

# **Unit 5: Animal Structure and Function (Structure, Function, and Information Processing)**

Content Area: **Science**  
Course(s): **Science Gr 4**  
Time Period: **February**  
Length: **23 Days**  
Status: **Published**

## **Title Section**

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## **Department of Curriculum and Instruction**



**Belleville Public Schools**

**Curriculum Guide**

## **Science: Grade 4**

# **Unit 5: Animal Structure and Function**

**Belleville Board of Education**

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**Belleville, NJ 07109**

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Board Approved: September 23, 2019

## **Unit Overview**

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### **HMH Science Dimensions, Unit 4 - Lesson 1:**

- **Engage:** "Can You Explain It?" lesson
- **Explore/Explain:** "Plant Dissection" and "What's Inside?," and "Can Plants Move?" lessons and hands-on activity (Exploration 1, 2, & 3)
- **Elaborate:** "Discover More" extension activity
- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

### **HMH Science Dimensions, Unit 4 - Lesson 2:**

- **Engage:** "Can You Explain It?" lesson
- **Explore/Explain:** "Why Do Plants Have Flowers?," "What If Plants Don't Produce Flowers?," and "On the Move" lessons and hands-on activity (Exploration 1, 2, & 3)
- **Elaborate:** "Discover More" extension activity
- **Evaluate:** "Lesson Check" and "Lesson Roundup" assessments (formative/summative)

### **HMH Science Dimensions, Unit 4 - Performance Task (Flower Parts):**

- **Define Task**
- **Research**
- **Make A Plan**
- **Dissect and Illustrate**
- **Communicate**

### **HMH Science Dimensions, Unit 4 - Unit Project (Plant and Animal Partnerships):**

- **Research and Plan**
- **Analyze Results**

- **Claims, Evidence, and Reasoning**

## **Enduring Understanding**

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- External animal structures serve functions in growth, survival, behavior, and reproduction.
- Conditions in different environments can limit or control what characteristics animals that live in those environments can have to survive.
- Animals have adapted to the environments in which they live.
- Animals have internal parts with many functions.
- There are similarities and difference in the internal structure of animals.
- Internal structure help support survival and behavior for animals.
- Different parts of the body system have different receptors.

## **Essential Questions**

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- **What are external structures of animals?**
- **How do external animal structures assist with growth, survival, behavior, and reproduction?**
- **What structures do animals have in common?**
- **How do structures function similarly and differently?**
- **What are internal structures of animals?**
- **What are the functions of internal animal parts?**
- **How do internal animal structures support survival and behavior?**
- **How do senses work?**

## **Exit Skills**

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**By the end of Grade 4, Science Unit 5, the student should be able to:**

- Ask questions and define problems
- Construct explanations and design solutions
- Define and delimit engineering problems
- Develop possible solutions
- Optimize the design solution
- Analyze the influence of science, engineering, and technology on society and the natural world

## **New Jersey Student Learning Standards (NJSLS-S) & NGSS**

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SEP - Engaging in Argument from Evidence

SEP - Developing and Using Models

DCI - Structure and Function

DCI - Information Processing

DCI - Electromagnetic Radiation

CCC - Systems and System Models

### [NextGen Science Standards](#)

|                 |                                                                                                                                                                                             |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4-LS1-1         | Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.                                  |
| 4-LS1-2         | Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. |
| 4-LS1-1.LS1.A.1 | Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.                                                 |

## **Interdisciplinary Connections**

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Do the Math! p. 308

|             |                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MA.4.OA.A.3 | Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. |
| MA.4.G.A.3  | Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.                                                                                                                                                            |

## **Learning Objectives**

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**In Unit 5, students will demonstrate the ability to:**

HMH Science Dimensions, Unit 5 - Lesson 1:

- **Construct** an argument that explains how external animal structures serve functions in growth, survival, behavior, and reproduction
- **Support** argument with evidence about the function and structure of animal parts
- **Determine** the importance of external structures of animals

HMH Science Dimensions, Unit 5 - Lesson 2:

- **Compare and Contrast** the internal structure of animals
- **Analyze** how internal structures work through a hands-on activity
- **Determine** the importance of internal structures of animals

HMH Science Dimensions, Unit 5 - Lesson 3:

- **Differentiate** between the function of different receptors
- **Asses** the effectiveness of having senses
- **Analyze** how receptors word in a body system

Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy. These are useful in writing learning objectives, assignment objectives and exam questions.

| Remember  | Understand    | Apply       | Analyze       | Evaluate  | Create      |
|-----------|---------------|-------------|---------------|-----------|-------------|
| Choose    | Classify      | Choose      | Categorize    | Appraise  | Combine     |
| Describe  | Defend        | Dramatize   | Classify      | Judge     | Compose     |
| Define    | Demonstrate   | Explain     | Compare       | Criticize | Construct   |
| Label     | Distinguish   | Generalize  | Differentiate | Defend    | Design      |
| List      | Explain       | Judge       | Distinguish   | Compare   | Develop     |
| Locate    | Express       | Organize    | Identify      | Assess    | Formulate   |
| Match     | Extend        | Paint       | Infer         | Conclude  | Hypothesize |
| Memorize  | Give Examples | Prepare     | Point out     | Contrast  | Invent      |
| Name      | Illustrate    | Produce     | Select        | Critique  | Make        |
| Omit      | Indicate      | Select      | Subdivide     | Determine | Originate   |
| Recite    | Interrelate   | Show        | Survey        | Grade     | Organize    |
| Select    | Interpret     | Sketch      | Arrange       | Justify   | Plan        |
| State     | Infer         | Solve       | Breakdown     | Measure   | Produce     |
| Count     | Match         | Use         | Combine       | Rank      | Role Play   |
| Draw      | Paraphrase    | Add         | Detect        | Rate      | Drive       |
| Outline   | Represent     | Calculate   | Diagram       | Support   | Devise      |
| Point     | Restate       | Change      | Discriminate  | Test      | Generate    |
| Quote     | Rewrite       | Classify    | Illustrate    |           | Integrate   |
| Recall    | Select        | Complete    | Outline       |           | Prescribe   |
| Recognize | Show          | Compute     | Point out     |           | Propose     |
| Repeat    | Summarize     | Discover    | Separate      |           | Reconstruct |
| Reproduce | Tell          | Divide      |               |           | Revise      |
|           | Translate     | Examine     |               |           | Rewrite     |
|           | Associate     | Graph       |               |           | Transform   |
|           | Compute       | Interpolate |               |           |             |
|           | Convert       | Manipulate  |               |           |             |
|           | Discuss       | Modify      |               |           |             |
|           | Estimate      | Operate     |               |           |             |
|           | Extrapolate   | Subtract    |               |           |             |
|           | Generalize    |             |               |           |             |
|           | Predict       |             |               |           |             |



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### Suggested Activities & Best Practices

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HMH Science Dimensions, Unit 5 - Lesson 2:

- **Compare and Contrast** the internal structure of animals
- **Analyze** how internal structures work through a hands-on activity

- **Determine** the importance of internal structures of animals

HMH Science Dimensions, Unit 5 - Lesson 3:

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- **Analyze** how receptors word in a body system

## **Assessment Evidence - Checking for Understanding (CFU)**

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- Admit Tickets
- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- HMH End-of-Year Test (Benchmark)
- HMH Mid-Year Test (Benchmark)
- HMH Performance-based Assessment (Alternative)
- Illustration
- Journals
- KWL Chart
- Learning Center Activities
- Multimedia Reports
- Outline
- Question Stems
- Quickwrite
- Quizzes (Formative)
- Red Light, Green Light
- Self- assessments
- Study Guide

- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Unit review/Test prep
- Unit tests (Summative)
- Web-Based Assessments
- Written Reports

## **Primary Resources & Materials**

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HMH Science Dimensions: Teacher Edition, Student workbooks, online resources

HMH Equipment & Safety Kits

HMH Science Dimensions S&E Leveled Readers

- On Level: How do Plants and Animals Reproduce and Adapt?
- Extra Support: How do Plants and Animals Reproduce and Adapt?
- Enrichment: Exploring the Galapagos Islands

## **Ancillary Resources**

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Science Weekly, Scholastic News, NewsELA, YouTube/TeacherTube, National Geographics Kids, Science Channel

<https://ngss-assessment.portal.concord.org/>

## **Technology Infusion**

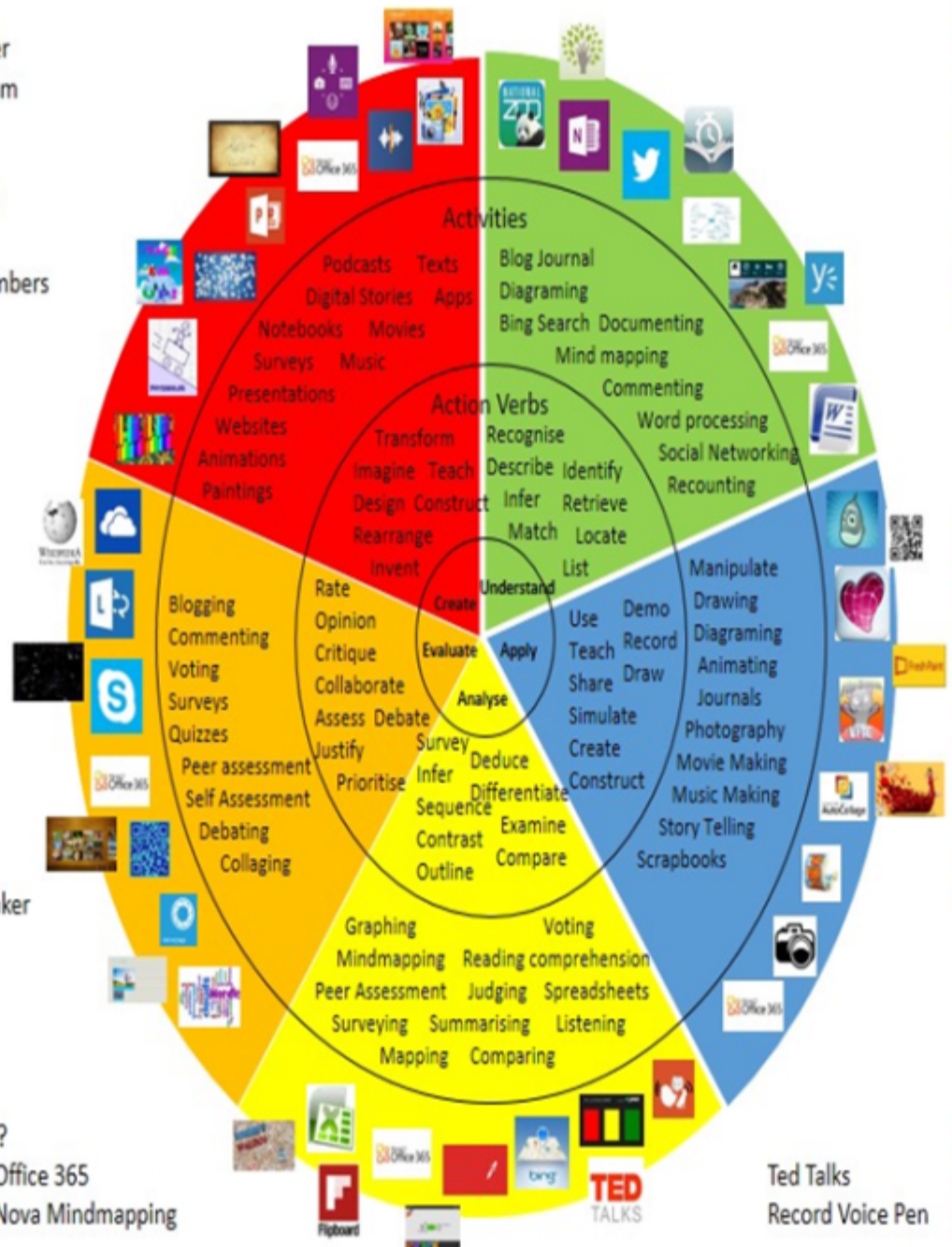
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Originally taken from <http://www.coetail.com/vzimmer/files/2013/02/IPadagogy-Wheel.001.jpg>  
And adapted for Windows 8.1 devices by Charlotte Beckhurst @CharBeckhurst

Wikipedia  
Skydrive  
Lync  
SkyMap  
Skype  
Office 365  
Puzzle Touch  
Easy QR  
Memorylage  
Life Moments  
Word Cloud Maker

Ted Talks  
Record Voice Pen



## **Alignment to 21st Century Skills & Technology**

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Mastery and infusion of **21st Century Skills & Technology** and their Alignment to the core content areas is essential to student learning. The core content areas include:

- English Language Arts;
- Mathematics;
- Science and Scientific Inquiry (Next Generation);
- Social Studies, including American History, World History, Geography, Government and Civics, and Economics;
- World languages;
- Technology;
- Visual and Performing Arts.

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CRP.K-12.CRP1.1 | Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.                    |
| CRP.K-12.CRP4.1 | Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome. |
| CRP.K-12.CRP5.1 | Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.                                                                                                                                                                               |
| CRP.K-12.CRP6.1 | Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.                                                             |

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## **21st Century Skills/Interdisciplinary Themes**

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

## 21st Century Skills

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- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

## Differentiation

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### Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe

- Small group setting

#### **Hi-Prep Differentiations:**

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

#### **Lo-Prep Differentiations**

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

## **Special Education Learning (IEP's & 504's)**

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- printed copy of board work/notes provided
- additional time for skill mastery

- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

## **English Language Learning (ELL)**

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- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarify
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of work presented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers

- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

## **At Risk**

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- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of work presented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

## **Talented and Gifted Learning (T&G)**

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- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and

growth opportunities

- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge