

# Cells

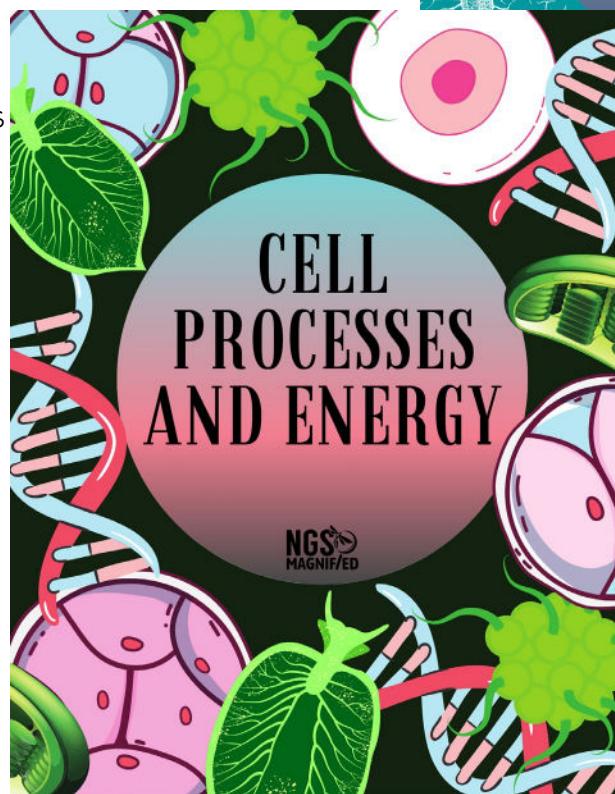
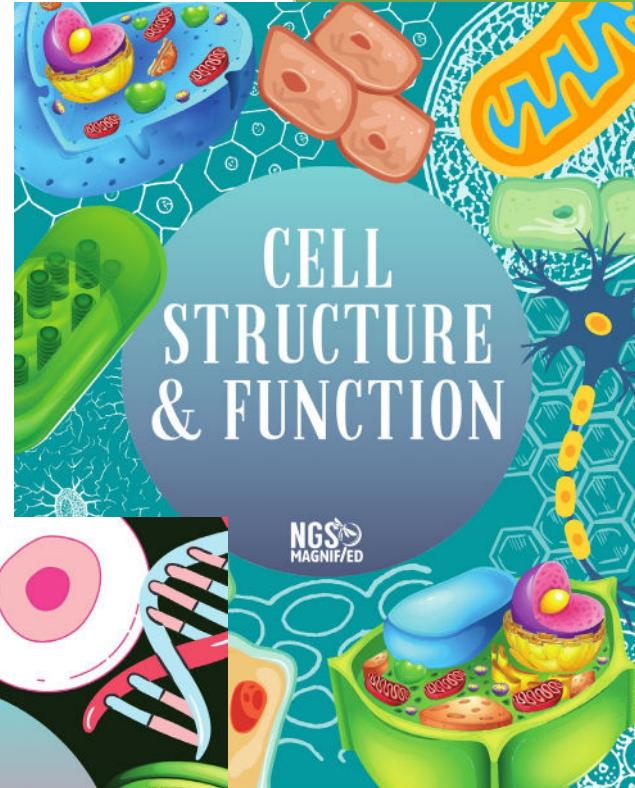


Cells Unit includes two units –

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		
	• 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.

## Section 1: Photosynthesis

Directions: Cut out and color the following leaf. Draw a cell wall on the left side and a large central vacuole on the right side. Then draw the structures of the leaf and plant parts indicated in the directions on the left.

Cut and color the following leaves and leaf structures. Please draw structures on the leaf where appropriate to describe photosynthesis.

Name \_\_\_\_\_  
Date \_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

## Section 2: Cellular Respiration

### Section 4: Mitosis

### Section 4: Mitosis

Directions: Cut and color the four boxes. Print, assemble, and illustrate for each of the following cards and match the name, description, and illustration for each task. (All illustrations have been printed inside the cards for each phase of mitosis. Print and paste each phase onto the four various boxes with the correct name on each box.)

Telophase		<ul style="list-style-type: none"><li>Chromosomes reappear</li><li>NUCLEAR ENVELOPE REAPPEARS</li><li>Spindle fibers disappear</li><li>NUCLEUS FORMS</li></ul>
Anaphase		<ul style="list-style-type: none"><li>Nuclear envelope forms</li><li>NUCLEUS FORMS</li><li>Chromosomes move to opposite poles</li><li>Spindle fibers disappear</li><li>Cytokinesis begins</li></ul>
Prophase		<ul style="list-style-type: none"><li>Chromosomes condense</li><li>NUCLEUS DISAPPEARS</li><li>Spindle fibers form</li><li>NUCLEUS DISAPPEARS</li><li>Chromosomes decondense</li><li>NUCLEUS FORMS</li></ul>
Metaphase		<ul style="list-style-type: none"><li>Chromosomes align at the equator</li><li>NUCLEUS DISAPPEARS</li><li>Each chromosome is attached to spindle fibers at the centromere</li></ul>

### Section 4: Chromosome-Based Assessment Foldable (10 points)

Name \_\_\_\_\_ Date \_\_\_\_\_

Name \_\_\_\_\_ Date \_\_\_\_\_

## Section 5: DNA Structure and Replication

Name \_\_\_\_\_ Date \_\_\_\_\_

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# 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: Label the parts of the phospholipid bilayer by clicking and dragging the text boxes below.

Phospholipid  
inside cell  
outside cell  
phosphate  
carbohydrate chain  
fatty acid chains  
protein channel  
protein

PHOSPHOLIPID BILAYER

THE PLASMA MEMBRANE

Plasma Membrane -

- The plasma membrane regulates what enters and leaves the cell and also provides protection and support. This is called \_\_\_\_\_

Selective Permeability -

Structure of Plasma Membrane:

- Phospholipid bilayer
- Phospholipid -

Plasma membranes contain \_\_\_\_\_ molecules that are embedded in the phospholipid bilayer. \_\_\_\_\_ molecules are attached to many of the proteins. The organization of all these structures is called the \_\_\_\_\_ model.

How is a plasma membrane like a window screen?

Hyperlinked tabs so student can easily move through chapter for review

Students watch video < 6 min to complete notes.

The Plasma Membrane

Digital Textbook

For further exploration, click button(s) below:

Fluid Mosaic Model

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

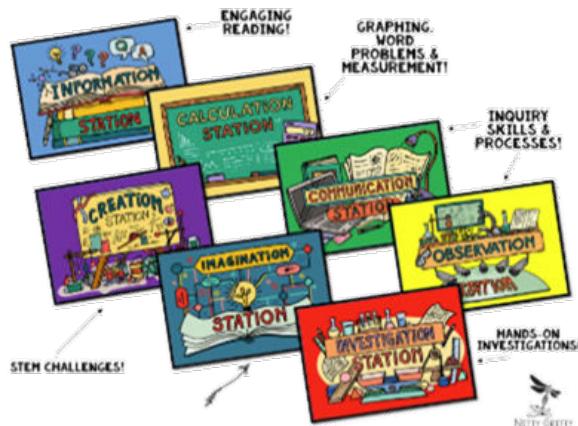
Working in the lab and being engaged in science experiments is the most exciting part of science.



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

• projector  
• eye dropper  
• mask  
• mask  
• mask

**Procedure:**

1. Blow an eye on the underside of the Petri dish and display for class using the projector.
2. Crack open the egg and place the egg white only in the Petri dish.
3. Explain that the proteins in egg white are similar to those found in the protein layer of the eye.
4. Tell them that acetone was being cautious and has splashed acid into their eye. cold drops of acid to the eye when.
5. Ask students to make observations of what is happening to the egg white.
6. Try adding water to reverse the effects. Ask students make observations.

**Discussion:**

Q: What happened to the egg white?  
A: The protein layer became cloudy and damaged the eye.

Q: What type of safety equipment must be worn when doing lab?  
A: goggles, aprons, hair ties, gloves

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 (SI). Prefixes are used to make units easier to use. They can help in multiplying or dividing by 10. Each step is 10 times larger than the last. Millions only add one more step. The following table lists the prefixes used to name the most common SI units.

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

**Materials:**

- graduated cylinder
- tape
- balance
- petri dish
- graduated cylinder with markings
- fertilizer solution
- soil
- 20 ml. graduated cylinder
- colored pencils

**Safety:**

**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:**

1. Make a hypothesis of how density of a liquid will affect splatter size. Write your lab sheet.
2. Place the piece of paper down on the lab table in order to catch droplets.
3. 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.
4. 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.
5. Measure the size of the splatter in MILLIMETERS. Record in data table on answer sheet.
6. Repeat for each height.
7. Use the collected data to graph the splatter size versus drop height for each liquid.

**Analyze and Conclude:**

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

## USER-FRIENDLY PAGES:

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

**INVESTIGATION**

Name \_\_\_\_\_ Date \_\_\_\_\_

**Hypothesis**

Drop height (cm)

Colored Water	Colored Syrup			
5	25	50	75	100

Height of Drop vs. Splatter Size

Legend:  Water  Syrup

Node of Drop Size

Rate of Drop Size

**Analyze and Conclude:**

1. \_\_\_\_\_

2. \_\_\_\_\_

**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 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

**DECIDE**

What cell structure uses energy from sunlight to make food molecules?

a. cell wall    c. nucleus  
b. cytoskeleton    d. chloroplast

**DECIDE**

The first scientist to describe living cells as seen through a simple

**DETERMINE**

What cell structure controls most cell processes and contains DNA?

a. cell wall    c. nucleus  
b. cytoskeleton    d. chloroplast

**DETERMINE**

Determine what solution this cell is in. Explain your answer.

**EXPLAIN**

What process produces carbon dioxide?

a. cellular respiration    c. mutation  
b. photosynthesis    d. replication

**DECIDE**

The chromosomes line up across the center of each cell.

a. prophase    c. anaphase  
b. metaphase    d. telophase

**COMPLETE**

The organelle in which photosynthesis takes place is \_\_\_\_\_.

**COMPLETE**

The \_\_\_\_\_ is the source of energy for most living things.

**DETERMINE**

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 layer  
enzyme layer  
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

The image shows a stack of six study guide pages for 'CELL STRUCTURE'. Each page is titled 'STUDY GUIDE' and contains various sections and activities:

- Section 1:** Directions: Fill in the gaps highlighting the main parts of a cell.
- Section 2:** Directions: Draw your own picture of a plasma membrane in the box below. Label the phospholipid, protein molecule, and cell membrane.
- Section 3:** Directions: Label the cell using the terms from the word bank below.
- Section 4:** Directions: Give a brief description for each part of a eukaryotic cell structure. Labels: Nucleus, Mitochondria, Cytoplasm, Vesicles, Smooth endoplasmic reticulum.
- Section 5:** Directions: Fill in the blank for each term. Labels: capsule, ribosomes, cell wall, plasmid, plus, chromato.
- Section 6:** Directions: Choose six of the words below and give the definition, making sure to include the role it plays in cellular transport. Labels: pinocytosis, carrier protein, facilitated diffusion, endocytosis, osmosis, passive transport, exocytosis, active transport.

The pages are labeled 'CELL STRUCTURE' vertically on the left side. The background features a green and white abstract design with a dragonfly illustration in the bottom left corner.

# 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.

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