Companies Racing To Build Electric Car

Subjects

Arts & Humanities
--Language Arts
Science
--Physical Science
----Environmental
----Physics
Social Studies
--Current Events

Grades

Grades 2-up

News Content

The Chevy Volt and Tesla Roadster are two of the electric cars that are on the drawing board.

Anticipation Guide

Before sharing this weeks news story with your students, write on a whiteboard or chart the term *lithium-ion battery*. Explain to students that lithium-ion batteries (sometime called li-ion batteries) are commonly used to power laptops, PDAs, cell phones, and iPods. In this news story, students will learn of one more use for li-ion batteries.

Companies Racing To Build Electric Car

For many years, people have talked about creating a car that is powered by electricity rather than gasoline. Since gasoline prices can rise quickly from time to time, some companies are working harder and faster to try to build an electric car.

One reason that companies have had trouble building an electric car is that they could not find a battery that worked well. Then someone suggested trying the kind of batteries used to power laptop computers. Scientists have found that those batteries, called *lithium-ion batteries,* work better in cars than other batteries.

A California company called Tesla Motors has designed the first all-electric sports car. That car, called the Roadster, will sell for $109,000. The car can travel more than 200 miles before its battery pack -- which contains more than 6,000 small lithium-ion batteries -- must be recharged by plugging it into an electric outlet. It will take from four and 30 hours to fully charge the car's battery pack.

NEWS WORD BOX

electric battery recharge
create design company

General Motors (GM) also has created an electric car. Their car, called the Volt, will go on sale in 2010. The Volt will use a large T-shaped lithium-ion battery pack that is as long as the car. The car will run about 40 miles on its batteries. If the battery pack runs low as someone is driving the car, a small gasoline engine will start and make enough electricity for the car to run for another 300 miles. The Volt's battery pack can be recharged in a few hours.

MORE FACTS ABOUT ELECTRIC CARS

- The first electric cars will be expensive. The Volt might cost as much as $40,000.
- Electric cars are not completely "green." Much of the electricity used to power them will come from burning coal, which produces greenhouse gases.
- If electric cars become popular, communities and power companies will need to build "charging stations" so drivers can power up their car batteries.

THINK ABOUT THE NEWS

If electric cars become popular, what kind of changes might you see in your community?

You might also share that lithium-ion batteries have grown in popularity because they have many advantages over other types of batteries, including the following:

They're generally lighter than other types of rechargeable batteries of the same size.
They lose their charge much less quickly than many other batteries do.
They dont need to be completely discharged before they can be recharged.
They can handle hundreds of charge/discharge cycles.
News Words

Next, introduce these words that appear in the News Word Box on the students printable page: *electric, battery, recharge, create, design,* and *company*. Discuss the meanings of any of those words that might be unfamiliar. Then ask students to use one of those words to complete each of these sentences:

When Sara grows up, she wants to ____ clothes for a living. *(design, create)*
Pablo will use a special computer program to ____ a graph that shows how the cost of gasoline has changed in recent years. *(create, design)*
Sammy slid a new ____ into the cell phone, and it was as good as new. *(battery)*
Mr. Sandstrom is starting a ____ that will build parts for the space shuttle. *(company)*
If the laptops battery runs low, you can ____ it in just about an hour. *(recharge)*
Will the company turn off our power if we dont pay the ____ bill by the first of the month? *(electric)*
Read the News

Click for a printable version of this weeks news story Companies Racing to Build Electric Car.

Reading the News

You might use a variety of approaches to reading the news:

Read aloud the news story to students as they follow along.

Students might first read the news story to themselves; then you might call on individual students to read sections of the news aloud for the class.

Photocopy the news story onto a transparency and project it onto a screen. (Or use your classroom computer's projector to project the story.) Read the story aloud as a class, or ask students to take turns reading it.

Arrange students into small groups. Each student in the group will read a paragraph of the story. As that student reads, others might underline important information or write notes in the margin of the story. After each student finishes reading, others in the group might say something -- a comment, a question, a clarification -- about the text.

More Facts to Share

You might share these additional facts with students after they have read this weeks news story.

General Motors gave outsiders their first full look at the new Chevrolet Volt electric vehicle on Tuesday, August 5, 2008. "The Volt symbolizes GM's commitment to the future," said Rick Wagoner, the company's chairman and CEO. (View a slideshow of the Volt.)
"Seventy-eight percent of trips in the United States are under 40 miles a day," says Bob Lutz, the vice chairman of General Motors. "If all those people had Volts, you would have 78 percent of Americans basically never using another drop of gasoline."
Everything about the Volt works like a conventional car *except* there's no noise.
The Volt will have a top speed of 100 mph. It will go from zero to 60 mph in under nine seconds, which is about average for a modern car. The car will seat four passengers.
The car will use less electricity annually than a refrigerator, according to GM. It should cost less than 2 cents per mile to drive on electricity, compared with 10 cents a mile on gasoline (assuming a gasoline price of $3 a gallon).

The Volt is different from so-called hybrid" cars, which switch to gasoline power when a battery charge wears down. The Volt will never directly *run* on gasoline power. The gasoline will simply be used to generate electricity to drive the car.
GM has not announced final pricing for the car; that is still to be determined. Some estimates place the cost between $30,000-40,000. The company is expecting to produce at least 10,000 Volts in the car's first year and higher numbers after that.
GM first introduced the Volt concept car at the 2007 Detroit Auto Show.
Unlike cars you know, the Volts front-end grill is pretty much closed. Thats because the car doesnt have a big engine that needs all the cooling it can get. So the front-end grill is included more for design appearance (so it looks like most other cars on the road) than for practical purposes.
Another battery-powered vehicle, the Roadster produced by Tesla Motors, is propelled by more than 6,000 finger-sized lap top batteries and not a single drop of oil. The Roadster can accelerate from zero to 60 in four seconds, according to Elon Musk, the chairman of Tesla.
Recharging the Roadster is "like plugging in a hairdryer... its so simple," Musk told CBSs *60 Minutes*.
Musk made his fortune by inventing PayPal, the online banking service.
Some hurdles remain before electric cars will replace gas-powered vehicles. One problem -- lithium-ion batteries have been known to burst into flames -- has been solved, according to GMs Lutz. But the batteries need more testing to ensure they will work well in extreme weather conditions.
Comprehension Check

Recalling Detail

Why are some companies working so hard to create an electric car? *(Answers will vary.)*
What company is building the all-electric Roadster? *(Tesla Motors)*
What is the name of the electric car that General Motors is building? *(the Volt)*
What kind of battery will power the Chevy Volt? *(a lithium-ion battery)*
How many lithium-ion batteries make up the Roadsters battery pack? *(6,000 batteries)*
How long is the battery pack in the Volt? *(It is the length of the car.)*
Which car runs farther on a single full charge, the Volt or the Roadster? *(the Roadster)*
Which car will cost more, the Volt or the Roadster? *(the Roadster)*
Will the Volt be a green car"? *(It will be green" in the sense that it will pollute much less than todays cars, because it does not require gasoline to run; but its batteries require electricity to charge, and much of our electricity comes from coal-burning power plants.)*

Think About the News

Discuss the Think About the News question that appears on the students news page. You might use the think-pair-share strategy with students to discuss this question. If you use this strategy

First, arrange students into pairs to discuss and list responses to the question.
Then merge two pairs of students together to create groups of four students. Have them discuss and add to the ideas they generated in their pairs.
Next, merge two groups of four students to form groups of eight students. Have students create a new combined list of ideas.
Finally, bring all students together for a class discussion about changes that might happen if electric cars become common in our communities.
Students responses to the Think About the News question might include the following:

There will be a decreased need for gasoline stations.
Electric power sources (recharging stations) might be built in parking lots and other places.
Car repair shops will need to retool for electric cars.
Communities will be cleaner.
What other changes did students suggest?
Follow-Up Activities

Study skills organizing information. Have students use information from the news story to answer the questions on the chart below. Begin this activity by copying the chart format and bold-type text onto a board or chart. Let students fill in the columns that are headed Volt and Roadster. When the chart is complete, have students use it to compare the two cars. What are the advantages and disadvantages of each vehicle?

Volt

Roadster

Which company produces the car?

General Motors (Chevrolet)

Tesla Motors

How many miles does it travel before recharging?

40 miles

200 miles

What type of battery does it use?

lithium-ion battery

lithium-ion battery

How long does it take to recharge the battery?

a few hours

4 to 30 hours

How much will the car cost?

approximately $40,000

$109,000

Language arts word meaning. Ask students to think about the name of the new car being built by General Motors. Why is Volt a good name for that car? *(Accept reasoned responses. For example, students might suggest that volt is a word often used to explain electric power, to describe something that has strong power)* Next, draw students attention to the headline of this weeks news story: Companies Racing to Build Electric Car. Ask students if that is a good headline for this news story. Why or why not. *(Accept reasoned responses. Students might point out that the word racing" is cleverly used here; the word is often used when talking about cars and NASCAR. Also, companies are in a race" to see which can create an electric car that will be priced right and popular with consumers.)* You might extend this lesson on language use with a fun activity. Write some of the following headlines on a board or chart. Invite students to read each headline and explain why it is poorly worded. (Or is it just cleverly worded?)

Fifth Graders Get to Grill Lions (referring to players on Detroits NFL team)
Dealers Will Hear Car Talk at Noon (Will the car *really* talk?)
Enraged Cow Injures Farmer With Ax (How did the cow get its hooves on an ax?)
Eye Drops Off Shelf (What was the eye doing on a shelf?)
Farmer Bill Dies in House (What about Farmer Bob?)
Grandmother of Eight Makes Hole in One (In which kid did she poke a hole?)
Queen Mary Having Bottom Scraped (The ship, of course!)
Stolen Painting Found by Tree (Had the tree been actively looking?)
William Kelly Was Fed Secretary (He had an appetite for women?)
Red Tape Holds Up New Bridges (Didnt they used to use nuts and bolts?)
New Study of Obesity Looks for Larger Test Group (Talk about an unfair study!)
Kids Make Nutritious Snacks (I like the brown-haired ones. Yum!)
Local High School Dropouts Cut in Half (Thats a pretty severe punishment.)
Hospitals Are Sued by Seven Foot Doctors (Tall doctors, huh?)
Lung Cancer in Women Mushrooms (Male mushrooms are healthier?)
Language art root words. Have students write or spell aloud the root word of each of these words from this weeks news story: creating *(create)*, powered *(power)*, prices *(price)*, quickly *(quick)*, companies *(company)*, building *(build)*, suggested *(suggest)*, batteries *(battery)*, designed *(design)*, recharged *(recharge or charge)*, plugging *(plug)*, fully *(full)*, completely *(complete)*, produces *(produce)*, gases *(gas)*, communities *(community)*

Assessment

Use the Comprehension Check (above) as an assessment. Or have students work on their own (in their journals) or in their small groups to respond to the **Think About the News** question on the news story page.

Lesson Plan Source

Education World
National Standards

LANGUAGE ARTS: English
GRADES K - 12
NL-ENG.K-12.2 Reading for Understanding
NL-ENG.K-12.3 Evaluation Strategies
NL-ENG.K-12.7 Evaluating Data
NL-ENG.K-12.11 Participating in Society
NL-ENG.K-12.12 Applying Language Skills

SCIENCE
GRADES K - 4
NS.K-4.2 Physical Science
NS.K-4.5 Science and Technology
NS.K-4.6 Science in Personal and Social Perspectives
GRADES 5 - 8
NS.5-8.2 Physical Science
NS.5-8.5 Science and Technology
NS.5-8.6 Science in Personal and Social Perspectives
GRADES 9 - 12
NS.9-12.2 Physical Science
NS.9-12.5 Science and Technology
NS.9-12.6 Science in Personal and Social Perspectives

SOCIAL SCIENCES: Civics
GRADES K - 4
NSS-C.K-4.5 Roles of the Citizen

GRADES 5 - 8
NSS-C.5-8.5 Roles of the Citizen
GRADES 9 - 12
NSS-C.9-12.5 Roles of the Citizen

SOCIAL SCIENCES: Economics
GRADES K - 4
NSS-EC.K-4.8 Supply and Demand
NSS-EC.K-4.9 Competition in the Marketplace
NSS-EC.K-4.14 Entrepreneurs
GRADES 5 - 8
NSS-EC.5-8.8 Supply and Demand
NSS-EC.5-8.9 Competition in the marketplace
NSS-EC.5-8.14 Entrepreneurs
GRADES 9 - 12
NSS-EC.9-12.8 Supply and Demand
NSS-EC.9-12.9 Competition in the Marketplace
NSS-EC.9-12.14 Entrepreneurs

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Education World®

10/29/2008