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Opening extract from

Mission Invent

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MISSION INVENT

You love being an apprentice designer at Toy Towers, where they make the world's most amazing toys. You wish you could meet the owner, Mr. Jollypops.

You arrive one morning to find Mr. Jollypops's assistant waiting for you.

Mr. Jollypops wants to see you urgently. He will explain everything.

HOW INTRIGUING! WHAT COULD MR. JOLLYPOPS WANT WITH YOU?
FIND OUT on PAGE 12

No, clockwork mechanisms only got their name because they were first invented to drive the hands on clocks.

GO BACK TO PAGE 33 TO TRY AGAIN

No, a straight bar does not convert your pedaling power to turn the wheels.

GO BACK TO PAGE 28

The next morning, the box is open and your camera is on the floor. There's a photo of some yellow shoes, but you don't recognize them.

Luckily, there's no damage to your car. You roll it out to the starting grid, where your rivals are already waiting.

Every car in the race must weigh exactly the same, no matter how heavy the driver is. To do this, each driver is weighed, and then given a "handicap" weight. This takes them and their car up to the right weight.

The weighing machine shows your weight in NEWTONS, rather than pounds! Should you tell the steward that the weighing machine is faulty?

ABSOLUTELY
GO TO PAGE 42

NO, JUST GO WITH IT
HEAD OVER TO PAGE 24

Right answer! Gravity is the force that pulls the roller coaster carriage faster and faster as it runs down the slope. It has no need of an engine!

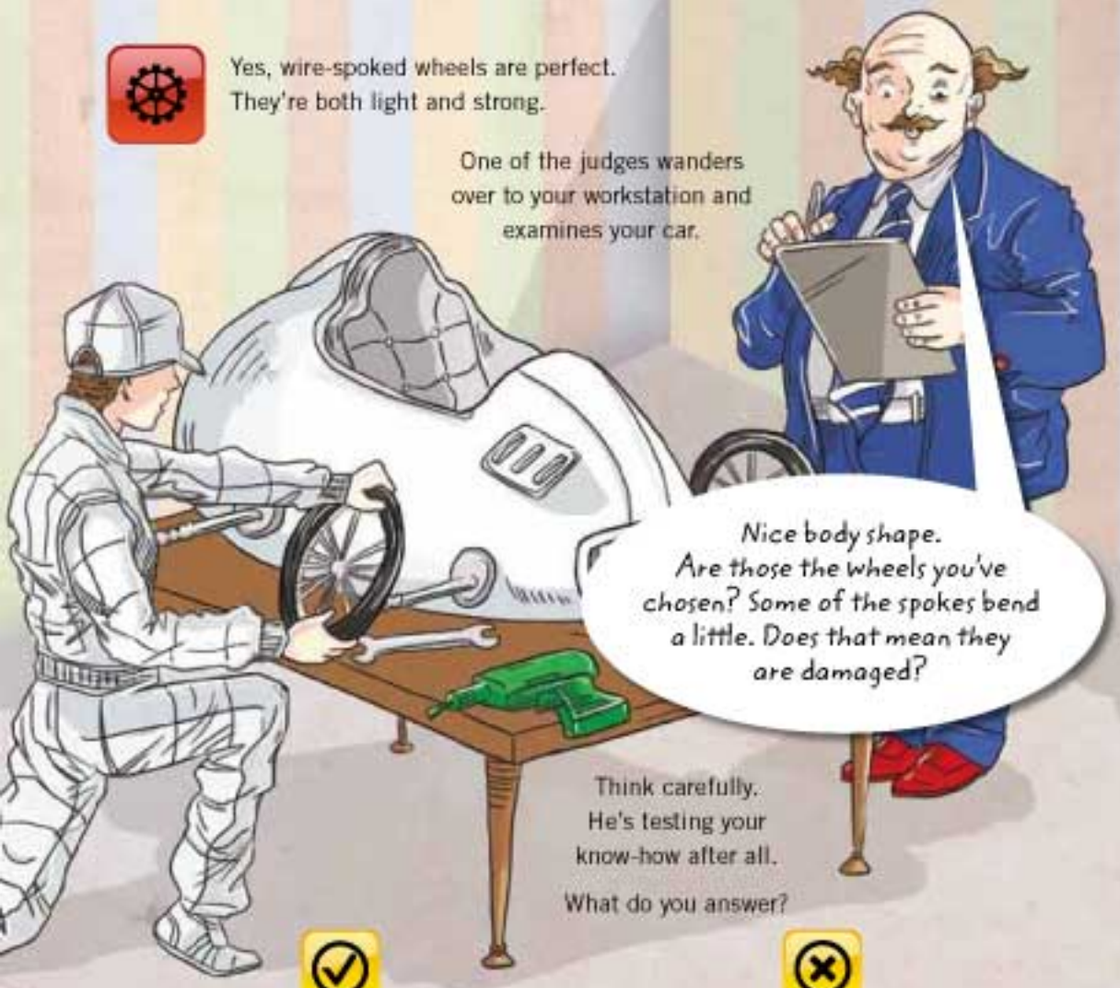
You open the door and step out into the street.

Wow! What an event! You head to the garages. An announcement booms out from the loudspeakers.

YOU ALL RUN TO YOUR WORKSTATIONS ON PAGE 31

Yes, wire-spoked wheels are perfect. They're both light and strong.

One of the judges wanders over to your workstation and examines your car.



Think carefully. He's testing your know-how after all.

What do you answer?

YES, THEY MUST BE DAMAGED!
YOU NEED TO GET SOME NEW ONES QUICKLY.
HEAD OVER TO PAGE 27

NO, THE SPOKES ARE FINE.
THE FLEXIBILITY KEEPS THE WHEELS STABLE.
GO TO PAGE 33

Wrong. Think about what a machine is—something that makes a task require less effort.

GO BACK TO PAGE 43 AND TRY AGAIN

No, you'd need to affix the pulley wheel to the ceiling first.

GO BACK TO PAGE 20

Oh my. The soldier may look small, but he's made of lead and weighs 200 pounds. As soon as you step in the basket and release the hook, you both plummet downward.

GO BACK TO PAGE 39 AND TRY AGAIN

AC

No, a gear and knob won't allow you to turn the mechanism inside the door.

GO BACK TO PAGE 30

No, the effort is the force that you apply to a machine to make something happen.

RETURN TO PAGE 42

That's right! Just as you finish tightening the last nut, a stranger in overalls strolls over, checks no one is listening, then whispers:

Apart from the fact that it would be cheating, would it help you? What do you say?

GREAT, THE OIL WILL REDUCE THE FRICTION—
YOU'LL BE THE FASTEST OUT THERE!
GO TO PAGE 16

NO, OIL WILL JUST MAKE THINGS HARDER.
GO AWAY!
TURN TO PAGE 28

No, pushing the lever forward will only open the trapdoor further.

GO BACK TO PAGE 19 AND TRY AGAIN

No, an inflated balloon could drift away and the cheater could easily escape.

BACK TO PAGE 13 TO TRY AGAIN

Correct! By adding the rack and pinion, the steering mechanism works perfectly.

PINION

RACK

You line up at the starting point, ready for the next race.

START! You power along, moving from last to fourth. Cranky Colin crashes on the first bend because his steering fails. Candy Clockwork spins off the track too, because she takes the second bend too fast.

What do you do when you reach the bend?

TURN YOUR STEERING WHEEL SHARPLY
HEAD TO PAGE 36

SLOW DOWN
GO TO PAGE 22

Yes, a piston provides the strong pushing force. You whiz up the tower!

A crackly voice comes from a speaker in the elevator.

This is Mr. Jollypops. I have something important to tell you—but only if you can pass the tests and reach my office. Good luck!

When the doors open at the top, your way is blocked by a mechanical knight. There's a switch on its chest, with two positions, and a small plaque.

TO DISENGAGE THIS MACHINE, WHAT IS AN AUTOMATON?

Which position do you push the lever to?

A REMOTE-CONTROLLED MACHINE. GO TO PAGE 27

A SELF-OPERATING MACHINE. FLIP TO PAGE 33

Mr. Jollypops's office is at the top of the highest tower, so you need to take the superfast elevator. There's a bright red sign on the elevator door.

TO OPEN THE DOORS, ANSWER THIS QUESTION: IS THIS ELEVATOR HYDRAULIC OR PNEUMATIC? PRESS THE CORRECT BUTTON.

Clue: The elevator uses fluid to move

HYDRAULIC — TURN TO PAGE 21

PNEUMATIC — HEAD OVER TO PAGE 37

No, in a suspension bridge, the bridge is suspended from looping cables hung between towers. You don't have cables or anything to hang them from.

GO BACK TO PAGE 32

CHALLENGE 2: ORAL EXAM

You are each taken into a room to answer questions in front of a panel of judges.

Question one:
Which Greek scientist came up with the theory of levers more than 2,000 years ago?

ARCIMBOLDO
GO TO PAGE 20

ARCHAEOPTERYX
HEAD TO PAGE 33

ARCHIMEDES
FLIP TO PAGE 43

Great, a camera will do the trick!

You have a few leftover parts on your workstation. If you're smart, you can fix the camera so it will pop up and take a picture the moment anyone opens the box.

Which part should you use to affix the camera to the box?

BALLOON
GO TO PAGE 10

RUBBER BAND
TURN TO PAGE 19

COIL SPRING
FLIP TO PAGE 36

All of these are important elements of more complex machines, but they aren't simple machines.

GO BACK TO PAGE 23 AND TRY AGAIN

No, electricity is a force, but it plays no part in the movement of a roller coaster. Roller coasters are driven by gravity and momentum alone.

CHOOSE AGAIN ON PAGE 41

No, you've spelled out motion, which is the power of movement.

GO BACK TO PAGE 29 AND TRY AGAIN