Name: _____ Date: _____

How Does a Car Work?

Reading level 8 (4th grade) · 947 words

A ball rolls into the road. You are in the back seat, and you see it before the car slows. Ms. Boyd, the driver, has both hands on the wheel and her eyes on the road. She sees it too. The next few seconds depend on the whole car, and on a driver who has learned to use it. This book follows those seconds.

First, what makes the car go? A gasoline engine burns fuel. The burning makes gas that pushes a piston. The piston turns a shaft, and gears carry the spin to the wheels. Less than a third of the fuel's energy moves the car. Most of the rest turns into heat. An electric car has no burning, and it wastes much less.

Ms. Boyd uses a few controls, and each one took her a long time to learn. The gas pedal tells the engine how much fuel and air to take in. The steering wheel points the car. The rest of the steering system answers whatever Ms. Boyd turns. Then there is the part she trusts most of all, the brake.

A brake slows a car by taking energy out of its motion, mostly with friction. When Ms. Boyd presses the pedal, fluid in tubes carries the push to each wheel. The car's moving energy leaves as heat. An electric car can do something extra. Its motion can turn the motor into a generator that makes power for the battery.

Back to the ball. Ms. Boyd sees it, thinks, and moves her foot. Those first moments cost distance, because the car keeps rolling. The distance a car goes while the driver reacts is the thinking distance. The distance it goes while the brakes work is the braking distance. Add them up and you get the stopping distance.

Even a slow car needs room. In a table that Virginia's law tells courts to use, an average car on a dry road needs about 63 feet to stop from 20 miles an hour. That is nearly five car lengths. Most of it, about 44 feet, is thinking distance, because a driver needs about a second and a half to react. Wet roads make every stop longer.

Now double the speed to 40 miles an hour. The thinking part doubles, because the car goes twice as far each second. The braking part grows four times as long. The same table gives about 164 feet for the whole stop. Twice the speed needs more than two and a half times the room, on a good car and a dry road.

So what does Ms. Boyd watch? Not just the car in front. California's driver handbook says to scan the road at least 10 seconds ahead. That gives a driver time to react. Mirrors show what is behind and beside her. But every car has blind spots, places mirrors cannot show. They are mostly at the sides, just behind the driver.

Cars cannot talk, so they use lights. Brake lights say a car is slowing. Turn signals say where it is going next. Headlights do two jobs. They light the road for the driver. They also make the car easy for everyone else to see. Ms. Boyd's car is telling the cars around it what it plans to do.

Ms. Boyd's phone stays out of sight. Reading one text takes a driver's eyes off the road for about 5 seconds. At 55 miles an hour, a car goes about 400 feet in that time. That is longer than a football field, driven with your eyes closed.

Say Ms. Boyd has to stop hard for the ball. The car slows down. You do not. You keep moving at the car's old speed until something stops you. A seat belt is that something. It holds you to the seat, so you slow down with the car. It presses on the strong bones of your hips, ribs and shoulder.

The front of a car is built to crumple. That sounds bad, but it gives a crash more time. The change in speed is gentler. Then an air bag fills like a pillow. It opens in less than one twentieth of a second, as fast as a blink. Air bags work together with seat belts. They do not replace them.

An air bag opens so fast that a person sitting too close can be hurt. That is one reason NHTSA says children under 13 should ride in the back seat. It also says the back seat is farthest from where most crashes hit. So the seat you are in is the right one.

Ms. Boyd was not born knowing any of this. Every driver starts as a learner. In the United States, a learner gets a permit, practices with a licensed adult beside them, and then passes a road test. In 2026, permit ages run from 14 in South Dakota to 16 in New York. Every state teaches in steps, because new drivers crash more often than experienced ones.

Some driving lessons use a car with a second brake pedal on the passenger side. The teacher sits beside the learner and can slow the car if needed. Practice takes a long time. California asks for 50 hours before the road test, and Maine asks for 70. A few states ask for none.

New cars may carry cameras and radar. Some warn the driver about a car ahead. Some even brake on their own. But in 2026, no car sold to the public can drive itself. NHTSA says every car for sale still needs a driver who is paying full attention. For now, someone in the front seat still has to watch the road.

Questions

1. What are the two parts of a stopping distance?

A. Braking distance and steering distance
B. Thinking distance and braking distance
C. Thinking distance and parking distance

2. Why does a seat belt help when a car stops suddenly?

A. It makes the car stop faster
B. It keeps the engine cool
C. It holds you so you slow down with the car

3. In this book, what does it mean to scan the road?

A. Look far ahead and all around
B. Drive very slowly
C. Read signs out loud

4. What happens to the braking part of a stop when speed doubles from 20 to 40 miles an hour?

A. It stays the same
B. It grows about four times as long
C. It gets twice as long

5. Why is the back seat the right place for children under 13?

A. It has the biggest air bags
B. Front seats have no belts
C. It is farthest from where most crashes hit

Words to know

piston: moving engine part
friction: rubbing force
scan: look all around
crumple: fold up
permit: written permission

Answer key: How Does a Car Work?

1. B. Thinking distance and braking distance
2. C. It holds you so you slow down with the car
3. A. Look far ahead and all around
4. B. It grows about four times as long
5. C. It is farthest from where most crashes hit