



Lesson Objective

Students will describe life science as the study of living things at many sizes, turn a local observation into a testable question, and name STEM careers that study life.

Standards:

NGSS SEP: Ask investigable questions. Turns noticing into questions.

TEKS 7.4C: Explore STEM career resources. Explores STEM careers.

Essential Question: What do life scientists study, and how do they turn what they notice into a question they can test?

Top 3 Concepts

- 1 **Life science happens at many sizes.**
Life scientists study living things at many sizes, from a single cell to a whole patch of ground full of plants and animals.
- 2 **An observation can turn into a question.**
Noticing something outside is an observation, but shaping it into a question a scientist could test takes one more careful step.
- 3 **People study life science as a job.**
Many different careers focus on living things, with pay and daily work that can look very different from one job to the next.

Why This Matters

The ground right outside your door is already busy with living things doing their own thing, and every single one of them is something you could investigate like a real scientist. Learning to notice it closely today is the exact same first step people took before they became zoologists, microbiologists, or conservation scientists for a living.



Prediction

What is one living thing near your school that you could study, and what question could you ask about it?

Asking Questions and Defining Problems

The grass behind the school is still wet with dew when the first students cross it. An ant hauls a crumb twice its size along a crack in the sidewalk. A robin pulls a worm from the soil nearby. None of this looks like a science lab, but the schoolyard works like one. One ant carrying a crumb is a single living thing meeting a need. All the ants of one species living in that patch form a population. A robin circling overhead is hunting across the whole patch at once, and one small stretch of ground holds many scales a life scientist can study.

Life Science Happens at Many Sizes

Life science is the study of living things, at sizes too small to see and too big to walk across in a day. *Biology* is another word for life science.

A life scientist can zoom in on one tiny cell, a small living part inside a blade of grass, or zoom out and study the whole patch of ground where that grass grows.

Somewhere inside that ant, tiny cells are using energy from its last meal, a process too small to see without a microscope. Between one cell and a whole patch of ground are more sizes life scientists study: one living thing, a population, and a whole place. Life scientists move between these sizes depending on what they want to learn.

The size a life scientist chooses depends on the question they want to answer.

A scientist studying ant tunnels looks closely at one ant colony. A scientist studying plants in sidewalk cracks compares many patches of ground across a city. A third scientist might study just one leaf under a microscope to see how its cells are built.

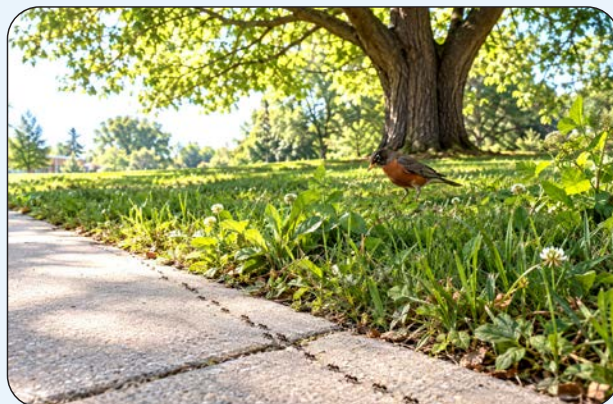


Figure x.1 - A schoolyard patch of grass and trees can hold ants, birds, and plants all at once. Every one of these living things is something a life scientist could study closely.

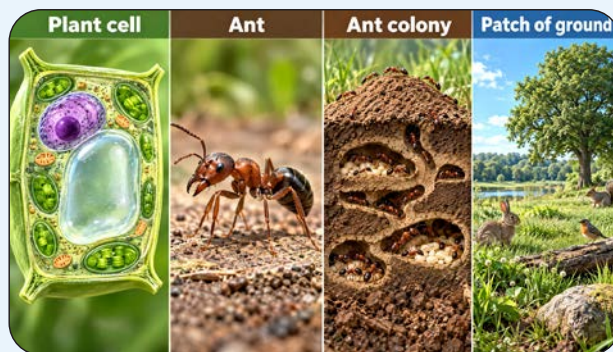


Figure x.2 - Life scientists study many sizes, from one tiny cell to a whole patch of ground. This picture shows how zooming in or zooming out changes what a scientist sees.



STOP AND THINK (Figure 1.2):

Look at Figure x.2. Which size in the image would a scientist studying one ant colony be working at?



Figure x.3 - **Noticing something is an observation.**

Turning that observation into a question that can be checked with real evidence is what makes it testable.

An Observation Can Turn Into a Question

Noticing something is called making an *observation*. Watching an ant carry food or seeing a dandelion grow in a crack are both observations. Neither one requires measuring or testing anything, just paying attention.

An observation becomes more useful once it turns into a *testable question*, one that can be checked with real evidence. A student who notices ants near the cafeteria door could ask: do ants visit crumbs closer to their nest more often? That can be tested by measuring distances.

A question like why do ants exist cannot be tested the same way, since nothing about it can be measured directly.

Scientists also use *inference*, a reasonable guess based on what they observed but didn't see directly. A student sees ants around a crumb and infers they may be gathering food.

A good inference is based on real evidence, never a guess out of nowhere.



STOP AND THINK (Figure x.3):

Look at Figure 1.3. What does a testable question let a scientist do that an observation alone does not?

People Study Life Science as a Job

People who study living things work in many different jobs, each built around its own kind of training. Some study animals in the wild. Others study tiny living things through a microscope. Still others study whole forests, oceans, or farms. Two people in these jobs might spend their day very differently, even if both study living things.

Did You Know: Two scientists can make the same observation and still ask different testable questions. That's part of what makes life science full of discoveries.

These jobs are often grouped under the label STEM: science, technology, engineering, and math.

Each letter stands for a different kind of thinking, and life science careers often blend more than one. A zoologist studies animals and how they behave. A microbiologist studies living things too small to see without tools. A conservation scientist protects wild places so plants and animals can keep living there. A medical scientist studies how the human body works and tests new ways to help people stay healthy. Getting one of these jobs often starts with the same curiosity a student feels looking at an anthill, then grows through years of schooling and hands-on practice.

Many life scientists say their interest in the outdoors started young, long before they knew a job like this existed.



STOP AND THINK (Figure x.6):

Look at Figure 1.6. Name one thing this scientist is doing that started with an observation.

THINK LIKE A SCIENTIST

Walk past one patch of ground near your home tomorrow. Make one observation about a living thing there. What testable question could that observation lead you to ask?

Testable question



Untestable question



Figure x.4 - Some questions can be checked with real evidence, like measuring a distance. Other questions, like why living things exist, cannot be tested the same careful way.

Wildlife Biologist



Microbiologist



Figure x.5 - STEM careers in life science look different from each other.

Some scientists work outdoors with animals, while others work indoors with microscopes and lab equipment every day.



Figure x.6 - This scientist is making an observation in the field, writing down what they notice. That careful noticing is often the very first step toward a testable question.

GUIDED NOTES



Complete the guided notes as you read, using key ideas and evidence from the article to organize and strengthen your understanding.

Three Most Important Concepts

Based on the article, identify and explain the three most important topics you learned:

Concept 1: _____

Concept 2: _____

Concept 3: _____

Main Concept Overview

Fill in each blank using one word from the box. Each sentence restates a big idea from the article.

Word Bank: evidence | zoom | STEM | measured | question

1. A life scientist can _____ in on one tiny cell, or zoom out to study a whole patch of ground.
2. The size a life scientist chooses depends on the _____ they want to answer.
3. A question like why do ants exist cannot be tested, since nothing about it can be _____ directly.
4. A good inference is based on real _____, never a guess out of nowhere.
5. These jobs are often grouped under the label _____: science, technology, engineering, and math.

Matching

- | | |
|----------------------------|--|
| _____ 1. Life Science | A. Noticing something |
| _____ 2. Biology | B. A reasonable guess based on real evidence |
| _____ 3. Observation | C. Another word for life science |
| _____ 4. Testable Question | D. The study of living things |
| _____ 5. Inference | E. A question that can be checked with real evidence |

True or False

Write True or False in the blank.

1. A life scientist always studies living things at exactly one size.
2. A good inference is based on real evidence.
3. An observation and a testable question are the exact same thing.
4. STEM stands for science, technology, engineering, and math.
5. A question like “why do ants exist” can be tested by measuring something directly.

Table: From Noticing to Testing

Complete the table using the article.

Step	What It Means
Observation	
Testable Question	
Inference	

Critical Thinking

Think of one living thing you could observe near your home.

Write one observation about it, then turn that observation into a testable question.

REFLECTION & TRANSFER



Use evidence from the article and examples from your own life to explain your thinking.

01

CONNECT



Think of a time you noticed something living nearby — a plant, insect, or animal. Describe what you noticed.

THINK ABOUT



Your observation could be about your yard, a park, or even a classroom plant.

02

APPLY



Imagine you notice ants gathering around a spilled drink at a picnic. Write one testable question you could ask about the ants.

THINK ABOUT



A testable question can be checked with real evidence, like counting or measuring.

03

DECIDE



Choose one living thing near your school or home that you want to learn more about. Decide what question you would ask a life scientist about it.

THINK ABOUT



Think about what a zoologist, microbiologist, or conservation scientist might study.

DATA ANALYSIS



Use the data table below to answer the questions that follow.

Life Science Careers			
Occupation	Typical Entry-Level Education	Median Annual Pay (2024)	Projected Job Growth (2024–2034)
Conservation Scientists and Foresters	Bachelor's degree	\$69,060	3%
Zoologists and Wildlife Biologists	Bachelor's degree	\$72,860	2%
Microbiologists	Bachelor's degree	\$87,330	4%
Genetic Counselors	Master's degree	\$98,910	9%
Medical Scientists	Doctoral or professional degree	\$100,590	9%
Source: U.S. BLS, Occupational Outlook Handbook (2024).			

The article introduced people who study life science for work. This table compares five of those careers.

Analysis Questions

Q1. Which occupation in the table has the highest median annual pay?

Q2. How much more does a Microbiologist earn per year than a Conservation Scientist and Forester?

\$ _____ - \$ _____ = \$ _____

Q3. Does more schooling always mean more pay? Make a claim, give evidence from the table, and explain your reasoning.

Claim: _____

Evidence: _____

Reasoning: _____



HYPOTHETICAL SCENARIOS

Read each hypothetical scenario carefully. Use evidence from the article and what you have learned to analyze the situation, solve the problem, and explain your reasoning.

Scenario 1: Lights, Bugs, Action!

Every Friday night, Camila's soccer team plays under bright stadium lights. She notices moths, beetles, and even a few bats swirling around the lights the second the sun goes down, but almost none near the dark end of the field where the benches sit. Between saves, she starts wondering if the bugs are drawn to the brightness itself, or just showing up at the same time every week no matter what.

What testable question could Camila ask to check whether the light is really what's pulling the bugs in?

Scenario 2: The Countdown Hamster

Right before lunch each day, Mr. Alvarez's classroom hamster, Biscuit, starts sprinting on its wheel like it's training for a race. Some students think Biscuit somehow knows what time it is. Others think Biscuit is just reacting to the noise of chairs scraping as everyone lines up. One student notices Biscuit still sprints even on days the class eats lunch late.

What testable question could the class ask to check whether it's really the time, or something else, that sets Biscuit off?

KEY TERMS



Write the definition of each term in your own words.

TERM	DEFINITION
Biologist	
Biology	
Conservation Scientist	
Inference	
Life Science	
Microbiologist	
Observation	
STEM	
Testable Question	
Zoologist	

What Are Life Sciences?

T A E O T O M G S U L R R L E I S I E S I S T G
 G S A N E V N J C I M L S O I N H O T N E O I D
 O G O O I S E R N O E B P O S B E C A S Y S O I
 T T O A S N W G I S S L C E N F I C M U S B C I
 E E A E C L Y A O L H R T T B S E O S S T E O I
 M E E S O N O S O T T T G F G L O N L I E E S E
 N L B E E E O A I E T T Y S Z L I S D O E C T Y
 Z O O L O G I S T B V O M Z N L E E V N G I T I
 B R B I R O G T C S R S R H S Q N R V C E Y E S
 E O S G I T O N M I R S E U E E E V N H C B C E
 T I E N E N T R Y M H E O E O N U A T E O C O S
 Z K R U N P F E T B I O L O G I S T L F T H B T
 O N V O S E C E I L O T G N E E N I L M I I V O
 S H A N H O E S R O I N G S B Y M O E T E S G O
 R S T E S T A B L E Q U E S T I O N I G R T E E
 L E I M T B U H O I N O S T T R O S I Y U T O T
 C V O E D R R H S A E C O E O G E C I O O E T E
 A G N D X E I G T O N G E M I P S I H E A A A E
 R O Z S I N T A I L N I O U T E N E L Z U T E O
 E L J J S O I H P S I S G O T T O N N E R R T T
 B S E M O I I O O I G V S E A N A T N F E O O T
 R I O E F C M I C R O B I O L O G I S T R I N O
 I I D S E M E E L N B B B L I F E S C I E N C E
 R M C E E I C B I I A D N I T H L T C L C B T H

BIOLOGIST

BIOLOGY

CONSERVATION SCIENTIST

INFERENCE

LIFE SCIENCE

MICROBIOLOGIST

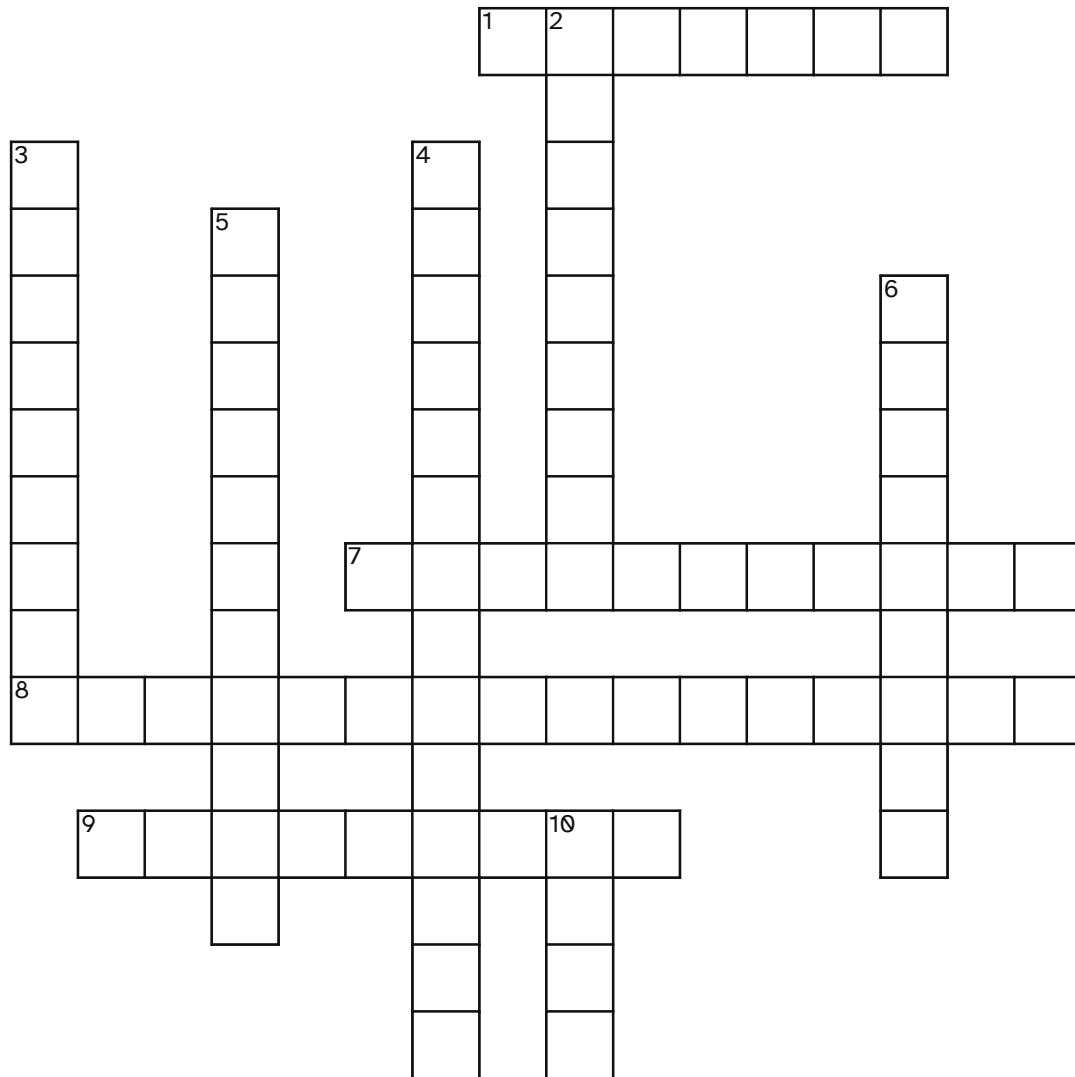
OBSERVATION

STEM

TESTABLE QUESTION

ZOOLOGIST

What Are Life Sciences?



ACROSS

- 1 Another name for the study of living things
- 7 Study of living things, from tiny to enormous (2 words)
- 8 Question that can be checked with real evidence (2 words)
- 9 Person who studies living things for a living

DOWN

- 2 Reasonable guess based on real evidence
- 3 Researcher who studies animals and their behavior
- 4 Researcher who studies organisms too tiny to see without special tools
- 5 Noticing something
- 6 Conservation _____ — Conservation worker who protects wild places for plants and animals
- 10 Career label covering science, technology, engineering, and math