

Anoka Hennepin K-12 Curriculum Unit Plan

Department: Science

Course/Grade Level: 3rd

Unit Title: Structures of Life – Bean Plants and Crayfish
one-hour days OR 34 half-hour days

Number of Lessons/Days:17

Unit Summary: This is a life science unit designed for 3rd grade. The unit will provide students with opportunities to observe, compare, categorize and care for select organisms. Students will understand the relationship between plant and animal life cycles. Working in cooperative groups, students will identify features of plants and animals and sort them on the basis of observable characteristics. Students will investigate and synthesize how the environment can effect growth and survival of live organisms. At the completion of this unit, disposal of crayfish should follow district guidelines received via e-mail.

DESIRED RESULTS (STAGE 1)

Program Understanding and/or Minnesota State/Local/Core Standards and Technology Standard(s) addressed:

- II. Students will understand that there is a diversity of life forms, which are interdependent and interconnected.
- V. Students will understand that the process of inquiry is the collection of information verified through observation and experimentation, which allow scientist to critically analyze, draw conclusions and make inferences about the natural world.
- VI. Students will understand that scientists use various communications to share knowledge and promote understanding about our natural world.
- VIII. Students will understand that scientists use and design technology to answer questions, share information and solve problems.

MN Standards and Benchmarks:

- 3.1.1.1 Scientists work as individuals and in groups, emphasizing evidence, open communication and skepticism.
 - 3.1.1.1.1 Provide evidence to support claims other than saying "Everyone knows that," or "I just know," and question such reasons when given by others.
- 3.1.1.2 Scientific inquiry is a set of interrelated processes incorporating multiple approaches that are used to pose questions about the natural world and investigate phenomena.
 - 3.1.1.2.1 Generate questions that can be answered when scientific knowledge is combined with knowledge gained from one's own observations or investigations.

- 3.1.1.2.2 Recognize that when a science investigation is done the way it was done before, even in a different place, a similar result is expected. *For example:* Investigate the sounds produced by striking various objects.
- 3.1.1.2.3 Maintain a record of observations, procedures and explanations, being careful to distinguish between actual observations and ideas about what was observed. *For example:* Make a chart comparing observations about the structures of plants and animals.
- 3.1.1.2.4 Construct reasonable explanations based on evidence collected from observations or experiments.
- 3.1.3.4 Tools and mathematics help scientists and engineers see more, measure more accurately, and do things that they could not otherwise do.
 - 3.1.3.4.1 Use tools, including rulers, thermometers, magnifiers and simple balances, to improve observations and keep a record of the observations made.
- 3.4.1.1 Living things are diverse with many different characteristics that enable them to grow, reproduce and survive.
 - 3.4.1.1.1 Compare how the different structures of plants and animals serve various functions of growth, survival and reproduction. *For example:* Skeletons in animals and stems in plants provide strength and stability.
 - 3.4.1.1.2 Identify common groups of plants and animals using observable physical characteristics, structures and behaviors. *For example:* Sort animals into groups such as mammals and amphibians based on physical characteristics. *Another example:* Sort and identify common Minnesota trees based on leaf/needle characteristics.
- 3.4.3.2 Offspring are generally similar to their parents, but may have variations that can be advantageous or disadvantageous in a particular environment.
 - 3.4.3.2.1 Give examples of likenesses between adults and offspring in plants and animals that can be inherited or acquired. *For example:* Collect samples or pictures that show similarities between adults and their young offspring.
 - 3.4.3.2.2 Give examples of differences among individuals that can sometimes give an individual an advantage in survival and reproduction.

Overarching Understanding(s) from Curriculum Map/Course Understandings:

Students will understand that...

- plants and animals have different structures that serve various functions and allow scientists to classify them.

Essential Question(s) from Curriculum Map. Course Essential Questions:

To understand, students will need to consider such questions as....

- How do species make adaptations?

- many characteristics of an organism are inherited from its parents and these can be advantageous or disadvantageous in a particular environment.
- scientific investigations require us to ask questions, make observations, plan and create tests to verify predictions with evidence and data, and to generate further questions.
- scientists use a variety of written and oral communication skills to support and discuss their findings.
- scientists work individually and collaboratively to understand the natural world and learn from one another.

Students will understand that...

Topical Understanding(s) Specific to Unit:

- species adapt to the environment in order to survive
- each plant and animal has different inherited characteristics that serve different functions in growth, survival, and reproduction
- scientists use their observations to make predictions and to generate further questions
- scientists use and interpret data/evidence from multiple observations and investigations to draw logical conclusions

- How do scientists share what they know with others?
- How do scientists use observations to construct reasonable explanations?

To understand, students will need to consider such questions as....

Topical Essential Questions for Unit:

- How do the characteristics of an organism make it easier or more difficult for them to survive in an environment?
- How do scientists classify plants and animals?
- What do I do with my scientific questions?
- How do scientists use observations to construct reasonable explanations?
- How do tools help improve scientific observations and data collection?

To understand, students will need to...

know... Students will need to know the following in order to... (e.g. facts, concepts, generalizations, rules, theories, principles)

- seeds are found in the fruit of a plant.
- plants and animals have observable characteristic or properties.
- a life cycle is the life history of an organism.
- a habitat is the community in which an organism lives.
- plants and animals need water, food and space to survive
- plants and animals make adaptations to survive in their habitat.
- the structure of organisms change over time to adapt to the environment to which it lives.

ESSENTIAL VOCABULARY**MCA Essential Vocabulary:**

- **acquired-** to get or come to have
- **amphibians-** animals that are born in water and then live on land.
- **appendage-**a body part attached to the main trunk of the body (e.g. arms, legs, wings, fins)
- **behavioral characteristics-**actions of animals or plants (e.g. hibernation, nesting, mimicry, migration, reaction time)
- **birds-** animals with two wings, two feet and a body covered with feathers.
- **coverings-** scales, feathers, skin or hair on an organism

be able to... (Students will be able to DO.. skills, procedures, processes)

- describe and compare the properties of germinated seeds.
- observe exhibited behaviors of specific organisms.
- explain the components of a life cycle.
- compare and contrast different life cycles.
- make predictions about the behavior of a crayfish.
- identify common groups of plants and animals using observable physical characteristics, structures and behaviors.
- predict plant growth based upon changes in environmental factors.

Advanced learners may:

- analyze the effect of an oil spill or hurricane on the habitat and life cycle of an organism of choice.
- research an animal or plant that has adapted over time and create a timeline representing how and why the adaptation occurred.

- **crustaceans**- aquatic animals that have hard, flexible shells, jointed legs, and two pairs of antennae.
- **fruit**- the part of a flowering plant where the seeds are.
- **inherited**- characteristics received from a parent.
- **insects**- small animals with a hard covering over their body. Most have bodies divided into three parts, and most have six legs and one or two pairs of wings.
- **leaves**-usually green flat parts of a plant or tree that grows from the stem or branch.
- **mammals**- animals that have hair and feed their babies with milk from the mother.
- **needles**- the leaves of an evergreen tree.
- **offspring**- the child or young of a plant or animal
- **physical characteristics**- features (eg. size, color, skin covering) of plants and animals that are different from others
- **reproduction**- the process by which living things create young or offspring.
- **reptiles**- cold-blooded animals with a skeleton inside its body and dry scales or hard plates on its shell.
- **scales**- many hard, thin plates that cover fish, reptiles and certain other animals.
- **structural characteristics/structures**- a part of a plant or animal.
- **survival**- to stay alive.

Structures of Life Unit Essential Vocabulary:

- biologist- a scientist who studies living things.
- bristles- short hairs on the crayfish that help them sense things in their environment.

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- carapace- the main body shell of crustaceans.
- classify/classification – to identify and sort based on how things are alike
- cotyledon- main parts of the seed that supply food for the young plant.
- dormant- when something is resting or inactive.
- embryo- a tiny young plant (with leaf and root) inside a seed.
- germination- when a seed begins to develop into a plant after a period of dormancy.
- hydroponics- the growing of plants in water and nutrients.
- nutrient- chemicals plants need to survive and grow.
- pincers- the big jointed leg like structures (body parts) in the front of a crayfish.
- seed coat- the layer covering the seed.
- swimmerets- small leg like structures (body parts) under the tail of a crayfish.

ELL and Emergent Learners should start by learning basic unit vocabulary including: hydroponics, seed coat, cotyledon, crustaceans, and swimmerets. The other vocabulary may not be mastered.

- Common misunderstanding(s):
 - Tomatoes and cucumbers are vegetables.
 - All life cycles are the same.
 - All organisms reproduce in the same way.
 - Hydroponics exists only in laboratory situations.