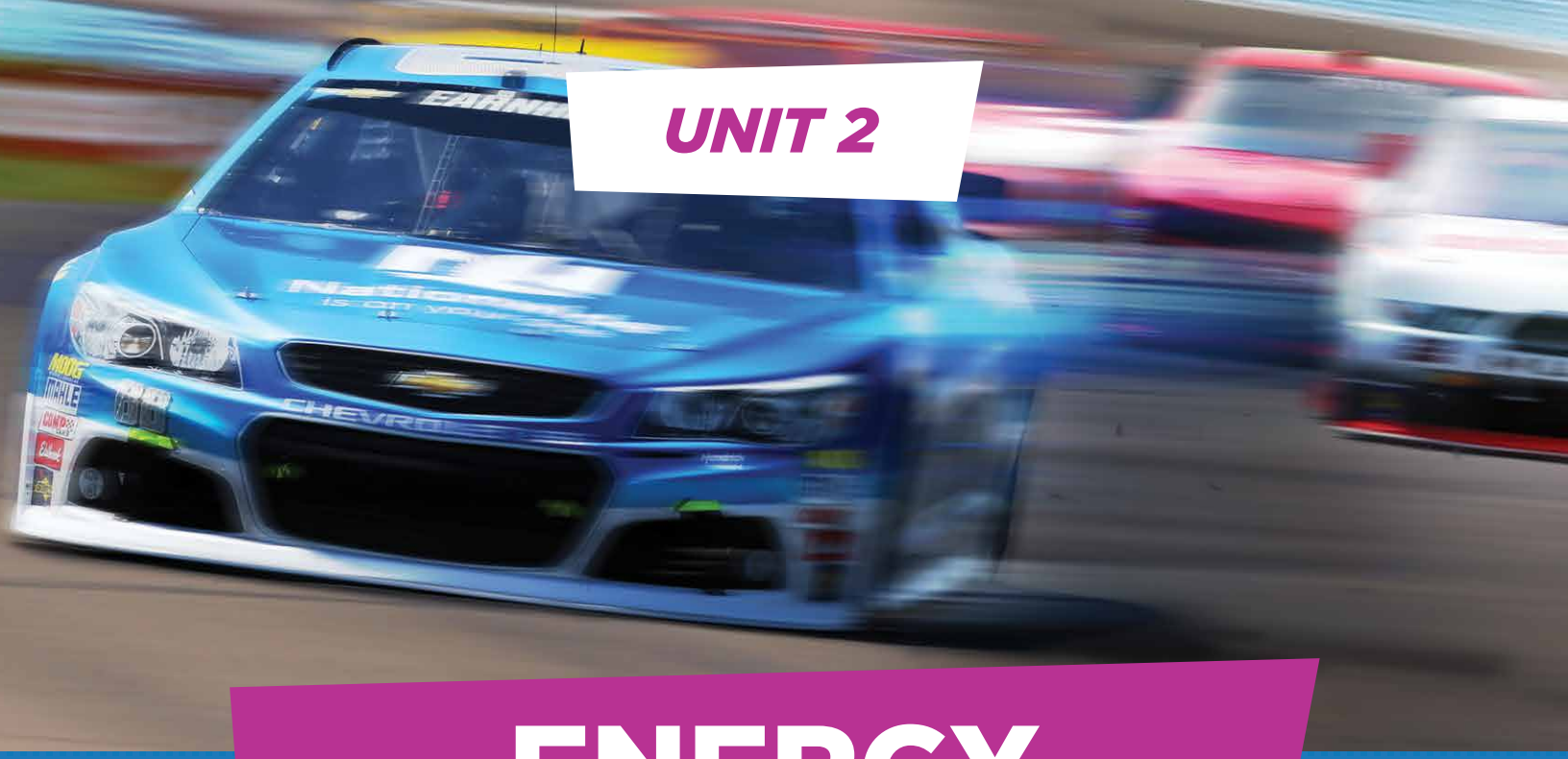

UNIT 2

ENERGY AND NASCAR

POTENTIAL ENERGY • KINETIC ENERGY
FRICTION & ENERGY

★ NASCAR ENERGY UNIT LEARNING OUTCOMES ★

LESSON 1: POTENTIAL ENERGY **HIDDEN ENERGY**	LESSON 2: KINETIC ENERGY **ENERGY IN MOTION**	LESSON 3: FRICTION AND ENERGY **A DYNAMIC DUO**
At the end of Lesson 1, students will be able to: 1. **Define potential energy.** 2. **List the four main types of potential energy.** 3. **Identify forces that influence potential energy.**	At the end of Lesson 2, students will be able to: 1. **Define kinetic energy.** 2. **Identify forces that influence kinetic energy.** 3. **Describe the relationship between potential and kinetic energy.**	At the end of Lesson 3, students will be able to: 1. **Define friction.** 2. **Describe the relationship between friction and speed.** 3. **Describe the relationship between friction and racecar safety.**

CORE CONCEPTS AND SKILLS SPOTLIGHT

NEXT GENERATION SCIENCE STANDARDS

Energy and NASCAR covers overarching concepts and skills relevant to a range of science principles that can be easily applied to your state's science standards.

DISCIPLINARY CORE IDEAS: PHYSICAL SCIENCE

Motion and Stability: Forces and Interactions

- The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.

  Related Standard:
  Support an argument that the gravitational force exerted by Earth on objects is directed down.

- The sum of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. For any given object, a larger force causes a larger change in motion.

  Related Standard:
  Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

Energy

- Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.

  Related Standard:
  Construct and interpret graphical displays of data to describe the relationship of kinetic energy to the mass of an object and to the speed of an object.

- A system of objects may also contain stored (potential) energy, depending on their relative positions.

  Related Standard:
  Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

SCIENCE AND ENGINEERING PRACTICES

Planning and Carrying Out Investigations

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
- Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.

Engaging in Argument From Evidence

- Construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

Constructing Explanations and Designing Solutions

- Construct an explanation of observed relationships.

Obtaining, Evaluating, and Communicating Information

- Communicate scientific and/or technical information orally and/or in written formats, including various forms of media as well as tables, diagrams, and charts.

Source: NGSS Lead States. 2013. *Next Generation Science Standards: For States, By States.* Washington, DC: The National Academies Press.