# Appendix

*Rogue Rodent Mystery* is a 10-lesson program that helps learners meet the Next Generation Science Standards and the Common Core State Standards (CCSS).

Ideally suited for learners in grades K-2, Rogue Rodent Mystery meets many of the practices, crosscutting concepts, and disciplinary core ideas that comprise the Next Generation Science Standards. The practices, concepts, and disciplinary ideas specifically covered in this unit include:

**PRACTICES:**

Asking Questions and Defining Problems

- Ask questions that can be investigated within the scope of the classroom, outdoor environment, libraries and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles.

Planning and Carrying Out Investigations

- Make observations and measurements to produce data to serve as the basis of evidence for an explanation of a phenomenon.
- Conduct an investigation to produce data to serve as the basis for evidence that can meet the goals of the investigation.

Analyzing and Interpreting Data

- Analyze and interpret data to determine similarities and differences in findings.

Engaging in Argument From Evidence

- Support an argument with evidence, data, or a model.

Scientific Knowledge is Based on Empirical Evidence

- Science knowledge is based upon logical and conceptual connections between evidence and explanations.
- Science disciplines share common rules of obtaining and evaluating empirical evidence.

**CROSS CUTTING CONCEPTS:**

Patterns

- Patterns can be used to identify cause-and-effect relationships.
- Graphs, charts, and images can be used to identify patterns in data.

Cause and Effect

- Events have causes that generate observable patterns. (2-PS1-4)
- Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2)

**DISCIPLINARY CORE IDEAS:**

PS2.A: Forces and Motion

- Pushes and pulls can have different strengths and directions. (K-PS2-1),(K-PS2-2)
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1),(K-PS2-2)

PS2.B: Types of Interactions

- When objects touch or collide, they push on one another and can change motion. (K-PS2-1)

PS3.C: Relationship Between Energy and Forces

- A bigger push or pull makes things speed up or slow down more quickly. (*secondary to K-PS2-1*)

LS1.A: Structure and Function

- All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.

In addition to aligning to the underlying concepts that comprise the Next Generation Science Standards (NGSS), this unit meets Common Core Learning Standards (CCLS) in Mathematics and English Language Arts and Literacy in grades K-2.

Specific CCLS addressed include:

CCSS.ELA-LITERACY.SL.K.5

- Add drawings or other visual displays to descriptions as desired to provide additional detail.

CCSS.ELA-Literacy.CCRA.SL.1:

- Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

CCSS.ELA-Literacy.CCRA.SL.2:

- Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-Literacy.CCRA.R.1:

- Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

CCSS.ELA-LITERACY.CCRA.R.3

- Analyze how and why individuals, events, or ideas develop and interact over the course of a text.

CCSS.ELA-LITERACY.W.K.3

- Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.

CCSS.ELA-LITERACY.CCRA.W.1

- Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

CCSS.ELA-LITERACY.RI.K.7

- With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).

CCSS.ELA-LITERACY.RI.2.1

- Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

CCSS.MATH.CONTENT.K.MD.A.2

- Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.

CCSS.MATH.CONTENT.1.MD.A.2

- Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.

| Standard | Lesson | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| ***Next Generation Science Standards*** | | | | | | | | | | |
| Practice: Asking Questions and Defining Problems | * | * | * | * | * | * | * | * | * | * |
| Practice: Planning and Carrying Out Investigations | * | | | | * | * | * | * | | |
| Practice: Analyzing and Interpreting Data | * | * | * | * | * | * | * | * | * | * |
| Practice: Engaging in Argument from Evidence | * | | | * | * | * | | * | * | * |
| Practice: Scientific Knowledge is Based on Empirical Evidence | * | * | * | * | * | * | * | * | * | * |
| Cross-Cutting Concept: Patterns | * | | | | * | * | | * | | * |
| Cross-Cutting Concept: Cause and Effect | | | | | * | | | | * | |
| Disciplinary Core Idea PS2.A: Forces and Motion | | | | | * | | | | | |
| Disciplinary Core Idea PS2.B: Types of Interactions | | | | | * | | | | | |
| Disciplinary Core Idea PS3.C: Relationship Between Energy and Forces | | | | | * | | | | | |
| Disciplinary Core Idea LS1.A: Structure and Function | | | | | | | * | | | |

| Standard | Lesson | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| ***Common Core State Standards*** | | | | | | | | | | |
| **CCSS.ELA-LITERACY.SL.K.5** Add drawings or other visual displays to descriptions as desired to provide additional detail. | | ✶ | ✶ | ✶ | | | | ✶ | | ✶ |
| **CCSS.ELA-Literacy.CCRA.SL.1:** Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ |
| **CCSS.ELA-Literacy.CCRA.SL.2:** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ | ✶ |
| **CCSS.ELA-Literacy.CCRA.R.1:** Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. | | ✶ | | ✶ | | | ✶ | ✶ | ✶ | |
| **CCSS.ELA-LITERACY.CCRA.R.3:** Analyze how and why individuals, events, or ideas develop and interact over the course of a text. | | ✶ | | ✶ | | | ✶ | | | ✶ |
| **CCSS.ELA-LITERACY.W.K.3:** Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened. | ✶ | ✶ | | ✶ | ✶ | | | | | ✶ |
| **CCSS.ELA-LITERACY.CCRA.W.1:** Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence. | | | | | ✶ | ✶ | | | | ✶ |
| **CCSS.ELA-LITERACY.RI.K.7:** With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts). | | ✶ | ✶ | | | ✶ | | | | ✶ |
| **CCSS.ELA-LITERACY.RI.2.1:** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. | ✶ | | | | | | ✶ | ✶ | | ✶ |
| **CCSS.MATH.CONTENT.K.MD.A.2:** Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. | | | | | | ✶ | | | ✶ | |
| **CCSS.MATH.CONTENT.1.MD.A.2:** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. | | | | | | ✶ | | | | |