

Reading Selection

Making the Switch from Kid's Stuff to Engineering

Linda and Juan work as engineers for a big automobile company. They designed many of the cars you see every day on the road. What kinds of things did Linda and Juan like to do when they were kids? How did these interests help them become engineers? Let's find out.

Not Just Playing Around

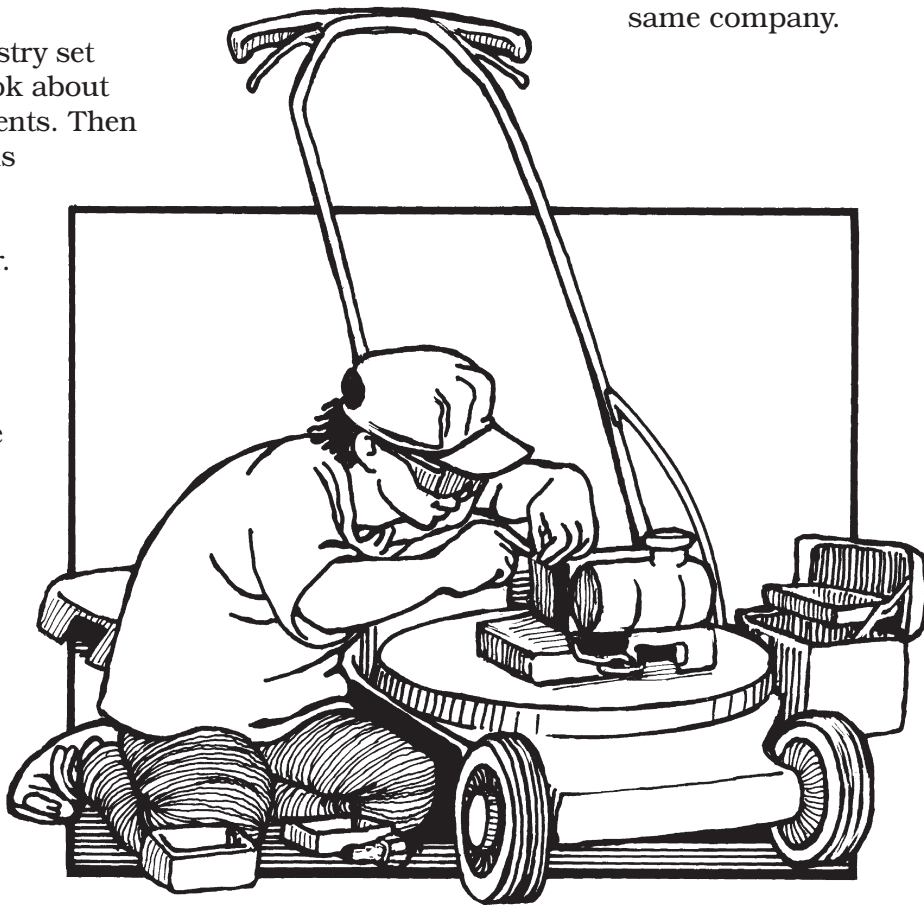
Linda always enjoyed taking things apart. She liked to see what was inside them. She also liked to put them back together. When her bicycle broke down, she fixed it herself. Her mother and father were amazed. When her parents bought a computer, Linda said "Wow!" She used the computer more often than her parents did. She even bought books to learn how it worked.

Juan liked to play with his chemistry set most of all. Whenever he read a book about chemistry, he got ideas for experiments. Then he would mix together the chemicals and see if his ideas were right. As Juan got older, he also liked to tinker with the family's lawn mower. One spring he said to his father, "Don't take the lawn mower to the shop this year. I will fix it myself." And he did. By reading the manual and checking out different parts, he learned how to keep the mower running just right.

Math and Science Count!

Both Linda and Juan liked math and science in school. They took every math and science class they could. In her physics class, Linda became interested in how forces make objects turn and move. Juan loved chemistry, especially when he learned about how gasoline burns in a car engine.

When Linda and Juan went to college, they already knew from their earlier experiences that they would like to become engineers. They studied more math and science. They also studied how engineers use math and science in their work. After they graduated from college, they landed their first jobs in the same company.



LESSON 14

Remember how Linda liked to work with computers? Well, now she designs the computers inside cars. Juan uses his interest in chemistry when he designs new car engines. They both love their work. Just like when they were kids, they get to tinker

and explore every day! And, working together, they make better cars for people to drive.

Are you like Linda and Juan? What math and science activities do you like? What do you think you'd like to be when you grow up?



Record Sheet 14–A

Names: _____

Date: _____

Planning Our Final Design Challenge

How we will meet the challenge

Sketch of the vehicle we will build

Materials needed to build our vehicle

Materials needed to move our vehicle

How we will move our vehicle (for example,
rubber band power or falling weight)

How we will test whether our vehicle
meets the challenge (for example, use
a timer or a measuring tape)

Proposed budget (or total cost) for our vehicle

Design Challenge Cards: Lesson 14**Challenge A**

You are part of a famous engineering design team. An agency just awarded your team a contract to design a rescue vehicle for saving mountain climbers who are trapped at the top of snowcapped mountains. The vehicle you design must move as quickly as possible without causing an avalanche.

Design requirements:

- Your vehicle must move up the hill within five seconds or less.
- Your vehicle must stop moving within 5 cm (2 in) of the top of the hill
- The top of your incline must be at least 20 cm (8 in) off the ground.

Cost is important. You must build the vehicle as inexpensively as possible without affecting its performance.

Challenge B

You are part of a famous engineering design team. An agency just awarded your team a contract to design a vehicle that services a hospital's rooftop heliport (a landing place for helicopters). The vehicle will be used to transport patients slowly from a helicopter to the elevator near the edge of the roof.

Design requirements:

- Your vehicle must move across a table, a squared-off area of the floor, or other area that simulates a rooftop heliport.
- Your vehicle must start in the center of the roof and move toward the edge of the area.
- Your vehicle must be able to move this distance slowly, in three seconds or more.
- Your vehicle must stop within 5 cm (2 in) of the edge.
- Your vehicle must move backward to return to the center of the roof.

Cost is important. You must build the vehicle as inexpensively as possible without affecting its performance.

Design Challenge Cards: Lesson 14, *continued*

Challenge C

You are part of a famous engineering design team. An agency has just awarded your team a contract to design a pizza delivery truck. To keep the customers happy, the driver of the vehicle must be able to travel quickly and safely both long and short distances and deliver the pizzas piping hot.

Design requirements:

- Your vehicle must be able to carry one load of pizzas (represented by one block).
- Your vehicle must move quickly and safely (in 4 seconds or less).
- Your vehicle must travel at least 3 m (10 ft) and deliver the pizza within 50 cm (20 in) of the 3-m mark.
- Your vehicle must return to the pizza shop (starting line) without its load of pizzas in 7 seconds or less.

Cost is important. You must build the vehicle as inexpensively as possible without affecting its performance.

Challenge D

You are part of a famous engineering design team. An agency has just awarded your team a contract to design a parade float that is powered by air pushing it from behind. The parade float must travel long distances at a slow speed.

Design requirements:

- Your parade float must use a sail to help it move.
- Propelled by a fan, your vehicle must move 3 m (10 ft) in 10 seconds or more.

Cost is important. You must build the vehicle as inexpensively as possible without affecting its performance.

Design Challenge Cards: Lesson 14, *continued*

Challenge E

You are part of a famous engineering design team. An agency has just awarded your team a contract to design a drag racing car. The dragster must move a relatively short distance as quickly as possible and then come to a stop.

Design requirements:

- In 2 seconds or less, your vehicle must move from the starting line to the finish line.
- The distance of the race track is 2 m (6½ ft).
- Your vehicle must stop within 50 cm (20 in) of the finish line.
- You may drag weights or other objects behind your vehicle to slow it down.

Cost is important. You must build the vehicle as inexpensively as possible without affecting its performance.