Youngstown City Schools Model Curriculum Framework  
Kindergarten Quarter 1: Thinking Like a Scientist

<table>
<thead>
<tr>
<th>Grade Band Theme: Observations of the Environment</th>
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<th>Topic: The Atmosphere</th>
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<th><strong>Time Frame:</strong> 3 weeks</th>
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<td><strong>Science Inquiry and Application</strong></td>
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<td>- I can plan and conduct simple investigations.</td>
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<td>- I can employ simple equipment and tools to gather data and extend the senses.</td>
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<td>- I can use appropriate mathematics with data to construct reasonable explanations.</td>
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<table>
<thead>
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<th><strong>Condensed Content Statements:</strong></th>
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<td>- I can observe and ask questions about the natural environment.</td>
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<tr>
<th><strong>Common Misconceptions:</strong></th>
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<tr>
<td>- The process of science is purely analytic and does not involve creativity. (“When I work on a science investigation, I can only follow the directions, without adding any ideas of my own.”)</td>
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<tr>
<td>- Investigations that don’t reach a firm, definite conclusion are useless and unpublishable. (“This investigation didn’t prove what I set out to prove, so it’s a waste of time.”)</td>
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<tr>
<td>- Science is boring. (“Science is boring!”)</td>
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<table>
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<tr>
<th><strong>Prior Knowledge</strong></th>
<th><strong>Current Content Elaboration</strong></th>
<th><strong>Future Application of the Concept</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(none at this level)</td>
<td>The emphasis of this content statement is to build a grade appropriate understanding of the basic science processes they will be using throughout elementary school, including: observe, classify, communicate, experiment, predict, problem solve, measure, infer, hypothesize, control variables, interpret data, design, representation, reasoning and proof, safety, connect, compare, and draw conclusions.</td>
<td>Student mastery will include understanding of the following: Students will use all of the basic science process skills appropriately and understand their importance in conducting investigations and communicating the results of those communications to others.</td>
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## Daily “Thinking Like a Scientist” Plan

The following framework is used at all grades (K-12) for the first 12 days of school. During this initial unit, students are to understand lab safety, experience a scientific investigation, learn how to analyze data, become familiar with the process skills, be introduced to the lab form for the grade level and begin writing in the grand band mode of scientific writing.

Day 1: This day is used as an introduction to this year’s science class. This is the time to discuss the role of a scientist, what it means to be scientifically literate, to discuss roles in a scientific investigation (e.g. timer, material getter, recorder), and “tour” the science classroom.

Day 2: Today is set aside for class time on lab safety, procedures, scientific equipment, and procedures. Every teacher has procedures and preferences on how the students will operate in their science classroom. This is the day to discuss these and to focus on safety rules.

Day 3: Begin the first lab, emphasizing safety procedures.

Day 4: Complete the first lab, emphasizing safety procedures.

Day 5: Use this day to wrap up lab safety and why it is important. Safety videos, games, and songs can be used this day.

Day 6: Introduce the grade level’s lab form for the year, pointing out the new components for the grade band (K-2: draw/write conclusions and results; 3-5: completing/labeling graphs, materials, procedures, developing hypotheses; 6-8: creating/reading graphs, data collection, independent/dependent variables; 9-12: research, introduction, conclusion, completing lab reports). Review process skills.

Day 7: Complete the second lab, focusing this time on procedures, process skills, the lab form, and collecting data.

Day 8: Complete the data analysis for the lab done on Day 7.

Day 9: Repeat the second lab, changing one variable at a time.

Day 10: Complete the data analysis for the repeat lab. Compare both sets of data and discuss differences, variable changes, etc.

Day 11: Introduce the focus of scientific writing for this year (K-2: journals, 3-5: SA/ERs and Science Notebooking, 6-8: Science Notebooking and SA/ERs, and 9-12: Researching for Comprehensive Introductions and Conclusions).

Day 12: Continue Day 11’s work. Wrap up learning points for this first unit. Possibly create collaborative posters/signs/materials about the major learning objectives for this first unit to post around the room/lab for the year to remind scientists of their work.
### Scientific Literacy (Reading, Writing, Speaking, and Listening Like a Scientist)

See “Thinking Like a Scientist: Bubbles” Lesson.

### Vocabulary

To strengthen science vocabulary skills teachers may select strategies from the *Instructional Strategies Guide: Enhancing Science Vocabulary Skills*. (Example: Pictionary, Scrabble, Sparkle, etc.)

Science Vocabulary Terms:

<table>
<thead>
<tr>
<th>observe</th>
<th>classify</th>
<th>communicate</th>
<th>experiment</th>
<th>predict</th>
</tr>
</thead>
<tbody>
<tr>
<td>problem solving</td>
<td>predict</td>
<td>problem solving</td>
<td>measure</td>
<td>infer</td>
</tr>
<tr>
<td>hypothesize</td>
<td>control variables</td>
<td>interpret data</td>
<td>design</td>
<td>representation</td>
</tr>
<tr>
<td>reasoning and proof</td>
<td>safety</td>
<td>connect</td>
<td>compare</td>
<td>draw conclusions</td>
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### Enrichment

Activity: Complete the Bubble Lab again, with a change in 2 variables. Draw the steps you followed and how the bubbles changed, if at all.

### Content Statement-Related Enrichment Centers (in the Instructional Strategies Resource Guide):

- Window Watchers (K)
- Part of a Whole (K)

### Classroom Portals/Technology

#### Discovery Education:

(http://streaming.discoveryeducation.com/)

- “Professor Fritz” (a segment of “Timothy Goes To School”)

#### SMART:

(Search the Smart Exchange site (http://exchange.smarttech.com) for these specific titles):

- “Sorting” (SMART Notebook Lesson)

#### Websites:

- “CSI: Tugboat Thug” (http://www.pbs.org/teachers/connect/resources/6581/preview/)
- “CSI: Squeak Sneak” (http://www.pbs.org/teachers/connect/resources/6030/preview/)
- “Robot Rover” (http://www.pbs.org/teachers/connect/resources/3993/preview/)
Thinking Like a Scientist: Bubbles
Kindergarten

Condensed Content Statement:

I can observe and ask questions about the natural environment.

I can plan and conduct simple investigations.

I can employ simple equipment and tools to gather data and extend the senses.

I can use appropriate mathematics with data to construct reasonable explanations.

I can communicate about observations, investigations, and explanations.

I can review and ask questions about the observations and explanations of others.

Lesson Summary:

This topic focuses on readying Kindergarten students for the year’s science investigations and studies by familiarizing them with the methods and processes of science in the elementary school.

Suggested Time Frame:

3 weeks

Materials:

- Natural materials (leaves, grass, bugs, etc.)
- Hand lenses
- Pre-made bubble solution OR homemade bubbles (dish detergent, water, and glycerin)
- Scented oils (potpourri and essential cooking oils such as cinnamon and lemon)
- Variety of bubble-making tools, such as chenille stems (pipe cleaners), bubble wands, empty Pringles cans, fly swatters, bubble pipes, etc.
- Disposable pie pans or shallow plastic plates

Process Skills:

All Process Skills
Thinking Like a Scientist: Bubbles
Kindergarten

**Teacher Background**

Students will use all of the basic science process skills appropriately and understand their importance in conducting investigations and communicating the results of those communications to others.

**Teacher Notes**

The emphasis of this content statement is to build a grade appropriate understanding of the basic science processes they will be using throughout elementary school, including: observe, classify, communicate, experiment, predict, problem solve, measure, infer, hypothesize, control variables, interpret data, design, representation, reasoning and proof, safety, connect, compare, and draw conclusions.

This lesson is designed to get your students excited and ready for the investigations they’ll be completing this year in Kindergarten science. It’s not as formal as some of the later investigations, but it will give your students practice with how these investigations are set up in your class.

**Engage (Warm-up):**

Days 1 & 2

Start with a discussion of what scientists do. Students will probably have some vague ideas from TV, movies, and books, such as scientists being old men in lab coats who cook up crazy and possibly dangerous experiments in their basement laboratories. Allow students to share their ideas, then tell them that they might change these ideas since THEY’LL be scientists this year.

Introduce the idea that scientists must follow some basic rules in order to keep themselves and others safe. In our Kindergarten investigations, students will be assigned certain roles or jobs to help ensure that everyone stays safe and that we’re not wasting time or materials. Jobs in various classrooms may vary; however, basic jobs include a Timer, a Materials Gatherer, and a Recorder. Students should understand that some investigations will be done in small groups, while others may be teacher demonstration. The important thing will be that we work together and learn from the investigations, both those that turn out like we expect and those that may surprise us!

Spend some time in these beginning days showing where students will work on their investigations throughout the year, where the materials will be, and where Science Journals will be kept.
Thinking Like a Scientist: Bubbles  
Kindergarten

Days 3 - 6  
Explore  
Part 1

1. Students will begin their careers as Kindergarten investigators by working on some of the most basic process skills: observation, communication, classifying, and safety.

2. Provide some natural materials for the students to observe. Emphasize the use of the senses in observing the items. Are there any senses they should not use? (For safety’s sake, discourage tasters!) You may also choose to have students take a nature walk around the school to collect natural materials, but be sure to talk to them about having respect for nature and not destroying things they find outside. They can use hand lenses to get up-close to the things they’re observing. You may even wish to have a Bug House ready for the adventurous, non-squeamish students who will pick up anything that flies or crawls! Emphasize the importance of being a good scientist and lab partner by taking turns observing the items and sharing them amongst all of the other scientists in the class. What do we see? What do we hear? What do we smell? What do we feel? Students will communicate their ideas in small groups and with the class.

3. Ask students to look at all of the items collected and observed. Are there things that naturally seem to go together? For example, show a flower and a leaf. These items go together, or are similar, because they both grow on plants. Can students classify the items they observed into groups, or categories? Encourage them to come up with multiple ways to sort the objects. You may wish to record their ideas on chart paper.

4. Ask students to bring an object from home for Day 4. This can be an object from nature that they find in their homes (such as part of an indoor plant, with parent permission!), in their backyards, or somewhere in the neighborhood. Remind them that they must stay safe while obtaining the object; only go where their families allow them to go and pick up only what their families allow them to gather. On Day 4, you can repeat the observation, communication, and classification portion of this lesson; allow students to lead the discussions and the sorting activities.

5. On Day 5, wrap up the discussions of this investigation by reviewing the charts showing how they sorted the objects. Ask students why they think it’s so important to follow safety procedures during science investigations. Remind them that when they’re working on future investigations, if they have any questions about how to stay safe, it’s best to ask the teacher and to find out for sure!

By this point, students should have a basic understanding of some of the jobs scientists do. There’s a terrific video and song by the group They Might Be Giants entitled “Science is Real.” It explores the idea that while many things like unicorns and fairy tales are fun to read about, they differ from science in that science is a study of things that are real. This video can be accessed at: http://www.learninggamesforkids.com/science_songs/educational_videos_science_is_real_song.html
6. On Day 6, introduce the Lab Form the students will be working with this year and have a
discussion about the process skills they’ve practiced so far. Starting on Day 7, they’ll be using
this new form and the process skills in a new investigation, all about bubbles!

Days 7-12
Explore
Part 2

1. On Day 7, students will begin an investigation into bubbles. Have enough bubble solution
ready for at least 4 stations, among which the students will rotate. You can make your own
bubble solution using unscented dish detergent, water, and glycerin, which is available in
most drug stores; a recipe for the bubbles can be found at
http://www.stevespanglerscience.com/experiment/00000028. You can also scent the
different bubble stations using essential cooking oils (like peppermint or lemon, found in the
baking aisle) or potpourri oils (floral scents or spices, found in craft supply stores.) Each
station should have its own bubble-making contraptions; for instance, one station should use
the bubble wands that come with basic bubble solution, while another should use empty
Pringles cans with both ends removed. THIS INVESTIGATION IS BEST COMPLETED OUTSIDE!

2. In advance, work out a signal for your students to know when to rotate among the groups.
You may use a bell, lights, chimes, or voice cues, but whatever signal you choose, students
should understand that when they hear the signal, they should quickly and quietly clean up
what they’ve used at one center before moving on to the next. The signal you choose now
will probably be the one that you use throughout the year, so students will get to know it very
well!

3. For Day 7, the main purpose of the investigation is to help students practice the process skills
they’ve already learned: safety, communication, observation, and classification. Allow
students to rotate in small assigned groups among the stations and try the different methods
of creating bubbles at each station. Remind them that they can use MOST of their senses to
observe this investigation, but again, NO TASTING!

4. On Day 8, lead a discussion of what the students observed with the bubbles the day before.
Record their observations on the chart. Ask students to tell how they might change the
investigation; introduce the word “variable” if you feel it is appropriate for your student.
Lead them to understand that we can change one aspect of an investigation (a variable)
and find all new results, which is what students will be practicing on Day 9.

5. On Day 9, set out several bubble making stations (OUTSIDE) again, but this time with a
change in variable. For example, you may wish to have students make their own bubble
wands out of chenille stems, toilet paper tubes, or fly swatters; you may use the same
equipment from Day 7, but encourage them to blow harder or softer and observe the effect
this has on the bubbles; or you may change the temperature of the bubble solution (some at
room temperature, some heated briefly in microwave, and some refrigerated) to see if this
affects the bubbles at all. Once again, encourage students to lead their own discussions
during the group times and to follow your signal when it’s time to change centers.
Thinking Like a Scientist: Bubbles
Kindergarten

6. On Day 10, look back at both days’ investigations. Discuss what they observed was the same in both days and what differed during the two investigations. Did the change in variables change how big the bubbles were, or how long they lasted before popping, or any other aspect of the bubbles?

7. On Day 11, introduce (via overhead projector or document camera) the Science Journal format students will use this year in Kindergarten. With the class, complete one journal page in large format that the students can use as reference on Day 12, when they complete their own individual Science Journal pages.

8. Day 12: Students fill out their own Science Journals. Allow opportunity for students to share in small groups or with whole class what they’ve recorded in their journals.

Extensions/Additional Resources

Classroom Portals/Technology:

Discovery Education:

- “How Scientists Work: What Is Scientific Inquiry?” (all segments)—for teacher background
- “How Scientists Work: What Is the Scientific Method?” (all segments)—for teacher background
- “Professor Fritz” (a segment of “Timothy Goes to School”)

SMART Exchange:

- Learning Colors
- Warm and Cool Colors
- Color Stories
- How to Use a Ruler
- Non-Standard Measurement
- Textures
- Measuring Madness
- Magnifying Glass Observations
- Sorting
## Grade Band Theme: Observations of the Environment

*This theme focuses on helping students develop the skills for systematic discovery to understand the science of the physical world around them in greater depth by using scientific inquiry.*

## Topic: Physical and Behavioral Traits of Living Things

*This topic focuses on observing, exploring, describing, and comparing living things in Ohio.*

### Condensed Content Statements:

Living things are different from nonliving things.

- I can observe, explore, describe, and compare living things in Ohio.
- I can observe and ask questions about the natural environment.

### Time Frame: 6 weeks

### Science Inquiry and Application

During the years of PreK-4 all students must become proficient in the use of the following scientific processes, with appropriate laboratory safety techniques, to construct their knowledge and understanding in all science content areas:

- I can plan and conduct simple investigations.
- I can employ simple equipment and tools to gather data and extend the senses.
- I can use appropriate mathematics with data to construct reasonable explanations.
- I can communicate about observations, investigations, and explanations.
- I can review and ask questions about the observations and explanations of others.

### Common Misconceptions:

- Anything that moves is alive. (“The truck is moving down the street so it is alive.”)
- Plants and trees are nonliving. (“Plants and trees don’t move or talk so they are non-living”)
- All non-living things are man-made. (A rock is non-living so it is man-made.)
- *Benchmarks for Science Literacy* contains a detailed discussion of energy. Scroll to section heading E for detailed information of grade-appropriate exposure to energy.
- *AAAS’ Benchmarks 2061 Online, Chapter 15, 5a, Diversity of Life*, states that children use criteria such as movement, breath, reproduction and death to determine whether things are alive, which leads some to think that fire, clouds and the sun are alive. Some plants and animals are considered nonliving due to interpretation of the given criteria.
### Prior Knowledge

(none at this level)

### Current Content Elaboration

The emphasis of this content statement is to build a grade-appropriate understanding of what it means to be living, not to distinguish living and nonliving.

There are different kinds of living things. At this grade level the focus is on macroscopic familiar organisms (grass, trees, flowers, cats, dogs, horses to provide a few examples). Some grade appropriate characteristics include that living things respond to stimuli, grow, and require energy.

Living things respond to stimuli. The responses described at this grade level should be easy to observe; for example, fish in an aquarium responding to a stimulus (food). Living things grow; for example, growing plants (not necessarily from seeds.)

Animals need food; plants make their own food. From grades Pre-K to four, exposures to many different examples of energy being used in everyday situations is appropriate. A detailed discussion of energy is not appropriate at this grade level, because energy is not scientifically explained until grade three in physical science.

The emphasis of this content statement is to build a grade-appropriate understanding of what it means to be living, not to distinguish living and nonliving.

When studying living things, ethical treatment of animals should be employed. Respect for and proper treatment of living things should be modeled and taught. Shaking the container, rapping on bug bottles, unclean cages or aquariums, leaving living things in the hot sun, or exposure to extreme temperatures (hot or cold) should be avoided. NSTA has a position paper to provide guidance in the ethical use and treatment of animals in the classroom.

http://www.nsta.org/about/positions/animals.aspx

### Future Application of the Concept

**Student mastery will include understanding of the following:**

- Living things include anything that is alive or has ever been alive.
- Living things have specific characteristic traits.
- Living things grow and reproduce. Living things are found almost everywhere in the world. There are somewhat different kinds in different places.

**Grades 1-2:** This content builds to understanding that living things use the environment to acquire what they need in order to survive.

**Grades 3-5:** Food webs, food chains (energy transfer)

**Grades 6-8:** Modern Cell Theory, reproduction (Characteristic of living things)
**Youngstown City Schools Model Curriculum**  
**Framework Kindergarten Quarter 1: Life Science**

### Expectations for Learning: Cognitive Demands and Visions into Practice

<table>
<thead>
<tr>
<th>Recalling Accurate Science (Quadrant A)</th>
<th>Interpreting and Communicating Science Concepts (Quadrant B)</th>
<th>Demonstrating Science Knowledge (Quadrant C)</th>
<th>Designing Technological/Engineering Solutions Using Science Concepts (Quadrant D)</th>
</tr>
</thead>
</table>
| Provide an example of how plants and animals interact with each other for food, shelter, and nesting.  
(Example Question: How does a bird interact with a tree? How does the interaction help the bird? How does the interaction help the tree?) | Explain how to show respect and proper care for living things in the classroom, at home, or in public place (zoos, aquariums, or pet stores.)  
(Example Question: Why is caring for living things important? How would you tell others to care for living things?) | Ask which type of flower attracts more birds, butterflies, bees, or moths? Investigate by growing a flower garden and keeping an accurate record of which types of animals visit each chosen type of flower.  
(Example Question: What conclusions can you draw based on the evidence we found? Why do you think this?) | Design an environment that will support a classroom pet. Provide for all of its needs including by not limited to food, water, air, shelter, cleanliness, and safety.  
(Example Question: Prove that this environment meets all of the basic needs of this pet.) |

### Resources:

#### Textbook Lessons
- What are Living and Nonliving Things?
- What Are Animals Like?
- What Do Animals Need?
- How Do Animals Grow and Change?
- What Are Living and Nonliving Things?
- What Are Animals Like?
- What Do Animals Need?
- How Do Animals Grow and Change?
- What Are Plants Like?
- What Do Plants Need?
- How Do Plants Grow and Change?
- Places to Live and Grow

#### Literature:
- Living and Nonliving by Carol K. Lindeen
- Is It Living or Nonliving? By Rebecca Rissman
- Are You Living? A Song about Living and Nonliving by Laurie Purdie Salas
- What Is a Living Thing? By Bobbie D. Kalman
### Instructional Strategies and Resources

This section provides additional support and information for educators. These are strategies for actively engaging students with the topic and for providing hands-on, minds-on observation and exploration of the topic, including authentic data resources for scientific inquiry, experimentation and problem-based tasks that incorporate technology and technological and engineering design. Resources selected are printed or Web-based materials that directly relate to the particular Content Statement. It is not intended to be a prescriptive list of lessons.

- Observe a variety of living things in the wild or the classroom and ask questions about what makes them living. *How do they get food? Where do they live? How do they take care of their young?* If using classroom pets, NSTA has a position paper to provide guidance in the ethical use and treatment of animals in the classroom.
- The [Ohio Department of Natural Resources](https://www.ohiodnr.gov/) provides information about observing animals in the wild while promoting safety for children and wildlife.
- ODNR’s [Guide to Using Animals in the Classroom](https://www.ohiodnr.gov/) provides guidance, explains legally which organisms may be collected and offers limited advice on the use of animals in the classroom.
- [Ohio’s Outdoor Bill of Rights](https://www.ohiodnr.gov/) provides information about outdoor education experiences available for children with summaries of research that support helping children reconnect with nature. Ohio’s parks have a variety of trails, nature centers and yearly activities to provide opportunities to study living things in the natural environment.

### Scientific Literacy (Reading, Writing, Speaking, and Listening Like a Scientist)

**Vocabulary** (words that should be fluently used by the student in writing and speaking during this unit)

To strengthen science vocabulary skills teachers may select strategies from the [Instructional Strategies Resource Guide: Enhancing Science Vocabulary Skills](https://www.nsta.org/store/). (Example: Pictionary, Scrabble, Sparkle, etc.).

<table>
<thead>
<tr>
<th>living</th>
<th>nonliving</th>
<th>characteristics</th>
<th>traits</th>
</tr>
</thead>
<tbody>
<tr>
<td>similarities</td>
<td>differences</td>
<td>variation</td>
<td>group</td>
</tr>
<tr>
<td>real</td>
<td>pretend</td>
<td>environment</td>
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</tr>
</tbody>
</table>

**Enrichment**

Activity: Create a biome (drawing, diorama, etc.) for a plant or animal showing how the animal receives its basic needs in that environment.

### Content Statement-Related Enrichment Centers (in the Instructional Strategies Resource Guide):

- Real or Not (K)
- Real and Make-Believe Memory Game (K)
- One Small Square (1)

### Classroom Portals/Technology

#### Discovery Education:

- “Living and Nonliving Things” (all segments)

#### SMART:
([Search the Smart Exchange site for these specific titles](http://exchange.smarttech.com))

- “Living and Nonliving Things”

#### Websites:

“Ourselves” ([http://www.bbc.co.uk/schools/scienceclips/ages5_6/ourselves.shtml](http://www.bbc.co.uk/schools/scienceclips/ages5_6/ourselves.shtml)) At this interactive website, students explore and sort several things including a horse, an ant, a hat and more. Students can see how each moves and determine if it is
### Youngstown City Schools Model Curriculum
#### Framework Kindergarten Quarter 1: Life Science

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
<th>Link</th>
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<tbody>
<tr>
<td>“Many Kinds of Families” (a segment of “All About Families”)</td>
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<tr>
<td>“The Blue Dragon: What a Waste!”</td>
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<tr>
<td>“Pete’s a Pizza”</td>
<td>(Have students discuss what would be needed to create a real pizza and compare it with the pretend play of Pete and his parents.)</td>
<td></td>
</tr>
<tr>
<td>“Mother and Babies Sort (Animal and Human”)</td>
<td>(SMART Notebook Lesson)</td>
<td><a href="http://www.amnh.org/ncslet/online_field_journal/index.html">http://www.amnh.org/ncslet/online_field_journal/index.html</a></td>
</tr>
<tr>
<td>“Alive or Not”</td>
<td>(from the SMART Table Activity Pack)</td>
<td></td>
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<tr>
<td>“Am I Alive?”</td>
<td>(from the SMART Table Activity Pack)</td>
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<tr>
<td>“Describing Animals”</td>
<td>(from the SMART Table Activity Pack)</td>
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<tr>
<td>“Living Things Change Their Environment”</td>
<td>(SMART Notebook Lesson, Submitted by S. Kirkland)</td>
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<tr>
<td>“Group the Animals”</td>
<td>(from the SMART Table Activity Pack)</td>
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<tr>
<td>“Who Is In My Family?”</td>
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<tr>
<td>“Comparing Animals”</td>
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<tr>
<td>“Comparing Plants”</td>
<td>(from the SMART Table Activity Pack)</td>
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Living or not. When done, students can take a quiz on what they have learned.

- “Online Field Journal” ([http://www.amnh.org/ncslet/online_field_journal/index.html](http://www.amnh.org/ncslet/online_field_journal/index.html))
Real versus Not Real
Kindergarten

Suggested Time Frame:
1 day

Condensed Content Statement:
Living things are different from nonliving things.

Living things include anything that is alive or has ever been alive.

Living things have specific characteristic traits.

Living things grow and reproduce.

Living things are found almost everywhere in the world. There are somewhat different kinds in different places.

Materials:
- Little Red Riding Hood
- Three Little Wolves and the Big Bad Pig
Optional:
- Other fairy tales

Vocabulary:
Real
Pretend
Fake
True
Characteristics

Process Skills:
Compare
Representation

Lesson Summary:
This lesson helps the children to explore the difference between fact and fiction - real and pretend, focusing on fairy tales, nursery rhymes and TV programs. The lesson also explores how older people are portrayed in the tales, rhymes and programs that the children are familiar with, emphasizing that the way older people are portrayed is not always accurate.
Real versus Not Real
Kindergarten

**Teacher Background**

One of the biggest reasons that children have trouble comprehending what they read is that they do not make mental pictures. Television and computer games do not contribute to this important development. While picture books are great for young learners, chapter books without pictures or with few pictures do encourage kids to have mental pictures of what is happening.

**Teacher Notes**


**Engage (Warm-up)**

Start with a discussion of the difference between fact and fiction - real and pretend. Ask the children about games they play and favorite make-believe characters. The following may be helpful:

1. **What is the difference between real and pretend?** Do you ever play “Let's Pretend” games? Who do you play these games with? What kind of “let's pretend” games do you play? When you play pretend games, you might pretend to be a mom or a dad - but are you really a mom or a dad? Elicit differences between real and pretend.

2. **Some stories and characters are pretend or make-believe.** What are your favorite stories, TV programs, films, songs and rhymes? Are the characters in these stories and rhymes real (Ex. Pied Piper and Rapunzel)? Why do we have these stories if the characters are not real? (Possible answer: To entertain us, to make a point or to tell a cautionary tale. Ex. Cinderella was good and she went to the ball). Ask the children for an example of each type of story (Ex. Red Riding Hood, The Fisherman's Wife, The Boy Who Called Wolf).

3. **Some stories are real.** Stories and TV programs can be based on reality (Ex. stories about when parents or grandparents were small, news on TV and so on). Some of these stories, although true, may be interpreted in different ways (Ex. in sports news, supporters of the winning team think it is good news, while supporters of the losing team think it is bad news; or, we tell children that sweets are bad for their teeth, which is true, but to children it’s bad news).

4. **Some things are not make-believe, but are not true either.** People may say things that are not true or correct (Ex. ads for toys tell children that they have to have all of these toys, but they know they can’t have all of them; ads tell children that toys will make them happy, but this isn't always the case either). So we can't always believe what we see and hear. **Draw a**
Real versus Not Real
Kindergarten

picture. Ask the children to draw a picture of themselves playing their favorite “Let’s Pretend” game or a picture of their favorite make-believe character (Ex. Humpty Dumpty).

Explore (Instructional Strategies)

1. Read Little Red Riding Hood to the class.

2. Discuss the story. The following questions may helpful:
   Is it real or pretend? How did the wolf manage to dress up in Grandma’s clothes? Are Red Riding Hood and her Grandma real? Is the wolf real?
   Is this story anything like real life? Are real Grandmas strong or are they not? Would a real Grandma be fooled by the wolf’s imitation of Red Riding Hood’s voice? Emphasize that some older people are strong and some are not, just like other people, and that most older people would be too sensible to be taken in by the wolf.
   What older people are in other stories that you know? Discuss other stories featuring older people, for example:
   • The Elves and Shoemaker: the shoemaker and his wife were old, poor and tired. Are all older people poor and tired? Elicit examples from the children, or mention well-known older public or community figures.
   • The Grand Old Duke of York: he was powerful and used his position to show off. Do all older people like to show off?
   • The Old Woman Who Lived in a Shoe: she was cruel to the children. Are all older people cruel to children?
   • Old King Cole: he was a merry old soul. Are all older people good-humored?

3. Invite the children to discuss older characters from favorite TV programs, videos, comics or storybooks. Emphasize that older characters display a range of characteristics, just like the children themselves. For example, the grandfather from Rugrats is portrayed as absent-minded, but in one episode, he stays out late with his friends and feels bad next day, behavior that would be expected of someone much younger, and as a result is admonished by his adult son.

Interdisciplinary Connections

Role play - Red Riding Hood with a difference
Help the children to form groups. Allow each group to act out the story - with a difference. In this version of the story, Grandma doesn’t let the wolf in because she realizes that Red Riding Hood doesn’t have such a gruff voice. The wolf realizes that Grandma is too clever for him and disappears forever.
Assessment

1. How is a real pig like the ones in "The Three Little Pigs"? How is a real pig different from those pigs?
2. How do you know Franklin is not a real turtle? What makes him like a real turtle? What makes him different?
3. Do characters in stories always act like people in real life? Describe a character in a story who acts like you and me. Describe a different character who does things you and I cannot do.

Reteach Ideas

Story: The Three Little Wolves and the Big Bad Pig by Eugene Trivizas. Read the story to the class. This book is a version of this classic story with the roles reversed and emphasizes the idea, already introduced by the role-play, that characters do not always have to behave as we expect them to.

Closure

- Journal
- Quick Write
- Is everything in storybooks, TV and other media always correct?

Extensions/Additional Resources

Classroom Portals/Technology:

SMARTExchange:

- What is Real About Plants and Animals? (SMARTCreated)

Discovery Education:

- Pete's a Pizza (Have students discuss what would be needed to create a real pizza and compare it with the pretend play of Pete and his parents.)

Literature:

- Not a Box by Portis, A. (Use imagination to make pretend objects from a real box)
Living versus Nonliving
Kindergarten

Condensed Content Statement:

Living things are different from nonliving things.

Living things include anything that is alive or has ever been alive.

Living things have specific characteristic traits.

Living things grow and reproduce.

Living things are found almost everywhere in the world. There are somewhat different kinds in different places.

Lesson Summary:

Students will classify objects that they collect during a scavenger hunt on their school playground according to living and nonliving. They will then create “real” and pictographs that represent their data.

Materials:

- Worm
- Plant
- Rock
- Sheets of butcher paper with graph lines, 5
- Pictograph (to use as an example)
- Magazines
- Glue
- Scissors
- Scavenger hunt worksheets, 10
- Plastic grocery bags, 5
- Cut-outs of trees and cars
- Plastic lunch baggies, 3 per student
- Wet paper towel
- Bean seeds, 3 per student
- Concept book, Growing (from science series)

Vocabulary:

- Living
- Nonliving
- Characteristics

Process Skills:

- Compare
- Draw Conclusions
- Interpret Data
Living versus Nonliving
Kindergarten

Teacher Background

Young children often have difficulty characterizing things as living or nonliving. For example, they tend to describe anything that moves as alive. They also do not yet understand the cycle of life (birth, growth, death), and therefore classify as nonliving anything that has died. In science, “living” is used to describe anything that is or has ever been alive (dog, flower, seed, road kill, log); “nonliving” is used to describe anything that is not now nor has ever been alive (rock, mountain, glass, wristwatch). Over time, students will begin to understand that all living things grow, breathe, reproduce, excrete, respond to stimuli, and have similar basic needs like nourishment. Older students may even realize that all living things are made up of cells.

Engage (Warm-up)

Place a rock, a plant, and a worm on a table. Have students gather around and brainstorm what they observe. Make a class list of the similarities and differences between the three objects.

- How are the plant and the animal alike?
- How are these two different from the rock?
- What makes something living? What makes something nonliving?

Explore (Instructional Strategies)

Part 1
1. In groups of four, students will participate in a scavenger hunt around the playground. They will gather nine items, some living things and some nonliving things, as depicted on the scavenger hunt worksheet (students may need to get some of the items by cutting pictures out of magazines).

2. Once they have collected the objects (or pictures), they will return to the classroom and categorize the items into two piles, living and nonliving.

3. Have students show the class which pictures they cut out of the magazine. Ask: Why did you select those pictures? What makes those objects living or nonliving?

4. Students will create a “real” graph by placing the all of the items on the butcher paper. The students will count how many items are living and how many are nonliving on the graph.

5. They will create a pictograph by gluing cut-outs of trees (to represent living) and cars (to represent nonliving) on the sheet of butcher paper.

Part 2
1. Have students present their pictographs to the class.

2. Ask: What makes something living? What makes something nonliving? Which objects collected in the scavenger hunt were difficult to classify?
Living versus Nonliving
Kindergarten

3. Introduce the scientific characteristics of living and nonliving things. Come back to the initial brainstorming list used in “Engage” and focus on the concept that all living things grow and develop.

4. Read the concept book, Growing, to the class and have children identify the living and nonliving things in the book.

5. Ask: What do all living things need in order to grow? How do we get energy? How do plants get energy? What do plants need in order to grow?

6. Present 3 seeds to each student, and using the concepts they learned about living and nonliving things, discuss and vote on whether the seeds are living or not.

7. Have each student place one seed in a plastic bag with a wet paper towel in front of the window, place another seed in a plastic bag with a wet paper towel in the closet, and place a third seed in a plastic bag, without water in front of the window.

8. Challenge the students to observe the seed throughout the week.

9. Come back to the question later in the week to explore what happened to each of the seeds.

Interdisciplinary Connections

Students may graph the results of their seed growing activity on a 3-column graph, included.

Assessment

1. Give an example of a living thing. How do you know it is a living thing?
2. The seeds we planted cannot walk or talk. How can you be sure they are living things?
3. Is a teddy bear a living or nonliving thing? How do you know?

Reteach Ideas

In advance, cut apart and mix up the “Living/Not Living Sorting Cards” (included). Using a T-chart created on chart paper, with columns labeled “Living” and “Nonliving,” have students attach pictures into the appropriate column. Be sure to discuss after each picture why it’s been placed in a particular column.
Living versus Nonliving
Kindergarten

Closure

Students will demonstrate their understandings by:
1. observing and comparing the rock, the worm and the plant.
2. correctly categorizing and graphing the items from the scavenger hunt.
3. explaining the differences and similarities between living and nonliving things using the pictures they cut out of magazines.

Extensions/Additional Resources

Classroom Portals/Technology:

SMART Exchange:
- “Living and Non-Living Things” (SMARTCreated)
- “Alive or Not” (SMARTTable Activity Pack)
- “Am I Alive?” (SMARTTable Activity Pack)

Discovery education:
- “Living and Nonliving Things” (all segments)

Website:
- Ourselves (http://www.bbc.co.uk/schools/scienceclips/ages5_6/ourselves.shtml) (Living and Nonliving Things) At this interactive web site students explore and sort several things including a horse, a chair, an ant, a hat and more. Students can see how each moves and determine if it is living or not. When done students can take a quiz on what they have learned.

Literature:
- What Is a Living Thing? (Science of Living Things) by Bobbie Kalman
- Is It a Living Thing? (Introducing Living Things) by Bobbie Kalman
- What's Alive? by Kathleen Weidner Zoehfeld and Nadine Bernard Westcott
**Scavenger Hunt List**

Name: _______________________________

Directions: Try to find these nine items in magazines or outside. Collect them carefully.

<table>
<thead>
<tr>
<th>One brown leaf</th>
<th>One rock</th>
<th>One green leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Brown Leaf" /></td>
<td><img src="image2.png" alt="Rock" /></td>
<td><img src="image3.png" alt="Green Leaf" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>One bird</th>
<th>One piece of trash or litter</th>
<th>One flower</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4.png" alt="Bird" /></td>
<td><img src="image5.png" alt="Trash or Litter" /></td>
<td><img src="image6.png" alt="Flower" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>One piece of wood</th>
<th>One insect</th>
<th>One long piece of grass</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image7.png" alt="Wood" /></td>
<td><img src="image8.png" alt="Insect" /></td>
<td><img src="image9.png" alt="Long Piece of Grass" /></td>
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<tr>
<td>Name ______________________________</td>
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<tr>
<td><strong>Which Seeds Grew?</strong></td>
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<tr>
<td>1</td>
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<tr>
<td>Seeds in the Window with Water</td>
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<tr>
<td>Seeds in the Window with No Water</td>
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<tr>
<td>Seeds in the Closet with Water</td>
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</tr>
</tbody>
</table>

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**Living Things**  
**Kindergarten**

**Condensed Content Statement:**
Living things are different from nonliving things.

Living things include anything that is alive or has ever been alive.

Living things have specific characteristic traits.

Living things grow and reproduce.

Living things are found almost everywhere in the world. There are somewhat different kinds in different places.

**Lesson Summary:**
In order to learn about the living environment, young children should begin with direct observation of their immediate surroundings, such as a backyard, schoolyard, or local pond. As students observe their environment, they should have many opportunities to record and communicate their findings using words and pictures. In this lesson, students will observe living organisms in a local ecosystem and create detailed drawings and descriptions of them.

**Suggested Time Frame:**
1 day

**Materials:**
- Hand lens

**Optional:**
- Desired pages of the [online field journal](http://www.amnh.org/ncslet/online_field_journal/index.html), found on the American Museum of Natural History website

**Vocabulary:**
Living  
Nonliving

**Process Skills:**
Observe  
Representation  
Compare
Teacher Notes

Although hands-on experiences are essential, the Internet offers many resources for student exploration and discussion. It also gives students opportunities to observe environments and organisms that are very different from those near at hand. The final section of this lesson offers a few Internet resources to extend the ideas of this lesson.

Engage (Warm-up)

1. Review characteristics of living organisms with students.

2. Ask students questions such as:
   - What makes something a living thing?
   - Are you a living thing? How do you know?
   - What do living things need in order to stay alive? (Ex: food, water, air)
   - What are examples of living things in the classroom?
   - What are some living things outside?

3. You could present students with a living plant or animal as an example and ask questions such as:
   - Is this alive? How do you know?
   - What do you see as you look at this [plant or animal]? What do you hear? Smell? Feel?
   - How are plants and animals alike? How are they different?

Explore (Instructional Strategies)

1. Have students observe one or more local ecosystems, such as a schoolyard, backyard, neighboring lot, or local pond. In order to focus students' observation, it may be helpful to rope off a specific area. Have students count and record the number of living things that they encounter in this area. Encourage students to look for examples of living things interacting. Have students draw or write about the living things that they observe.

2. Students can create a field journal using words and pictures to document the living things that they encounter, along with any relationships that appear to exist between them. The American Museum of Natural History offers an online field journal with questions that can be used to guide student observation, as well as sample journal pages that can be printed out.

3. Encourage students to compare and discuss their findings. You may wish to construct a classroom graph, showing each living thing and the number of students who observed it. You can also engage in sorting (classifying as plants or animals) and counting lessons (finding the total number of living things observed by the class) related to student findings.
Living Things
Kindergarten

Interdisciplinary Connections

Read The Lorax by Dr. Seuss. Although this is a fictional book, this story can lead to a good discussion of some of the threats to the living environment, from air and water pollution to deforestation. It also illustrates the relationships between living organisms within an environment. Students can work in a class or teams to:

- Retell the story using words or pictures. Change some of the actions of the characters to create a “happy ending”. What would need to be done in order for the plants and animals to survive?"
- Create a plan of action for rebuilding the living environment at the end of the story.
- Have students identify those aspects of the book that are fantasy and those that are similar to reality, based on what they’ve learned through observation of the living environment.

Assessment

Assess student understanding by the observations and descriptions recorded in their field journals. In addition, have students describe (in words and/or pictures) living organisms.

Reteach Ideas

1. Visit the One Inch Square Project at the Cool Science for Curious Kids site (http://www.hhmi.org/coolscience/forkids/inchsquare/index.html), sponsored by the Howard Hughes Medical Institute. Tell students that they are going to observe the same outdoor area, but this time they will be looking through the one inch window.
2. Have students cut a one inch square window using the worksheet and instructions provided at the site. Allow students to look around the classroom using the one inch window. Encourage them to physically get closer to the things that they are observing. Allow them to share their observations.
3. Then ask students:
   - Will the outside area look different when you look at it this way?
   - Why might it be important to look more closely at a smaller area?
   - Do you think that you will still be able to find some living things in this much smaller area?
4. Have students return to the same outdoor area. Ask them to count and record the number of living things that they observe in one square inch. Again, encourage students to look for examples of living things interacting.
5. Have students draw or write about the living things that they are observing, as well as answer the questions on the website (found by clicking on the “Click Here” button at the bottom of the page). Allow them to share their findings, and discuss the importance of close observation and some of the tools that scientists use. You may wish to follow up or extend the lesson by allowing students to use hand lenses.
Extensions/Additional Resources

Classroom Portals/Technology:

SMARTExchange:

- “Living and Non-Living Things” (SMARTCreated)
- “Alive or Not” (SMARTTable Activity Pack)
- “Am I Alive?” (SMARTTable Activity Pack)

Discovery Education:

- The Blue Dragon: What A Waste!

Websites:

- Online Field Journal (http://www.amnh.org/ncset/online_field_journal/index.html)
- One Inch Square Project (http://www.hhmi.org/coolscience/forkids/inchsquare/index.html)

Literature:

- What Is A Living Thing? by Bobbie Kalman
My Family Tree
Kindergarten

Suggested Time Frame:
1 day

Condensed Content Statement:
Living things are different from nonliving things.
Living things include anything that is alive or has ever been alive.
Living things have specific characteristic traits.
Living things grow and reproduce.
Living things are found almost everywhere in the world. There are somewhat different kinds in different places.

Materials:
- Family books
- Family tree paper
- Crayons
- Pencil

Optional:
- Pictures of the children
- Pictures of family members from each child’s family

Vocabulary:
Family
Resemblances
Family tree
Similarities
Differences
Traditional family
Single parent family
Godparents
Foster parents

Process Skills:
Interpret Data
Observe
Compare

Lesson Summary:
Children will learn about family resemblances by studying their own family heritage. They’ll discuss similarities and differences among members of their family.
My Family Tree
Kindergarten

Teacher Notes

- Remember to be sensitive to those children who may be coming from adopted, blended, or foster families.
- Send home the parent letter (found at the end of the lesson) several days in advance of the lesson in order to have enough time for collecting the children’s family photos.
- You will want to have an example of a family tree for the children to observe and discuss. The children will enjoy meeting your family through your pictures and drawings.

Engage (Warm-up)

Using a large sheet of chart paper, brainstorm as many types/kinds of families as possible. Teacher guidance or prompting may be needed to guide certain responses. Some responses may include: traditional families, single parent families, foster parents, godparents, grandparents, extended family members, adoptive families, etc. This will allow rich discussion about respecting ALL types of families. Regardless of the type of family the children come from, they will still be able to identify some similarities and differences.

Explore (Instructional Strategies)

1. Read a selected text listed in the literature area of the lesson plan. Ask: Who has a family tree? How big is your family tree? Given this unfamiliar phrase, most of the children will begin sharing about trees in their yards/neighborhoods, etc.

2. Show them your family tree. Take time to introduce your family members to the class. Give ample time for the children to share what they observe about your family. What is the same about some of the family members? What is different about some of the family members? Be sure to emphasize similarities between yourself and the photos of family members (e.g., “My nose is the same shape as my dad’s,” or “My brother and I both have brown hair.”)

3. Show the blank “Family Tree” paper that they will be completing by drawing the family members that live in their house. Give clear directions for the children to
   - draw each person’s face or entire body.
   - label with family member’s names and relationship.
   - add details around your family tree (color/decorate).
   - turn in completed trees for reference points tomorrow.
My Family Tree
Kindergarten

Interdisciplinary Connections

As a Math tie-in, count and chart the number of people each child has listed in their Family Trees. You can then do a class graph with “Numbers of People in the Family” on the x-axis and the number of students in the class with that many family members on the y-axis.

Assessment

1. Do all families look alike? What’s the same about all families? What can be different?
2. Think of your best friend’s family. How is it like your family? How is it different?

Reteach Ideas

In advance, cut apart and mix up the “Families in Nature” sorting cards, included. Remind students that in many families, the children look like their parents. This is the case in nature, too, where the offspring will often look like their parents. (A kitten would look like the mother cat, not like another kind of animal.) Working as a class, sort the pictures and pair the adults and their babies, discussing how you could be sure that the matches are correct.

Closure

To close the lesson and celebrate each of their families, each child will create a REAL family tree. Explain to the children how delicate photographs are and how they are to be handled. Using a SMALL amount of tape, help the children arrange their pictures to create their family trees. These can be a wonderful addition to any classroom or hallway display. Upon taking the family trees down, remember to return all photographs to the children’s families.
My Family Tree  
Kindergarten

Extensions/Additional Resources

Classroom Portals/Technology:

SMART Exchange:
- “Family Tree” (SMARTCreated)
- “Mother and Babies Sort: Animal and Human” (SMARTNotebook Lesson)
- “Describing Animals” (SMARTTable Activity Pack)
- “Group the Animals” (SMARTTable Activity Pack)
- “Who Is In My Family?” (SMARTTable Activity Pack)

Discovery Education
- “Many Kinds of Families” (A Segment of “All About Families”)

Websites:
- Family Tree Kids (http://kids.familytreemagazine.com/kids/FamilyTreeForm.asp)

Literature:
- Grandfather’s Journey by Allen Say
- Honeypaw and Lightfoot by Jonathon London
- Love You Forever by Robert Munsch
- Motherlove by Virginia Kroll
- If You Were My Baby by Fran Hodgkins
- Horace by Holly Keller
- Shades of Black by Sandra L. Pinkney
- Kelly In the Mirror by Martha M. Vertreace
- Are You My Mother by Dr. Seuss
- I Love You This Much! by Lynn Hodges
My Family Tree.

Paste them onto your
Cut out the boxes and
under their picture.
Then print their name.

Family tree (can paste on a
photo or each member of your
page. Draw a picture

Living the boxes on this
Dear Kindergarten Families,

In Science this quarter, we are learning that plants, animals, and people resemble their parents. We would like to help our students understand this concept by looking at their families and learning about family trees. We would appreciate it if you could provide pictures of your child’s family (labeled on the back with the names of the family members and their relationship to your child, if possible) no later than _____________. We will display the family trees we make and then return the photos to you when the unit is finished.

Thanks so much for your cooperation and help! We look forward to seeing the pictures soon!

Sincerely,
Condensed Content

Statement:
Living things are different from nonliving things.

Living things include anything that is alive or has ever been alive.

Living things have specific characteristic traits.

Living things grow and reproduce.

Living things are found almost everywhere in the world. There are somewhat different kinds in different places.

Lesson Summary:

Students will make observations of many kinds of living things to build an understanding their variations. Students will cluster living things by similarities and explain how members of that kind are also different.

Estimated Duration: Two hours

Commentary:

This lesson provides opportunities to investigate many diverse kinds of plants and animals. This can be determined by the natural setting of the school building, pictures available, student personal experiences and classroom resources.

This lesson was field tested by teachers across Ohio. Two of the teachers’ comments follow:

“The hands-on observation and activities are great. This would be a nice tie in with art class activities.”

“I liked the math component of the apple section, as did the students.”

Pre-Assessment:

Engage:

- Show the children a picture of one kind of animal (e.g., a litter of puppies, herd of cows, litter of kittens) and one picture of one kind of plants (e.g., philodendrons, pine trees, deciduous trees, flowers). Ask students to:
  a. name the types of living things in the pictures;
  b. name the types of living things in the pictures that are the same kind;
  c. identify what is different about the same kind of living things in each picture.
- List their replies on the board or chart paper.
Being Alike Is Also Really Being Different – Grade Kindergarten

Scoring Guidelines:
Make an informal observation of the children’s responses using the scoring guidelines below.

<table>
<thead>
<tr>
<th>Meets expectation</th>
<th>Does not meet expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Student correctly names the living things in the pictures.</td>
<td>• Student names the living things in the pictures.</td>
</tr>
<tr>
<td>• Student correctly names the living things of the same kind.</td>
<td>• Student names one of the living things of the same kind.</td>
</tr>
<tr>
<td>• Student can identify differences in the same kind of living things.</td>
<td>• Student cannot identify differences in the same kind of living things.</td>
</tr>
</tbody>
</table>

Post-Assessment:
- Repeat the pre-assessment with a different, picture.
- Show the children pictures of two kind of animals (e.g., a litter of puppies, herd of cows, litter of kittens) and pictures of two kinds of plants (e.g., philodendrons, ground cover, flowers). Ask students to:
  a. name the living things in the pictures;
  b. name the living things in the pictures that are the same kind;
  c. identify what is different about the same kind of living things in each picture.
- List their replies on the board or chart paper.
- Ask students to give a characteristic that each unique group shares.

Scoring Guidelines:
Make observations of the children’s responses using the scoring guidelines below.

<table>
<thead>
<tr>
<th>Meets expectation</th>
<th>Does not meet expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Student provides one common characteristic of each of the same kind of living thing.</td>
<td>• Student does not provide common characteristics of the same kind of living things.</td>
</tr>
<tr>
<td>• Student correctly names the living things in the pictures.</td>
<td>• Student names the living things in the pictures.</td>
</tr>
<tr>
<td>• Student correctly names the living things of the same kind.</td>
<td>• Student names one of the living things of the same kind.</td>
</tr>
<tr>
<td>• Student can identify differences in the same kind of living things (e.g., color, shape, size, texture).</td>
<td>• Student cannot identify differences in the same kind of living things (e.g., color, shape, size, texture).</td>
</tr>
</tbody>
</table>
Being Alike Is Also Really Being Different – Grade Kindergarten

Instructional Procedures:

Explore
1. Pass around the picture of the plants used from the pre-assessment and ask students to look closely. Ask students how the plants are the same and how they are different.
2. Take the class outside to look at trees close up to compare and contrast. Ensure that the observations include more than one living thing of the same species. Note differences in size of tree, size of leaves, shapes of leaves and texture of bark.
3. Have students make bark and leaf rubbings of two trees and circle the word to describe the size of the tree. See Attachment A, *Trees*.

Instructional Tip:
When making leaf rubbings using attachment A, *Trees*, place the leaf, vein side up, under the paper. Tape the leaves to a table, and label with the words “Right” and “Left.” Have students move the leaf and rub the leaf on the right or left side of the paper. Show students how to rub over the leaf with the side of an unwrapped crayon.

Explain
4. Instruct students to call very large plants with leaves and trunks “trees” even though each tree is different in many ways. Ask students to describe the variations they observed (e.g., different texture bark, different shaped leaves).
5. Use a picture of a group of animals (e.g., herd of dairy cows, animals on the savannah in Africa).
   a. Pass around the picture, or display, and ask students to look closely at the animals.
   b. Refer to one of the animals. Describe and show to the children how to observe similarities and differences (e.g., cows: size, shape, coloring, spots).
   c. Ask how the animals in the picture are the same and how they are different. (For example, the student may observe giraffes in the picture. They are very tall with long legs, but not all are exactly the same size or have spots exactly alike.) Explain to the children that scientists group some living things as animals, but each animal is different in many ways.
6. Ask students if they can name other animal groups.

Explore
7. Show students a picture of an apple tree with apples on the branches. Ask them to describe what they see. Students will likely name it as an “apple tree.” Ask them questions so that they connect their learning to the previous experience. For example: What makes it a tree?
8. Give each student a small apple of different varieties. Instruct students to partner with a peer to make a close observation/investigation of their apples using magnifying lenses, balances with non-standard measuring tools (such as counters, bears, etc.) and tape measures. Have students draw and record the differences between their apples. Model how to do this with an apple.
9. Direct students to record the size of their apple in appropriate units. See Attachment B, *Apples*.
10. Have students divide into pairs and place each of the apples in a brown paper lunch bag to mix them. Ask students to reach inside and remove the apples. After examining the apples closely, have each student choose his/her own apple. Ask what makes his/her apple different from the other. Sample student responses may be: shape, color, blemishes, stem/no stem, and number of bumps on the bottom near the core.

11. Have students work in quads and repeat the activity by placing the apples in a brown lunch bag. Ask students if they can find their own apples, what made them easier or harder to find and how they were able to identify their apples.

**Instructional Tip:**
The previous activity can be implemented with items other than apples (e.g., potatoes, nuts).

**Explain**
12. Lead a class discussion on how many living things in the world, like apples, are both alike and different. Discuss how scientists put living things into groups by how they look at characteristics.

13. Ask students if the apples can be placed in smaller groups by characteristics such as shape, with or without stems and color. Clarify this concept by relating this question to the trees and animals in the picture in step five.

**Instructional Tip:**
If additional time allows, have students wash their apples, and the teacher can cut the apples in half for students to observe. Then allow students to eat their apples.

**Differentiated Instructional Support:**
Instruction is differentiated according to learner needs to help all learners either meet the intent of the specified indicator(s) or, if the indicator is already met, to advance beyond the specified indicator(s).
- Allow students to work in pairs during the activity.
- Have students draw pictures or use words to convey their ideas.
- Challenge students to write words to describe the tree or apple.
- Encourage students, who already have met the intent of the indicator, to learn about more specific traits that a favorite animal group share. For example, tigers, lions, cheetahs and jaguars all are large cats. In what ways are they similar?

**Extension:**
- Use pictures of litters of young animals to build an understanding of how living things are the same in some ways and different in other ways, even in a group of the same kind of dog or cat.
- Visit a zoo, nature preserve or arboretum.
- Have students notice that the coloring, shape of the face or size of the living thing is different.
Being Alike Is Also Really Being Different – Grade Kindergarten

- Use twins (if part of the class) as a way to help discuss similarities and differences among close relatives.
- Obtain samples of family pictures that allow students to observe similarities and difference of family traits.
- Take a field trip to a garden center where children could explore and examine plants and talk about similarities and differences between different plants and plants of the same species.
- Art extension:
  1. Make leaf collages by rubbing a variety of leaves with fall colors.
  2. Make collages of groups of living things using pictures cut out of magazines.
  3. Students will explain their collage using the “big ideas” from the lesson.

**Homework Options and Home Connections:**

- Have students bring in pictures of their pets for a bulletin board display to show how pets are alike and different.

**Interdisciplinary Connections:**

**Social Studies**

- **Social Studies Skills and Methods**
  - **Benchmark B:** Predict outcomes based on factual information.
  - **Indicator 3:** Compare similarities and differences among objects or pictures.

**Mathematics**

- **Patterns, Functions and Algebra**
  - **Benchmark A:** Sort, classify and order objects by size, number and other properties, and describe the attributes used.
  - **Indicator 1:** Sort, classify and order objects by size, number and other properties.

**English Language Arts**

- **Communication: Oral and Visual**
  - **Benchmark C:** Follow multi-step directions.
  - **Indicator 3:** Follow simple oral directions.

**Materials and Resources:**

The inclusion of a specific resource in any lesson formulated by the Ohio Department of Education should not be interpreted as an endorsement of that particular resource, or any of its contents, by the Ohio Department of Education. The Ohio Department of Education does not endorse any particular resource. The Web addresses listed are for a given site’s main page, therefore, it may be necessary to search within that site to find the specific information required for a given lesson. Please note that information published on the Internet changes over time, therefore the links provided may no longer contain the specific information related to a given lesson. Teachers are advised to preview all sites before using them with students.
Being Alike Is Also Really Being Different – Grade Kindergarten

For the teacher: Picture of newborn animals (e.g., puppies, kittens, ducklings); picture of a herd of animals; picture of landscape of trees with animals, such as a calendar picture; picture of apple tree with apples.

For the students: Crayons for rubbings, apple for each student, brown paper lunch bags, pan balances and non-standard counters, magnifying lenses, tape measures, paper for crayon rubbings, leaves from trees.

Vocabulary:
- different
- group
- living things
- similar
- variation

Technology Connections:
- Have students use digital cameras on field trips to photograph groups of living things.
- Guide students in using tools such as pan balances and tape measures and magnifying lenses.

Research Connections:

One of the nine researched strategies in Marzano’s book is using non-linguistic representation to help students to remember information about their learning.


This resource is one of a series of books that provides practical ideas for putting standards into practice and provides guidelines for the nature of the learner in each grade band, giving help to the teacher in making decisions about teaching practices in the science classroom.


Tomlinson finds that when a teacher differentiates there are three main components: the what, the how, and the why. Through determining the student’s need, differentiation can best be utilized to the student’s benefit while still remaining valid for the classroom application.
General Tips:
• This lesson can be divided into ten lessons of approximately thirty minutes each.

Attachments:
Attachment A, *Trees*
Attachment B, *Apples*

Classroom Portals:

SMART Exchange:

- “Comparing Animals” (SMART Table Activity Pack)
- “Comparing Plants” (SMART Table Activity Pack)
## Attachment A

**Trees**

<table>
<thead>
<tr>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bigger</td>
<td>Bigger</td>
</tr>
<tr>
<td>Smaller Size of Leaf</td>
<td>Smaller Size of Leaf</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Draw your apple here.

My apple weighs __________.
My apple is __________.

My apple is different than other apples.