

Cells

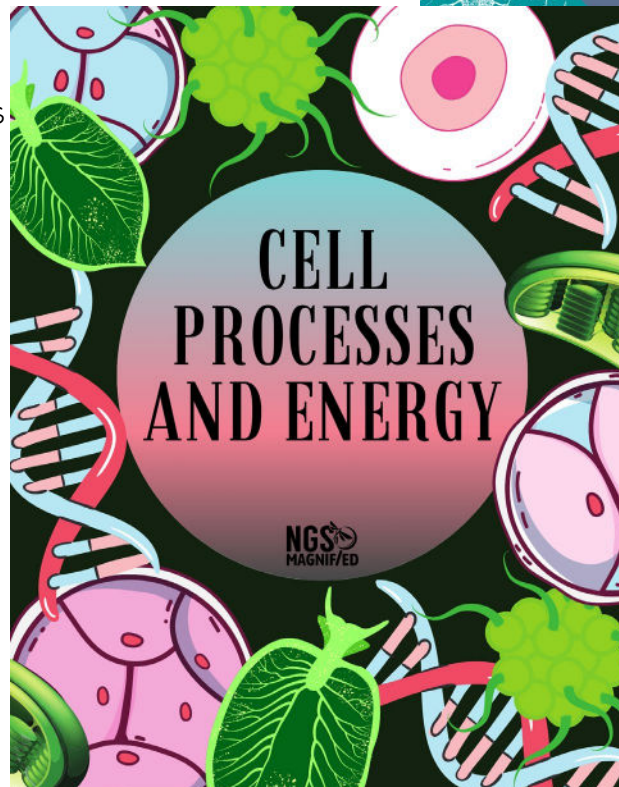
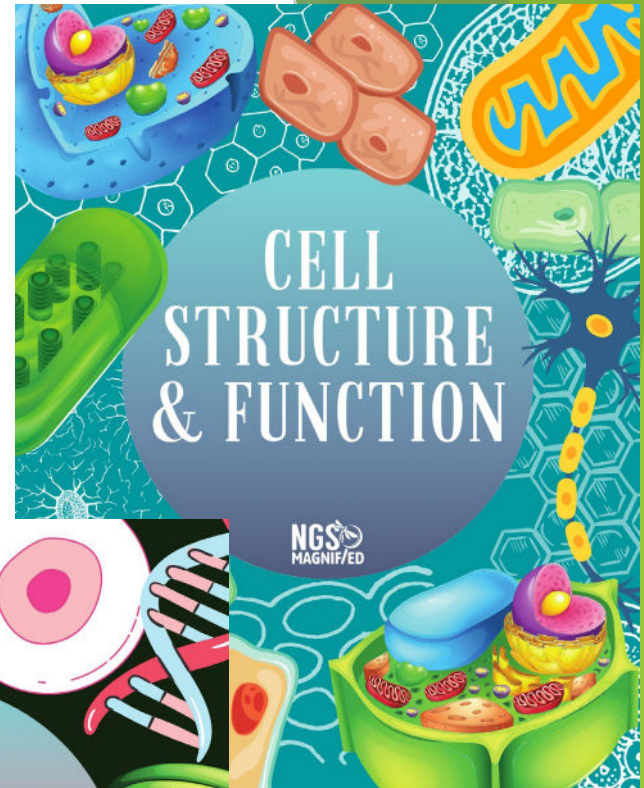


Cells Unit includes two units –

Cell Structure and Function & Cell Processes and Energy

Each 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		
4	• Section 3 Notes – use PowerPoint		x			
	• INB Activity			x		
5	• Mini-quiz					x
	• Section 4 Notes – use PowerPoint		x			
	• INB Activity			x		
6	• Mini quiz					x
	• Science Stations				x	
7	• Science Stations				x	
8	• Final draft and testing for Creation Station (STEM)				x	x
9	• Task Card Review (game-style, full class, partner)				x	
10	• Chapter Test					x
	• 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.

Section 1: Photosynthesis

Directions: Cut out and glue the foldable for each concept. Cut out the photosynthesis foldable and glue it into your notebook. The foldable will show the process of photosynthesis and the structures of the leaf where the process takes place. The foldable will also show the chemical equation for photosynthesis.

Section 2: Cellular Respiration

Directions: Cut out and glue the foldable for each concept. Cut out the cellular respiration foldable and glue it into your notebook. The foldable will show the process of cellular respiration and the structures of the cell where the process takes place. The foldable will also show the chemical equation for cellular respiration.

Section 3: Mitosis

Directions: Cut out and glue the foldable for each concept. Cut out the mitosis foldable and glue it into your notebook. The foldable will show the process of mitosis and the structures of the cell where the process takes place. The foldable will also show the chemical equation for mitosis.

Mitosis Matching

Directions: Cut and glue the cards for each concept. Cut out the mitosis matching cards and glue them into your notebook. The cards will show the process of mitosis and the structures of the cell where the process takes place. The cards will also show the chemical equation for mitosis.

Section 4: DNA Structure and Replication

Directions: Cut out and glue the foldable for each concept. Cut out the DNA structure and replication foldable and glue it into your notebook. The foldable will show the structure of DNA and the process of replication. The foldable will also show the chemical equation for DNA replication.

Instructions:

The first task for this interactive is for students to match mitotic phase descriptions with the correct phase and phase diagram. Once matches are complete, they are to paste cards for each phase on an accordion foldable that can later be used for self-quizzing purposes.

Included for this section are Mitosis Matching cards, templates for accordion foldable and a mini-quiz.

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.

Hyperlinked tabs so student can easily move through chapter for review

Students watch video < 6 min to complete notes.

The screenshot displays a digital notebook page for a biology lesson. On the left, a sidebar contains a list of terms: Phospholipid, inside cell, outside cell, phosphate, carbohydrate chain, fatty acid chains, protein channel, and protein. Above this list is a box with directions: "Directions: Label the parts of the phospholipid bilayer by clicking and dragging the text boxes below." The main content area is divided into two sections. The top section, titled "PHOSPHOLIPID BILAYER", features a 3D diagram of a phospholipid bilayer with various parts labeled with blue boxes and arrows. The bottom section, titled "THE PLASMA MEMBRANE", contains text about the membrane's function and structure, followed by a video player titled "The Plasma Membrane" with a play button. To the right of the video player is a "Digital Textbook" button. Below the video player is a section titled "For further exploration, click button(s) below:" with a "Fluid Mosaic Model" button. A vertical sidebar on the right side of the notebook contains several yellow tabs labeled "Home", "Chapter 1", "Chapter 2", "Chapter 3", "Chapter 4", "Chapter 5", "Chapter 6", "Chapter 7", "Chapter 8", "Chapter 9", "Chapter 10", "Chapter 11", "Chapter 12", "Chapter 13", "Chapter 14", "Chapter 15", "Chapter 16", "Chapter 17", "Chapter 18", "Chapter 19", "Chapter 20", "Chapter 21", "Chapter 22", "Chapter 23", "Chapter 24", "Chapter 25", "Chapter 26", "Chapter 27", "Chapter 28", "Chapter 29", "Chapter 30", "Chapter 31", "Chapter 32", "Chapter 33", "Chapter 34", "Chapter 35", "Chapter 36", "Chapter 37", "Chapter 38", "Chapter 39", "Chapter 40", "Chapter 41", "Chapter 42", "Chapter 43", "Chapter 44", "Chapter 45", "Chapter 46", "Chapter 47", "Chapter 48", "Chapter 49", "Chapter 50", "Chapter 51", "Chapter 52", "Chapter 53", "Chapter 54", "Chapter 55", "Chapter 56", "Chapter 57", "Chapter 58", "Chapter 59", "Chapter 60", "Chapter 61", "Chapter 62", "Chapter 63", "Chapter 64", "Chapter 65", "Chapter 66", "Chapter 67", "Chapter 68", "Chapter 69", "Chapter 70", "Chapter 71", "Chapter 72", "Chapter 73", "Chapter 74", "Chapter 75", "Chapter 76", "Chapter 77", "Chapter 78", "Chapter 79", "Chapter 80", "Chapter 81", "Chapter 82", "Chapter 83", "Chapter 84", "Chapter 85", "Chapter 86", "Chapter 87", "Chapter 88", "Chapter 89", "Chapter 90", "Chapter 91", "Chapter 92", "Chapter 93", "Chapter 94", "Chapter 95", "Chapter 96", "Chapter 97", "Chapter 98", "Chapter 99", "Chapter 100".

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

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

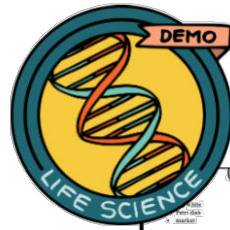
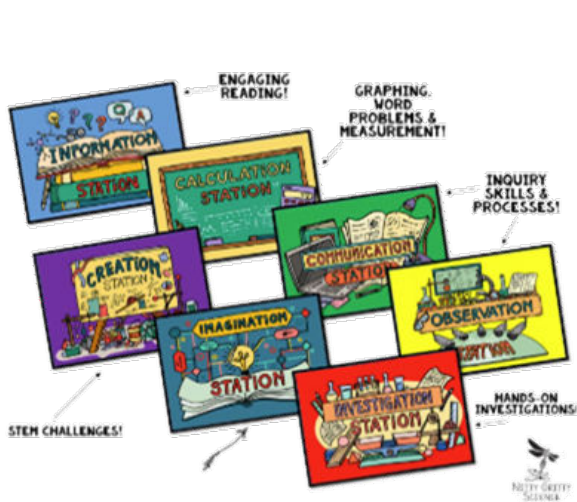
Working in the lab and being engaged in science experiments is the most exciting part of science.



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



Eye Safety

SCIENCE SKILLS AND LAB SAFETY

Procedure:

- Place an eye on the underside of the Post-it and display for class using the projector.
- Each group the eye and place for eye vision only of the front glass.
- Explain that the proteins in egg whites are similar to those found in the protective layer of the eye.
- Tell them that someone's eye has been damaged and has splashed with their eye. Call drops of and to the egg whites.
- Ask students to make observations of what is happening to the egg whites.
- Try adding water to cover the effects. Have students make observations.

What's Happening?

The proteins in the egg whites become cloudy when they are exposed to a denaturation of the proteins. This is an irreversible chemical reaction and students need to understand that a chemical reaction can cause damage to their eyes or skin if not used properly. Students must be made aware of the safety procedures, especially when using heating equipment, glassware, acids, bases, etc. Make sure they are aware of safety equipment: eye wash station, shower, fire blanket, etc.

Discussion:

- What happened to the "eye"?
- The protective layer became cloudy and denatured the eye.
- What type of safety equipment must be worn when doing lab?
- Explain safety rules, then discuss.

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Discussion questions and teacher set-up included!

Teacher guide and answer key offered for every lab!

Easy-to-get materials!



Measure with SI Units

SCIENCE SKILLS AND LAB SAFETY

The standard system of measurement used by scientists around the world is known as the International System of Units, which is abbreviated as SI. It is very easy to use because they use basic units of measurement. SI units are used to measure length, mass, volume, time, temperature, and energy. The following table lists the prefixes used to name the basic common SI units.

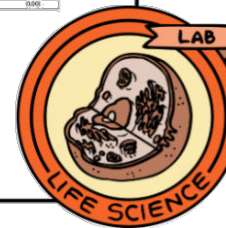
Prefix	Symbol	Amount
kilo-	k	1,000
hecto-	h	100
deka-	da	10
deci-	d	0.1
centi-	c	0.01
milli-	m	0.001

Materials:

- 1. graduated cylinder
- 2. tape
- 3. balance
- 4. weighing scale
- 5. equipment (e.g., small scale, balance)
- 6. graduated cylinder
- 7. metric ruler
- 8. small graduated cylinder
- 9. graduated cylinder

Safety:

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Drip, Drop, Splat!

How does the density of a liquid and drop height affect the size 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 splatters.
- 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 increasing height of drop.
- Use the eye dropper to drop 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?

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USER-FRIENDLY PAGES:
Students easily recognize which answer sheet to use at each station by matching station icons located on each page!!

Investigation Station

Name _____ Date _____

Hypothesis

Drop Height (cm)

Drop Height (cm)	Water	Syrup
5		
10		
15		
20		
25		
30		
35		
40		
45		
50		

Height of Drop vs. Splatter Size

Height of Drop (cm)

Size of Splatter (mm)

Legend:

- Water
- Syrup

Analyze and Conclude:

-
-

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TEACHERS SAVE TIME:
Laminate station pages and reuse for each class and for years to follow!
Inquiry skills used are timeless!

Instructional Videos

Cells 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 focus
- 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

DECIDE 1
What cell structure uses energy from sunlight to make food molecules?
a. cell wall c. nucleus
b. cytoskeleton d. chloroplast

DECIDE 2
The first scientist to describe living cells as seen through a simple microscope was _____.

DECIDE 3
What cell structure controls most cell processes and contains DNA?
a. cell wall c. nucleus
b. cytoskeleton d. chloroplast

EXPLAIN 4
What process produces carbon dioxide?
a. cellular respiration c. mitosis
b. photosynthesis d. reproduction

EXPLAIN 5
The chromosomes line up across the center of each cell during _____.
a. prophase c. anaphase
b. metaphase d. telophase

COMPLETE 6
The organelle in which photosynthesis takes place is the _____.

COMPLETE 7
The _____ is the source of energy for most living things.

IDENTIFY 8
Identify the phase of mitosis shown above.

Digital Task Cards

Cell Structure and Function
The plasma membrane is made up of a(n) _____.
cholesterol layer
protein
enzyme
lipid bilayer

Cell Structure and Function
The long whip-like structure that aids in the movement of some cells is called a _____.
Flagella

Cell Processes and Energy
Which part of the cell controls most of the cell's activities?
vacuole
mitochondria
cytoplasm
nucleus

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



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: Photosynthesis

Circle the word that makes each statement true.

- Photosynthesis occurs mostly in two (roots, leaves) of a plant.
- (Chloroplasts, Cytoplasm) in plant cells capture energy using a green (chlorophyll, chloroplast).
- Carbon dioxide, which enters the leaf through the plant's (stomata, chloroplasts), is a chemical reaction to produce sugar.
- Plants use energy from the sun to make their own food, therefore (heterotrophs, autotrophs).
- In photosynthesis, light energy from the sun is converted into (chemical, kinetic) energy.

Name _____ Date _____

Quiz: Photosynthesis

Circle the word that makes each statement true.

- Photosynthesis occurs mostly in the (roots, leaves) of a plant.
- (Chloroplasts, Cytoplasm) in plant cells capture energy using a green (chlorophyll, chloroplast).
- Carbon dioxide, which enters the leaf through the plant's (stomata, chloroplasts), is a chemical reaction to produce sugar.
- Plants use energy from the sun to make their own food, therefore (heterotrophs, autotrophs).
- In photosynthesis, light energy from the sun is converted into (chemical, kinetic) energy.

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

ANSWER KEY INCLUDED – IMAGES ARE BLURRED FOR COPYRIGHT REASONS

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