# Unit 4: Plants and Animal Structures (Structure, Function, and Information Processing)

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## Title Section

## Department of Curriculum and Instruction

**Belleville Public Schools**

**Curriculum Guide**

# Science: Grade 1

# Unit 4: Plants and Animal Structures

**Belleville Board of Education**

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## Unit Overview

In this unit, children will ...

- describe how parts of a plant help it to survive and grow
- explain how parts of an animal help it to survive and grow
- relate the shape and stability of structures to their function(s)
- use evidence to describe how plants and animals process and respond to information
- describe how human-made products are designed by applying knowledge of the natural world
- use observations to design a solution to a human problem by mimicking how plants use their parts to survive

## Enduring Understanding

- Students will define a problem and design a solution by applying the structure and function of the parts of water plants.
- students will be able to design a solution to a human problem by mimicking how plants use their parts to survive and grow.
- students will be able to design a solution to a human problem by mimicking how animals use parts of their body for protection.
- students will be able to design a solution to a human problem by mimicking how animals use their body parts to meet their needs.
- students will be able make observations to describe how behaviors of living things help them grow and survive.

## Essential Questions

Students can be prepared for their Unit 4 Project by asking the following questions:

- What helps you stay healthy and grow?
- What helps you stay safe?
- How do you get things you need to stay healthy and safe?

**Essential Questions:**

- What parts help plants live?
- How did the maple seed give people ideas to make the helicopter blades?
- What body parts help animals stay safe?
- What ideas can you get from a hedgehog to keep something safe?
- What body parts help animals meet their needs?
- How can you get an idea from the giraffe to make a tool that reaches high places?
- How do plants and animals respond to their environment?
- Why are the trees growing in unusual ways?

## Exit Skills

By the end of Grade 1, Science Unit 4, the students should be able to:

- explain how nature helps people solve problems
- offer a reasonable explanation about how the maple see gave people the idea for the helicopter blades
- explain that a hedgehog's spines keep it safe
- identify an idea to keep something safe that has a structure and function similar to a hedgehog's spine
- describe the problem their idea could help solve
- effectively communicate how people use the ideas they get from animals to solve problems
- explain how people use animal's structures as models for human-made structures with similar functions
- identify a plant's needs for sunlight and water
- describe how trees respond to their environment
- explain the cause and effect relationship that results in trees having unusual growth patterns

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

SEP - Constructing Explanations and Designing Solutions

SEP - Asking Questions and Defining Problems

SEP - Developing and Using Models

SEP - Analyzing and Interpreting Data

DCI - Structure and Function

DCI - Defining and Delimiting Engineering Problems

DCI - Optimizing the Design Solution

DCI - Information Processing

CCC - Structure and Function

CCC - Cause and Effect

CCC - Influence of Engineering, Technology, and Science on Society and the Natural World

NextGen Science Standards

| | |
|---|---|
| 1-LS1-1 | Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. |

## Interdisciplinary Connections

Do the Math! pp. 143, 168, 182, 198

**Lesson 1:**

**Connections to Math**

1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

**Connections to English Language Arts**

W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

R.1.1 Ask and answer questions about key details in a text.

**Lesson 2:**

**Connections to Math**

1.MD.A.2 Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (length and 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.

**Connections to English Language Arts**

W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

**Lesson 3:**

**Connections to Math**

1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

**Connections to English Language Arts**

W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

**Lesson 4:**

**Connections to Math**

MP.4 Model with mathematics.

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.

**Connections to English Language Arts**

W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

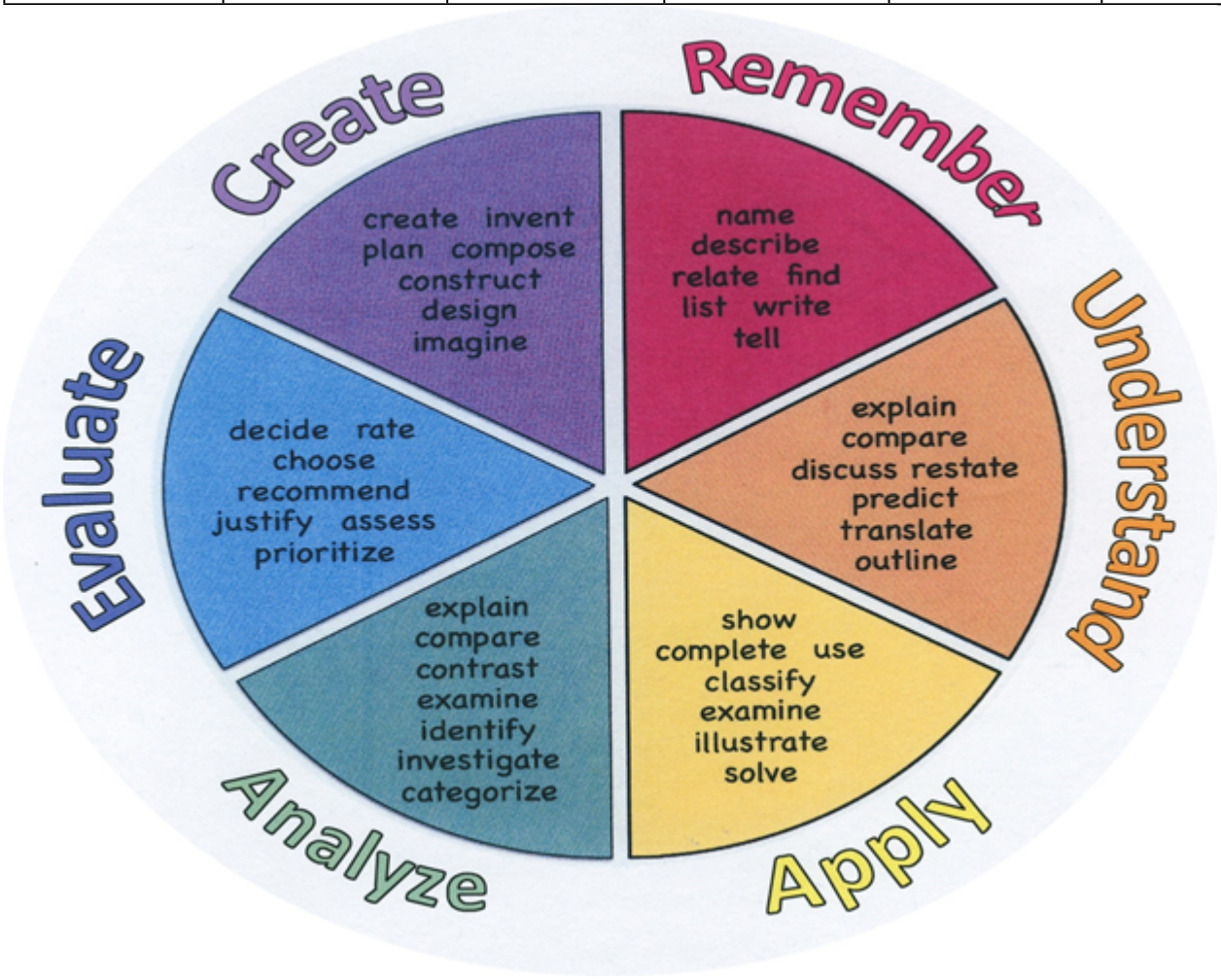
## Learning Objectives

- SWDAT design a solution to a human problem by mimicking how plants use their parts o survive and grow
- SWDAT use an idea from a plant to design and build something that would help keep them cool
- SWDAT use a design process to solve their problem
- SWDAT design a solution to a human problem by mimicking how animals use parts of their body for protection
- SWDAT identify a problem related to keeping feet safe and use ideas about animals body parts to develop a solution to a problem
- SWDAT design a solution to a human problem by mimicking how animals use their body parts to meet their needs
- SWDAT use an idea from an animal to design and build a tool that would help them pick up food
- SWDAT make observations to describe how behaviors of living things help them grow and survive
- SWDAT make observations from an investigation to construct an evidence-based account for a plant's growth pattern

**Action Verbs:** Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy.

| 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<br>Predict | | | | |




## Suggested Activities & Best Practices

Vocabulary Game- Make a Match

Hands-On Activities: Use Ideas from Plants to Design a Solution, Design a Shoe, Use Ideas from Animals, & Change How a Plant Grows

Interactive Activity: Build a Safety Helmet

Unit Project

Take It Further

- Plants We Eat
- New Body Parts for Animals
- Hear Like a Bat
- Insects in Winter

## Assessment Evidence - Checking for Understanding (CFU)

- Admit Tickets
- Anticipation Guide
- 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
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes (Formative)
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep
- Unit tests (Summative)
- Web-Based Assessments
- Written Reports

## Primary Resources & Materials

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

HMH Equipment & Safety Kits

HMH Science Dimensions S&E Leveled Readers

- On Level: What Can We Learn About Animals? What is a Plant?
- Extra Support: What Can We Learn About Animals? What is a Plant?
- Enrichment: Amazing Animals; Weird and Wacky Plants

## Ancillary Resources

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

## Technology Infusion

HMH Science Dimensions "Explore online" sections embedded throughout online teacher/student edition to

extend student learning

HMH Science Dimensions "Can you explain/solve it?" videos embedded throughout online teacher/student edition

Computer-based assessments

## Alignment to 21st Century Skills & Technology

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. |

## 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

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

## Differentiation

Leveled Readers (On Level, Extra Support, Enrichment)

Reinforce Vocabulary- To help students remember the vocabulary word, have them take turns mimicking a partner's behavior and use the word in a sentence. Remind students to look for the highlighted word as they proceed through the lesson.

RTI/ Extra Support- Supply students with plants for hands-on discovery. Provide examples of different plant parts. Allow students to explore each part and encourage them to use descriptive words for each part.

Extension- Students who want to find out more can do research on plants in different environments.

ELL- Point out labels, pictures, captions, and headings throughout the lesson. Discuss real-life connections to content, and provide hands-on examples of materials when possible.

(ELL support resources include a glossary in English and Leveled Readers in Spanish and English)

**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)

- Provide modifications dictated by the IEP/504 Plan
- Modify assessment format
- Check work frequently for understanding

- 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)

- Provide study guides
- Allow students to correct errors (looking for understanding)
- Allowing productions (projects, models, timelines, demonstrations, charts, etc.) to demonstrate student's learning

- teaching key aspects of a topic.  Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- 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 workpresented 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

- Tutoring by peers
- Using videos, illustrations, pictures, and drawings to explain or clarify
- Decreasing the amount of work represented or required

- 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 workpresented 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)

- Advanced problem-solving
- Higher order, critical and creative thinking skills, and discovery

- Utilize project based learning for a greater depth of knowledge

- 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