Third Grade At Home Learning

Session 2

May 4-15, 2020

Student's Name:_____

Teacher: _____

Fasten your seatbelts, you are about to go for a ride through Michigan history! We have included three stories for you to read that all focus on the automobile industry and one very important man. Henry Ford was an inventor and he was born in Michigan. As you are *READING*, highlight important facts that might help you to complete this session's project. Your mission is to learn all you can about Henry Ford and how he invented the Model T. Then you are going to invent your own car! You have four different cars to choose from. Make sure you keep track of your budget, for *MATH*, by recording exactly how much money you are spending to build your car, you will need that information! Take good notes, during the inventing process (*SCIENCE*,) because when you are done, you are going to market that car! Your job is to convince your teacher why he or she should buy from your automobile dealership. You may create an advertising poster, direct a commercial or write a report to persuade your teachers that your car is something they can't live without! Take photos or draw pictures, be creative! You will need to *WRITE* a description, (use those sparkle words!) Make sure to check spelling, punctuation, and grammar! For the math, you will need to provide the value of your car, how much it costs to manufacture (*SOCIAL STUDIES*) and how big it is. Use the grid

paper to help you find the area and perimeter of the car you made (more *MATH*!) All of this should be included in your final presentation, which includes your skills in each subject: Reading, Writing, Math, Science and Social Studies. Remember you have two weeks to complete this project, so take your time and have fun!

Enjoy!

Mrs. Delia, Mrs. Flock, Mr. Schafer, Mrs. Vaughn, Mrs. Whittle, and Miss Wills

Included in this packet:

Automobiles: Then and Now

Henry Ford 1863-1947

A Nation on Wheels

The Race Is On: Directions, Car Parts, Graphic Organizers, and Grids

Ready Set Go: Feelings Stoplight

Bonus Challenge: Make a Car From Trash

Some Helpful Online Sites to Keep You "ON TRACK!"

https://youtu.be/UD9LM7Fu948 Ford Model T

https://youtu.be/AgL1ZL_sh08 100 Years of Moving Assembly Line in Seconds

7 Mini videos: Fremont Page, Remote Learning, Daisy Brook, Third Grade (Watch Intro first)

Session 2 Outcomes:

Reading: 3.RI.1, 3.RI.3 (Informational Text)

Writing: 3.W.7, 3.W.8 (Research)

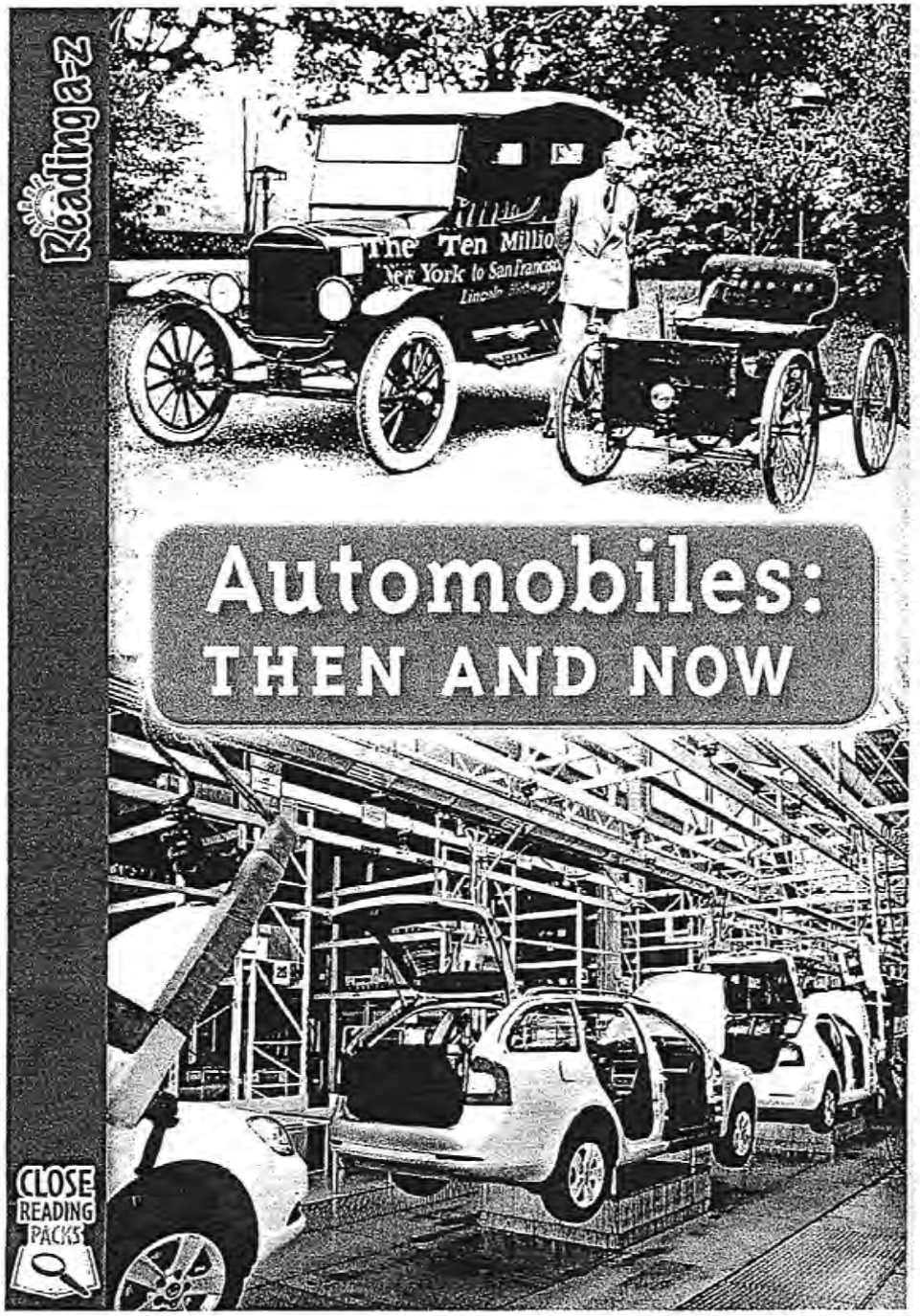
Math: 3.MD.4, 3.MD.5a, 3.MD.8 (Area, Perimeter, Measurement, Real World Problems)

Social Studies: 3.E1.O.3 (Manufacturing)

Science: 3-5.ETS1.1, 3-5.ETS1-2, 3-5.ETS1.3 (Engineering)

Social Skills: Feelings Stoplight 3.SEL (Social Emotional Reflection)

******If you are doing your packet online, you will need to print out the car parts on pages 17,19,21,23 & 25***



The first automobile was built in France. It had three wheels and was powered by steam instead of gasoline. That was in 1769. It moved very slowly because it was so heavy. A steam engine turned out not to be the best kind of engine for an automobile. The water had to boil before the car could go!

Next came an automobile with an electric engine. This automobile ran smoothly. It was also easy to operate. But it did not run well at high speeds. And it could not go for long distances. The battery had to be recharged every 50 miles.

Then in 1896, Henry Ford made an automobile that became very popular. It ran on gasoline and was called the Model-T. Because it was so popular, Ford had to make a lot of them.

In 1913, Ford came up with the idea of the assembly line. An assembly line is made up of many workers. Each worker does the same job every time. The automobile moves on a conveyor, and the worker adds his or her part. Then it moves to the next worker for the next part. Using the assembly line allowed Ford to produce millions of cars.

DID YOU KNOW?

Mary Anderson invented windshield wipers in 1903. By 1913, they could be found on most American cars.

Automobile plants still use assembly lines today. However, automobiles themselves have gone through many changes. The first Model-Ts could go a little more than 30 miles per hour. Some cars today go well over 100 miles per hour. A Model-T got about 10 miles to the gallon. Modern cars get about 25 miles to the gallon.

Today's automobiles keep you warm in winter or keep you cool in summer. You can listen to the news as you drive. You can listen to your favorite songs or watch a favorite movie. If you get lost, an onboard computer will help you find your way home!

Credits: left: © Phalog2112/Dreamstime.com; right: © Wojciech Kaczkowski/123RF

Name:

Henry Ford

1863-1947

Henry Ford was a pioneer in automobile making. Born in Dearborn, Michigan in 1863 Henry took an interest in machines at an early age. He always liked working on machines. At age sixteen, he went to work in a Detroit machine shop. With hard work, Henry built his first car in 1896. To make his first car, he spent many hours and made each part separately by hand.

Henry Ford began his own car company in 1903, which later became known as the Ford Motor Company. His company started with limited money and only twelve workers. Luckily, he was given additional money by the Dodge brothers who helped him keep his company going. At first the cars made by the Henry Ford were bought only by rich people. Yet he dreamed of finding a way to build cars that ordinary workers and farmers could afford to buy.

Henry Ford believed the fulfillment to his dream relied on mass production, which is a way of making many cars at once. Henry Ford's first mass-produced car was the Model N. This car came out in 1906 and cost only $500. Soon, Henry Ford started working on the Model T. Even though he could barely get together enough money to make it, the first Model T rolled out in 1908. It could go forty miles an hour and cost $850. It only came in the color black.

In 1909 Ford started to use the assembly line method to produce more Model T automobiles. Along a line of workers each one did a special job as cars passed them on a long belt. One worker placed a certain part on the car. Another worker tightened a certain bolt. This method made it possible to produce many cars in a short period of time, and it also saved money! Not only did Ford produce many more cars that way, mass production made prices go lower. By 1916 the Model T, nicknamed the Tin Lizzie, cost only $360! Henry Ford's production idea worked so well that 15 million black Model T cars were sold between 1908 and 1927. For a time, most of American car-owners drove Model T automobiles or Tin Lizzies. Other automobile makers soon produced assembly line cars, and by the middle of the 1920s, about half of American families owned a car. Henry Ford's inventiveness helped change the way of life for many Americans.

By J. Park

A Nation on Wheels

A Reading A–Z Level P Leveled Book
Word Count: 763

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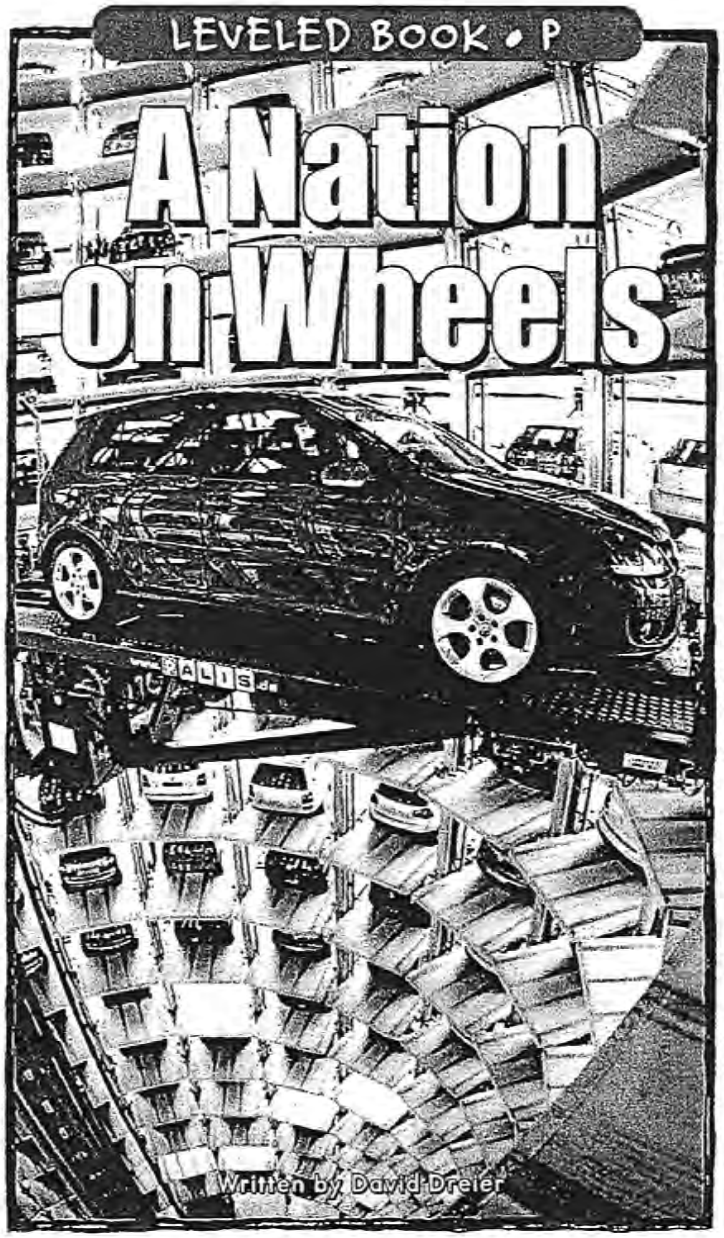

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A Nation on Wheels

Written by David Dreier

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A Nation on Wheels
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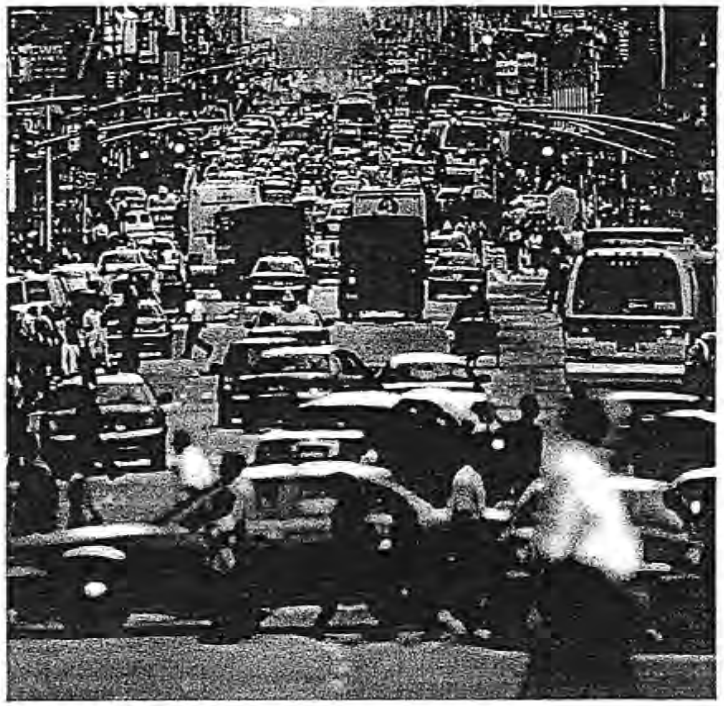


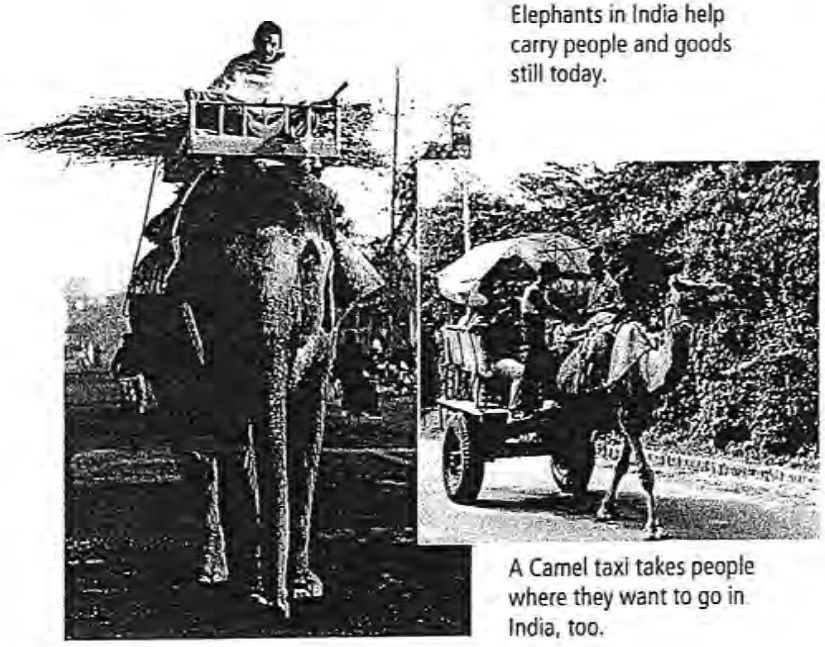
New York City traffic

Introduction

The world is full of cars and trucks. There are over 600 million of them! They are in even the smallest town in the smallest country. There are over 200 million cars and trucks just in the United States. Most of these vehicles are **automobiles**. We are a nation moving on wheels!

The Early Days

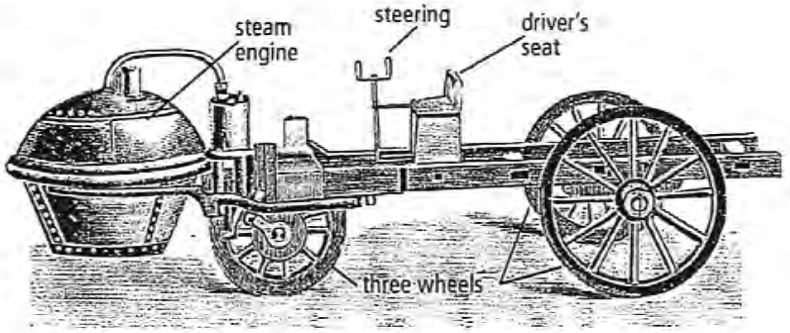
People have always needed to travel. At first, people walked everywhere—even long **distances**. Then they tamed animals to ride and taught some to pull wagons. Horses, camels, and even elephants helped people make trips and carry things. Imagine riding to school on an elephant! Using animals was better than walking—but it was still slow.



Elephants in India help carry people and goods still today.

A Camel taxi takes people where they want to go in India, too.

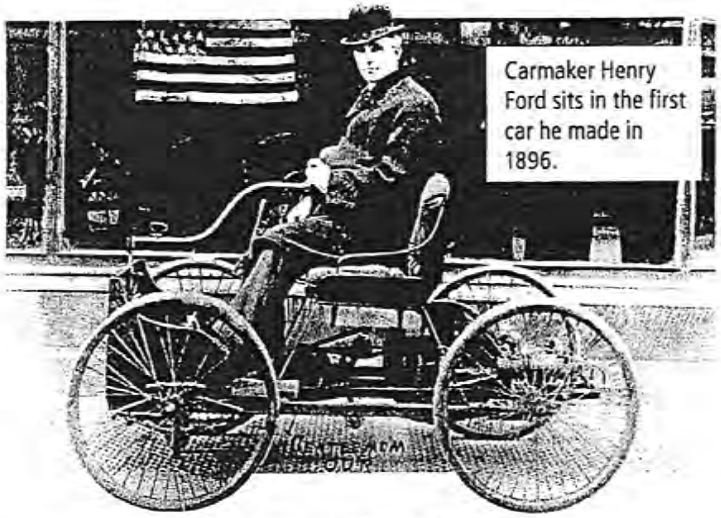
Inventors tried to build a machine with wheels to carry people faster. They thought of building an **engine** to run it. They tried running engines with steam or with electricity. But neither engine worked well enough. In the late 1880s, people made engines that could run on gasoline, or gas. These engines were small but powerful. They could travel faster and go farther. Today, most cars use gas engines.



One of the first steam vehicles, built in 1770

Do You Know?

Which word came first—*car* or *automobile*? *Car* was first used in 1301 to describe a Celtic war chariot. *Automobile* was first used by a Frenchman in 1883 to describe electric cars. How are they used now?

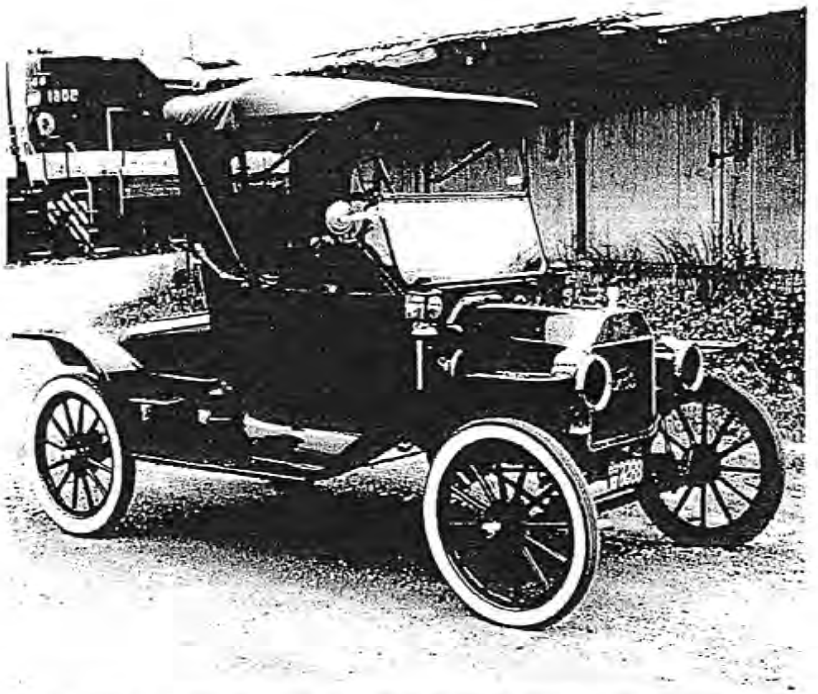


Carmaker Henry Ford sits in the first car he made in 1896.

How Cars Are Made

The first cars did not look like the ones you see today. They looked like carriages without horses. People even called them horseless carriages!

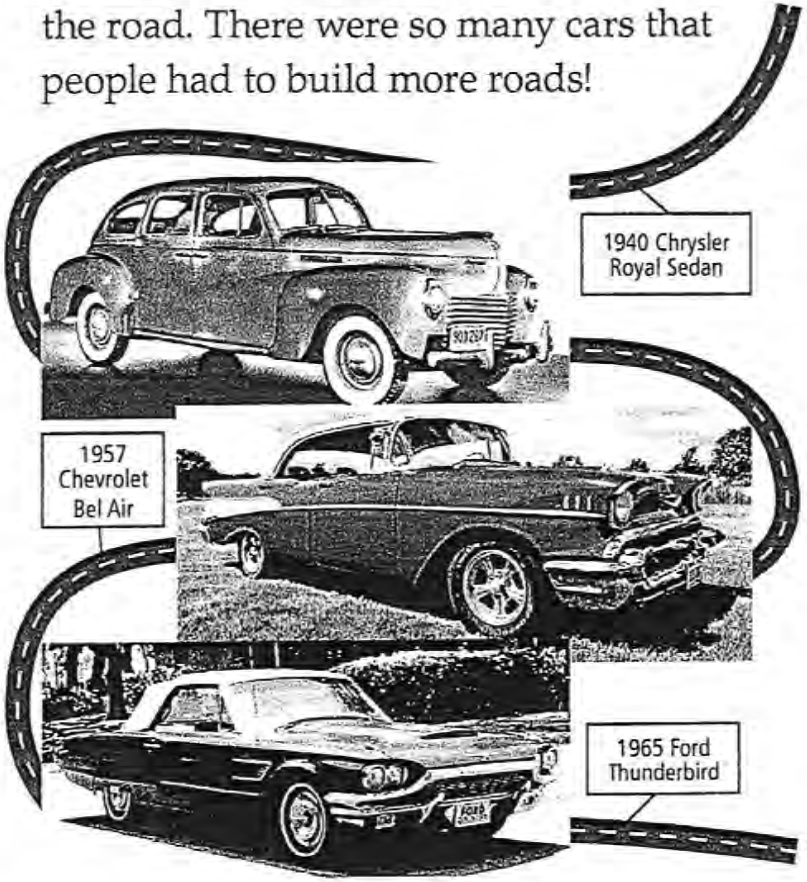
At first, cars were made one at a time by hand. It took a long time. They were **expensive**. Not everyone could afford a handmade car. People tried ways to **manufacture** cars faster and at a lower cost. In 1896, one early company could make only 13 cars in a year. But by 1899, a company could make over 2,000!



Henry Ford's company made more than 15 million Model Ts over almost twenty years.

In 1903, Henry Ford started the Ford Motor Company in Detroit, Michigan. Detroit would soon become the center of car making. Ford's company sold a car called the Model T. Ford wanted to make cars that cost less—so more people could buy them. This meant he had to manufacture more cars and do it faster.

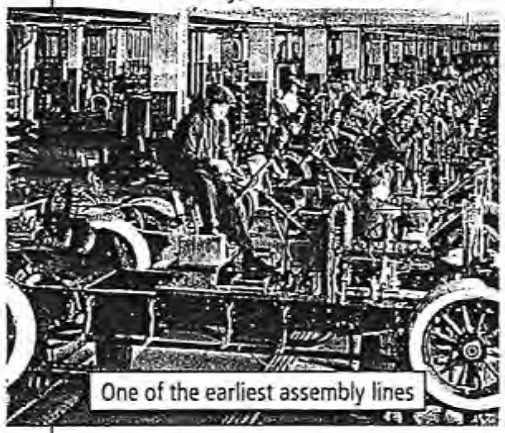
Ford thought about all the ways he could do this. In 1913, he invented the assembly line. It was a faster and cheaper way to make a car. Soon, other companies made their cars this way. Now almost everyone could buy a car. By 1929, over 3.5 million cars were on the road. There were so many cars that people had to build more roads!

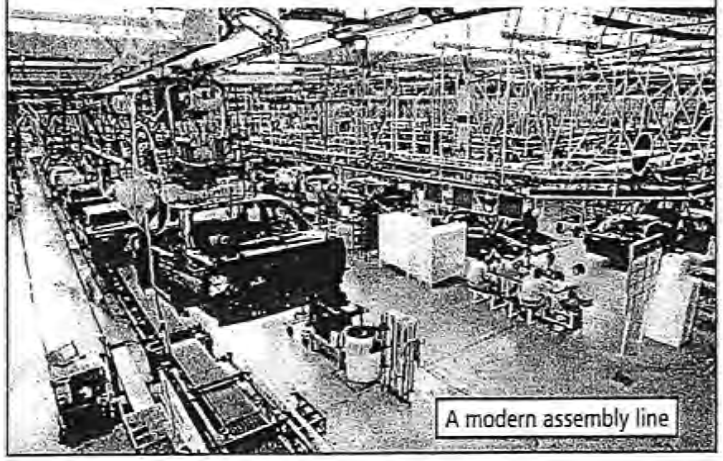


What Is an Assembly Line?

On an assembly line, a car is assembled—put together—one piece at a time. Machines pull unfinished cars through the factory in a long line. As each car moves along the line, parts are added to it. At the end of the line, the car is complete.

For years, people did all the work on an assembly line. But today, machines called *robots* often do this work. These robots are not like the ones in movies. These are special machines that work the same way that an arm and hand work. Robots can work without getting tired.


One of the earliest assembly lines


A modern assembly line

Companies That Make Cars

Three big companies have been making cars in the United States for a long time: General Motors, Chrysler, and Ford. Since cars first hit the streets, American companies have led the world in car **production**. In the 1960s and '70s, a Japanese company named Toyota began offering cars that were built to last longer and break down less often than most American-made cars. But the American car manufacturers still sold the most cars. Then in 2007, the pattern changed. Toyota, the first **foreign** company to do so, sold more cars and trucks than any other company in the world.

Toyotas are not the only cars made outside the United States. Volkswagen and BMW are **imported** from Germany. But the countries of Japan and South Korea have brought the highest numbers of cars into the United States.

U.S. Carmakers and Brands in 2007

Chrysler makes the Chrysler, Dodge, and Jeep.

Ford makes the Ford, Lincoln, Mercury, Mazda and Volvo.

Some Foreign Carmakers and Brands in 2007

BMW makes the BMW, MINI, and Rolls-Royce.

Volkswagen makes the Audi, Bentley, Bugatti, Lamborghini, Skoda, and SEAT.

Honda makes the Honda and Acura.

Nissan makes the Nissan and Infiniti.

Hyundai

Kia

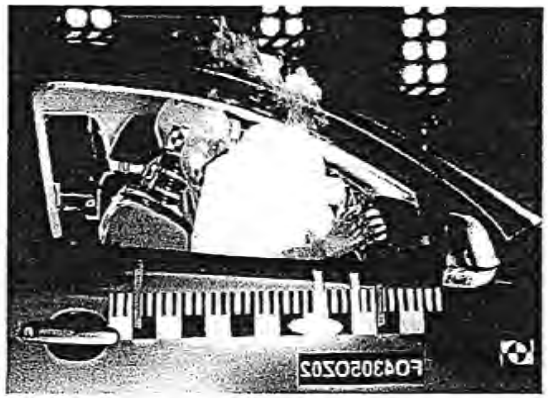
Problems Caused by the Automobile

Automobiles are helpful, but they can also cause serious problems for people. Exhaust (burning gases from a car's tailpipe) gets in the air. That means unhealthy **chemicals** get in the air that we breathe. These chemicals can make people sick. Every year, car companies try to reduce the amount of chemicals their cars make.

Have you ever been in a traffic jam? All the cars on the road just sat still, and you couldn't go anywhere. So many cars are on the road today that it causes problems. Remember—there are about 200 million cars in the United States. That's almost as many cars as people. In fact, the number of cars has grown faster than the number of people.

The Future of the Automobile

Years ago, most cars were unsafe in accidents. Today, special car parts help to protect people. Cars have seat belts. Babies and small children ride in safety seats. Newer cars have big airbags that inflate—fill with air—in accidents. What do you think would make cars even safer?



Carmakers see how well airbags work by using crash test dummies that look like humans.

Car companies are also working on new kinds of engines. One type of car, called a hybrid, uses both a gas engine and an electric motor. Hybrids use less gas. This might cut down on the unhealthy chemicals in the air.

A company called ZAP made these electric cars to help cut down on bad chemicals in the air.

We will always be a nation that travels from one place to another. But will it always be on wheels? How will cars look in the future? How will they work? Perhaps your ideas will shape the future.

Glossary

automobiles *(n.)*	vehicles with four wheels that have an engine and travel on roads (p. 4)
chemicals *(n.)*	substances that are produced by or used in a chemical process (p. 13)
distances *(n.)*	the amounts of space between things or places (p. 5)
engine *(n.)*	a machine with moving parts that uses power to create motion (p. 6)
expensive *(adj.)*	costly; having a high price (p. 7)
foreign *(adj.)*	of or from a different country or language (p. 11)
imported *(v.)*	brought in and bought goods from another country or state (p. 11)
inventors *(n.)*	people who create, design, or build something that did not exist before (p. 6)
manufacture *(v.)*	to make finished goods, especially using industry (p. 7)
production *(n.)*	the process of combining resources to make a product for sale (p. 11)

THE RACE IS ON!

You are now one of the most famous race car drivers in the WORLD and you have the chance to build and design your very own car.

You need to stay within your budget to make the fastest car possible.

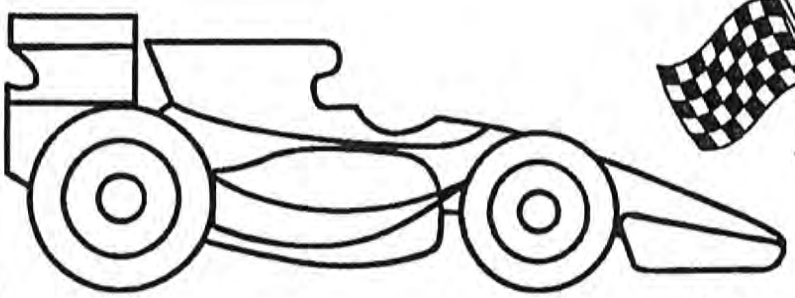
You will choose your car, your tires, your engine, and add-ons to make the best car you can.

After everyone is finished, we will see who wins the race based on your car's design!

Directions:

1. Cut out your car. As you're making your car, be sure to record your car's data on your data sheet located on the back of this page.
2. When cutting, be sure you don't cut the tabs off. These will fold in so you can glue your top on.
3. Color your race car!
4. Begin gluing your car together.
5. Choose your add-ons, including tires, windows, and other features.

Name: _____ YOUR BUDGET: $29,000



Price

Car Name: _____ _____

Tire/Rim: _____ _____

Engine: _____ _____

Front Spoiler: Used/Unused _____

Back Spoiler: Used/Unused _____

Ornament: Used/Unused _____

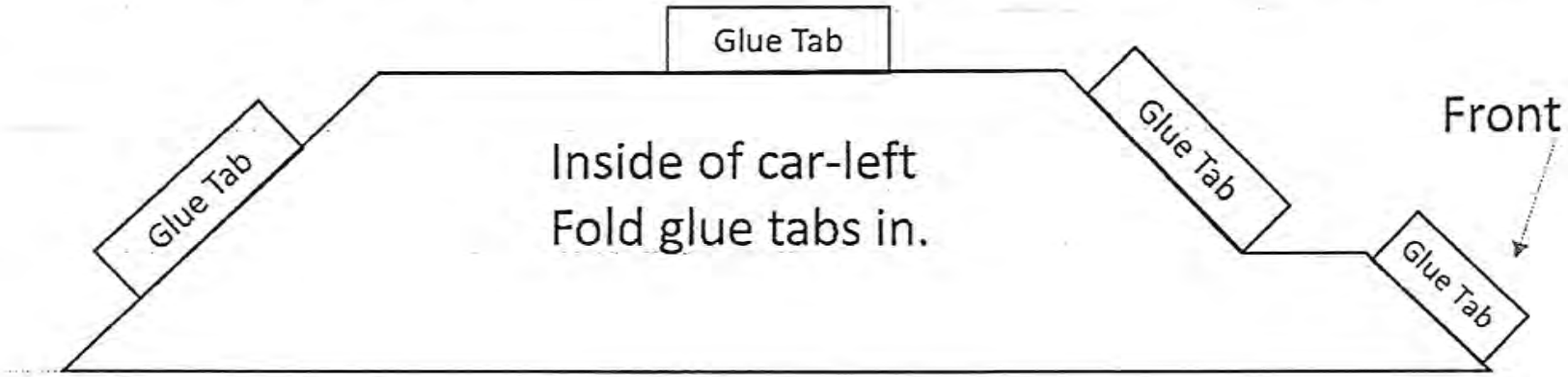
Super Charger: Used/Unused _____

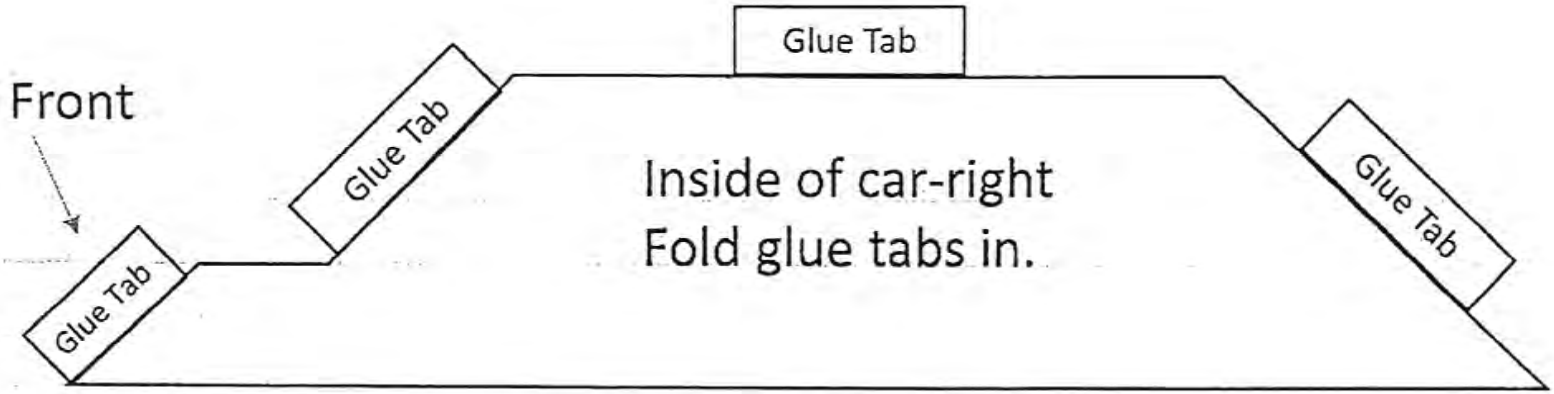
TOTAL: _____

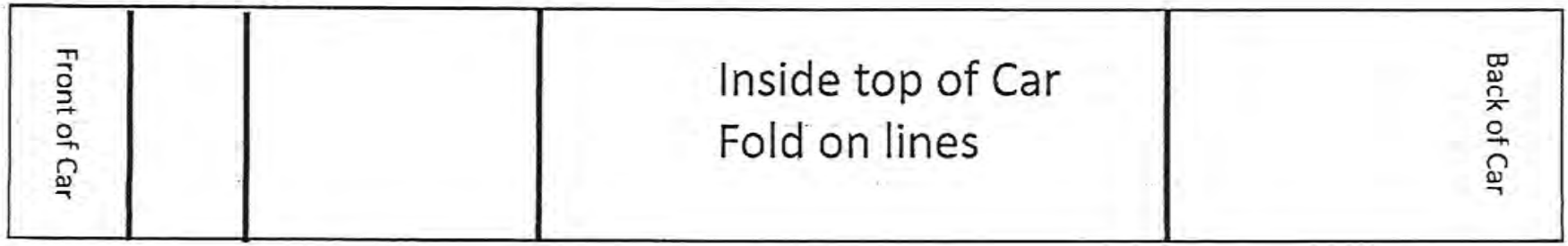
MARKETPLACE

CAR #1- THE ZIPPER

COST: $22,000

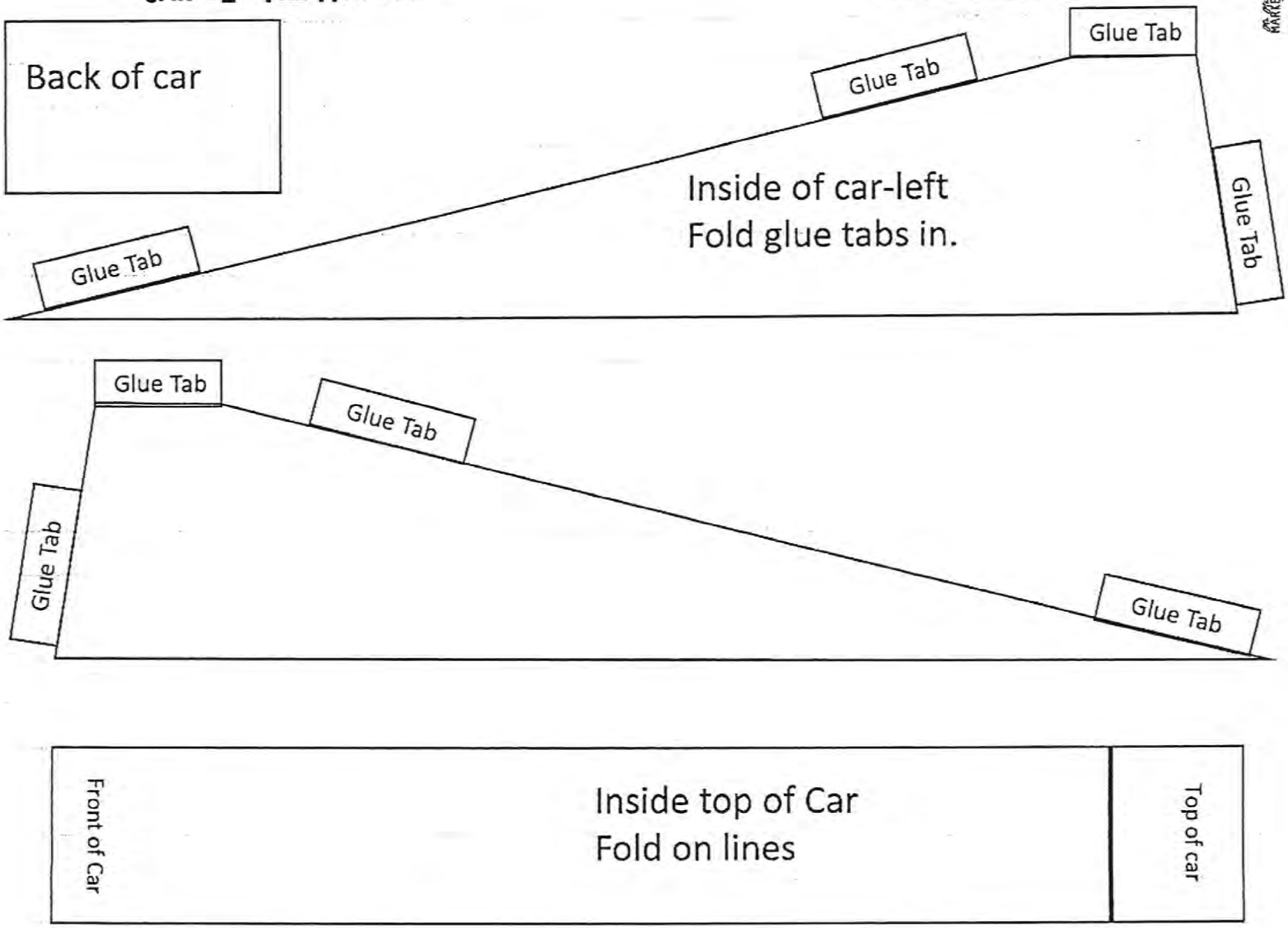






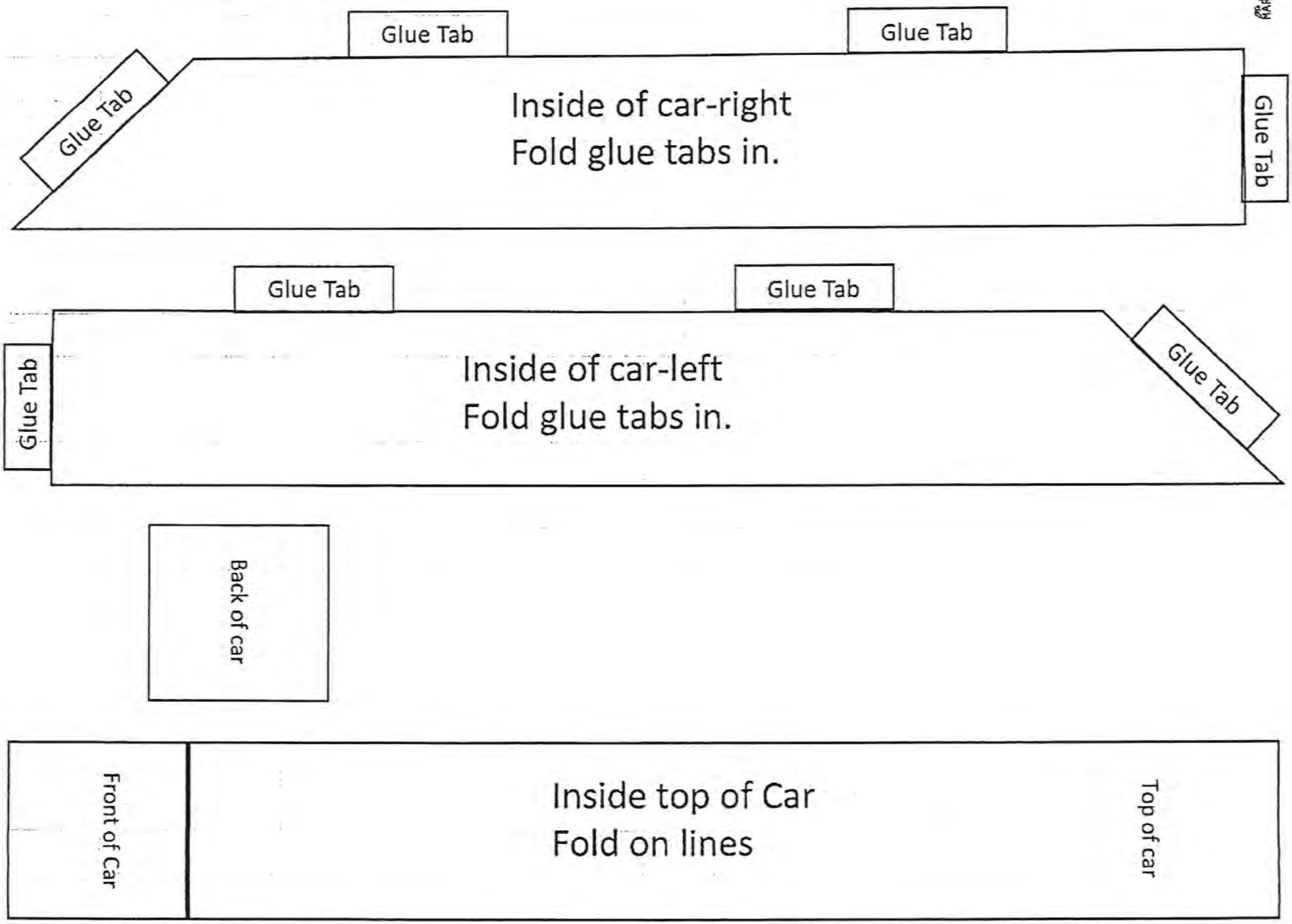
CAR #2- THE MUSCLE

COST: $23,000



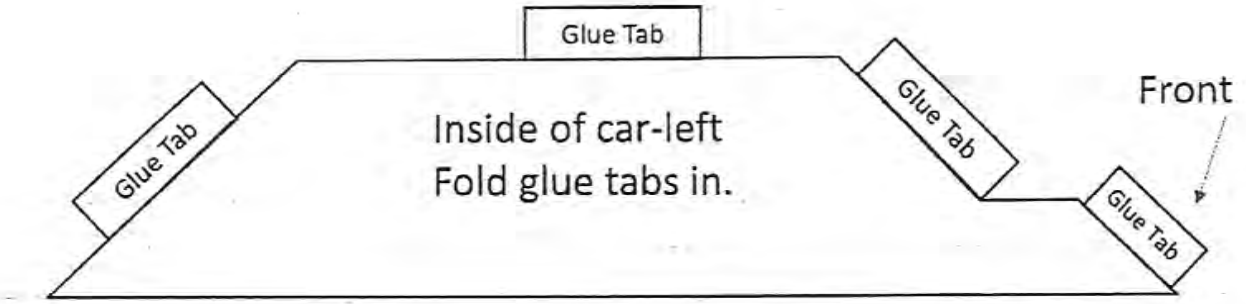
CAR #3- THE ROCKET

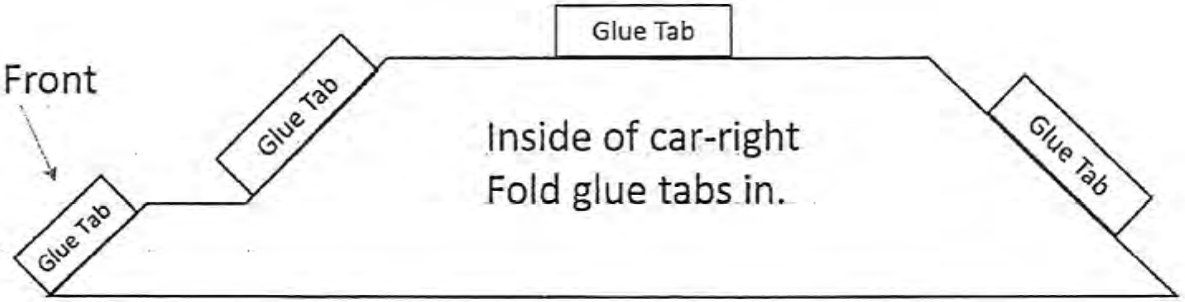
COST: $21,000

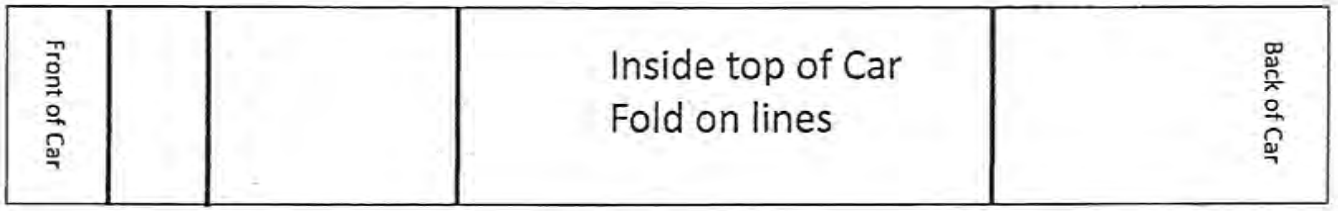


CAR #4- THE MINI

COST: $20,000

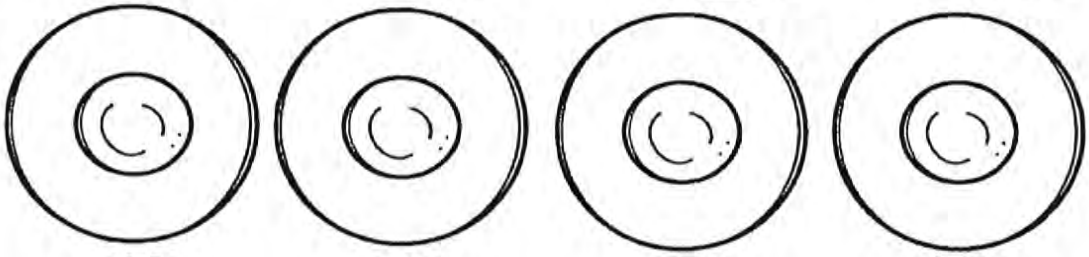




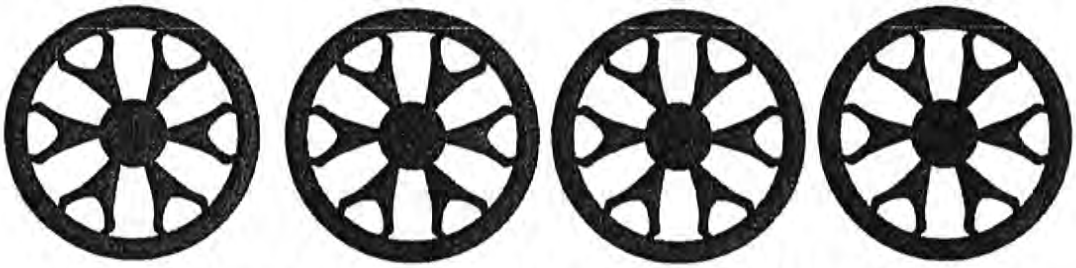


Tire/Rim A
$3,000

Tire/Rim B
$1,000

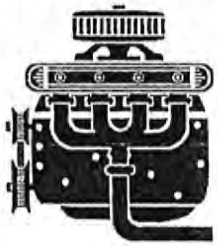


Tire/Rim C
$2,500



Hood Ornament
$200

Duel Stroke Engine
$0 Upgrade



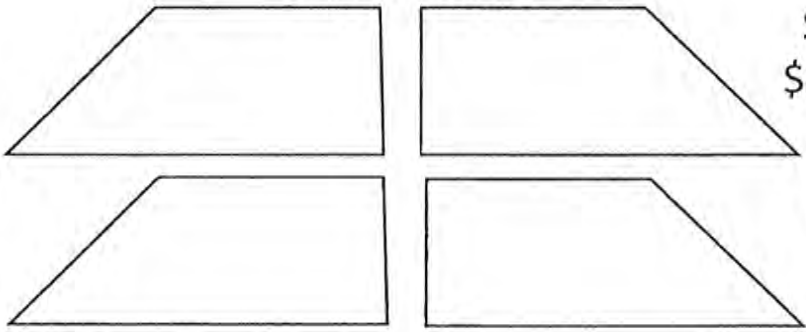
Glue your engine inside of your car.

Hemi Engine
$3,000 Upgrade

Front Spoiler
$2,000

Only glue front section of the fin to the top front of the car above the windshield.

Side windows



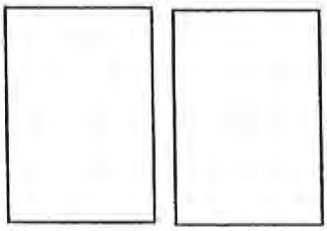
Super Charger
$3,000 Upgrade

Glue on hood if you choose this add-on.

Back Spoiler
$2,000

Only glue front section of the fin to the back of the car above the back windshield.

Front and Back Windshields



RACE RESULTS

Place	Name	Score
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Race Reflection

Name: _____

1. What place were you in? _____

2. What was your overall race score? _____

3. Which tires did you choose? _____

4. Why do you think some tires earned more points than others? Explain.

_____

_____

_____

5. What was a better choice, the Hemi Engine or the Super Charge? How do you know?

_____

_____

_____

6. The back spoiler was worth 0 points. Why?

_____

_____

Page 2

7. Why do you think the hood ornament was worth -4 points? Explain

_____

8. If you could make one change to your car, what would it be? Why?

_____

_____

_____

9. If you had an unlimited budget, what else would you add to your car?

_____

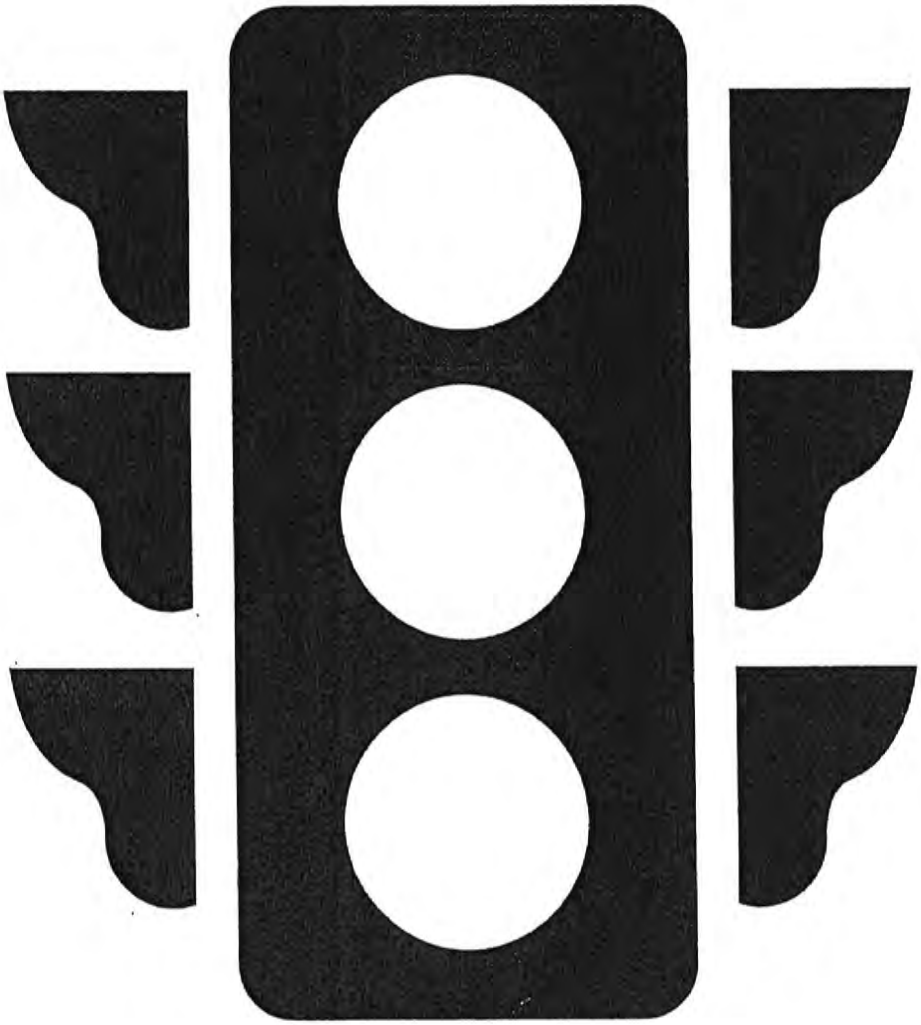
_____

_____

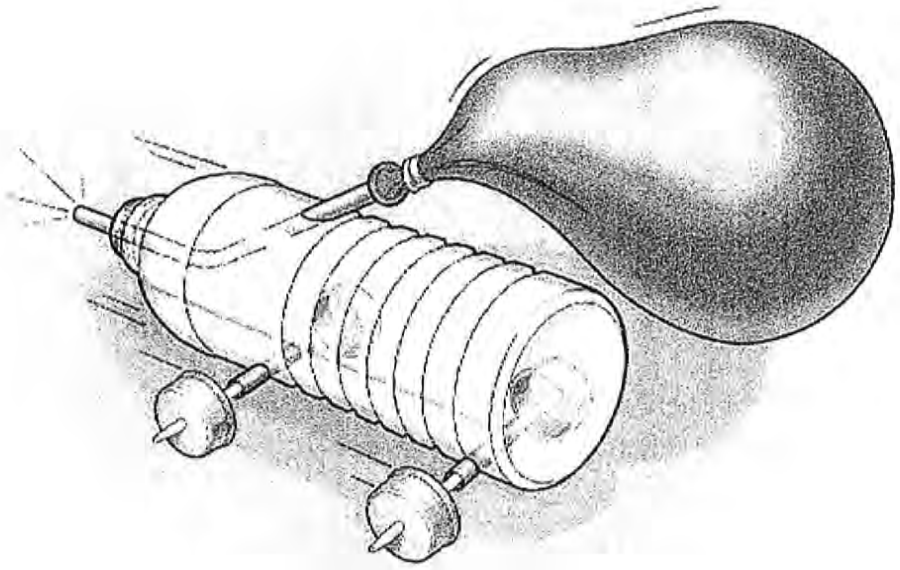
Draw a side view of your car!

READY, SET, GO!

Make a ***personal feelings*** stop light! Write the name of things that make you feel angry in the top circle using a red crayon or colored pencil, things that make you feel calm in the center circle using yellow, and things that make you feel happy in the bottom circle with green crayon or colored pencil!



Challenge – Trash / Recycle Car



Key concepts
Physics
Kinetic energy
Potential energy
Conservation of energy
Newton's laws of motion

Introduction
Turn a pile of trash into a toy car—and watch it go! In this activity you will learn some physics concepts and use recycled materials to build a toy car that is propelled by a balloon. You can even challenge a family member, build two cars and race them against each other. Whose car will go the fastest?

Background
It might not seem like it at first, but a simple balloon car is loaded with physics and engineering concepts! When you inflate a balloon, it stores potential energy in the form of stretched rubber and the compressed air inside. When you release the balloon, this energy is converted to kinetic energy—the energy of motion—as the balloon zooms around the room. Some of the energy is also converted to heat due to friction. According to the law of conservation of energy, the total amount of energy is conserved. Energy never "disappears"—it just changes to another form.
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Another way to think about the balloon's movement is to use Newton's third law of motion: For every action there is an equal and opposite reaction. When you inflate a balloon and then release the nozzle, the rubber contracts and pushes the air out the nozzle. This means that there must be an equal and opposite reaction—the air pushes back on the rubber, propelling the balloon forward. This principle is used in real rockets and jets that shoot a high-speed stream of gases out the back of their engines, propelling the vehicle forward. In this project you will use this principle to build a toy car that is propelled forward by the stream of air escaping a balloon as it deflates.

The car also contains a simple machine: the wheel and axle. This invention has been around so long, we take it for granted—and many of us ride in wheeled vehicles every day. You will see, however, getting your wheel and axle to spin smoothly is a critical part of getting your balloon car to work!

Materials

- Plastic bottle
- Four plastic bottle caps
- Wooden skewer

- Two straws
- Balloon
- Tape
- Scissors or sharp knife (Have an adult use or supervise your use of this tool.)
- An adult helper

Preparation

- Cut one of the straws in half.
- Tape both pieces of the straw to one side of the water bottle.
- Cut the wooden skewer in half and push each piece through one of the straws. These will form your axles. (Have an adult help.)
- Have an adult help use the scissors to poke a "+"-shaped hole directly in the center of each plastic bottle cap
- Press each bottle cap onto the ends of the wooden skewers. These will form your wheels.

Procedure

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- Put your car down on a flat surface and give it a good push. Make sure the car rolls easily and coasts for a bit before stopping. If your car gets stuck or does not roll smoothly make sure: your axles are parallel to each other; the hole in each bottle cap is centered; and the straws are securely taped to the water bottle and do not wobble. You can add some glue if tape is not sufficient.
- Tape the neck of the balloon around one end of the other straw. Wrap the tape very tightly so the connection is airtight.
- Cut a small hole in the top of the water bottle, just big enough to push the straw through.
- Push the free end of the straw through the hole and out the mouth of the bottle.
- Use tape to secure the straw to the bottle.
- Blow through the straw to inflate the balloon, then put your finger over the tip of the straw to trap the air. *What do you think will happen when you put the car down and release your finger?*
- Put the car down on a flat surface and release your finger. *What happens?*
- See what adjustments you can make to make the car go farther.
- *What happens if you inflate the balloon more?*
- *What happens if you adjust the direction the straw is aimed? Does it work best if the straw is aimed straight back?*
- **Extra:** There are many different ways to build a balloon car. Turn this into an engineering design project and try building your car with different materials. For example: *What happens if you use a cardboard box instead of a plastic bottle for the body? What happens if you use different diameter straws? What about different materials for the wheels and axles?* Get some friends and try building different cars and racing them against one another. *What materials work the best?*

Observations and results

When you inflate a balloon and let it go, it zips randomly around the room. When you tape the balloon to a straw and attach it to the body of your car, however, you can control the direction of the escaping air. When the end of the straw is aimed backward, the air pushes your car forward, as described by Newton's third law of motion. Your design will be most efficient if the straw is pointed straight back and not downward or to the side. The more you inflate the balloon the more potential energy it stores, which in turn is converted to more kinetic energy, according to the law of conservation of energy—so the car will go faster.

Tips: You may find your car does not work perfectly on the first try, particularly if its axles are not parallel or the wheels wobble. Too much friction can cause the wheels to get stuck, and the balloon will not be powerful enough to push the car forward. Test your car to make sure the wheels spin freely and, when you give it a push, the car rolls easily. If not, you might need to make some adjustments to your design. You should also make sure no air escapes the balloon where it is taped to the straw, and re-tape it more tightly if necessary. *Concept Credit: Science Buddies/Retseck