

Name _____ Class _____ Date _____

Vehicle Efficiency Worksheet

ENERGY EFFICIENCY WARM-UP

Car owners often compare the “miles per gallon” ratings for different cars.
Let’s say your mom’s car gets **31 miles per gallon**.

Question 1: How many gallons does her car use to go one mile? _____ gallons/mile

In the metric system, the energy in gasoline and other sources is measured in Mega-Joules (MJ).

Scientists know there are 130 Mega-Joules (MJ) of energy in one gallon of gas.
We know 31 miles equals about 50 kilometers.
So, we know your mom’s car uses **130 MJ to go 50 km**.

Question 2: how many MJ does your mom’s car use to go one kilometer? _____ MJ/km

When transportation engineers calculate the energy efficiency of trains and buses, they divide the energy use by the number of passengers carried.

Say a bus uses **25 MJ/km and carries 20 passengers**.

Question 3: How many MJ/km does the bus use per passenger? _____ MJ/km per passenger

ENERGY EFFICIENCY CHALLENGE

It’s your lucky day! You can choose how you want to get to school tomorrow:

- Option A: Drive in your mom’s gas-powered car.
- Option B: Fly in the principal’s helicopter.

Before you make your choice, you need to compare the energy efficiency of option A and option B.

It’s a safe bet that the helicopter is less efficient than a car. But the principal is willing to let you fly one time if you can prove the helicopter uses less than **10 times more energy** than the car.

So make a claim - do you think the helicopter will use 5 times as much, 20 times as much, or some other amount?

Question 4: Write your claim here: The helicopter will use _____ times more energy than the car.

Let's see if your claim is correct! Get the numbers you need from the *Vehicle Fact Sheet* provided by your teacher.

Question 5: Write your facts and conclusions here:

- The helicopter uses _____ MJ/km
- The gas-powered car uses _____ MJ/km.
- So, the helicopter uses _____ times **more energy** per kilometer than the car.
- Was your claim correct? Can you take the helicopter to school? _____
- Look at the *Vehicle Fact Sheet* again. How does the helicopter compare with an electric car?

Helicopter _____ MJ/km Electric Car _____ MJ/km