

Intro to Life Science

Intro to Life Science Unit includes:

- Print and digital Interactive Notebooks
- Editable Resources, including notes, PowerPoints, and test
- Instructional Videos
- Teacher-led Demos & Guided Inquiry Labs
- Task Cards & Digital Task Cards
- Study Guides





Suggested Pacing Guide

The following is a *suggested pacing guide* for my COMPLETE COURSES (Earth, Life or Physical Science) which are based on 50-minute class periods. There are three variations below. Each variation is based on the number of sections in your SCIENCE INTERACTIVE NOTEBOOK chapter.

Based on a **4-Section Chapter**

Day	Lesson/Activity	Engage	Explain	Explore	Elaborate	Evaluate
1	• Teacher Demo	x				
	• Section 1 Notes – INB input		x			
	• INB Activity – INB output (homework if not completed in class)			x		
2	• Mini-quiz					x
	• Section 2 Notes – use PowerPoint		x			
	• INB Activity			x		
3	• Mini-quiz					x
	• Guided Inquiry Lab – Student Led			x		
	• Section 3 Notes – use PowerPoint	x				
4	• INB Activity			x		
	• Mini-quiz					x
	• Section 4 Notes – use PowerPoint	x				
5	• INB Activity			x		
	• Mini quiz					x
	• Science Stations			x		
6	• Science Stations				x	
7	• Final draft and testing for Creation Station (STEM)				x	x
8	• Task Card Review (game-style, full class, partner)				x	
9	• Chapter Test					x
10	• Have students complete notes for next chapter*	x				

* **Note-taking option:** Once students are done with chapter test, they get the next set of notes and work quietly on completing them while other students finish up. All notes are to be completed when they return to class. Have students glue each page of notes into the next few pages of their INB (right side only). This way, when you go over the PowerPoint each day, they have already reviewed topic and are ready for class.

5 E Model

Engage – Teacher-led demos foster wonder and classroom discussion and serve as the hook for the lesson. Videos and images of natural phenomena also foster questioning and communication. NGSS phenomena are aligned to middle school NGSS standards.

Explain – PowerPoints, instructional videos, and guided notes (input side of interactive notebooks) provide definitions, explanations, and information through mini-lecture, text, internet, and other resources which encourages students to explain concepts and definitions in their own words.

Explore – Students investigate problems, events, or situations. As a result of their mental and physical involvement in these activities, students question events, observe patterns, identify and test variables, and communicate results.

Elaborate – It is important to involve students in further experiences that apply, extend, or elaborate the concepts, processes, or skill they are learning. Elaborate activities provide time for students to apply their understanding of concepts and skills. They might apply their understanding to similar phenomena or problems.

Evaluate – Use a variety of assessment to gather evidence of student's understanding and provide opportunities for them to assess their own progress.

Student Interactive Notebook

Each concept shares:

- Actual photos of both the INPUT and OUTPUT pages of Science Interactive Notebook
- Instructions on how to create/use/complete activity for OUTPUT side
- Mini-Quizzes for each concept to check students' understanding
- Answer Keys for all mini-quizzes
- Appendix with Teacher Notes for Interactive Notebook in LARGE print.

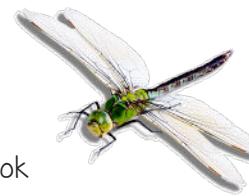


Table of Contents: Intro to Life Science/Biology

Description	Page
Introduction	3
Section 1: The Science of Biology	4
Ten Themes of Biology Printable (Table)	5
Ten Themes of Biology Printable (descriptions)	6
Quiz: The Science of Biology	7

Introduction

If you are new to the idea of using a Science Interactive classroom, stop by my Nifty Grity Science shop and Science Interactive Notebooks tutorial for #REF! 1 in how to begin with your students, what materials to have on hand, how it will enhance your students' learning, and how it will enhance your students' learning.

Section 2: Science Lab Safety

Based on the following pages cover Nifty Grity Science Laboratory Safety Contract.

Student Science Laboratory Safety Contract

Directions: Take this Science Laboratory Safety Contract home and read with your parents and your teacher. Now, how are you going to implement all of these in the Science lab? Make sure you read it again. You and your participating parents will sign and initial the following lab safety contract when you return to be returned to your teacher. Paste this page into Science Interactive Notebook.

The Student Science Laboratory Safety Contract states that I agree to:

- Act responsibly at all times in the laboratory
- Follow all instructions given orally or written by my teacher
- Perform ONLY those activities assigned and approved by my teacher
- Print my name, first and last, on my safety equipment clothing, protection equipment, providing my name
- Carry out good housekeeping practices as instructed by my teacher
- Know the location of safety and first aid equipment in the laboratory
- Notify my teacher immediately of an emergency
- NEVER work alone in the laboratory
- NEVER eat or drink in the laboratory unless instructed to do so by my teacher
- Handle living organisms or preserved specimens only when authorized by my teacher and then always carefully and with respect
- NEVER enter or work in a supply room unless authorized to do so by my teacher

(Customize this portion to your classroom)

I _____ understand each statement in the Student Science Laboratory Safety Contract. I understand the rules set in place by my teacher, school and any other safety regulations put in place. I understand by doing so I am protecting myself and others from unnecessary harm.

Student Signature _____ Date _____

I declare that my student has read this contract and understands its contents as per my instructions.

Parent Signature _____ Date _____

Section 1: The Science of Biology

Section 1: The Science of Biology

Ten Themes of Biology

Directions: Cut out and read the following descriptions that apply to all levels of biology for all living organisms. Match each description to the correct Biological Science theme and paste into the table. When the table is complete, cut and paste it into your Science Interactive Notebook.

Theme	Description
Biological	

Ten Themes of Biology

Directions: Cut out and read the following descriptions that apply to all levels of biology for all living organisms. Match each description to the correct Biological Science theme and paste into the table. When the table is complete, cut and paste it into your Science Interactive Notebook.

Theme	Description
Biological	

Quiz: Science Lab Safety

Identify the safety symbol and explain its meaning

Quiz: Science Lab Safety

Identify the safety symbol and explain its meaning

Student Digital Notebook

The student notebook is on Google Drive and ready for you to share with your students. Here's a quick overview of the features:

Set up like a traditional interactive notebook with input and output sides.

Directions: Click and drag the theme below and place them with the correct description.

- Interaction with Environment
- Regulation
- Cellular Basis of Life
- Scientific Inquiry
- Energy and Life
- Form and Function
- Biology and Society
- Biological Systems
- Reproduction & Inheritance
- Adaptation and Evolution

THE 10 THEMES OF BIOLOGY

Shows a combination of parts. Can form a more complex organization called a system - bone + muscle + nerves → hand	Organisms are made of cells and most multicellular organisms have cells that are specialized for different functions.
How something works is related to its structure - "Form fits function" [ex. bird's wing which has hollow bones and feathers]	The ability of organisms to reproduce their own kind or make offspring.
As part of an ecosystem, each organism interacts continuously with its environment.	Life requires organisms to perform work which involves an energy change. It is needed for moving, growing, and reproducing.
Organisms have the ability to regulate their internal conditions, for example body temperature.	Changes in genes in each generation lead to inherited traits that help an organism survive and reproduce.
Humans apply biology in many ways - medical procedures, stem cell research, and environmental issues are some examples.	Involves asking questions about nature and biology then using observations and experiments to answer those questions.

THE SCIENCE OF BIOLOGY

Biology -

Organism -

Characteristics of a Living Thing

1.	5.
2.	6.
3.	7.
4.	8.

Life can be studied at the following levels:

Level	Description
Cell	Port of entry that contains all ecosystems

Encouraging independent learners. Directions for output side are here along with what they need to complete the activity.

Hyperlinked tabs so student can easily move through chapter for review

Students watch video < 6 min to complete notes.



Notes are chunked into manageable sections with large spaces for textboxes

Some pages have links so students can go deeper into the topic if they need.

Demos, labs, & Science Stations

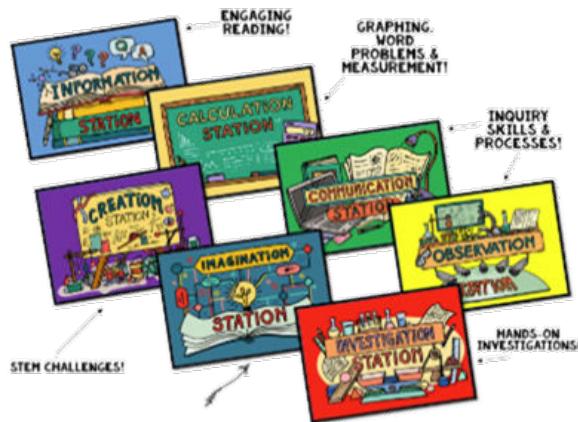
Working in the lab and being engaged in science experiments is the most exciting part of science.



Demo, Labs, and Science Stations Includes:

1. **SCIENCE STATION SIGNAGE** for all 7 stations is provided in color and in black and white (see preview) and all student answer sheets have icons that correspond with each station for ease of use.
2. **DEMONSTRATION** (teacher-led) allows teachers to invite scientific discussions and can help uncover misconceptions and, most importantly, lead to heightened curiosity and interest in the topic being studied.
3. **GUIDED INQUIRY LAB** which is a traditional lab that allows students to perform an investigation in order to solve a problem. Students will hypothesize, collect and analyze data and communicate their results.
4. **TEACHER GUIDES to DEMOS & SCIENCE STATIONS** help get you started and give you background information to make your science lessons engaging.
5. **7 SCIENCE STATIONS** which are designated locations in the classroom with activities that challenge students to extend their knowledge and elaborate on their science skills by working independently of the teacher in small groups or pairs. Stations included are:
 - INFORMATION STATION – Group members will read an interesting and relevant science passage then complete a task to help increase science literacy and deepen their understanding of the science concept.
 - OBSERVATION STATION – Group members will have images, illustrations, or actual samples at this station that show applications or processes of the science topic. Using what they've learned, they will need to apply their observation skills to complete the questions attached to each.
 - CALCULATION STATION – Group members use their math skills to complete the station challenge. Skills may include graphing, analyzing data, using models, measurement, and calculating formulas or word problems.
 - INVESTIGATION STATION – Group members will work with one another to explore the concept through hands-on activities so they may practice specific inquiry process skills as they learn.
 - COMMUNICATION STATION – There are three different options for this station: interviews, video, group essay. Depending on the option you choose, group members will communicate what they know by answering questions in creative ways.
 - CREATION STATION – Group members will work together to solve a STEM (Science, Technology, Engineering, Math) challenge by creating models or designs that demonstrate their understanding of the science topic being taught.
 - IMAGINATION STATION – This station makes science concepts relevant for students by asking them to imagine scenarios that will bring about discussion and critical thinking.
6. **INQUIRY PROCESS SKILLS CHECKLIST** is provided with each set to show teachers and administrators the inquiry skills used by students in each activity. These skills include, but are not limited to, communicating, creating models, inferring, classifying, identifying variables, measuring, observing, predicting, gathering and organizing data, comparing and contrasting, interpreting data, and manipulating materials.

Science Stations



ENGAGING READING!

GRAPHING,
WORD
PROBLEMS &
MEASUREMENT!

INQUIRY
SKILLS &
PROCESSES!

STEM CHALLENGES!

Eye Safety

SCIENCE SKILLS AND LAB SAFETY

Procedure:

- Draw an eye on the underside of the Petri dish and display the eye using the projector.
- Crack open the egg and place the egg white only in the Petri dish.
- Explain that the proteins in egg whites are similar to those found in the protective layer of the eye.
- Tell them that someone was not being eye-safe and has splashed acid into their eye < add droplets of acid to the egg white to show what happened.
- Ask students to make observations of what is happening to the egg white.
- Try adding water to neutralize the effects. Ask students make observations.

What's Happening?

The egg white is like human tears. It is used to neutralize acid. If the protein in the egg white comes in contact with acid, it will cause damage to the eye or skin or to any living tissue. Students must be taught how to be safe when working with acids. If acid gets in your eye, wash it out with water. If acid gets on your skin, wash it off with water. Make sure they are aware of safety equipment. Eye wash station, shower, fire blanket, etc.

Discussion:

Q: What happened to the "eye"?

A: The protective layer became cloudy and damaged the eye.

Q: What type of safety equipment must be worn when doing lab?

A: goggles, apron, hair ties, gloves.

Discussion questions and teacher set-up included!

Drip, Drop, Splat!

How does the density of a liquid affect the height and shape of droplet splatters?

Materials:

- colored water (graduated cylinder A)
- colored syrup (graduated cylinder B)
- eye dropper
- paper
- metric ruler
- meter stick

Procedure:

- Make a hypothesis of how density of a liquid will affect splatter size on your lab sheet.
- Place the piece of paper down on the lab table in order to catch droplets.
- Measure the heights listed in the data table using a meter stick. Place meter stick with end starting at zero on paper and move up stick when measuring height of drops.
- Use the eye dropper to drip ONE drop of colored water and ONE drop of colored syrup. Make sure to drop on different places on paper.
- Measure the size of the splatter in MILLIMETERS. Record in data table on answer sheet.
- Repeat for each height.
- Use the collected data to graph the splatter size versus drop height for each liquid.

Analyze and Conclude

- Was your hypothesis correct? Explain.
- What are two controls in your experiment that helped you collect the most accurate data possible?

TEACHERS SAVE TIME:

Laminate station pages and reuse for each class and for years to follow!

Inquiry skills used are timeless!

USER-FRIENDLY PAGES:

Students easily recognize which answer sheet to use at each station by matching station icons located on each page!!

Hypothesis

Drop Height (cm)	5	25	50	75	100
Colored Water					
Colored Syrup					

Height of Drop vs. Splatter Size

Legend: Water Syrup

Drop Height (cm)	5	25	50	75	100
Height of Splatter (mm)					

Analyze and Conclude:

1. _____

2. _____

Teacher guide and answer key offered for every lab!

Easy-to-get materials!



Measure with SI Units

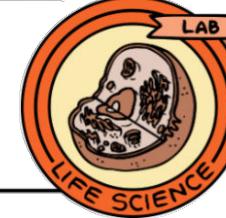
SCIENCE SKILLS AND LAB SAFETY

Materials:

- spatulated spoons
- tongs
- petri dish
- petri dish
- crayons/pencils
- small milk cartons
- metric ruler
- 10 ml graduated cylinder
- gloves

Common SI Prefixes

Prefix	Symbol	Abbreviation
hecto-	h	1,000
deka-	d	100
deci-	d	0.1
centi-	c	0.01
milli-	m	0.001



Instructional Videos



The Intro to Life Science Instructional Videos and Digital Assessments are designed to help teachers move instruction from the group learning space to the individual learning space. Not only does this give students independence in their learning, but it also allows more time for dynamic and interactive learning when teachers meet with students in a group setting.

This resource is perfect for:

- Flipped Classroom
- Absent students
- 1:1 Classrooms
- Sub Plans
- Hybrid Schedules
- Teachers who want more time to guide students as they apply concepts and engage creatively in the subject matter

Features of this resource include:

- Instructional videos which are six minutes or less to keep students focused
- Videos and assessments can be completed independently
- Auto grading and reporting in Google Forms
- Share link with students through educational platforms or email
- Quizzes are editable with 5 - 8 questions per quiz
- Information in video pairs with NGS Magnified Interactive Notebooks

Task Cards & Digital Task Cards

Task cards are a great tool for concept review that can be used in a variety of ways - pairs, small groups, team games, or individually. The reason they are so effective is there is only ONE task per card, allowing students to focus on that single task until they have successfully completed it. Answers sheet and answer key for teachers are included.

The digital, self-checking task cards are hosted at Boom Learning™ and are compatible with Google Classroom. These are perfect for displaying on your interactive whiteboard and leading class games or review sessions.

Print Task Cards

1. **COMPLETE**
_____ is the study of life.

2. **IDENTIFY**
Explain what is shown in the image.

5. **IDENTIFY**
Identify which tools would be used while conducting qualitative research.

6. **COMPLETE**
An _____ has all the characteristics of life and is made of one or more cells.

9. **DECIDE**
The ability of organisms to make offspring is called _____.
a. reproduction c. adaptation
b. regulation d. energy

10. **IDENTIFY**
Explain what is shown in the image.

11. **DETERMINE**
Determine which type of microscope allows light to pass through the specimen and uses two lenses to form an image.

12. **DECIDE**
The _____ based on the _____.

17. **COMPLETE**
The smallest functional unit of life is a _____.

18. **DECIDE**
This bird's down feathers are able to keep it warm. This is an example of a(n) _____.
a. regulation c. cell
b. adaptation d. energy

19. **IDENTIFY**
Identify this image.

20. **COMPLETE**
The part of Earth that contains all ecosystems is called the _____.

Digital Task Cards

Intro to Life Science
The part of Earth that contains all ecosystems is called the _____.

Intro to Life Science
This bird's down feathers are able to keep it warm. This is an example of a(n) _____. 

Intro to Life Science
A community and its nonliving parts best describes which of the following?
organism
molecules
biosphere
ecosystem

Study Guides: Includes print or digital options

NGS Magnified Study Guides are directly aligned to the notes and assessments offered by NGS Magnified and include a variety of review strategies that meet the needs of your learners for independent study and indirect instruction.

Each study guide provides a combination of strategies which may include:

- Graphic organizers
- Vocabulary building
- Compare and contrast
- Problem-solving
- Concept mapping
- Interpreting data
- Critical thinking
- Theme connection
- Matching
- Fill-in-the-blank
- Short answer
- Real-world application
- QR videos with accompanying questions

STUDY GUIDE

INTRO TO LIFE SCIENCE

SECTION 1 **BIOLOGY**
Directions: Fill in the blanks with the correct information.
Biology is

SECTION 2
Directions: Pick three levels of life studied listed below, provide a brief description of your choices, and then answer the questions below.
Biosphere: Population Cells Ecosystem: Organism Molecules Community: Group

SECTION 3
Directions: Fill in the graphic organizer with five rules that should be followed in the lab. At the bottom describe the functions of the microscopes listed.

SECTION 4
Directions: Match each of the terms with the correct definition.
Data Inference Metric System Observation

SECTION 5
Directions: Define quantitative. Draw a line to the instrument that is used for quantitative research.

SECTION 6
Directions: Find three things to measure and use the metric system to measure them. Then draw it on the chart to show your work.

SECTION 7
Directions: Scan the QR code to watch the video and explain how living things change with their environment. Include what adaptations are and how they can help an animal. What other animals can you think of that have adaptations?

LIVING THINGS CHANGE

Did you know the first microscopes were called "the glasses" because they were used to study small insects?



Assessments:

Teachers can use a variety of assessments to evaluate student progress throughout the unit. The curriculum provides mini-quizzes for each Interactive Notebook chapter and an online assessments that goes with the instructional videos. The chapter test includes multiple choice, short answer, interpreting diagrams, and an essay.

Name _____ Date _____

Quiz: The Science of Biology

Matching

- ____ 1. form and function
- ____ 2. scientific inquiry
- ____ 3. adaptation
- ____ 4. biological system
- ____ 5. reproduction
- ____ 6. energy
- ____ 7. interaction with environment
- ____ 8. regulation

ability of organisms to make offspring
b. maintenance of a stable internal environment
c. how something works is related to its structure
d. each organism interacts differently with its environment
e. a combination of parts can form a more complex organization

6. involves asking questions about nature and science is needed for organisms to grow, develop and reproduce. changes in genes lead to inherited traits that help organisms survive and reproduce

Name _____ Date _____

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Name _____ Date _____

CHAPTER TEST: DRAFT TO USE

Multiple Choice

Choose the answer. Not best complete each statement.

1. The theory that reflects the idea that there is a common ancestor for all living things is called _____
a. theory of evolution
b. unity of diversity
c. natural selection
d. adaptation
2. Below are the facts and concepts about biology are _____
a. living things
b. environment
c. interaction
d. energy
3. Living things _____
a. are plants
b. are animals
c. are microorganisms
d. are all of the above
4. The study of biology is learning about the _____
a. environment
b. the animal
c. the plant
d. all of the above
5. Most living things _____
a. individual
b. individuals
c. individuals
d. all of the above
6. A group of all _____
a. individuals
b. individuals
c. individuals
d. all of the above
7. Living things _____
a. are plants
b. are animals
c. are microorganisms
d. are all of the above
8. All living things _____ to make more living things.
a. individual
b. individuals
c. drive
d. adapt
9. The information gathered from experiments is called _____
a. data
b. research
c. hypothesis
d. conclusion
10. The three common types of life problems called _____
a. pure science
b. applied science
c. pure research
d. applied research
11. Quantitative research is the _____
a. graphs or charts
b. description of behavior
c. description of behavior
d. all of the above
12. What is the first thing you do?
a. Fix the science project
b. Do the research project
c. Start first set of hypotheses
d. all of the above
13. Staying one or more of your _____
a. diversity
b. diversity
c. diversity
d. diversity
14. _____ is used to make small details of an object visible to a scientist.
a. A _____ is used to make small details of an object visible to a scientist.
b. A _____ is used to make small details of an object visible to a scientist.
c. A _____ is used to make small details of an object visible to a scientist.
d. A _____ is used to make small details of an object visible to a scientist.
15. The science of living things and life is called _____
16. The study of life is called _____

ANSWER KEY INCLUDED — IMAGES ARE BLURRED FOR COPYRIGHT REASONS

EDITABLE CHAPTER TEST INCLUDES MULTIPLE CHOICE, FILL IN THE BLANK, INTERPRETING DIAGRAMS, & SHORT ANSWERS QUESTIONS

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