculations. • Provide students with pre-made tracings of tires.
<p>Real-Life Connection</p> <p>Encourage students to compute the weight of several other vehicles. Determine if the weight of the vehicle has any correlation to gas mileage of the various vehicles.</p> <p>Compare the results of extended activity to actual weight of the vehicle to determine if the activity is accurately computing the weight of the vehicles.</p>			

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Activity Title - How to Weigh a Car Without a Scale

Introduction

Say: It seems impossible to weigh something as large and heavy as an automobile without a large scale. Using just a simple gauge and some basic math, we can determine the weight of a vehicle easily and with a fair degree of accuracy.

Main Activity

Say: We will all go to the parking lot and make an outline of the footprint of the four tires on an automobile. After we draw our footprints we will meet back here in the classroom and do our computation.

Do: Meet the class in the parking lot. Place one sheet of inch graph paper beneath each tire of an automobile. Roll the vehicle onto the four sheets of paper. Stop the car and set the brake. Measure the air pressure in each tire and mark it on the corresponding graph paper. Outline each tire footprint with the sharpie or pencil and roll the vehicle off from the graph paper. Meet the class back in the classroom.

Say: We will now utilize some math to compute the weight pressing down on each tire. We will then add these totals and determine the approximate weight of the vehicle.

Do: Create a sample footprint on the overhead or board to illustrate the next step.

Say: We will now determine how much our vehicle weighs.

Do: Instruct the students to count the total number of inch squares contained within each hand drawn footprint. Multiple each total by the total pounds per square inch that you measured for each tire. This will yield a weight per tire. Add these four totals to determine the weight of the vehicle.

Square inches within footprint X pounds per square inch = weight per tire

Add all weight per tires = total vehicle weight

Closure/Conclusion

Do: Discuss the value of using math in real life situations to determine facts that would be physically impossible to determine by any physical means such as measuring huge objects, extreme heights and heavy weights.

Follow-Up Lessons/Activities

Do: Instruct students to utilize this technique to determine the weight of other items such a bikes, inflated balls etc.