Connections to National and Michigan Standards and Expectations

Michigan Grade Level Content Expectations

The Science, Life Skills and Innovations in American Automobile Racing unit plans meet Michigan Grade Level Content Expectations for grades 3-8. However, grade 3 teachers should consider introducing the lessons' concepts rather than assigning activity sheets, depending on students' background knowledge.

Science

S.RS.03.11
Demonstrate scientific concepts through various illustrations, performances, models, exhibits and activities.

S.RS.03.16
Identify technology used in everyday life.

S.RS.03.17
Identify current problems that may be solved through the use of technology.

P.FM.3.35
Describe how a push or a pull is a force.

P.FM.3.36
Relate a change in motion of an object to the force that caused the change of motion.

P.FM.03.37
Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.

P.FM.03.38
Demonstrate when an object does not move in response to a force, it is because another force is acting on it.

P.FM.03.41
Compare and contrast the motion of objects in terms of direction.

P.FM.03.42
Identify changes in motion.

P.FM.03.43
Calculate the speed of an object based on the distance it travels divided by the amount of time it took to travel that distance.

S.RS.04.11
Demonstrate scientific concepts through various illustrations, performances, models, exhibits and activities.

S.RS.04.16
Identify technology used in everyday life.

S.RS.04.17
Identify current problems that may be solved through the use of technology.

S.RS.05.15
Demonstrate scientific concepts through various illustrations, performances, models, exhibits and activities.

S.RS.05.16
Design solutions to problems using technology.

P.FM.05.31
Describe what happens when two forces act on an object in the same or opposing directions.

P.FM.05.32
Describe how constant motion is the result of balanced (zero net) forces.

P.FM.05.33
Describe how changes in the motion of objects are caused by a nonzero net (unbalanced) force.

P.FM.05.34

Relate the size of change in motion to the strength of unbalanced forces and the mass of the object.

P.FM.05.41

Explain the motion of an object relative to its point of reference.

P.FM.05.42

Describe the motion of an object in terms of distance, time and direction, as the object moves and in relationship to other objects.

P.FM.05.43

Illustrate how motion can be represented on a graph.

S.RS.06.15

Describe what happens when two forces act on an object in the same or opposing directions.

S.RS.06.16

Design solutions to problems using technology.

S.RS.06.19

Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.

P.EN.06.11

Identify kinetic energy and potential energy in everyday situations.

S.RS.07.16

Design solutions to problems using technology.

S.RS.07.19

Describe how science and technology have been advanced because of the contributions of many people throughout history and across cultures.

National Science Education Standards

Standard 1: Science as Inquiry

All students should develop:

- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry

Standard 2: Physical Science

All students should develop an understanding of:

- Properties and changes of properties in matter
- Motions and forces
- Transfer of energy

Standard 5: Science and Technology

All students should develop:

- Abilities of technological design
- Understandings about science and technology

Standard 7: History and Nature of Science

All students should develop understanding of:

- Science as a human endeavor
- Nature of scientific knowledge
- Historical perspectives

Lesson 1
Life Skills and Automobile Racing

Michigan Grade Level Content Expectations

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P.FM.03.38
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P.FM.03.42
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S.RS.04.11
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P.FM.05.42
Describe the motion of an object in terms of distance, time and direction, as the object moves and in relationship to other objects.

S.RS.06.15
Describe what happens when two forces act on an object in the same or opposing directions.

S.RS.07.19
Describe how science and technology have been advanced because of the contributions of many people throughout history and across cultures.

Lesson 2 Newton's Three Laws and Racing

Michigan Grade Level Content Expectations

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S.RS.03.17
Identify current problems that may be solved through the use of technology.

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Describe how a push or a pull is a force.

P.FM.3.36
Relate a change in motion of an object to the force that caused the change of motion.

P.FM.03.37
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P.FM.03.42
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S.RS.04.11
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S.RS.04.16
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S.RS.06.15
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S.RS.06.19
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S.RS.07.19
Describe how science and technology have been advanced because of the contributions of many people throughout history and across cultures.

Lesson 3 Forces Involved in Automobile Racing

Michigan Grade Level Content Expectations

Science

S.RS.03.11
Demonstrate scientific concepts through various illustrations, performances, models, exhibits and activities.

S.RS.03.17
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P.FM.3.35
Describe how a push or a pull is a force.

P.FM.3.36
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P.FM.03.37
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P.FM.03.38
Demonstrate when an object does not move in response to a force, it is because another force is acting on it.

P.FM.03.42
Identify changes in motion.

S.RS.04.16
Identify technology used in everyday life.

S.RS.04.17
Identify current problems that may be solved through the use of technology.

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P.FM.05.42
Describe the motion of an object in terms of distance, time and direction, as the object moves and in relationship to other objects.

S.RS.06.15
Describe what happens when two forces act on an object in the same or opposing directions.

S.RS.06.19
Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.

S.RS.07.19
Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.

Lesson 4 Motion and Energy in Automobile Racing

Michigan Grade Level Content Expectations

Science

S.RS.03.17
Identify current problems that may be solved through the use of technology.

P.FM.3.35
Describe how a push or a pull is a force.

P.FM.3.36
Relate a change in motion of an object to the force that caused the change of motion.

P.FM.03.37
Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.

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P.FM.03.41
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P.FM.03.42
Identify changes in motion.

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P.FM.05.41
Explain the motion of an object relative to its point of reference.

P.FM.05.42
Describe the motion of an object in terms of distance, time and direction, as the object moves and in relationship to other objects.

P.FM.05.43
Illustrate how motion can be represented on a graph.

S.RS.06.15
Describe what happens when two forces act on an object in the same or opposing directions.

P.EN.06.11
Identify kinetic energy and potential energy in everyday situations.

Lesson 5 Ground Effects, Innovations and Safety in Automobile Racing

Michigan Grade Level Content Expectations

Science

S.RS.03.11
Demonstrate scientific concepts through various illustrations, performances, models, exhibits and activities.

S.RS.03.16
Identify technology used in everyday life.

S.RS.03.17
Identify current problems that may be solved through the use of technology.

P.FM.3.36
Relate a change in motion of an object to the force that caused the change of motion.

P.FM.03.37
Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.

P.FM.03.41
Compare and contrast the motion of objects in terms of direction.

S.RS.04.11
Demonstrate scientific concepts through various illustrations, performances, models, exhibits and activities.

S.RS.04.16
Identify technology used in everyday life.

S.RS.04.17
Identify current problems that may be solved through the use of technology.

S.RS.05.15
Demonstrate scientific concepts through various illustrations, performances, models, exhibits and activities.

S.RS.05.16
Design solutions to problems using technology.

P.FM.05.41
Explain the motion of an object relative to its point of reference.

S.RS.06.16
Design solutions to problems using technology.

S.RS.06.19
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