Kindergarten Companion Document

K-Unit 3: Basic Needs of Living Things

Table of Contents Page 1

Introduction to the K-7 Companion Document
An Instructional Framework

Overview

The Michigan K-7 Grade Level Content Expectations for Science establish what every student is expected to know and be able to do by the end of Grade Seven as mandated by the legislation in the State of Michigan. The Science Content Expectations Documents have raised the bar for our students, teachers and educational systems.

In an effort to support these standards and help our elementary and middle school teachers develop rigorous and relevant curricula to assist students in mastery, the Michigan Science Leadership Academy, in collaboration with the Michigan Mathematics and Science Center Network and the Michigan Science Teachers Association, worked in partnership with Michigan Department of Education to develop these companion documents. Our goal is for each student to master the science content expectations as outlined in each grade level of the K-7 Grade Level Content Expectations.

This instructional framework is an effort to clarify possible units within the K-7 Science Grade Level Content Expectations. The Instructional Framework provides descriptions of instructional activities that are appropriate for inquiry science in the classroom and meet the instructional goals. Included are brief descriptions of multiple activities that provide the learner with opportunities for exploration and observation, planning and conducting investigations, presenting findings and expanding thinking beyond the classroom.

These companion documents are an effort to clarify and support the K-7 Science Content Expectations. Each grade level has been organized into four teachable units- organized around the big ideas and conceptual themes in earth, life and physical science. . The document is similar in format to the Science Assessment and Item Specifications for the 2009 National Assessment for Education Progress (NAEP). The companion documents are intended to provide boundaries to the content expectations. These boundaries are presented as “notes to teachers”, not comprehensive descriptions of the full range of science content; they do not stand alone, but rather, work in conjunction with the content expectations. The boundaries use seven categories of parameters:

a. **Clarifications** refer to the restatement of the “key idea” or specific intent or elaboration of the content statements. They are not intended to denote a sense of content priority. The clarifications guide assessment.
b. **Vocabulary** refers to the vocabulary for use and application of the science topics and principles that appear in the content statements and expectations. The terms in this section along with those presented

within the standard, content statement and content expectation comprise the assessable vocabulary.

c. **Instruments, Measurements and Representations** refer to the instruments students are expected to use and the level of precision expected to measure, classify and interpret phenomena or measurement. This section contains assessable information.
d. **Inquiry Instructional Examples** presented to assist the student in becoming engaged in the study of science through their natural curiosity in the subject matter that is of high interest. Students explore and begin to form ideas and try to make sense of the world around them. Students are guided in the process of scientific inquiry through purposeful observations, investigations and demonstrating understanding through a variety of experiences. Students observe, classify, predict, measure and identify and control variables while doing “hands-on” activities.
e. **Assessment Examples** are presented to help clarify how the teacher can conduct formative assessments in the classroom to assess student progress and understanding
f. **Enrichment and Intervention** is instructional examples the stretch the thinking beyond the instructional examples and provides ideas for reinforcement of challenging concepts.
g. **Examples, Observations, Phenomena** are included as exemplars of different modes of instruction appropriate to the unit in which they are listed. These examples include reflection, a link to real world application, and elaboration beyond the classroom. These examples are intended for instructional guidance only and are not assessable.
h. **Curricular Connections and Integrations** are offered to assist the teacher and curriculum administrator in aligning the science curriculum with other areas of the school curriculum. Ideas are presented that will assist the classroom instructor in making appropriate connections of science with other aspects of the total curriculum.

This Instructional Framework is NOT a step-by-step instructional manual but a guide developed to help teachers and curriculum developers design their own lesson plans, select useful portions of text, and create assessments that are aligned with the grade level science curriculum for the State of Michigan. It is not intended to be a curriculum, but ideas and suggestions for generating and implementing high quality K-7 instruction and inquiry activities to assist the classroom teacher in implementing these science content expectations in the classroom.

Kindergarten Unit 3:
Basic Needs of Living Things

Content Statements and Expectations

Background –

The Kindergarten content expectations for life science build a greater understanding of the basic needs of all living things and classify living and nonliving things. Through direct classroom experiences of living things and their habitats, students begin to think beyond movement as the defining characteristic of life and recognize characteristics of living things with eating, breathing, and reproducing.

K - Unit 3: Basic Needs of Living Things

Big Ideas (Key Concepts)

- All living things have basic needs (air, water, food and space).
- Nonliving things do not have these basic needs.

Clarification of Content Expectations

Standard: Organization of Living Things

Content Statement – L.OL.E.1
Life Requirements- Organisms have basic needs. Animals and plants need air, water, food and space. Plants also require light. Plants and animals use food as a source of energy and as a source of building material for growth and repair.

Content Expectations

L.OL.00.11 Recognize that living things have basic needs.

Instructional Clarifications
1. Recognize is to identify as by previous experience or perceive as truth that living things have basic needs.
2. The needs of living things is limited to air, water, food and space to survive.
3. Living things include plants and animals.
4. Plants require air, water and sunlight to make their own food.

Assessment Clarifications
1. Living things need air, water, food and space to survive.
2. Living things include plants and animals.

L.OL.00.12 Identify and compare living and nonliving things.

Instructional Clarifications
1. Identify means recognize the differences between living and nonliving things.
2. Students identify living things as plants and animals.
3. Living things need air, water, and food to survive.
4. Nonliving things do not need water, food or need air.
5. Nonliving things include things that once lived and things that never lived (logs versus rocks).

Assessment Clarifications
1. Students identify living things as plants and animals.
2. Living things need air, water, and food to survive.

3. Nonliving things do not take in water, food or need air.

Content Statement - E.SE.E.1
Earth Materials – Earth materials that occur in nature include rocks, minerals, soils, water, and the gases of the atmosphere. Some earth materials have properties that sustain plant and animal life.

Content Expectation

E.SE.00.12 Describe how earth materials contribute to plant and animal life.

Instructional Clarifications

1. Describe is to tell or depict in spoken or written words how soil and water contribute to plant and animal life.
2. At this level, students describe how plants grow in the soil and need water to grow and survive.
3. At this level, students describe how animals eat plants that grow in the soil, need water, and air to breathe to grow and survive.

Assessment Clarifications

1. At this level, students describe how plants grow in the soil and need water to grow and survive.
2. At this level, students describe how animals eat plants that grow in the soil, need water, and air to breathe to grow and survive.

Inquiry Process, Inquiry Analysis and Communication, Reflection and Social Implications

Inquiry Processes
S.IP.00.11 Make purposeful observation of the natural world using the appropriate senses.
S.IP.00.12 Generate questions based on observations using the senses.
S.IP.00.13 Plan and conduct simple investigations using the senses.
S.IP.00.14 Manipulate simple tools (hand lens, balances) that aid observation and data collection.
S.IP.00.16 Construct simple charts from data and observations.
Inquiry Analysis and Communication
S.IA.00.12 Share ideas about the senses through purposeful conversation.
S.IA.00.13 Communicate and present findings of observations.
S.IA.00.14 Develop strategies for information gathering (ask an expert, use a book, make observations, conduct simple investigations, and watch a video).
Reflection and Social Implications
S.RS.00.11 Demonstrate science concepts about the senses through illustrations, performances, models, exhibits, and activities.

Vocabulary

Critically Important-State Assessable	Instructionally Useful
living things	space
basic needs	sunlight
nonliving things	once living
air	dead
water	organisms
food	
plants	
animals	
survive	

Instruments, Measurements, Representations

Observation Tools	Representation
hand lens	Observation of living and non-living things.
pencils	Construct simple charts that demonstrate living and non-living. (T-chart)

Instructional Framework

The following Instructional Framework is an effort to clarify possible units within the K-7 Science Grade Level Content Expectations. The Instructional Framework provides descriptions of instructional activities that are appropriate for inquiry science in the classroom and meet the instructional goals. Included are brief descriptions of multiple activities that provide the learner with opportunities for exploration and observation, planning and conducting investigations, presenting findings, and expanding thinking beyond the classroom. The Instructional Framework is ***NOT*** *a step-by-step instructional manual, but a guide intended to help teachers and curriculum developers design their own lesson plans, select useful and appropriate resources and create assessments that are aligned with the grade level science curriculum for the State of Michigan.*

Instructional Examples

Life Requirements: L.OL.00.11, L.OL.00.12

Objectives

- Make observations of plants and animals and their interactions.
- Focus on the needs of each and how they help the organism survive.
- Make observations on differences of living and nonliving things living things and that living things have specific needs.

Engage and Explore

- Brainstorm what is needed for organisms that will live in a classroom habitat. (L.OL.00.11)
- Students will set up a habitat to include living and non-living organisms for example: in a terrarium with soil, seeds, worms, rocks, and bark. (L.OL.00.11, L.OL.00.12, S.IP.00.11, S.RS.00.11)
- An aquarium could be used with appropriate materials.
- Students will observe the habitat over time, taking class notes/pictures/ journal entries - on any changes that they see over the course of the unit. (S.IP.00.11, S.IP.00.12)
- Plant need experiments may be done concurrently (for example – watering one seed and not another, or putting some in the dark and some in the light, etc.) (L.OL.00.11**,** S.IP.00.11, S.IP.00.13)

Explain and Define

- Living things have needs that sustain them and nonliving things do not. Identify living and nonliving things in the habitat. Students identify the needs of living things. (L.OL.00.11, L.OL.00.12)
- Make a t chart to help organize the living and nonliving characteristics. (L.OL.00.12, S.IP.00.16)
- Address the misconception that seeds need sunlight to sprout and grow. Discuss the results of seeds in the light and seeds in the dark and how seeds do not get direct sunlight when planted in the ground. (L.OL.00.11)

Elaborate and Apply

- Air, water, food and space should be elaborated on. (L.OL.00.11)
- Compare/Contrast the basic needs of plants with animals and humans. (L.OL.00.11)
- Discuss the Earth materials soil, air, and water and how they contribute to the growth and survival of plants and animals. (E.SE.00.12)
- Determine if other living things would be able to survive in our classroom habitat and what may be the limiting factors. (L.OL.00.11, S.IA.00.12, S.IA.00.13)
- Explore many outside habitats and compare them to the classroom habitat. (S.IP.00.11, S.IP.00.12, S.IA.00.12, S.IA.00.13)

Evaluate Student Understanding

Formative Assessment Examples

- Check student observation/pictures/journal entries to determine if observations are appropriate/applicable. (L.OL.00.11)
- Student conversations in their groups can be used as basis for monitoring understanding. (L.OL.00.11)

Summative Assessment Examples

- Circle the living things. (L.OL.00.12)
- Circle the needs of living things. (L.OL.00.11)
- Choose the thing that is not alive. (L.OL.00.12)
- Choose the thing that does not use food. (L.OL.00.11)
- Choose the thing that does not need air. (L.OL.00.11)

Enrichment

- Students plan and build a habitat using an aquarium, terrarium or other habitat and some different organisms.

Intervention

- Break students into research groups that focus on one aspect of the ecosystem e.g. Plant group, worm group, rock group, soil group, and have students report out on the happenings of their group over observable time.
- Then rotate through each group for more experience.

Examples, Observations, and Phenomena (Real World Context)

All organisms have basic needs (air, water, food or nutrition, and space). Young learners have a difficult time relating the basic needs of living things to themselves and other familiar animals. The recognition of plants as living things and the identification of trees as plants is also key at this stage in their understanding of living and non-living things.

The classification of things as living and non-living is the first step in classification of organisms. All living things have basic life functions: need food, grow, and have young. Living things include all plants and animals, including humans. Non-living things include sand, rocks, clouds, and all man-made items. Children's toys are often given characteristics of living things that may add to the confusion of young learners. Media also attach living characteristics to non-living things that students may site as living.

Parts of living things, such as leaves, branches, and molted skin are examples of once living things that cannot continue living without the whole organism. It does not grow, need food, air, or water, or have young.

Literacy Integration

Reading

R.IT.00.04 respond to individual and multiple texts by finding evidence, discussing, illustrating, and/or writing to reflect, make meaning, and make connections.

R.CM.00.01 begin to make text-to-self and text-to-text connections and comparisons by activating prior knowledge and connecting personal knowledge and experience to ideas in text through oral and written responses.

R.CM.00.04 apply significant knowledge from grade-level science, social studies, and mathematics texts.

There are many good trade books available for learning about living and non-living things and their needs for survival. Many books focus on single organisms or habitats.

One Small Square, Donald Silver, 1997
Under One Rock, Anthony D. Fredericks, 2001
Animals and Their Babies*, Melvin Berger, 1993*
The Tiny Seed, Eric Carle, 1987
Wonderful Worms, Linda Glaser, 1992

- After reading or listening to the reading of texts that describe living things and their needs to survive, students discuss their experiences with living things, both plants and animals. Students relate how they find their food, water, air, and space in their homes and neighborhoods to that of animals in their habitats.

Writing

W.GN.00.03 write a brief informational piece such as a page for a class book using drawings, words, word-like clusters, and/or sentences.
W.GN.00.04 contribute to a class research project by adding relevant information to a class book including gathering information from teacher-selected resources and using the writing process to develop the project.

- Write a book on your classroom habitat experience.
- Write a fact book about one of the animals or plants observed in the classroom or schoolyard.

Speaking

S.CN.00.01 explore and use language to communicate with a variety of audiences and for different purposes including problem-solving, explaining, looking for solutions, constructing relationships, and expressing courtesies.

S.DS.00.03 respond to multiple text types by reflecting, making meaning, and making connections.

- Read your book to the class.
- Students share their observations of living and non-living things.
- Students engage in conversation about the classroom habitat and the needs for the living organisms in the habitat.

Mathematics Integration

G.GS.00.02 Identify, sort, and classify objects by attribute and identify objects that do not belong in a particular group.

- Students sort things using the criteria of living and non-living.
- Students make observations of different leaves and sort by similar size, shape, color and other attributes.