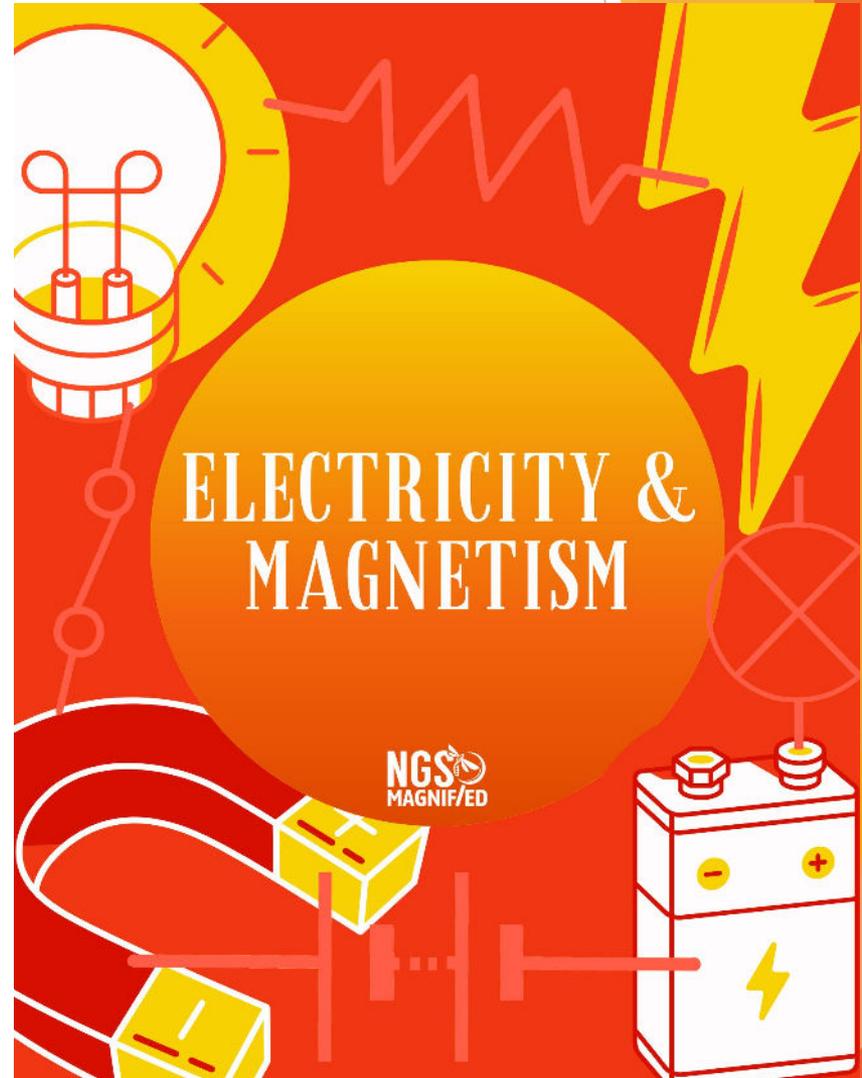


Electricity & Magnetism

Electricity & Magnetism 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 • INB Activity – INB output (homework if not completed in class)		x			
2	• Mini-quiz					x
	• Section 2 Notes – use PowerPoint • INB Activity		x	x		
3	• Mini-quiz					x
	• Guided Inquiry Lab – Student Led			x		
4	• Section 3 Notes – use PowerPoint • INB Activity		x	x		
	• Mini-quiz					x
5	• Section 4 Notes – use PowerPoint • INB Activity		x	x		
	• Mini quiz					x
6	• Science Stations				x	
	• 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.

The image displays a collection of student notebook pages for the topic of electricity and magnetism. The pages are arranged in a layered, overlapping fashion, showing different activities and content.

- Section 1: Electricity**: Includes a "Sequence Foldable" with instructions to place two sheets of paper (blue and green) and use two different colors. It features a diagram of a lightning bolt and a "Lightning Timeline" with a world map.
- Section 2: Electric Current**: Contains an "Electricity Timeline" with portraits of scientists like Benjamin Franklin, Thomas Edison, and Nikola Tesla. It also includes a "Lightning Template" for drawing.
- Section 3: Electrical Circuits**: Shows a "Circuit Drawing Practice" worksheet with various circuit diagrams and a "Circuit Drawing Practice" section with instructions on how to use the notebook pages.
- Mini-Quizzes**: Several pages include "Quiz Electricity" sections with multiple-choice questions about conductors, insulators, and the properties of protons and neutrons.
- Teacher Notes**: A page titled "INSTRUCTIONS" provides detailed guidance for students on how to use the notebook pages, including how to match names with faces and how to contribute to the field of electricity.

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.

Directions: Determine if each object in the circuit is an insulator or conductor. Click and drag the lightbulbs from the blue box to each circuit to indicate if they will turn on or off.

The screenshot shows a digital notebook page. On the left, there's a section titled 'CONDUCTORS VS INSULATORS' with several circuit diagrams. Each diagram has a lightbulb that can be moved from a blue box. Below this is a 'Directions' box. On the right, there's a section titled 'ELECTRICITY' with notes on 'Static Electricity', 'How do atoms become charged?', 'Law of Conservation of Charge', and 'Positive and negative charges exert forces on each other'. There are also diagrams of charges and a list of 'Conductors' and 'Insulators'. A navigation menu on the right side has tabs for 'ELECTRICITY', 'ELECTRIC CURRENT', 'ELECTRICAL CIRCUITS', 'MAGNETISM', 'MAGNETISM & ELECTRICITY', and 'CLASSROOM LIBRARY'.



Digital Textbook

For further exploration, click button(s) below:

▶ Name that Charge Game

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.

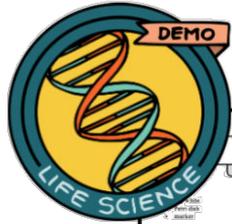
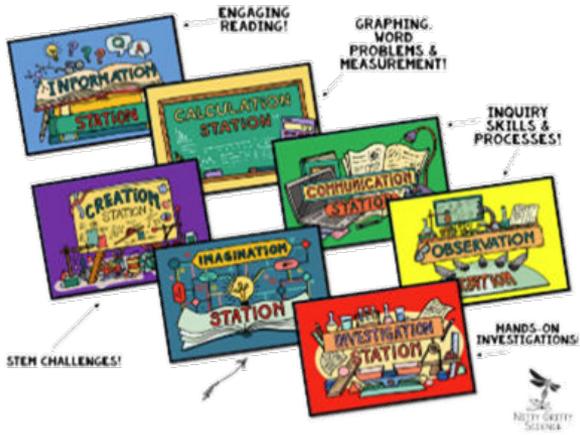
Demos, Labs, & Science Stations

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

Name: _____ Date: _____

Materials:

- projector
- colored water
- eye dropper
- eye safety goggles
- metric ruler
- paper
- meter stick

Procedure:

1. Place an eye on the underside of the Petri dish and display for class using the projector.
2. Each group the apparatus for the eye vision only for the first trial.
3. Explain that the proteins in egg whites are similar to those found in the protective layer of the eye.
4. Tell them that someone who has been excessive and has splashed acid into their eye - call drops of acid to the egg whites.
5. Ask students to make observations of what is happening to the egg whites.
6. For ability work to observe the effects. Have students make observations.

What's Happening?

(The proteins in the egg whites become cloudy when they react to a combination of the procedure. This is an irreversible chemical reaction and students need to understand that a chemical reaction can occur even though it is not visible to the eye. Students must be able to see that if the safety procedure is followed, there is no harm done and no injury. Make sure they are aware of safety equipment: eye wash station, gloves, fire blanket, etc.)

Discussion:

1. What happened to the "eye"?
2. The protective layer between the eye and the world.
3. Explain that safety equipment must be worn when doing lab!
4. Explain safety, but not gloves.

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Teacher guide and answer key offered for every lab!

Easy-to-get materials!

Measure with SI Units

SCIENCE SKILLS AND LAB SAFETY

Name: _____ Date: _____

Materials:

- graduated cylinder
- paper
- balance
- metric ruler
- eye dropper
- eye safety goggles
- metric ruler
- 10 mL graduated cylinder
- colored water

Procedure:

1. Measure the mass of the graduated cylinder.
2. Add 10 mL of water to the graduated cylinder.
3. Measure the mass of the graduated cylinder with the water.
4. Subtract the mass of the graduated cylinder from the mass of the graduated cylinder with the water.
5. Record the mass of the water.
6. Repeat steps 1-5 for 20 mL and 30 mL of water.
7. Compare the results of the three trials.
8. Discuss the results of the experiment.

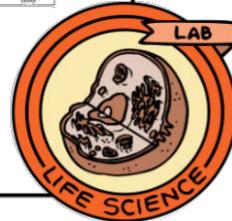
What's Happening?

(The mass of the water is equal to the volume of the water multiplied by the density of the water. This is a direct relationship between mass and volume. Students must be able to see that if the safety procedure is followed, there is no harm done and no injury. Make sure they are aware of safety equipment: eye wash station, gloves, fire blanket, etc.)

Discussion:

1. What happened to the "eye"?
2. The protective layer between the eye and the world.
3. Explain that safety equipment must be worn when doing lab!
4. Explain safety, but not gloves.

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Discussion questions and teacher set-up included!

USER-FRIENDLY PAGES:

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

Drip, Drop, Splat!

How does the density of a liquid affect drop height, color, 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 on your lab sheet.
2. Place the piece of paper down on the lab table in order to catch splatters.
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 increasing height of drop.
4. Use the eye dropper to drop ONE drop of colored water and ONE drop of colored syrup. Make sure to drop on different pieces 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?

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Name: _____ Date: _____

Hypothesis

Drop Height (cm)

Color	3	25	50	75	100
Water					
Syrup					

Height of Drop vs. Splatter Size

Number of Drops

Size of Splatter (mm)

Legend

- Water
- Syrup

Analyze and Conclude:

1. _____
2. _____

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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

Electricity and Magnetism 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

1 **COMPLETE**
A _____ is a material that allows electrons to flow through it.

2 **DECIDE**
A path that allows only one route for an electric current is called _____.

3 **COMPLETE**
A car battery is an example of a _____.

4 **DECIDE**
Electric charge that has accumulated on an object is referred to as _____.

5 **EXPLAIN**
A _____.

6 **IDENTIFY**
Using the diagram above, label the parts of the circuit.

7 **IDENTIFY**
What type of circuit is represented in the diagram above?

8 **DESCRIBE**
In the circuit above, what happens to light bulb A if light bulb C burns out?

9 **DECIDE**
Lightning is _____.

10 **IDENTIFY**
What circuit is represented in the diagram above?

11 **COMPLETE**
A magnetic field causes domains to _____.

12 **IDENTIFY**
Lightning is _____.

13 **DESCRIBE**
In the circuit above, what happens to light bulb A if light bulb C burns out?

14 **DESCRIBE**
In the circuit above, what happens to light bulb A if light bulb C burns out?

15 **IDENTIFY**
What circuit is represented in the diagram above?

16 **COMPLETE**
A magnetic field causes domains to _____.

Digital Task Cards

1 **DESCRIBE**
A car battery is an example of a _____.

2 **DESCRIBE**
Which of these images is a closed circuit?

3 **DESCRIBE**
Which of these items are conductors?

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

ELECTRICITY & MAGNETISM

SECTION 1
Directions: Answer these questions about electricity.
1. What is static electricity?

SECTION 2
Directions: Identify each of the following pictures as a conductor or as an insulator and write it in the box below.

SECTION 3
Directions: Answer the questions below about circuits.
What is a circuit?

SECTION 4
Directions: Fill in the blank with the correct word from the word bank below.
resistance, voltage difference, Ohm's law, electric current
1. A _____ is the movement of electric charge in a single direction through a wire or conductor.
2. The force that causes electric charges to move is called _____.
3. The closed path that an electric current flows through is called _____.
4. When a material opposes the flow of electrical energy into thermal and light energy, it is called _____.
5. _____ states that the current in a circuit is equal to the voltage difference divided by resistance.
Directions: Draw the circuit symbols in the box below.
Wire, Lightbulb, Closed Switch

SECTION 5
Directions: Label each circuit as a parallel or a series and then draw your own example in the box below.

SECTION 6
Directions: Explain the interaction between the north and south poles in the pictures below.
Do you know some other terms enough to put the pieces of a circuit together?
Directions: Define each of the terms in the graphic organizer below.
Magnetism, Magnetic Field, Magnetic domain, Permanent magnets

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: Electric Current

Matching

1. Voltage difference	a. current is equal to circuit divided by res
2. Resistance	b. flow of electric of
3. Electric current	c. tendency of mobile electrons
_____ 4. Circuit	d. a push that cause
_____ 5. Ohm's law	e. closed path throug

6. Explain the difference between a water and a dry cell battery.

7. How can one increase electrical resistance?

Name _____ Date _____

Quiz: Electric Current

Matching

1. Voltage difference	a. current is equal to circuit divided by res
_____ 2. Resistance	b. flow of electric of
_____ 3. Electric current	c. tendency of mobile electrons
_____ 4. Circuit	d. a push that cause
_____ 5. Ohm's law	e. closed path throug

6. Explain the difference between a water and a dry cell battery.

7. How can one increase electrical resistance?

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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