

NAME _____

DO YOU KNOW THE SCIENCE OF SPEED?

This unit is about aerodynamics and how it influences force, momentum, and speed.
Share what you know about the science of speed.

- 1 **What does the science of aerodynamics study?**
 - A The weight of objects
 - B The speed and flight of objects
 - C The movement of air
 - D The sound of air
- 2 **What are three key aerodynamics principles?**
 - A Drag, height, and acceleration
 - B Drag, downforce, and drafting
 - C Acceleration, downforce, and motion
 - D Acceleration, height, and motion
- 3 **What word describes a force that slows an object when air pushes against it?**
 - A Drag
 - B Downforce
 - C Drafting
 - D Deceleration
- 4 **What aerodynamics force is used to create both lift and downforce?**
 - A Air speed
 - B Air pressure
 - C Both A and B
 - D Neither A nor B
- 5 **When the downward forces on a moving race car are equal (e.g., in front and in back), then the car is:**
 - A Aerodynamically balanced
 - B Wind stable
 - C Force level
 - D None of the above
- 6 **True or false? Downforce is the opposite of lift.**
 - A True
 - B False
- 7 **True or false? Aerodynamic balance is too complicated for engineers to make changes that improve the performance of a race car.**
 - A True
 - B False
- 8 **Drafting happens when:**
 - A Two or more race cars accelerate next to each other with inches between them.
 - B Two or more race cars line up, one behind the other, with inches between them.
 - C Two or more race cars tap the bumpers of the cars in front of them.
 - D None of the above
- 9 **The goal of adaptations to NASCAR race cars is:**
 - A To prevent race cars from flipping over or lifting.
 - B To provide more downforce to improve tire traction.
 - C To force high-pressure air over the car to make sure it "sticks" to the track.
 - D To create more contact between the tires and the track?
 - E All of the above
- 10 **Why is the science of aerodynamics important to racing?**
 - A Aerodynamics helps improve the safety of the race cars, keeping them on the track.
 - B Aerodynamics enhances the speed of the race cars, helping drivers zoom past the competition.
 - C Aerodynamics helps improve the performance of the cars, keeping them running smoothly and consistently.
 - D All of the above

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WHAT DID YOU LEARN ABOUT THE SCIENCE OF SPEED?

**You just completed a unit about aerodynamics and its influence on an object's speed.
Share what you have learned about aerodynamics.**

1 The science of aerodynamics studies:

- A** How fast a car or plane can move.
- B** The movement of air.
- C** How objects can change the air.
- D** The weight of objects.

2 What are three key aerodynamics principles?

- A** Drag, distance, and downforce
- B** Drafting, distance, and drag
- C** Drag, downforce, and dynamics
- D** Drag, downforce, and drafting

3 Drag occurs when:

- A** Air pushes against an object.
- B** Air enters an object.
- C** Air avoids an object.
- D** None of the above

4 Poor aerodynamic balance will make a race car:

- A** Faster
- B** Difficult to steer
- C** Better at drafting
- D** None of the above

5 True or false? Fast-moving air creates high air pressure.

- A** True **B** False

6 True or false? When two cars draft, the area of low pressure behind the first car sucks the second car forward, causing it to move even faster.

- A** True **B** False

7 Aerodynamic balance is affected by:

- A** Adaptations of aerodynamic parts
- B** Added weight in the vehicle
- C** Downforces
- D** All of the above

8 The flaps on race cars that create drag:

- A** Help the cars move faster.
- B** Slow the cars down to better control their speed.
- C** Help cars increase speed during drafting.
- D** All of the above

9 Downforce is important to NASCAR race cars because:

- A** It helps the cars move faster.
- B** It makes it safer to speed around turns.
- C** It helps cars "stick" to the track.
- D** All of the above

10 In the world of NASCAR racing aerodynamics, engineers:

- A** Create car adaptations that help improve the safety and speed of race cars.
- B** Design helmets that help the drivers focus better when driving.
- C** Invent car adaptations that make the cars heavier and safer.
- D** Develop adaptations that enhance the communication between the car and the driver.