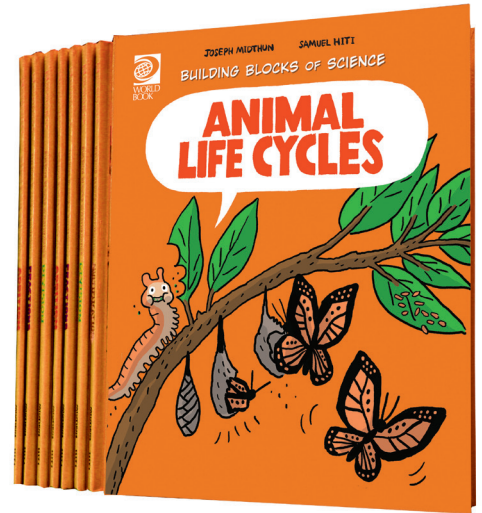


BUILDING BLOCKS OF SCIENCE

LIFE SCIENCE SET 2 LESSON PLANS

This series explores animal behavior using real-life examples to simplify often complex topics. Students will be introduced to such subjects as plant classification, genetic traits and heredity, the cell cycle, and more, in the familiar fun, approachable style.



Grades K through 5+
ISBN: 978-0-7166-2820-0
8 volumes • 256 pages
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\$249 (US) \$279 (CAN)

General Information					
Life Science Lesson Plan Series:	Animals, Plants, and Cells: The Building Blocks of Our World				
Lesson Grade Level:	Grades 2 through 5				
Additional Grade Levels:	Each lesson can be adjusted to fit a range of elementary skill levels.				
Instructional Setting:	✘	Single Student	✘	Small Group	✘ Whole Class

Lesson Description and Objectives

Objective and Description of Lesson(s):

1) Animals: The Transformation Station!

Objectives:

Students will:

1. Learn about the process of metamorphosis for amphibians and insects as it pertains to stages in a life cycle.
2. Be able to recognize and define new upper-level vocabulary, including "metamorphosis," "larva," "pupa," and "chrysalis."
3. Be able to identify the stages of a life cycle for multiple organisms and verbally explain the process.

Description:

a. In *Animal Life Cycles*, use the sections that explain the concept of metamorphosis, which can be found on pages 18-19 (Metamorphosis and the Amphibian), 20-21 (Metamorphosis and the Butterfly), and 22-23 (Metamorphosis and the Caterpillar Wasp) as a basic introduction to the class. Make a copy of each for each student. Read each example aloud to the class and explain the stages of metamorphosis for each using the book and adding details as needed.

b. Assign each student one of the metamorphosis animals (amphibian, butterfly, or caterpillar wasp). Provide small cardboard paper cutouts and 4 popsicle sticks. Have the students draw each of the 4 stages of the animal's development on a separate cardboard cutout and glue to the back of each popsicle stick, using their print outs for reference.

c. Partner students with a classmate who has been assigned a different animal. Each student can put on a puppet show for his or her partner explaining the life stages.*

Ex. Amphibian: egg, tadpole with tail, tadpole with tail and legs, frog

Ex. Butterfly: egg, caterpillar or larva, pupa, butterfly

Ex. Caterpillar Wasp: egg on caterpillar, larva, pupa, caterpillar wasp

*For older or advanced students, have them practice using the scientific vocabulary words in bold (i.e., metamorphosis, larva[e], chrysalis, pupa) when presenting their puppet shows.

Lesson Description and Objectives

Objective and Description of Lesson(s):

2) Plants: The Fun Food Factory—Photosynthesis!

Objectives:

Students will:

1. Identify the types of living things that use photosynthesis.
2. Understand the concept of photosynthesis.
3. Support an argument that plants need appropriate amounts of sunshine to grow.

Description:

- a. Open the lesson with a question and ask the students, *what did you eat for dinner last night?* Ask the class to give examples. Explain that the food they eat gives them energy, which in turn helps them to grow. Then ask the students if plants eat any of these things for dinner. They will, of course, say NO! Pose the question, so how do plants get the energy they need to help them grow?
- b. Refer to pages 4-5 of *Plant Life Cycles*, which explain the process of photosynthesis and how plants acquire energy to help them grow. Show the classroom this comics-style explanation on an interactive whiteboard or projector, or print out a copy for each student. Explain the process of photosynthesis step by step with the class.
- c. To illustrate how photosynthesis works in action, use three similar houseplants in an experiment. Place the first plant in a window that gets plenty of sunlight. Place the second plant in a dark place, like a closet. Place the third plant in a neutral place that does not get direct sunlight, but is not totally dark. Water all the plants with the same amount and frequency. After a week or two, place all of the plants side by side and ask students to compare the differences in leaf color, size, and general appearance of the plants. Have students write their observations in a journal or speak them aloud and speculate as to why a particular plant looks healthier than another that week. Place all of the plants back into their former positions. This time, do not provide the plants with any water. Bring them out again after another week or two for student observation. There should be noticeable differences in the health of the plants each week. Feel free to repeat for as many weeks as necessary. Have students review their weekly journals and write a conclusive paragraph about what conditions produced the healthiest looking plant and what requirements lead the plant to thrive.

Lesson Description and Objectives

Objective and Description of Lesson(s):

3) Traits and Heredity: No One Else Like Me!

Objectives:

Students will:

1. Learn about what is considered an inherited trait and what is an acquired, learned, or environmental trait.
2. Be able to distinguish the two types of traits and provide examples of each.
3. Understand that every organism is assigned a unique set of traits.

Description:

a. In *Traits and Heredity*, using pages 8-9 and 24-25, give the class a basic introduction to the concept of heredity and traits. Show the classroom this comics-style explanation on an interactive whiteboard, projector, or print out copy for each student. Explain that we are born with some traits and these are called **inherited traits**. Others we gain from our environment, and these are called **acquired traits**.

b. To further illustrate this concept, draw a picture of a dog on the chalkboard. List **inherited traits** that the dog may have, including ear shape (pointy, floppy), tail length, fur color and length, and size. List **acquired traits** that the dog may have, including the ability to sit on command, where they like to be petted, or their preferred treat.

c. Then, have students number lines 1-10 on a blank sheet of notebook paper and write the following words (or hand out a copied worksheet with these traits):

- hair color -
- eye color -
- hair type (curly, straight, wavy) -
- favorite sport -
- favorite animal -
- gender (boy or girl) -
- left-handed or right-handed -
- able to roll tongue or not -
- favorite ice cream flavor -

Ask students to label each characteristic “A” for acquired or “I” for inherited and to fill in answers about themselves.

Lesson Description and Objectives

Objective and Description of Lesson(s):	<p>Ex. Hair color - I - brown</p> <p>Favorite ice cream flavor - A - chocolate</p> <p>d. As homework, students can interview a family member (can be related or not) and ask them to answer the same questions. Students will be instructed to write a short paragraph about what similarities and differences they have with their family member using the new vocabulary words they learned, “acquired” traits and “inherited” traits.</p> <p>e. As follow-up, collect the data and create a graph detailing the most common traits in the classroom to the least common.</p>
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Subject Areas

Subject Area:	Life Science, Environmental Science, Language Arts, Writing
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Curriculum Correlations Addressed by *Building Blocks of Life Science Lesson Plans*

Standards:	<p>Lesson 1</p> <p>CCSS.ELA-LITERACY.SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.</p> <p>CCSS.ELA-LITERACY.SL.3.2 Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.</p> <p>NGSS-3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.</p>
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Subject Areas

Standards:

Lesson 2

CCSS.ELA-LITERACY.SL.3.2

Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-LITERACY.SL.3.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

NGSS-2-LS2-2

Plan and conduct an investigation to determine if plants need sunlight and water to grow.

NGSS-5-LS1-1

Support an argument that plants get the materials they need for growth chiefly from air and water.

NGSS-5-LS2-1

Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Lesson 3

CCSS.ELA-LITERACY.SL.3.2

Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

NGSS-1-LS3-1

Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

NGSS-3-LS3-1

Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

NGSS-3-LS3-2

Use evidence to support the explanation that traits can be influenced by the environment.

Assessment Types	✗	Writing Samples	✗	Group Discussion
	✗	Observations	✗	Demonstrations
	✗	Interviews		
	✗	Journals		
		Other:		

Materials Needed

Materials and resources used by teachers and students:	<p>Metamorphosis: A copy of <i>Building Blocks of Life Science</i>, set 2 Popsicle sticks (4 per student) Cardboard paper Crayons, markers, pens, or colored pencils Glue or tape Scissors</p> <p>Photosynthesis: A copy of <i>Building Blocks of Life Science</i>, set 2 3 similar houseplants Student journals or notebook paper Pencils or pens</p> <p>Traits and Heredity: A copy of <i>Building Blocks of Life Science</i>, set 2 Chalkboard, chalk Notebook paper Pencils or pens</p>
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