### MONTH: January 04 - January 29, 2016

<table>
<thead>
<tr>
<th>BIG IDEA</th>
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<td>Each organism (plant/animal) have specific behavioral and physical characteristics allowing it to better survive in a given environment. As environments change over time, these characteristics may change (adapt) to allow then to continue to survive or flourish in their environment.</td>
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### DEPTH OF KNOWLEDGE:

**BIG IDEA**

Each organism (plant/animal) have specific behavioral and physical characteristics allowing it to better survive in a given environment. As environments change over time, these characteristics may change (adapt) to allow then to continue to survive or flourish in their environment.

**DRIVING QUESTION**

Why do animals look and act the way they do?

**STANDARD**

**CONTENT STATEMENT**

**Evolution**

**Part B - Species Adaptations and Survival**

**L.EV.M.1**

Species with certain traits are more likely than others to survive and have offspring in particular environments. When an environment changes, the advantage or disadvantage of the species’ characteristics can change. Extinction of a species occurs when the environment changes and the characteristics of a species are insufficient to allow survival.

**Grade Level Content Expectations**

<table>
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<th>CONTENT STATEMENT</th>
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**FOCUS QUESTION(S)**

How can physical characteristics help us identify and classify related animals? What behavioral and physical characteristics of an animal help them survive?

**INSTRUCTIONAL FRAMEWORK**

**Objectives:**

1. To identify behavioral and physical traits allowing organisms to survive better in particular environments.
To determine how these characteristics have changed over time through analyzing catastrophic events and fossils.

**VOCABULARY**

anatomical features, genetic relatedness, adaptation, inherited traits, acquired traits, learned behavior, nocturnal, heredity, environmental factors, fossil, catastrophic events (volcanic eruptions, tsunamis, asteroid impact, floods, tornados, hurricanes), natural selection, instinct, habit, behavioral characteristics, physical characteristics (traits), survival, internal structures, external structures, vertebrate, invertebrate, flowering, non-flowering, aquatic, terrestrial, cold-blooded, warm blooded

**Suggested Materials**

Harcourt Science Fifth Grade

### Teaching Objectives and Resources

1. Recognizing that living things may be grouped based on similar structures.
   - **Harcourt Science**: A36-41

### Suggested Activities

1. Create a classroom exhibit to demonstrate the classification of organisms.
**Use Grade 5 Archived Ancillaries**

2. Describe structural similarities in categories that scientists use to classify living things
   - Harcourt Science: ppA42-47, WB pp 25,26; A48-53; WB pp 30,31

3. Identify behaviors of animals and classify as learned (dog tricks), or instinctive (nest building)
   - Harcourt Science: B42-47

4. Identify physical characteristics that help plants and animals adapt to their environment (webbed feet, thorns, shape of beaks)
   - Harcourt Science: B42-47

5. Describe behavioral and physical characteristics of plants and animals that help them survive in their environment.
   - Activity Resource: Students create a poster using three different organisms and how they survive in their environment, identify adaptation, instinct and behavior it might learn

2. Create a Venn Diagram to compare and contrast vertebrates and invertebrates.

3. Generate questions about how animals and plants are related based on observations of animal characteristics.

4. Plan and conduct an investigation with vascular plants.

5. Setup a class ecosystem (aquatic pond) Pick one organism and observe daily to identify physical and behavioral characteristics that help the organism survive.

6. Challenge students to identify all the instinctual behaviors of the ant. *Purchase an ant farm/set up in classroom

7. Debate which instinct- hibernation (staying inactive during winter months) or homing (always knowing how to find your way home) - is more important to a bear’s survival. Give evidence for your arguments and record in journal.

8. Provide resource materials for students to research animal physical attributes, diet, habitat, etc.

9. Display pictures of various animals behaviors (learned and instinctive). Have students generate questions about their observations.

10. Research the contributions of African Americans and the advancements they have made in understanding evolution and heredity.

1. Sample Bellwork / Do Now

   - How do scientists classify organisms? Why is it helpful?
   - Birds and butterflies both have wings. Do you think a scientist would classify them in the same group? Why or why not?
   - List 5 vertebrates and 5 invertebrates.
   - Are there differences among instinctive and learned behaviors? Explain your response.
   - Select an animal. Describe how the animal’s body parts help it meet its needs.
   - Describe some instincts that people have that keep them safe

**Sample Assessments**

- Performance Assessment: multiple choice, true/false
- Students select two animals that have similar features. Describe how the two are different and make several inferences about them.
- Create a game using 5x8 index cards highlighting animal facts (classifying characteristics)
- Make a diorama showing the adaptation of a land animal and its natural habitat.
- Create a concept map describe physical and behavioral characteristics that help animals survive.

**The 5 E Learning Cycle**
### ENGAGE
- In cooperative learning groups, students identify unique physical and behavioral characteristics they have that allow them to survive. They create a visual representation of their ideas. For example, they may draw a person and label characteristics while giving an explanation of how the characteristic allows them to survive.

### EXPLORE
- Explore how organisms better suited for a specific environment survive better. For example, camouflage is a characteristic that allows some organisms to survive better in some environments. Place students in groups of 3-4. Set up containers for each group containing 25 squares of one color construction paper and 25 squares of another color. The container should be lined with one of the colors, allowing one set of 25 to be camouflaged. The students will act as predators and have a limited amount of time (10-15 seconds) to find prey. The container should be located at least an arms length distance away from each student so he has to move to obtain the prey. The students will take turns until 6-8 trials are completed. (Upon completion of the trials, they should be able to determine that animals possessing camouflage have a better chance of survival). Students can then integrate math by making graphical representations and interpreting the mean of the class data (see math integrations below). Be sure to ask students to extend their thinking to include other factors (behavioral and physical characteristics and environmental) that would allow some organisms to survive better.
- Set up a classroom habitat with plants and animals for students to observe over a period of time. Students make purposeful observations of the behavioral and physical traits and how they help the organisms to survive in the model habitat. Students do further research on the classroom habitats to make connections between what they are observing in the model habitat and how the animals and plants survive in their natural habitats.
- Design an investigation to try to teach the animals a “learned” behavior, such as ringing a bell, making a noise, or changing the lighting, before placing food in the habitat.

### EXPLAIN & DEFINE
- Students work collaboratively, with a variety of animals (pictures/images or plastic pieces) to identify their unique behavioral and physical characteristics that allow them to survive in their particular environment.
- Students choose an animal to research and gather information about the behavioral characteristics and physical characteristics of the animal that helps it to survive in its environment. Students use multiple sources of information, organize and present the information to others.

### ELABORATE & APPLY
- Students design an imaginary organism with specific behavioral and physical characteristics allowing it to survive in a chosen environment. A written description of the characteristics must be included in the diagram or illustration.
- Students (individually, in pairs or small groups) research a particular organism, chosen by student or by teacher, and the organisms’ history to explain characteristic changes over time. Directions lead students to investigate changes in the organism’s fossils over time and other catastrophic events that may have caused these characteristics to change. Students then give short oral presentations while others take notes. Teacher should provide a rubric to help evaluate student research.
1. **Formative Assessment**
   - Evaluate student diagrams/illustrations depicting characteristics allowing survival in particular environments.
   - Evaluate student research and presentations or organisms’ changes over time.
   - Evaluate students’ ability to identify characteristics allowing organisms to survive in their environment.

2. **Summative Assessment**
   - Choose an organism to have students identify the behavioral and physical characteristics that allow it to survive in its particular environment.
   - Students analyze fossil evidence to determine how environmental conditions changed over time.

### Expanding and Differentiating Instruction

**Enrichment**

Allow students to research environmental factors that affect populations. The students can choose to investigate a particular environmental factor (change in temperature, deforestation, etc.) or a catastrophic event (volcanic eruption, tsunami, etc.) The student or teacher can choose the methods of completion for the activity (essay, poster, etc).

**Intervention**

- Give students a short article with information (or computer information) on two different organisms. They read the article or information (you may choose to read aloud) then together list the features the organisms have. After, discuss how the features may be helpful for the organisms in their particular environment. Allow students to practice more with two different organisms.

**Real World Context**

### Examples, Observations, and Phenomena

- Variation in the appearance of plants and animals of the same species may be caused by both differences in nutrition, disease, or other environmental factors and by the differences of in inherited genetic traits. Students generally recognize variations very easily within their own species but cannot always distinguish environmental from genetically influenced traits. In situations where genetically identical twins were raised in environments with different nutrition and exposure to diseases and other environmental factors they displayed greater differences in appearances as adults than twins raised in the same environment.

- Students can observe variations in nature. Some plants receive more sunlight, due to either competition or an object obstructing the light, than others therefore growing taller. Some may become infested with parasites limiting their growth and survival. After discussing human variation, it may be easier for students to understand variation among plants of the same species.

- The case of the peppered moth shoes how pollution caused by the industrial revolution caused populations changes. The darker moths were able to survive better and pass on their traits living in the more polluted forest while the lighter colored moths survived better in the unpolluted forests.

- Evolution at this grade level refers to behavioral and physical characteristics that allow animals to survive better in a particular environment as well as how there characteristics may have changed over time.
### Grade 5

**Unit 3 Part B – Species Adaptation and Survival**

#### Content Expectation

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<tr>
<th>L.OL.05.11</th>
<th>Explain how behavioral characteristics (adaptation, instinct, learning, habit) of animals help them to survive in their environment.</th>
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</table>
| **Instructional Clarifications** (Teacher Notes) | - Explain is to clearly describe by means of illustrations (drawing) demonstrations, and/or verbally how behavioral characteristics help animals survive in their environment.  
- Learned behavior may become a habit.  
- *Examples of a learned behavior:* birds coming to a bird feeder, raccoons getting into garbage cans to look for food.  
- *Examples of a habit:* some animals are active at night and may be protected from predators that are active during the day.  
- *Example of instinct:* a bird building a nest is an instinctive (unlearned behavior). All birds of the same species build the same type of nest. |
| **Assessment Clarifications** | - Some behavioral characteristics such as birds coming to a bird feeder, raccoons getting into garbage can to look for food, nocturnal activity, and nest building help animals to survive in their environment.  
- Give examples of behaviors due to adaptation, instinct, learned, and habit. |

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<th>L.OL.05.12</th>
<th>Describe the physical characteristics (traits) of organisms that help them survive in their environment.</th>
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</table>
| **Instructional Clarifications** (Teacher Notes) | - Describe is to tell or depict in spoken or written words how physical traits allow organisms to survive in their environment.  
- Observe and relate physical characteristics of plants and animals to the ways in which these traits may improve their survival. Examples: thorns or spines discourage plant eaters, webbed feet improve the swimming ability of animals making it possible for them to better avoid predators or get food, shapes of bird beaks/bills adapt them to using certain types of foods, mammals have specialized teeth adapted for eating certain types of foods. |
| **Assessment Clarifications** | - Specific physical characteristics such as thorns or spines, webbed feet, shape of beak/bill, and specialized teeth help improve the organisms’ chances for survival. |

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<th>L.OL.05.13</th>
<th>Describe how fossils provide evidence about how living things and environmental conditions have changed.</th>
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| **Instructional Clarifications** (Teacher Notes) | - Describe is to tell or depict in spoken or written words how physical traits allow organisms to survive in their environment.  
- Plant and animal types that live today and somewhat resemble fossil plants and animals indicate that living things have changes as the environment has changed. For example: whales once being land animals.  
- Some plants and animals exist only as fossils and not as living things today. |
| **Assessment Clarifications** | - Fossils indicate that environmental factors have led to changes of particular organisms. For example: whales as land animals |

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<th>L.OL.05.14</th>
<th>Analyze the relationship of environmental change and catastrophic events (e.g. volcanic eruption, floods, asteroid impact, tsunami) to species extinction.</th>
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| **Instructional Clarifications** (Teacher Notes) | - Analyze means to carefully examine by identifying key factors in the relationship between species extinction and either environmental change or other catastrophic events.  
- Catastrophic events may change widespread environmental conditions such as world temperatures (volcanic eruption dust and gases) or destroy habitat (tsunamis, hurricanes, tornados) leading to species extinction.  
- Records of mass extinctions follow evidence of catastrophic events such as asteroid impacts.  
- Localized catastrophic events such as tsunamis and volcanic eruptions may eliminate species with limited ranges and/or numbers, such as those existing only on one or a few ocean islands. |
Assessment Clariﬁcations
- Link catastrophic events (volcanic eruption, ﬂoods, asteroid impact, tsunami) to species extinction.
- Link speciﬁc environmental changes due to catastrophic events to a species extinction.

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<tr>
<th>Inquiry Processes</th>
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<tr>
<td>S.IP.05.11 Generate scientiﬁc questions about motion based on observations, investigations, and research.</td>
<td>2</td>
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<tr>
<td>S.IP.05.12 Design and conduct scientiﬁc investigations showing traits/characteristics and how they are inﬂuenced by the environment and genetics.</td>
<td>3</td>
</tr>
<tr>
<td>S.IP.05.13 Use tools and equipment appropriate to scientiﬁc investigations of environmental inﬂuence on characteristics and traits and characteristics improving survival rate (research materials, plants, soil of varying nutrient levels).</td>
<td>1</td>
</tr>
<tr>
<td>S.IP.05.14 Use metric measurement devices in the investigation of environmental factors on plant growth (height in centimeters, volume of water in milliliters, etc.).</td>
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<tr>
<td>S.IP.05.15 Construct charts and graphs from data and observations while investigating heredity and factors affecting populations and traits.</td>
<td>2</td>
</tr>
<tr>
<td>S.IP.05.16 Identify patterns in data from investigations of behavioral, physical, and environmental factors affecting traits and changes in populations.</td>
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<th>Inquiry Analysis and Communication</th>
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<td>S.IA.05.11 Analyze information on behavioral and physical characteristics and environmental inﬂuences on traits from data tables and graphs to answer scientiﬁc questions.</td>
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<tr>
<td>S.IA.05.12 Evaluate data, claims, and personal knowledge of traits, changes in traits/characteristics over time and degree of organism similarity through collaborative science discourse.</td>
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<tr>
<td>S.IA.05.13 Communicate and defend ﬁndings of observations and investigations using evidence of students traits and factors inﬂuencing traits.</td>
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<tr>
<td>S.IA.05.14 Draw conclusions from sets of data from multiple trials of a scientiﬁc investigation on environmental inﬂuence on traits.</td>
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<tr>
<td>S.IA.05.15 Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data while conducting research on environmental factors causing change in species/organisms over time.</td>
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<td>S.RS.03.11 Evaluate the strengths and weaknesses of claims, arguments, and data recorded investigating inﬂuences on traits.</td>
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<td>S.RS.03.12 Describe limitations in personal and scientiﬁc knowledge on heredity and traits as well as how the environment inﬂuenced these traits.</td>
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<td>S.RS.03.13 Identify the need for evidence in making scientiﬁc decisions while investigating factors inﬂuencing traits.</td>
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<tr>
<td>S.RS.03.15 Demonstrate scientiﬁc concepts of heredity, traits and characteristics through various illustrations, performances, models, exhibits, and activities.</td>
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Cross-Curricular Connections

**Literacy Integration**

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<tr>
<td>R.WS.05.04 Know the meaning of words encountered frequently in grades-level reading and oral language contexts.</td>
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<tr>
<td>R.CM.05.02 Retell through concise summarization grade-level narrative text and informational text.</td>
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<tr>
<td>R.CM.05.03 Analyze global themes, universal truths, and principles within and across text to create a deeper understanding by drawing conclusions, making inferences, and synthesizing.</td>
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### Writing

**R.CM.03.04**
Apply significant knowledge from grade-level science, social studies, and mathematics texts. In addition to instructional examples given, students need to read concepts in textbooks and other appropriate texts. They are expected to know vocabulary pertinent to the unit. Students should incorporate information read in texts with that learned while engaged in activities.

**W.GN.05.04**
Use the writing process to produce and present a research project; use a variety of resources to gather and organize relevant information into central ideas and supporting details for a teacher-approved narrowed focus question and hypothesis.

**W.PR.05.01**
Set a purpose, consider audience, and replicate authors’ styles and patterns when writing a narrative or informational piece.

**W.PR.05.02**
Apply a variety of pre-writing strategies for both narrative and informational writing (e.g., graphic organizers such as maps, webs, Venn diagrams) in order to generate sequence, and structure ideas (e.g., role and relationships of characters, settings, ideas, relationship of theory/evidence, or compare/contrast).

**W.PR.05.03**
Draft focused ideas using linguistic structures and textual features needed to clearly communicate information composing coherent, mechanically sound paragraphs when writing compositions.

**W.PR.05.04**
Revise drafts based on constructive and specific oral and written response to writing by identifying sections of the piece to improve organization and flow of ideas (e.g., position/evidence organizational pattern, craft such as titles, leads, endings and powerful verbs).

**W.PR.05.05**
Proofread and edit writing using grade-level checklists and other appropriate resources both individually and in groups.

**W.SP.05.01**
In the context of writing, correctly spell frequently encountered words (e.g., roots, inflections, prefixes, suffixes, multi-syllabic); for less frequently encountered, use structural clues (e.g., letter/sound, rime, morphemic) and environmental sources (e.g., word walls, word lists, dictionaries, spell checkers).

**S.CN.05.01**
Use common grammatical structures correctly when speaking including irregular verbs to express more complex ideas.

**S.CN.05.02**
Adjust their use of language to communicate effectively with a variety of audiences and for different purposes including research, explanation and persuasion.

**S.CN.05.03**
Speak effectively using varying modulation, volume, and pace of speech to indicate emotions, create excitement, and emphasize meaning in narrative and informational presentations.

**S.CN.05.04**
Present in standard American English if it is their first language (Students whose first language is not English will present in their developing version of standard American English).

**S.DS.05.01**
Engage in interactive, extended discourse to socially construct meaning in book clubs, literature circles, partnerships, or other conversation protocols.
- Students are expected to engage in cooperative or social learning during activities that are directed in pairs or small groups.
- Students need to appropriately and effectively present information orally to classmates.

### Mathematics Integration

#### Number and Operations

**N.ME.05.08**
Understand the relative magnitude of ones, tenths, and hundredths and the relationship of each place value to the place to its right.

**N.MR.05.15**
Multiply a whole number by powers of 10: 0.01, 0.1, 1, 10, 100, 1000, and identify patterns.

**N.FL.05.16**
Divide numbers by 10’s, 100’s, 1000’s using mental strategies.

#### Measurement

**M.UN.05.03**
Compare the relative sizes of one cubic inch to one cubic foot, and one cubic centimeter to one cubic meter.

**M.UN.05.04**
Convert measurements of length and weight within a given system using easily manipulated numbers.
| D.RE.05.01 | Read and interpret line graphs, and solve problems based on line graphs, e.g., distance-time graphs, and problems with two or three line graphs on same axes, comparing different data.  
• Students will interpret the data from the engage and explore activity associated with species adaptation and survival.

Students analyze line graphs representing population changes among species over time. They can compare this graph to one depicting catastrophic events or other environmental changes to interpret any connection. |
| D.AN.05.03 | Given a set of data, find and interpret the mean and mode. |