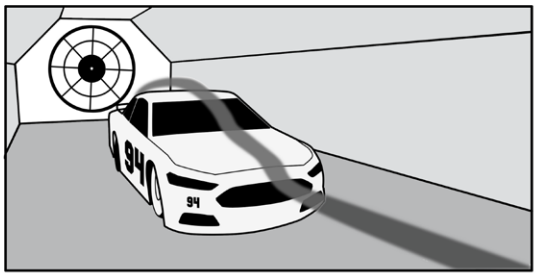
NAME

# TUNNEL TESTING



**A NASCAR racecar goes through extensive testing before it ever hits the track.**

Engineers want to know how forces such as drag and downforce will affect a racecar's performance. Read the passage below to find out how engineers study racecar aerodynamics using a **wind tunnel**. Then answer the questions on the right in complete sentences.

## ENGINEERING WIND

Engineers study racecars' aerodynamics to improve racecars' speed and safety, but that's not an easy thing to do while a racecar is hurtling more than 200 miles per hour around a track. Engineers need the car to stay put while they gather information on how air flows around it. To do that, engineers place a stationary racecar inside a wind tunnel.

A wind tunnel is a large, narrow room with powerful fans at one end. NASCAR engineers release smoke into the tunnel while the fans blow air over the racecar to make the air movements around the vehicle visible. High-tech sensors collect data about the forces the racecar experiences in the tunnel.

Wind-tunnel tests help engineers identify important changes to build better racecars. They might alter the car's body to give it a more aerodynamic shape, which can reduce drag and boost a car's speed. Or engineers might change the angle of a car's spoiler to increase downforce, which would help a car grip the track better. Both changes would improve the airflow around the racecar and allow it to go faster.

1. Context clues are hints in sentences near an unknown word that can help you define it. Use context clues to define the word *stationary*.

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2. In your own words, explain how a wind tunnel works.

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3. What is the main idea of this passage?

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4. Give one key detail in the second paragraph that supports the passage's main idea.

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5. Explain how engineers use the data they collect in a wind tunnel to improve a racecar's design.

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