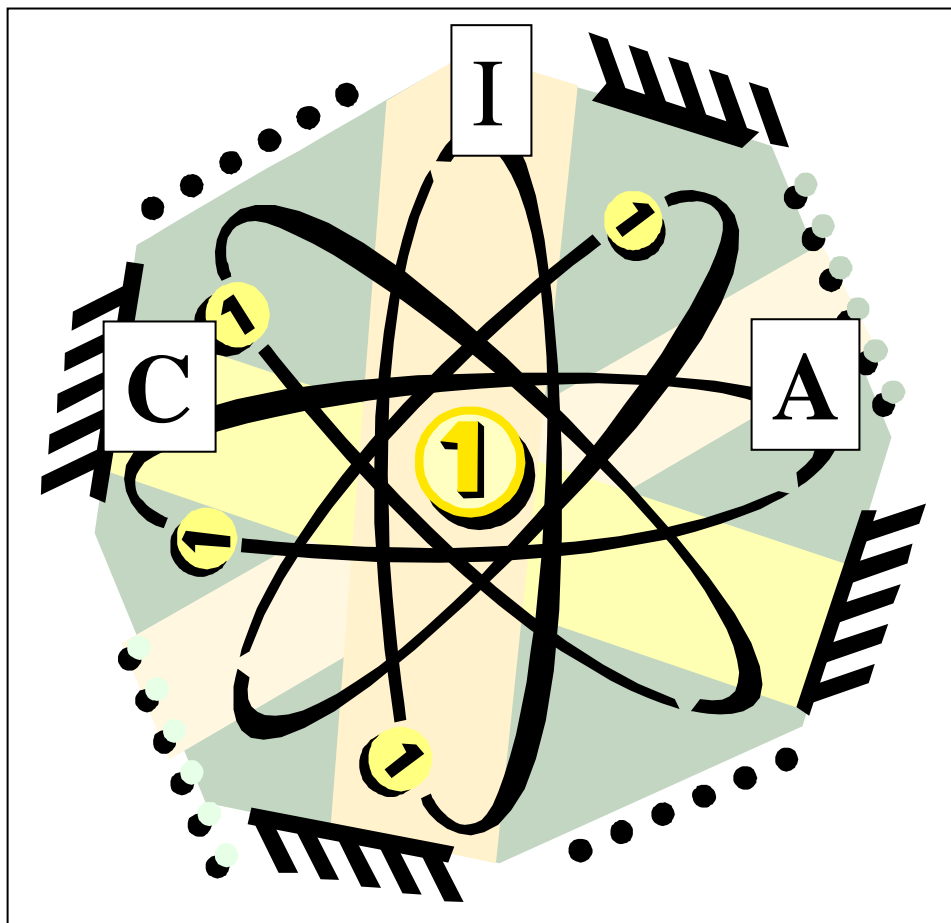


Curriculum, Instruction, Assessment (CIA) Alignment

Science, Kindergarten Unit 3: Living vs. Nonliving

Task Analysis and Hands-on Investigations



Ronald Blocker, Superintendent
Orange County Public Schools
Orlando, Florida

2003-2004



Subject Area: Science
Strand F: Processes of Life
Strand G: How Living Things Interact with Their Environment
Grade: K

Benchmarks

SC.A.1.1.1: The student knows that objects can be described, classified, and compared by their composition (e.g., wood or metal) and their physical properties (e.g., color, size, and shape).

SC.B.1.1.5: The student knows that every human action requires energy that comes from food.

SC.F.1.1.1: The student knows the basic needs of all living things.

SC.F.1.1.2: The student knows how to apply knowledge about life processes to distinguish between living and nonliving things.

SC.G.1.1.1: The student knows that environments have living and nonliving parts.

SC.G.2.1.1: The student knows that if living things do not get food, water, shelter, and space, they will die.

TASK ANALYSIS	
The student...	
	LIVING VS. NONLIVING
	<ul style="list-style-type: none"> • identifies objects as living or nonliving. • recognizes that most living things, including humans, need water, energy, air, shelter, and space. • observes that there are similarities and differences between living and nonliving things. • investigates living and nonliving things in the environment.



JUST LIKE ME!



BENCHMARKS and TASKS

SC.A.1.1.1 The student knows that objects can be described, classified, and compared by their composition (e.g., wood or metal) and their physical properties (e.g., color, size, and shape).

SC.F.1.1.1 The student knows the basic needs of all living things.

SC.F.1.1.2 The student knows how to apply knowledge about life processes to distinguish between living and nonliving things.

- The student identifies objects as living or nonliving.
- The student recognizes that most living things, including humans, need water, energy, air, shelter, and space.
- The student observes that there are similarities and differences between living and nonliving things.
- The student investigates living and nonliving things in the environment.

KEY QUESTION

How is a doll like me and different from me?

BACKGROUND INFORMATION

Everything with which students come into contact can be classified as either living or nonliving. All these things exist and interact to make up the ecosystem. There are five basic processes of living things:

- Metabolism: getting and using food
- Respiration: releasing energy
- Elimination: removing waste
- Growth
- Reproduction

MATERIALS

Teacher

lifelike doll

Venn diagram (See Explore.)

A big book to discuss living/nonliving

Is It Alive? (Creative Teaching Press)

Per group

hula-hoop or jump rope

pictures of living and nonliving things

Per student

magnifying lens

plastic spoon/craft

stick for digging

ENGAGE

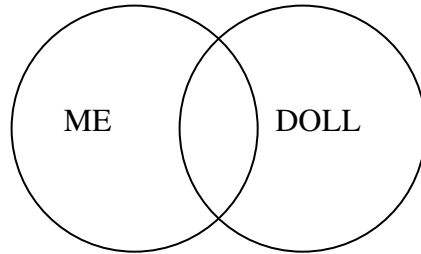
Display a lifelike doll and read the following poem to the class:

I have this doll and her name is Sue.
I have been told she looks like you.
But if you look closely, from her head to her shoe,
There are a lot of differences between the doll and you.

Tell students that they will be making observations about the similarities and differences between themselves and the doll.

EXPLORE

1. Draw a Venn diagram or a Double Bubble Map on the board or chart paper.



2. Ask students to brainstorm characteristics of themselves and the doll. If the characteristic is one that is unique to them (living things), write it in the circle labeled “me”. If it is a characteristic unique to the doll, (a nonliving thing), write it in the circle labeled “doll”. If both possess the characteristic, write the characteristic in the overlapping portion of the circles.
3. Ask: *How can you tell when something is living?*
What do living things need?
4. Give each group several pictures of living and nonliving things. Have students classify the pictures as living or nonliving things.
5. Read the big book to the class (e.g., *Who’s In the Shed?*) Ask: *What’s living? What’s not?*

EXPLAIN

1. Ask:
How are you like the doll?
How are you different?
How can we tell when something is living?
How can we tell when something is nonliving?
2. Tell students to look at the pictures of living things. Living things have certain needs that nonliving things do not. Ask: *What do living things need?*
Make a list of students’ responses.

EXTEND/APPLY

1. Go on a discovery walk. Take the class outside to find living and nonliving things. Have students tell something they see that’s living and something that’s non living (e.g., *I see the principal wearing glasses*). Make a list of living and nonliving things. Discuss what they found: Ask them to tell how they knew it was living or nonliving.
2. Field Study: Use a hula-hoop or a jump rope to make a circle on the ground. This becomes the area of study for a small group. Use tools: magnifying lenses, craft sticks, spoons, etc. to explore the area for living and nonliving objects. Have students fold a paper in half – one side labeled “living” (or L) and one side labeled “nonliving” (or N). Ask them to draw pictures of what they found during the field study in the correct column (e.g., an ant on the living side, a rock on the nonliving side).
3. Read *Is It Alive?*

EXTENSION

Make a class book of living and nonliving things using real pictures. Have a student stand by something at your school. Take a picture of the student and the object (e.g., stuffed animal, person, picture, computer, wooden animal, plant, tree, car). Glue pictures in book with caption (e.g., Are the pictures behind Jamie living or nonliving?). On the back of the page, write the answer. A good time to take pictures is during your living and nonliving walk.

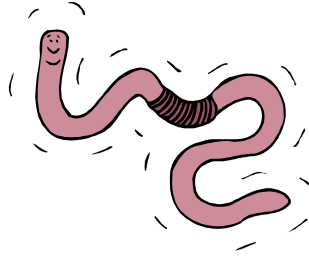
ASSESSMENT

Give the students pictures of living and nonliving objects (e.g., cat, dog, person, rock, toy car, book).

Have the students:

- Sort the pictures as to whether they are living or nonliving things.
- Ask them to explain how they know the object is living or nonliving.

LOOKING FOR LIFE



BENCHMARKS and TASKS

SC.A.1.1.1 The student knows that objects can be described, classified, and compared by their composition (e.g., wood or metal) and their physical properties (e.g., color, size, and shape).

SC.F.1.1.2 The student knows how to apply knowledge about life processes to distinguish between living and nonliving things.

SC.G.1.1.1 The student knows that environments have living and nonliving parts.

- The student identifies objects as living or nonliving.
- The student recognizes that most living things, including humans, need water, energy, air, shelter, and space.
- The student observes that there are similarities and differences between living and nonliving things.

KEY QUESTION

How can you tell if something is living?

BACKGROUND INFORMATION

Everything with which students come into contact can be classified as either living or nonliving. All these things exist and interact to make up the **ecosystem**. There are five basic processes of living things:

- Metabolism: getting and using food
- Respiration: releasing energy
- Elimination: removing waste
- Growth
- Reproduction

Earthworms are flexible, elongated bundles of muscle, efficiently evolved for life underground. Earthworms help the soil by mixing up the different layers of the soil and letting air in as they crawl around. They add nutrients to the soil by depositing their waste products (called castings) in the soil. Earthworms also help decompose dead plant and animal material, turning it into simpler parts that can be used again by new organisms. Worms eat some of the decaying matter.

Earthworms have two kinds of muscles. When the short muscles that encircle each segment contract, the worms get thinner and longer. When the long muscles that connect all the segments contract, the worm becomes shorter and fatter.

MATERIALS

Teacher

for the worm habitat:

soil
leaves
pebbles
several earthworms
plastic wrap
rubber band
black construction paper
clear plastic container, aquarium or tennis ball container

What Do You See? student sheet (optional)

All About Worms class chart

Rigby Big Book *Wiggly Worm* by Jill Eggleton

Per student or pair of students

worm in a cup of soil
hand lenses
gummy worms

TEACHING TIPS

1. Purchase earthworms at a local bait shop. Red wigglers are best for these activities.
Earthworms must stay cool! Do not leave them in a car.
2. Construct a worm environment.
 - a. Place a layer of pebbles on the bottom of the container. Next, place a layer of soil (not potting soil) over the pebbles. Finally, add a layer of leaves on top of the soil.
 - b. Add several worms to the container.
 - c. Place plastic wrap over the opening of the container. Punch several small holes in the plastic wrap. Use rubber bands to secure the plastic wrap. (If you choose not to make this right away, the worms will last in a refrigerator for a few days.)
 - d. Tape black construction paper around the outside of the container.
 - e. Feed the worms by placing slivers of potatoes (no eyes) in the soil.
3. Keep soil moist at all times. Spray it lightly with water from a plant mister as often as necessary.
4. Prepare the *All About Worms* class chart.
5. Talk to students about the humane treatment of all living things.
6. When you are finished with the worms, take them outside to a cool, moist, dark place to release them.
7. For hygiene reasons, you may want to do the gummy worm exploration before the earthworm exploration.

ENGAGE

Read and discuss *Wiggly Worm* by Jill Eggleton.

EXPLORE Part 1

1. Distribute a worm in a cup and hand lens to each student or pair of students. Let students remove the plastic wrap and observe the earthworms.
2. Allow students plenty of time to discover the characteristics of an earthworm, noticing such things as the way it moves, its texture, etc.
3. (Optional) Have students use their senses to fill out their *What Do You See?* student sheet.

EXPLAIN

1. Discuss their observations and record on the class *All About Worms* chart.

All About Worms	
Earthworms	Gummy Worms

2. Ask:
What do the earthworms feel like when you gently touch them?
How do the earthworms react to being touched?
How would you describe their movements?
How are the earthworms alike and how are they different?
Did you see lines or grooves on the worms?
Did you see eyes on the earthworms?
Did you see a mouth on the earthworms?
3. Introduce the term *segment* to the students.

EXPLORE Part 2

1. Collect the live worms and distribute the gummy worms. (If you plan to let the students eat the gummy worms, be sure they have time to wash their hands before you distribute them.)
2. Have students observe the gummy worms just like they did the earthworms.

EXPLAIN

Compare and contrast the student responses to the earthworms and the gummy worms.

Ask:

- How were the earthworms and gummy worms alike?*
How were they different?
Which one was living?
Which one was nonliving?
How can you tell when something is living?

EXTEND/APPLY

1. Have students compare and contrast the characteristics of earthworms to themselves.
2. Share the following poem:

Earthworms have two types of muscles
To help make them move.
They live under the soil and form
A tunnel called a groove.
Earthworms have no eyes or ears
And they cannot see or hear.
When a gardener sees them in his soil,
He hollers out a cheer.

Melissa Runge

3. After reading the poem, discuss why a farmer would cheer if he saw an earthworm in his garden.

ASSESSMENT

Through observation assess the following criteria:

- Student demonstrates understanding through completion of the activities and participation in class discussions.
- Student uses science tools appropriately and observes science safety rules.

What do you see?



Observe your worm with the magnifier. Draw your worm and color it.

A large, empty rectangular box with a black border, intended for the student to draw and color their worm.

How does the worm feel when you gently touch it?



How does the worm smell?



How does the worm sound? Does it make any noise?



WORM HOLE

BENCHMARKS and TASKS

SC.F.1.1.1 The student knows the needs of all living things.

SC.G.1.1.1 The student knows that environments have living and nonliving parts.

- The student recognizes that most living things, including humans, need water, energy, air, shelter, and space.
- The student investigates living and nonliving things in the environment.

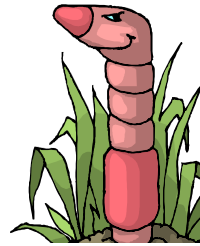
KEY QUESTION

What kind of **environment** do earthworms prefer?

BACKGROUND INFORMATION

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Earthworms have two kinds of muscles. When the short muscles that encircle each segment contract, the worms get thinner and longer. When the long muscles that connect all the segments contract, the worm becomes shorter and fatter.

MATERIALS

Teacher

Wonderful Worms, Houghton Mifflin

Per group

earthworms in a cup
moist and dry paper towels
dirt
2 trays with sides one inch high
cardboard to cover half of the tray
pebbles or fish tank gravel

TEACHING TIPS

1. Review humane treatment of all living things discussion from previous lesson.
2. Prepare the rough/smooth trays for each group by placing pebbles in one half of the tray and dirt in the other half of the tray.

3. Prepare the light/dark trays for each group by covering the entire bottom of the tray with dirt. Distribute the cardboard cover with the tray.
4. Make certain that the ½ sheet cardboard cover is wider than the tray.
5. Vanilla pudding and vanilla wafers (“Nilla” Wafers) can be substituted for students who do not like or are allergic to chocolate in the extension activity.

ENGAGE

Read *Wonderful Worms*, Houghton Mifflin

EXPLORE

1. Ask: *Are earthworms living or nonliving? How do you know?*
2. Ask: *Since earthworms are living, they need a special space in which to live. What kind of home (environment) might they like?*
3. Have students predict whether worms prefer a wet or dry, light or dark, or a rough or smooth environment.

Earthworm Environment

	wet	dry
predict		
actual		
	light	dark
predict		
actual		
	rough	smooth
predict		
actual		

4. Distribute worms and allow 5 – 10 minutes for the students to interact with the worms.
5. Distribute a moist and a dry paper towel to each group for wet/dry experiment. Have students test the prediction. Have the wet and dry paper towels overlap. (See illustration #1 on page 14.) Place worm where the wet and dry paper towels meet. Observe to see where the worm goes.
6. Repeat procedure for light/dark (illustration #2) environments. Place worm in the middle of the tray. Cover one half with the cardboard cover. Observe to see where the worm goes.
7. Repeat procedure for rough/smooth (illustration #3). Push the dirt to one side and put pebbles on the other side. Place the worm in the middle of the tray. Observe to see where the worm goes.

EXPLAIN

Ask and record their responses on the *Earthworm Environment* chart.

Did your earthworm prefer the wet or dry paper towel? Did the result match your prediction?

Did your earthworm prefer a dark or light area? Did the result match your prediction?

Did your earthworm prefer the rough or smooth surface? Did the result match your prediction?

Since earthworms are living things, what else do they need besides a special place to live? (air, food)

EXTEND/APPLY

Have students compare the earthworm environment with the environment of other animals such as themselves, a pet, birds, ducks.

EXTENSION

Make "Pudding Dirt Cups." Pour 2 cups of cold milk into a large bowl and add instant chocolate pudding mix. Beat until well blended. Let it sit for 5 minutes. Stir in Cool Whip and $\frac{1}{2}$ of the cookies ($\frac{1}{2}$ of a 16 oz. package of chocolate sandwich cookies). Place 1 tablespoon into cups; fill cups $\frac{3}{4}$ full with pudding mixture. Top with remaining crushed cookies. Refrigerate one hour. Decorate with a gummy worm half buried in the "dirt."

ASSESSMENT

Ask the students to draw a picture of an environment that their earthworm would like. Was their environment drawing reasonable?

Illustration #1 Wet and dry

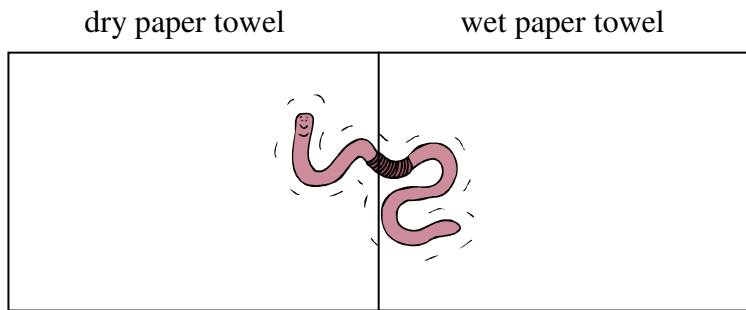


Illustration #2 Dark and light

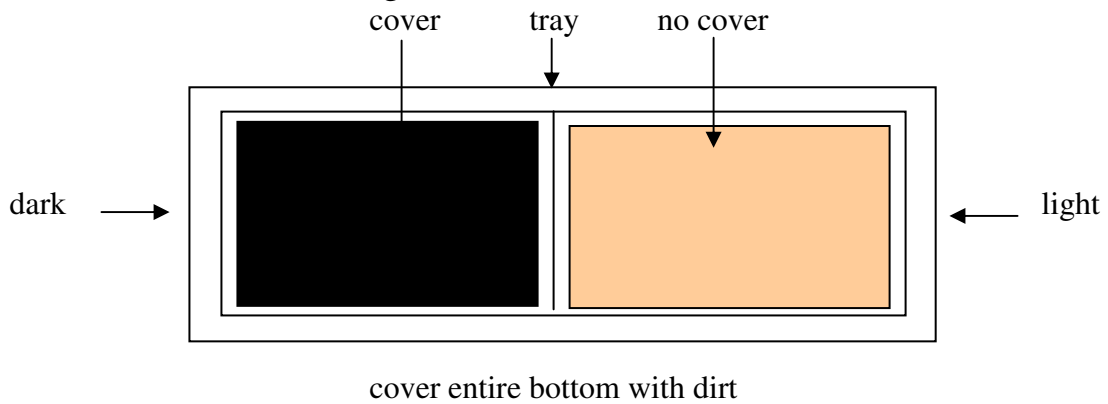
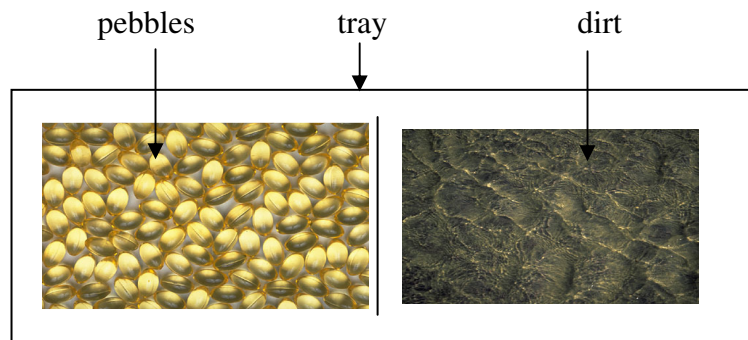


Illustration #3 Rough and smooth



LIFE'S NECESSITIES



BENCHMARKS and TASKS

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- The student identifies objects as living or nonliving.
- The student recognizes that most living things, including humans, need water, energy, air, shelter, and space.
- The student observes that there are similarities and differences between living and nonliving things.

KEY QUESTION

What are the needs of living things?

BACKGROUND INFORMATION

Everything with which students come into contact can be classified as either living or nonliving. All these things exist and interact to make up the ecosystem. There are five basic processes of living things:

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- Respiration: releasing energy
- Elimination: removing waste
- Growth
- Reproduction

MATERIALS

Teacher

All About Worms chart (from *Looking for Life* lesson)

What Do Pets Need (Benchmark Education Co.)

Per group

magazines

scissors

Class

Alive or Not Alive T chart

glue

ENGAGE

Use the *All About Worms* charts from the *Looking for Life* activity to review the characteristics of earthworms and gummy worms.

Stress the needs of living things during the discussion:

How could you tell that the earthworms were living?

Do the earthworms need water?

How do you know? (Moisture in the soil)

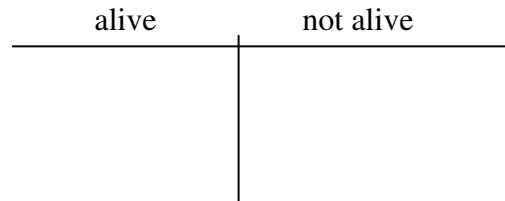
What other things, besides water, does the earthworm need in order to survive? (Food, appropriate habitat, adequate space, etc.)

What would happen to the earthworm if it did not have any of these things it needs to live?

What do you need in order to survive?

EXPLORE

Have students cut out pictures of living and nonliving things. Students should then glue the pictures on the corresponding side of the *Alive or Not Alive* chart.



EXPLAIN

1. Discuss the chart and have students tell why they placed their pictures on a particular side of the chart.
2. Ask students to consider the pictures in each section and think about how they are alike. Generate a list of common characteristics of the pictures on each side. Focus on the idea that living things can do certain things (breathe, grow, etc.) that nonliving things cannot do, and living things have certain needs (air, water, food, adequate space, etc.) that nonliving things do not have.

EXTEND/APPLY

1. Make up several riddles of living and nonliving things, such as:
I drink milk.
I am a pet.
I make a purring sound.
What am I?
Am I living or nonliving?
How do you know?
2. Read and discuss *What Do Pets Need?*

ASSESSMENT

Have the students draw a picture of a living thing and include what it needs to survive.