Energy Conversions
3-D Assessment Objectives Overview

The NGSS Performance Expectations specify three-dimensional learning objectives for Grade 4 as well as for the 3–5 grade band. The tables below include the Performance Expectations that incorporate DCIs targeted for this unit and identify the locations of summative and formative assessments that reveal student knowledge and use of the three dimensions to support progress toward these Performance Expectations.

Each table includes the Disciplinary Core Ideas (**DCIs**), Science and Engineering Practices (**SEPs**), and Crosscutting Concepts (**CCCs**) included in that Performance Expectation and specifies the location of assessments associated with these three dimensions. Note that SEPs and CCCs build across the grade and grade band, so we list relevant assessments across grades 3–5. Also, in cases in which a DCIs is addressed in multiple units at a grade, we list assessments in the additional unit(s).

Key:

- Summative assessments are noted with (**S**);
  if not so labeled, the assessment is designed to be formative.
- **OTFA** = On-the-Fly Assessment
- **CJ** = Critical Juncture
- **PRE** = Pre-Unit Assessment
- **EOU** = End-of-Unit Assessment
- **TS** = Teacher Support Note
- **INV** = Investigation Assessment
- **CW** = Chapter Writing Assessment

See the Assessment System overview document for more information.

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4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.

SEP: Constructing Explanations and Designing Solutions

Energy Conversions (Grade 4)
PRE: Lesson 1.1, Activity 1

Vision and Light (Grade 4)
PRE: Lesson 1.1, Activity 4
CW: Lesson 2.5, Activity 3
CW: Lesson 3.5, Activity 4
EOU: Lesson 4.6, Activity 2 (S)

Earth's Features (Grade 4)
PRE: Lesson 1.1, Activity 2

Waves, Energy, and Information (Grade 4)
PRE: Lesson 1.1, Activity 4
CW: Lesson 2.6, Activity 3
EOU: Lesson 4.4, Activity 3 (S)

Note: Due to space limitations, assessments of this practice in Grades 3 and 5 are not listed.

DCI: PS3.A: Definitions of Energy

Energy Conversions (Grade 4)
TS: Lesson 3.4, Activity 2

CCC: Energy and Matter

Energy Conversions (Grade 4)
PRE: Lesson 1.1, Activity 1
OTFA 9: Lesson 2.3, Activity 4
OTFA 10: Lesson 3.1, Activity 2
OTFA 18: Lesson 4.2, Activity 2

Ecosystem Restoration (Grade 5)
PRE: Lesson 1.1, Activity 2
CJ 1: Lesson 1.6, Activity 3
OTFA 3: Lesson 1.7, Activity 3
OTFA 7: Lesson 2.5, Activity 2
CJ 3: Lesson 3.6, Activity 2
EOU: Lesson 3.7, Activity 2 (S)

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4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

SEP: Planning and Carrying Out Investigations

Balancing Forces (Grade 3)
INV: Lesson 5.1, Activity 3 (S)

Vision and Light (Grade 4)
OTFA 3: Lesson 2.1, Activity 4
OTFA 7: Lesson 3.2, Activity 3
OTFA 8: Lesson 3.2, Activity 4
OTFA 11: Lesson 4.1, Activity 2
OTFA 13: Lesson 5.1, Activity 4
INV: Lesson 5.2, Activities 1-4 (S)

Earth's Features (Grade 4)
OTFA 12: Lesson 4.3, Activity 2

Patterns of Earth and Sky (Grade 5)
OTFA 5: Lesson 2.2, Activity 4
OTFA 10: Lesson 3.3, Activity 3
OTFA 13: Lesson 4.2, Activity 3
INV: Lesson 4.3, Activities 1-3 (S)

Modeling Matter (Grade 5)
OTFA 1: Lesson 1.2, Activity 2
OTFA 12: Lesson 3.1, Activity 3

The Earth System (Grade 5)
OTFA 9: Lesson 4.1, Activity 2
TS: Lesson 5.4, Activity 3
TS: Lesson 5.5, Activity 3

DCI: PS3.A: Definitions of Energy

Energy Conversions (Grade 4)
PRE: Lesson 1.1, Activity 1
OTFA 18: Lesson 4.2, Activity 2
CJ 3: Lesson 4.3, Activity 2
EOU: Lesson 4.6, Activities 1 & 2 (S)

Waves, Energy, and Information (Grade 4)
PRE: Lesson 1.1, Activity 4
OTFA 3: Lesson 1.4, Activity 2
CJ 1: Lesson 1.5, Activity 3
OTFA 4: Lesson 2.1, Activity 2
OTFA 8: Lesson 2.5, Activity 2
CJ 2: Lesson 2.6, Activity 3
CW: Lesson 2.6, Activity 3
EOU: Lesson 4.4, Activity 3 (S)

CCC: Energy and Matter

Energy Conversions (Grade 4)
PRE: Lesson 1.1, Activity 1
OTFA 9: Lesson 2.3, Activity 4
OTFA 10: Lesson 3.1, Activity 2
OTFA 18: Lesson 4.2, Activity 2

Ecosystem Restoration (Grade 5)
PRE: Lesson 1.1, Activity 2
CJ 1: Lesson 1.6, Activity 3
OTFA 3: Lesson 1.7, Activity 3
OTFA 7: Lesson 2.5, Activity 2
CJ 3: Lesson 3.6, Activity 2
EOU: Lesson 3.7, Activity 2 (S)

DCI: PS3.B: Conservation of Energy and EnergyTransfer

Energy Conversions (Grade 4)
PRE: Lesson 1.1, Activity 1
OTFA 3: Lesson 1.4, Activity 3
OTFA 4: Lesson 1.5, Activity 3
OTFA 5: Lesson 1.6, Activity 1
OTFA 7: Lesson 2.1, Activity 2
CJ 1: Lesson 2.3, Activity 1
CW: Lesson 2.4, Activity 4
OTFA 10: Lesson 3.1, Activity 2
TS: Lesson 3.1, Activity 2
OTFA 11: Lesson 3.1, Activity 4
OTFA 12: Lesson 3.2, Activity 2
CJ 2: Lesson 3.3, Activity 1
OTFA 16: Lesson 4.1, Activity 2
OTFA 17: Lesson 4.1, Activity 3
OTFA 18: Lesson 4.2, Activity 2
OTFA 20: Lesson 4.4, Activity 3
CJ 3: Lesson 4.3, Activity 2
EOU: Lesson 4.6, Activities 1 & 2 (S)

Waves, Energy, and Information (Grade 4)
OTFA 5: Lesson 2.2, Activity 3
OTFA 6: Lesson 2.3, Activity 1
OTFA 7: Lesson 2.4, Activity 1
OTFA 8: Lesson 2.5, Activity 2
CJ 2: Lesson 2.6, Activity 3
CW: Lesson 2.6, Activity 3
EOU: Lesson 4.4, Activity 3 (S)

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4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

SEP: Constructing Explanations and Designing Solutions

Environments and Survival (Grade 3)
OTFA 7: Lesson 2.7, Activity 3
OTFA 10: Lesson 4.3, Activity 3
EOU 2: Lesson 4.4, Activity 4 (S)

Energy Conversions (Grade 4)
OTFA 14: Lesson 3.5, Activity 1
OTFA 15: Lesson 3.6, Activity 3

The Earth System (Grade 5)
OTFA 8: Lesson 3.4, Activity 3
OTFA 11: Lesson 4.5, Activity 3

DCI: PS3.B: Conservation of Energy and EnergyTransfer

Energy Conversions (Grade 4)
PRE: Lesson 1.1, Activity 1
OTFA 3: Lesson 1.4, Activity 3
OTFA 7: Lesson 2.1, Activity 2
CJ 1: Lesson 2.3, Activity 1
CW: Lesson 2.4, Activity 4
OTFA 10: Lesson 3.1, Activity 2
OTFA 11: Lesson 3.1, Activity 4
OTFA 12: Lesson 3.2, Activity 2
CJ 2: Lesson 3.3, Activity 1
OTFA 16: Lesson 4.1, Activity 2
OTFA 17: Lesson 4.1, Activity 3
OTFA 18: Lesson 4.2, Activity 2
CJ 3: Lesson 4.3, Activity 2
EOU: Lesson 4.6, Activities 1 & 2 (S)

DCI: PS3.D: Energy in Chemical Processes and Everyday Life

Energy Conversions (Grade 4)
OTFA 12: Lesson 3.2, Activity 2
CJ 2: Lesson 3.3, Activity 1
OTFA 16: Lesson 4.1, Activity 2
OTFA 17: Lesson 4.1, Activity 3

DCI: ETS1.A: Defining Engineering Problems

Energy Conversions (Grade 4)
OTFA 13: Lesson 3.4, Activity 3
OTFA 14: Lesson 3.5, Activity 1
OTFA 15: Lesson 3.6, Activity 3
CW: Lesson 3.6, Activity 4
OTFA 19: Lesson 4.3, Activity 4
OTFA 21: Lesson 4.5, Activity 1

CCC: Energy and Matter

Energy Conversions (Grade 4)
PRE: Lesson 1.1, Activity 1
OTFA 9: Lesson 2.3, Activity 4
OTFA 10: Lesson 3.1, Activity 2
OTFA 18: Lesson 4.2, Activity 2

Ecosystem Restoration (Grade 5)
PRE: Lesson 1.1, Activity 2
CJ 1: Lesson 1.6, Activity 3
OTFA 3: Lesson 1.7, Activity 3
OTFA 7: Lesson 2.5, Activity 2
CJ 3: Lesson 3.6, Activity 2
EOU: Lesson 3.7, Activity 2 (S)

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4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

SEP: Obtaining, Evaluating, and Communicating Information

Energy Conversions (Grade 4)
OTFA 1: Lesson 1.2, Activity 4
OTFA 8: Lesson 2.2, Activity 4
OTFA 11: Lesson 3.1, Activity 4
OTFA 17: Lesson 4.1, Activity 3

Vision and Light (Grade 4)
OTFA 5: Lesson 2.3, Activity 2
CW: Lesson 2.5, Activity 3
CW: Lesson 3.5, Activity 4
EOU: Lesson 4.6, Activity 2 (S)

Earth's Features (Grade 4)
OTFA 1: Lesson 1.2, Activity 4
OTFA 4: Lesson 2.1, Activity 3
OTFA 10: Lesson 3.3, Activity 2
EOU 1: Lesson 3.5, Activity 2 (S)
OTFA 11: Lesson 4.1, Activity 3
EOU 2: Lesson 4.5, Activity 3 (S)

Waves, Energy, and Information (Grade 4)
OTFA 2: Lesson 1.3, Activity 2
CW: Lesson 2.6, Activity 3
EOU: Lesson 4.4, Activity 3 (S)

Note: Due to space limitations, assessments of this practice in Grades 3 and 5 are not listed.

DCI: ESS3.A: Natural Resources

Energy Conversions (Grade 4)
OTFA 11: Lesson 3.1, Activity 4
OTFA 15: Lesson 3.6, Activity 3

CCC: Cause and Effect

Inheritance and Traits (Grade 3)
PRE: Lesson 1.1, Activity 2
OTFA 11: Lesson 3.4, Activity 3

Vision and Light (Grade 4)
PRE: Lesson 1.1, Activity 4
OTFA 3: Lesson 2.1, Activity 4
OTFA 8: Lesson 3.2, Activity 4

Patterns of Earth and Sky (Grade 5)
PRE: Lesson 1.1, Activity 3

The Earth System (Grade 5)
TS: Lesson 5.4, Activity 3
TS: Lesson 5.5, Activity 3

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3-5 ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

SEP: Asking Questions and Defining Problems

Environments and Survival (Grade 3)
OTFA 7: Lesson 2.7, Activity 3

The Earth System (Grade 5)
TS: Lesson 2.8, Activity 3

DCI: ETS1.A: Defining and Delimiting Engineering Problems

Energy Conversions (Grade 4)
OTFA 13: Lesson 3.4, Activity 3
OTFA 14: Lesson 3.5, Activity 1
OTFA 15: Lesson 3.6, Activity 3
CW: Lesson 3.6, Activity 4
OTFA 19: Lesson 4.3, Activity 4
OTFA 21: Lesson 4.5, Activity 1

CCC: N/A*

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3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

SEP: Constructing Explanations and Designing Solutions

Environments and Survival (Grade 3)
OTFA 7: Lesson 2.7, Activity 3
OTFA 10: Lesson 4.3, Activity 3
EOU 2: Lesson 4.4, Activity 4 (S)

Energy Conversions (Grade 4)
OTFA 14: Lesson 3.5, Activity 1
OTFA 15: Lesson 3.6, Activity 3

The Earth System (Grade 5)
OTFA 8: Lesson 3.4, Activity 3
OTFA 11: Lesson 4.5, Activity 3

DCI: ETS1.B: Developing Possible Solutions

Environments and Survival (Grade 3)
OTFA 7: Lesson 2.7, Activity 3
OTFA 10: Lesson 4.3, Activity 3

Energy Conversions (Grade 4)
OTFA 14: Lesson 3.5, Activity 1

CCC: N/A*

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3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

SEP: Planning and Carrying Out Investigations

Balancing Forces (Grade 3)
INV: Lesson 5.1, Activity 3 (S)

Vision and Light (Grade 4)
OTFA 3: Lesson 2.1, Activity 4
OTFA 7: Lesson 3.2, Activity 3
OTFA 8: Lesson 3.2, Activity 4
OTFA 11: Lesson 4.1, Activity 2
OTFA 13: Lesson 5.1, Activity 4
INV: Lesson 5.2, Activities 1-4 (S)

Earth's Features (Grade 4)
OTFA 12: Lesson 4.3, Activity 2

Patterns of Earth and Sky (Grade 5)
OTFA 5: Lesson 2.2, Activity 4
OTFA 10: Lesson 3.3, Activity 3
OTFA 13: Lesson 4.2, Activity 3
INV: Lesson 4.3, Activities 1-3 (S)

Modeling Matter (Grade 5)
OTFA 1: Lesson 1.2, Activity 2
OTFA 12: Lesson 3.1, Activity 3

The Earth System (Grade 5)
OTFA 9: Lesson 4.1, Activity 2
TS: Lesson 5.4, Activity 3
TS: Lesson 5.5, Activity 3

DCI: ETS1.B: Developing Possible Solutions

Energy Conversions (Grade 4)
OTFA 14: Lesson 3.5, Activity 1

The Earth System (Grade 5)
OTFA 8: Lesson 3.4, Activity 3
OTFA 11: Lesson 4.5, Activity 3

DCI: ETS1.C: Optimizing the Design Solution

Energy Conversions (Grade 4)
OTFA 14: Lesson 3.5, Activity 1

The Earth System (Grade 5)
OTFA 8: Lesson 3.4, Activity 3
OTFA 11: Lesson 4.5, Activity 3

CCC: N/A*

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