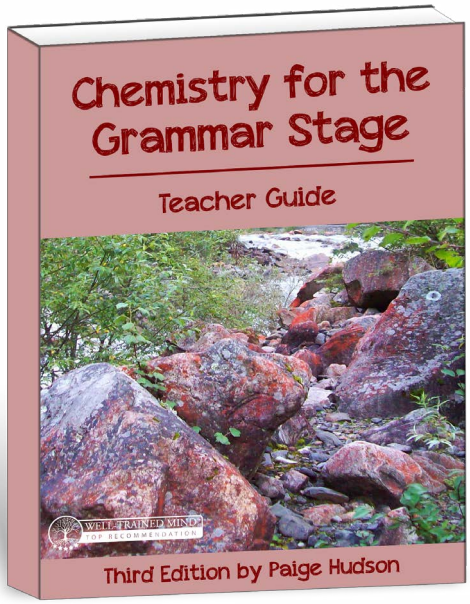
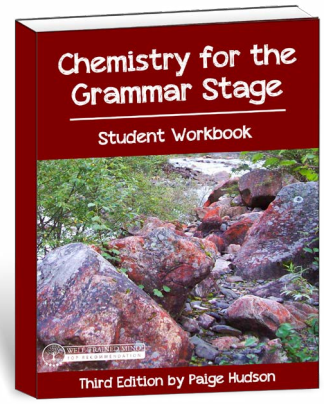
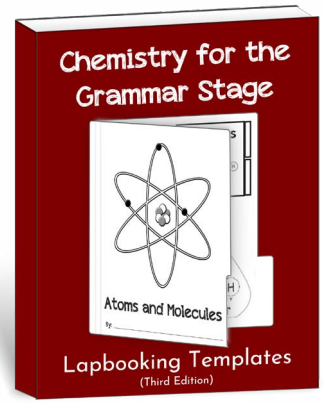
Chemistry for the Grammar Stage
Sample Packet

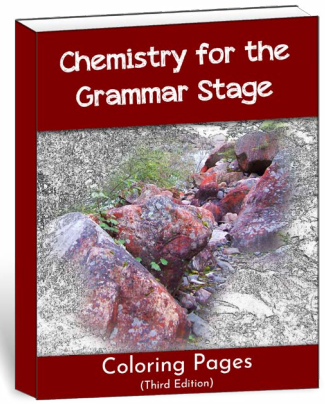


The following sample packet includes the first two weeks of the *Chemistry for the Gram-mar Stage Teacher Guide* (beginning on p. 7), plus the three student options:

- ✓ The Student Workbook (*beginning on p. 32*)
- ✓ The Lapbooking Templates (*beginning on p. 50*)
- ✓ The Coloring Pages (*beginning on p. 59*)







You do not need all of these to successfully complete this program. You can get more information and make your purchase here:

https://elementalscience.com/collections/chemistry-for-the-grammar-stage

elementalscience.com

A Peek Inside the Grammar Stage Teacher Guide

The teacher guide is your go-to resource for creating memorable science lessons!

1. Weekly Topic

Focus on one main idea, with several subtopics, throughout the week. You will learn about these ideas by doing scientific demonstrations, by reading from visually appealing encyclopedias, by recording what the students learned, and by adding other optional activities.

2. Two Scheduling Options

Know what to do when with the two grid-style scheduling options. There are a 2-day-a-week and a 5-day-a-week schedules. These schedules break down the essential work and the optional activities into manageable chunks so that you can proceed with confidence.

3. Reading Assignments

Find two reading options—one for younger students, one for older students—plus discussion questions and optional library books.

4. Memory work

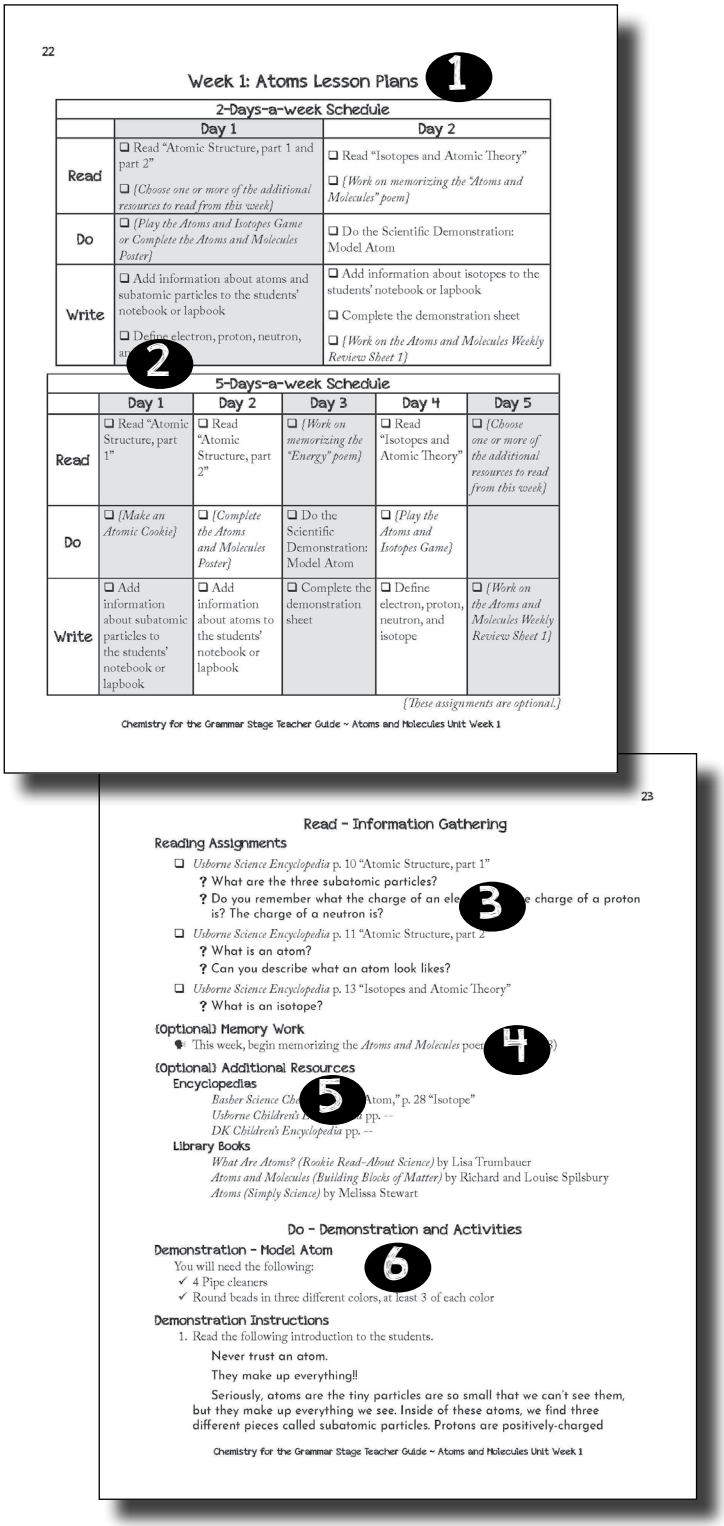
Boost your students' memory of what they have studied with a hallmark of classical education—memory work. These catchy poems share the key facts to remember about the unit's topics.

5. Additional Resources

See options for adding in more information about the weekly topic through children's encyclopedias and library books.

6. Related Scientific Demonstrations

Know what you will need to do a weekly hands-on science activity that coordinates



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Week 1: Atoms Lesson Plans 1

2-Days-a-week Schedule

	Day 1	Day 2
Read	❑ Read "Atomic Structure, part 1 and part 2" ❑ *{Choose one or more of the additional resources to read from this week}*	❑ Read "Isotopes and Atomic Theory" ❑ *{Work on memorizing the "Atoms and Molecules" poem}*
Do	❑ *{Play the Atoms and Isotopes Game or Complete the Atoms and Molecules Poster}*	❑ Do the Scientific Demonstration: Model Atom
Write	❑ Add information about atoms and subatomic particles to the students' notebook or lapbook ❑ Define electron, proton, neutron, an	❑ Add information about isotopes to the students' notebook or lapbook ❑ Complete the demonstration sheet ❑ *{Work on the Atoms and Molecules Weekly Review Sheet 1}*

2

5-Days-a-week Schedule

	Day 1	Day 2	Day 3	Day 4	Day 5
Read	❑ Read "Atomic Structure, part 1"	❑ Read "Atomic Structure, part 2"	❑ *{Work on memorizing the "Energy" poem}*	❑ Read "Isotopes and Atomic Theory"	❑ *{Choose one or more of the additional resources to read from this week}*
Do	❑ *{Make an Atomic Cookie}*	❑ *{Complete the Atoms and Molecules Poster}*	❑ Do the Scientific Demonstration: Model Atom	❑ *{Play the Atoms and Isotopes Game}*	
Write	❑ Add information about subatomic particles to the students' notebook or lapbook	❑ Add information about atoms to the students' notebook or lapbook	❑ Complete the demonstration sheet	❑ Define electron, proton, neutron, and isotope	❑ *{Work on the Atoms and Molecules Weekly Review Sheet 1}*

{These assignments are optional.}

Chemistry for the Grammar Stage Teacher Guide ~ Atoms and Molecules Unit Week 1

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Read - Information Gathering

Reading Assignments

❑ *Usborne Science Encyclopedia* p. 10 "Atomic Structure, part 1"
? What are the three subatomic particles?
? Do you remember what the charge of an ele e charge of a proton is? The charge of a neutron is?

3

❑ *Usborne Science Encyclopedia* p. 11 "Atomic Structure, part 2"
? What is an atom?
? Can you describe what an atom look likes?

❑ *Usborne Science Encyclopedia* p. 13 "Isotopes and Atomic Theory"
? What is an isotope?

{Optional} Memory Work

🗣 This week, begin memorizing the *Atoms and Molecules* poe 8)

4

{Optional} Additional Resources

Encyclopedias

5

Basher Science Ch Atom," p. 28 "Isotope"
Usborne Children's pp. --
DK Children's Encyclopedia pp. --

Library Books

What Are Atoms? (Rookie Read-About Science) by Lisa Trumbauer
Atoms and Molecules (Building Blocks of Matter) by Richard and Louise Spilsbury
Atoms (Simply Science) by Melissa Stewart

Do - Demonstration and Activities

Demonstration - Model Atom

6

You will need the following:
✓ 4 Pipe cleaners
✓ Round beads in three different colors, at least 3 of each color

Demonstration Instructions

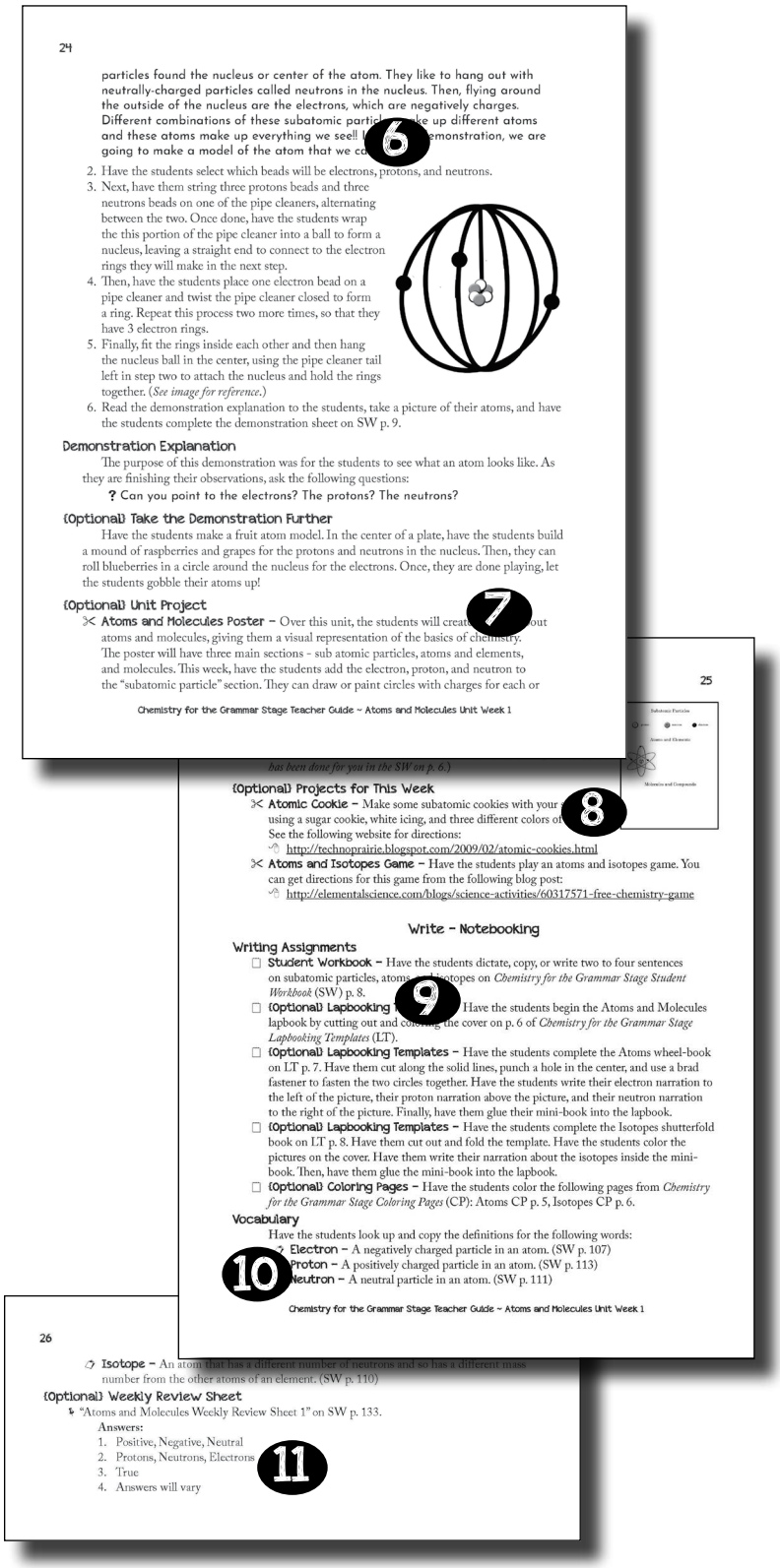
1. Read the following introduction to the students.

Never trust an atom.

They make up everything!!

Seriously, atoms are the tiny particles are so small that we can't see them, but they make up everything we see. Inside of these atoms, we find three different pieces called subatomic particles. Protons are positively-charged

Chemistry for the Grammar Stage Teacher Guide ~ Atoms and Molecules Unit Week 1



with the topic. This section includes the supplies you will need, along with scripted introductions. The easy-to-follow steps and scripted explanations make it a snap to complete the scientific demonstration. And if your kiddos want more, we have you covered with a related idea to take the science-learning fun even further.

7. Coordinated Unit Projects

Add in a bit of fun with these optional project ideas for the whole unit.

8. Optional STEAM Ideas

Get ideas for additional STEAM activities that relate to the week's topic.

9. Notebooking Assignments

Record what your students have learned with either the student workbook or the optional lapbook. The directions for these options are included for your convenience in the guide. Plus, see which coloring pages coordinate with the week's lesson in this section.

10. Relevant Vocabulary

Build your students' science vocabulary with words relevant to the weekly topic.

11. Review Sheets

See which review sheet to assign —these are found at the back of the student workbook—along with the answers. These sheets can be used as review or as quizzes.

A Peek Inside the Grammar Stage Student Materials

The Student Workbook

Harness the benefits of notebooking with the student workbook.

1. Weekly Notebooking Pages

Record what your students found interesting about the weekly subtopics using a hallmark of classical education—narration. Each of these customized notebooking pages has spaces to write and simple black-line illustrations for the students to color.

2. Simple Demonstration Sheets

Document the hands-on scientific demonstrations you do with simple lab sheets. These include sections for your materials, a simple procedure, your outcome, and the students' insights from the demonstration.

3. Glossary of Terms

Find a student glossary of terms following the weekly sheets. The terms are listed alphabetically with pictures to help your students remember their vocabulary.

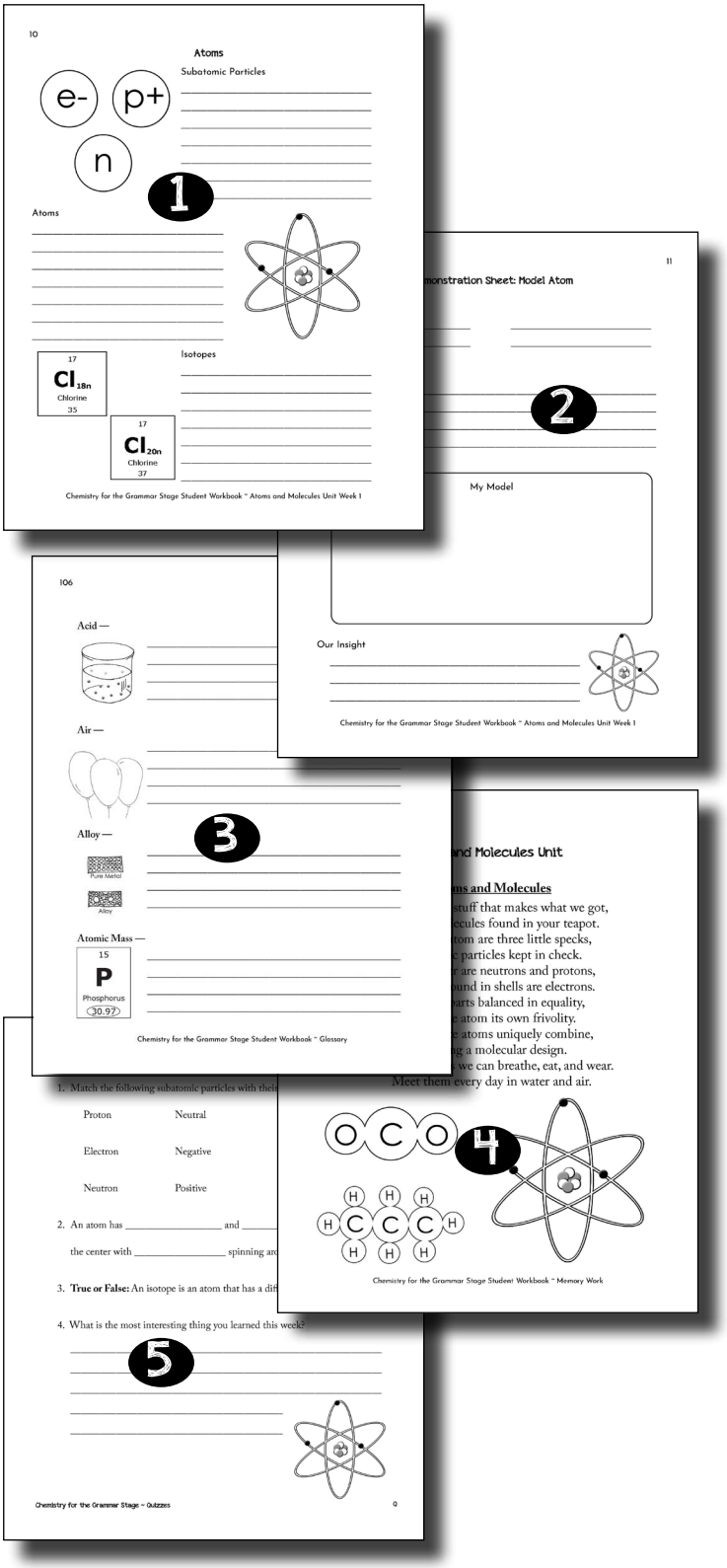
4. Memory Work Posters

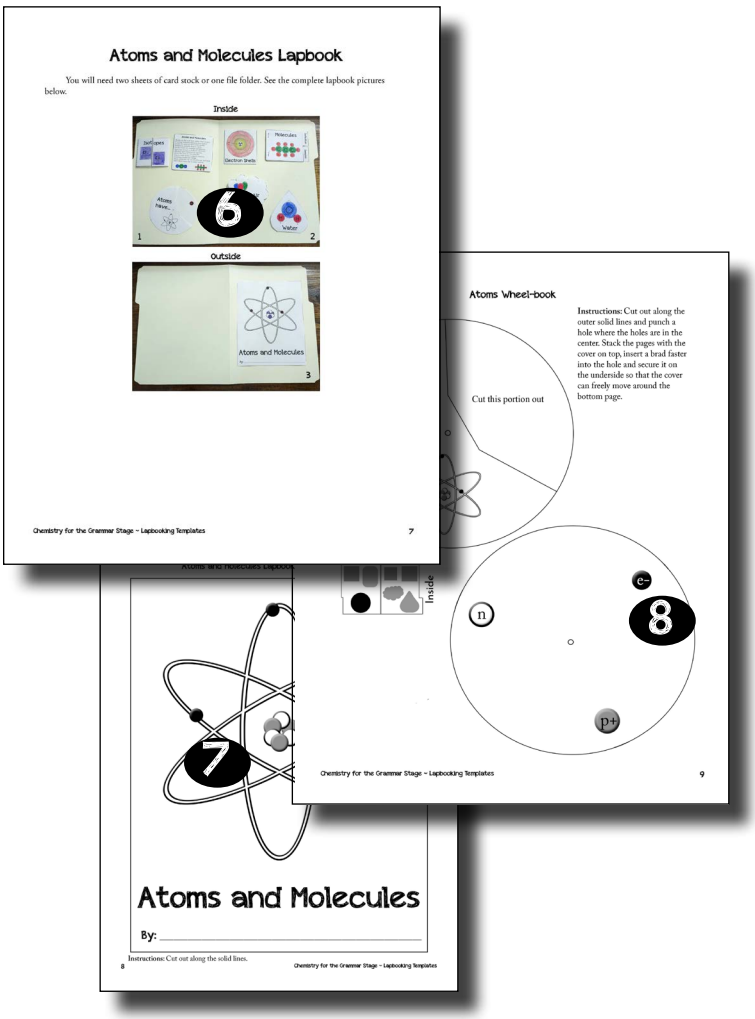
Help the students work on their memory work with these poster-style sheets. Each poem is in a large, readable font with illustrations related to the information in the poem.

5. Review Sheets

Review what the students have learned with the review sheets found at the back of the student workbook. These can be used as review or quizzes.

Add in the optional lapbooking templates and coloring pages for more fun!





The Lapbooking Templates

Use the lapbooking templates to review the concepts learned, or you can have the student create each one in lieu of completing the student workbook.

6. Lapbook Overview Sheets

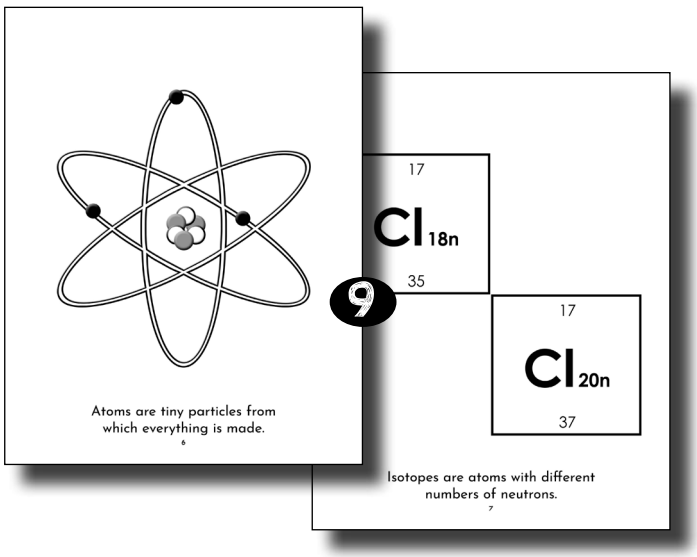
Know where to place the mini-books in the lapbook with these overview sheets. You will also find overall directions for completing the lapbook. The specific directions for completing each mini-book are found in the teacher guide.

7. Lapbook Cover

Find a unique cover for each of the suggested lapbooks.

8. Mini-book Templates

Get all the mini-books you will need to complete the suggested lapbooks, along with an exact placement guide. The templates include black-line illustrations and space for narrations.



The Coloring Pages

Use the coloring pages to add a bit of art to your science plans or to engage younger students.

9. Simple Coloring Pages

Color your way through learning about science with these coloring pages. Each page has a large, black-line illustration along with a key fact sentence for the students to learn about the topic. The specific directions for when to use these coloring pages are found in the teacher guide.

Chemistry for the Grammar Stage

Teacher Guide

Third Edition by Paige Hudson

In a Nutshell

Students will learn about atoms, the periodic table, and chemistry in the following ways:

- ✓ Listening to (or reading) **scientific information** from visually appealing encyclopedias.
- ✓ Watching (and doing) **hands-on science** through demonstrations and activities.
- ✓ Dictating (or writing down) what they have learned and seen using **notebooking**.

See p. 10 for a list of the topics explored in this program.

What You Need

In addition to this guide, you will need the following:

1. **The student materials** - You can purchase either the *Chemistry for the Grammar Stage Student Workbook* or the *Chemistry for the Grammar Stage Lapbooking Templates*. (Get a glimpse of these options on pp. 8-9.)

2. **The three spines:**
   - 🕮 *The Usborne Science Encyclopedia* (Usborne Books, 2015 Edition)
   - 🕮 *The Elements* (DK, 2022 Edition)

   You can also purchase the *Pasteur's Fight Against Microbes* for the scientist biography report in the last week of the Mixtures Unit and *Marie Curie's Search for Radium* for the scientist biography report in the last week of the Acids and Bases Unit. Alternatively, you can check a biography out from your local library. Get links to these books here:

   🖱 https://elementalscience.com/blogs/resources/cgs

3. **The demonstration supplies** - See a full list starting on p. 16 or save yourself the time and purchase the *Chemistry for the Grammar Stage Experiment Kit*.

How It Works

Each week you and your early elementary student will do the following

- **Read** the assigned pages with your students and use the included questions to discuss what was read.
- **Do** the weekly demonstration with the students using the scripted introduction, directions, and scripted explanation found in this guide.
- **Write** down what the students have learned and seen in a way that is appropriate for their skills.

You can also add in the optional memory work, library books, and STEAM activities if you want to dig deeper into a topic. For a more detailed explanation of the components in each lesson, we highly recommend checking out the peek inside this program on pp. 6-7 and reading the introduction starting on p. 11. Otherwise, the first lesson begins on p. 22.

Chemistry for the Grammar Stage Teacher Guide Table of Contents

List of Topics Covered in This Program

Atoms and Molecules Unit
- ✓ Atoms
- ✓ Subatomic Particles
- ✓ Molecules
- ✓ Air
- ✓ Water

Periodic Table Unit
- ✓ Elements
- ✓ The Periodic Table
- ✓ Alkali Metals
- ✓ Alkaline Earth Metals
- ✓ Transition Metals
- ✓ Poor Metals
- ✓ Metalloids
- ✓ Nonmetals
- ✓ Halogens
- ✓ Noble Gases
- ✓ Lanthanides
- ✓ Actinides

Physical Changes Unit
- ✓ States of Matter
- ✓ Changes in State
- ✓ Liquid Behavior
- ✓ Gas Behavior

Chemical Changes Unit
- ✓ Bonding (Covalent, Ionic, Metallic)
- ✓ Chemical Reactions
- ✓ Types of Reasons
- ✓ Catalysts
- ✓ Oxidation and Reduction

Mixtures Unit
- ✓ Mixtures
- ✓ Separating Mixtures
- ✓ Crystals
- ✓ Louis Pasteur

Acids and Bases Unit
- ✓ Acids
- ✓ Bases
- ✓ pH
- ✓ Salts
- ✓ Marie Curie

Organic Chemistry Unit
- ✓ Organics Compounds
- ✓ Fats
- ✓ Alcohols
- ✓ Detergents
- ✓ Esters
- ✓ Hydrocarbons
- ✓ Polymers
- ✓ Plastics

Quick Links

The following page contains quick access to the activity links suggested in this guide along with several helpful downloads:

https://elementalscience.com/blogs/resources/cgs

Introduction to the Third Edition

It has been more than 10 years since the first edition of *Chemistry for the Grammar Stage* was released. With each edition, the format has been refined, but the method has always been based on the same three keys to teaching science:

1. Read about science.
2. Do, or rather play with, science.
3. Write about science.

If you want to learn more about these keys, check out this free conference session:

- *The 3 Keys to Teaching Science* - https://elementalscience.com/blogs/news/3-keys

In this guide are the tools you need to teach science using the Classic Method found in *Success in Science: A Manual for Excellence in Science Education*. This method is loosely based on the ideas for classical science education that are laid out in *The Well-Trained Mind: A Guide to Classical Education at Home* by Jessie Wise and Susan Wise Bauer.

In *Success in Science*, the elementary student is compared to an empty bucket that is waiting to be filled with meaningful information. As such, the goal of this program is to give your elementary student exposure to age-appropriate topics of within the fields of chemistry, building a knowledge base for future studies. The tools you are going to use are weekly scientific demonstrations, reading suggestions, notebooking assignments, additional activities, and more.

Let's take a closer took at what you will find in this guide.

Unit Overview Sheets

Each unit will begin with an overview sheet that shows the resources you will need for the unit, the list of topics, the supplies you will need, the memory work you can use, and the vocabulary you will cover. These are meant to give you a snapshot of the unit. Please feel free to swap the units around, but do keep the weeks within the unit in order as you work through this program.

Weekly Lesson Schedules

Each week's lesson will begin with a breakdown of what your week could look like. There are two potential schedules for you to give an idea of how you could schedule each week—one that breaks the assignments over 2 days, and one that breaks these assignments over 5 days. Each of these schedules has three sections to reflect the three keys to teaching science—read, do, and write (more about these in a moment). Optional assignments are in italics so you can easily see what is required and what can be used as gravy on the week's science meal.

You can choose to use these schedules as your guide or create your own using the two schedule templates on pp. 195-196 of the appendix of this guide. You could also create a list schedule or mark the lesson plans with a checkmark or date when you do the assignment.

In other words, you, the teacher, have complete freedom in what you would like to use to present and explore the concepts each week. Please treat the schedules and information in this guide as tools to teach science, not as weekly task masters.

Read - Information Gathering

Reading Assignments

The first things you will see in the "Read" section are the reading assignments. These come from the following three encyclopedias:

- 🕮 *The Usborne Science Encyclopedia* (Usborne Books, 2015 Edition)
- 🕮 *The Elements* (DK, 2022 Edition)

These resources are essential for completing this program. You can often use older editions because they are virtually the same on the inside. (**Note -** *At this point, the idea is that you read the assigned pages to your students. Here is a helpful podcast to determine if your students can handle reading science on their own: Should I read science aloud or not? https://elementalscience.com/blogs/podcast/79*)

After the assigned pages, you will find questions to ask your students after you have finished the reading selections. Here is an example:

? What is the point of these questions?

The point is to get your students to think about the information that was read to them. This seems like an extra, unnecessary step, but please don't skip these questions as they are designed to help your students get ready for the writing portion. Here is another helpful podcast about discussion times:

- Don't skip that science discussion time: https://elementalscience.com/blogs/podcast/53

{Optional} Memory Work

Next up in the "Read" section is the unit's optional memory work. An elementary student is capable of memorizing information and you can use this spongelike ability to have the students memorize basics facts related to chemistry through simple poems. Remember that these poems are included as a resource for you to augment students' learning experiences and are not required to use this program successfully.

{Optional} Additional Resources

The final item in the "Read" section is a list of optional additional resources. First are several alternative encyclopedias, in case your student has a hard time (or an easy time) with the one from the reading assignments. Here is a list of all of the ***optional*** encyclopedias that are scheduled:

- 🕮 *The Usborne Children's Encyclopedia* (2014 Edition)
- 🕮 *The DK Children's Encyclopedia* (2022 Edition)
- 🕮 *Basher Science: Chemistry* (2010 Edition)
- 🕮 *Basher Science: The Complete Periodic Table* (2015 Edition)
- 🕮 *The Periodic Table by Sean Callery* (Scholastic, 2017 Edition)

You ***do not*** need to purchase these encyclopedias to complete this program. They are there as options to explore the topics deeper or to use as alternatives.

Finally, you will see a list of potential library books. These books are meant to be checked out from the library in case you decide that you would like to dig a little deeper into the topics. They

are not necessary to the success of this program. Because every library is different, the books listed may not be available in your area. If that is the case, simply look up the topic in your local library's system. A complete list of all the suggested books can be found in the appendix pp. 205-206.

Do - Demonstration and Activities

Scientific Demonstrations

The bulk of the items in the "Do" section have to relate to the week's scientific demonstration. These generally use easy-to-find materials and tie into what is being studied. At this age, you will be the driving force behind these demonstrations, meaning that you will be the one in control, and the students will be watching and participating when necessary. (**Note -** *If you want to read more about the differences between demonstrations and experiments, check out the following article: https://elementalscience.com/blogs/news/89905795-scientific-demonstrations-or-experiments*)

You will find several sections for the scientific demonstration:

- ❑ The Demonstration Title and Supplies
- ❑ The Instructions (*including a scripted introduction and detailed instructions*)
- ❑ The Explanation (*including the expected results and a scripted explanation*)

  All scripted text, introductions, and explanations will be in this font.
- ❑ Ideas to Take the Demonstration Further

These demonstrations are designed to provide a beginner's look at the scientific method and how scientific tests work. Even so, it is not necessary to ask the students to predict the outcome of the demonstration because they have no knowledge base to determine what the answer should be. However, if your students enjoy predicting or they are able to tell you what will happen, please feel free to let them do so.

{Optional} Unit Projects and Weekly Activities

The final two items in the "Do" section are packed with STEAM activities that coordinate with each lesson. These are definitely optional, but they can be used to add in fun and deepen understanding. Here is a podcast to help you decide if you should use these activities:

- Do you need to bother with the "extras" for science? https://elementalscience.com/blogs/podcast/22

The pages and pictures needed for the unit projects are included in the student workbook, whereas the directions for creating the projects are found in this guide. The weekly activities include crafts and other activities that can enhance the students' learning time. There are no sheets to record these additional activities in the student workbook. However, I have included a project record sheet template on p. 194 of the appendix of this guide.

Write - Notebooking

Writing Assignments

In the first part of the "Write" section, you will be asking the students to narrate and record what they have learned from the reading assignments in a student workbook. (**Note -** *We have put together a complete workbook for your students to record what they did—the Chemistry for the Grammar Stage Student Workbook, which you can peek inside on p. 8 of this guide. It contains all the pages you will need to complete the narrations, demonstration reports, and multi-week projects, along with memory work posters, alphabetical sheets for the student glossary, and review sheets. The student workbook gives the students the ability to create a lasting memory of their first journey through chemistry.*)

For younger students, you can have them dictate what they have learned to you, and then you write this into the student workbook. You can also have the students copy their narration into the workbook. You should expect only three to four sentences from a 3rd- or 4th-grade student. Here is a sample of what the students could write for week one of the Atoms and Molecules unit:

There are three subatomic particles – protons, neutrons, and electrons.
Protons and neutrons live in the nucleus of an atom.
Electrons fly around the nucleus.
Protons are positively charged and electrons are negatively charged.

When you are done writing, you can have the students color the provided picture on the narration page.

Here are a podcast and a video that will help you understand a bit more about how this process works:

- How do we narrate and what to expect - https://elementalscience.com/blogs/podcast/78
- Writing in Science: The Elementary Years - https://youtu.be/BrunFyeHhlQ

We also offer two other consumable options for the students—lapbooking templates and coloring pages. These are optional, but they can be used as review or in place of the student workbook.

- *Chemistry for the Grammar Stage Lapbooking Templates*
- *Chemistry for the Grammar Stage Coloring Pages*

Both of these are also scheduled in under the "Writing Assignments" section. You can peek inside these two resources on p. 9 of this guide.

Demonstration Sheets

The demonstration sheets are assigned in the "Do" section, but because they include writing, the explanation for how to use them is here. Each one of the scientific demonstrations has a corresponding sheet in the student workbook.

These demonstration sheets include four sections:

1. The "Our Tools" section is for the materials that were used during the demonstration.
2. The "Our Method" section is for a brief description of what was done during the scientific demonstration. This should be in the students' words.

3. The "Our Outcome" section is for what the students observed during the demonstration.
4. The "Our Insight" section is for what the students learned from the scientific demonstration.

Any time you see a box for a picture on the demonstrations sheet, you can have the students draw what happened, or you can take a picture of the demonstration and glue it in the box. For younger students, you can do the writing for them on the demonstration sheets.

Vocabulary

Next in the "Write" section, you will find the week's vocabulary. You can go over these words orally or have the students copy the definitions into the glossary at the rear of the student workbook. If you want to have the students practice looking up the definitions, you can use the included glossary of the terms on pp. 199-202 of this guide.

{Optional} Review Sheets

The last part of the "Write" section assigns a weekly review sheet. These sheets are found at the back of the student workbook. Although these review sheets are not essential, they are helpful in assessing how much the students are retaining. You can also use these review sheets as quizzes. The correct answers for the review sheets are found at the end of the lesson's materials.

Final Thoughts

Our goal at Elemental Science is to provide you with the information you need to be successful in your quest to educate your students in the sciences at home, which is why I encourage you to contact us with any questions or problems that you might have concerning this program at support@elementalscience.com. I, or a member of our team, will be more than happy to answer them as soon as we are able. I hope that you enjoy this year with *Chemistryfor the Grammar Stage*!

- Paige Hudson

Supplies Needed by Week

Atoms and Molecules Unit

Week	Supplies needed
1	4 Pipe cleaners, Round beads in three different colors (at least 3 of each color)
2	Jar with lid, Water, Food Coloring
3	Candle, Match, Clear glass bottle
4	Cup, Water, Salt

Periodic Table Unit

Week	Supplies needed
1	LEGO® bricks in a variety of colors and sizes , Paper, Pen
2	3 Cups, Water, Food coloring, Salt, Instant-read thermometer
3	Epsom salts, Ammonia, Water, Clear cup
4	Steel wool, Vinegar, Jar with lid
5	Alum powder, Ammonia, Clear jar, Water
6	Sugar, Baking soda, Rubbing alcohol, Sand, Aluminum pie pan (or other dish you can throw away), Match
7	Can of dark cola soda, Glass, Dirty pennies
8	Candle, Match, Glass jar
9	Small piece of potato, Small piece of bread, Small piece of fruit, Iodine swab
10	Helium-filled balloon, Scissors
11	3 Cups, 3 Pencils, 3 Clear liquids (i.e., water, alcohol, and corn syrup)
12	Bite-sized food, such as raisins or cereal puffs, Timer

Physical Changes Unit

Week	Supplies needed
1	3 Balloons, Ice, Water
2	Orange juice, Cup
3	Pepper, Dish soap, Bowl, Water
4	Empty aluminum can, Bowl, Hot water, Ice, Tongs, Pan

Supplies Needed by Week

Chemical Changes Unit

Week	Supplies needed
1	Salt, Magnifying glass, Warm water, Cup, Spoon
2	Shallow dish, Paper towel, Bowl, Vinegar, Pennies
3	Baking soda, Vinegar, Water, Epsom salts, 2 Cups
4	Apple, Cotton ball, Lemon juice

Mixtures Unit

Week	Supplies needed
1	Clear glass, Warm water, Powdered sugar
2	Washable markers, Coffee filter, Shallow dish or pan
3	Glass jar, Pencil, Pipe cleaners, Borax, Hot water
4	*No supplies needed.*

Acids and Bases Unit

Week	Supplies needed
Unit Prep*	Head of purple cabbage, Knife, Pot, Distilled water, Strainer, Clear glass jar or plastic container, Coffee Filters, Bowl, Cookie Sheet, Scissors, Plastic baggie
1	Water, Lemon juice, Cabbage indicator, Glass, Tablespoon
2	Cabbage paper, Vinegar, Ammonia, Jars with lids
3	Vinegar, Baking soda, Water, Cabbage juice, Cabbage paper, 2 Clear cups, Eyedropper
4	*No supplies needed.*

Organic Chemistry Unit

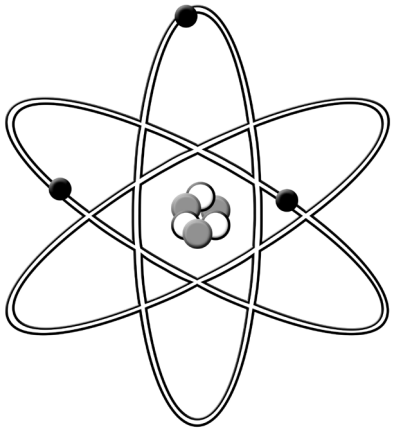
Week	Supplies needed
1	Construction paper, 6 Types of food (Cheese, Fruit, Yogurt, Chips, Muffin, Vegetable), Marker
2	Cotton ball, Vanilla Extract
3	Large clear glass bowl, Vegetable Oil, Water, Plastic spoon, Cotton balls, Polyester felt square
4	Vegetable oil, Cornstarch, Water, Food coloring, Plastic bag, Eyedropper

Chemistry for the Grammar Stage

Atoms and Molecules Unit

Atoms and Molecules Unit Overview

(4 weeks)



Books Scheduled

- 🕮 *Usborne Science Encyclopedia*

{Optional Encyclopedias}

- 🕮 *Basher Science Chemistry*
- 🕮 *Usborne Children's Encyclopedia*
- 🕮 *DK Children's Encyclopedia*

Sequence for Study

- **Week 1:** Atoms
- **Week 2:** Molecules
- **Week 3:** Air
- **Week 4:** Water

Atoms and Molecules Unit Memory Work

Atoms and Molecules
Atoms are the stuff that makes what we got,
Forming molecules found in your teapot.
Inside the atom are three little specks,
Subatomic particles kept in check.
At the center are neutrons and protons,
Spinning around in shells are electrons.
All three parts, balanced in equality,
Give the atom its own frivolity.
One or more atoms uniquely combine,
Creating a molecular design.
These molecules we can breathe, eat, and wear.
Meet them every day in water and air.

Supplies Needed for the Unit

Week	Supplies needed
1	4 Pipe cleaners, Round beads in three different colors (at least 3 of each color)

2	Jar with lid, Water, Food Coloring
3	Candle, Match, Clear glass bottle
4	Cup, Water, Salt

Unit Vocabulary

1. **Electron** – A negatively charged particle in an atom.
2. **Proton** – A positively charged particle in an atom.
3. **Neutron** – A neutral particle in an atom.
4. **Isotope** – An atom that has a different number of neutrons and so has a different mass number from the other atoms of an element.
5. **Electron Shell** – The region around an atom's nucleus in which a certain number of electrons can reside.
6. **Molecule** – A substance made up of two or more atoms that are chemically bonded.
7. **Air** – A mixture of gases that forms a protective layer around the Earth.
8. **Hard Water** – Water that contains a lot of dissolved minerals.

Week 1: Atoms Lesson Plans

2-Days-a-week Schedule		
	Day 1	**Day 2**
Read	❑ Read "Atomic Structure, part 1 and part 2" ❑ *{Choose one or more of the additional resources to read from this week}*	❑ Read "Isotopes and Atomic Theory" ❑ *{Work on memorizing the "Atoms and Molecules" poem}*
Do	❑ *{Play the Atoms and Isotopes Game or Complete the Atoms and Molecules Poster}*	❑ Do the Scientific Demonstration: Model Atom
Write	❑ Add information about atoms and subatomic particles to the students' notebook or lapbook ❑ Define electron, proton, neutron, and isotope	❑ Add information about isotopes to the students' notebook or lapbook ❑ Complete the demonstration sheet ❑ *{Work on the Atoms and Molecules Weekly Review Sheet 1}*

5-Days-a-week Schedule					
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Read	❑ Read "Atomic Structure, part 1"	❑ Read "Atomic Structure, part 2"	❑ *{Work on memorizing the "Atoms and Molecules" poem}*	❑ Read "Isotopes and Atomic Theory"	❑ *{Choose one or more of the additional resources to read from this week}*
Do	❑ *{Make an Atomic Cookie}*	❑ *{Complete the Atoms and Molecules Poster}*	❑ Do the Scientific Demonstration: Model Atom	❑ *{Play the Atoms and Isotopes Game}*	
Write	❑ Add information about subatomic particles to the students' notebook or lapbook	❑ Add information about atoms to the students' notebook or lapbook	❑ Complete the demonstration sheet ❑ Define electron, proton, neutron, and isotope	❑ Add information about isotopes to the students' notebook or lapbook	❑ *{Work on the Atoms and Molecules Weekly Review Sheet 1}*

{These assignments are optional.}

Read - Information Gathering

Reading Assignments

- ❑ *Usborne Science Encyclopedia* p. 10 "Atomic Structure, part 1"
  - ? What are the three subatomic particles?
  - ? Do you remember what the charge of an electron is? The charge of a proton is? The charge of a neutron is?
- ❑ *Usborne Science Encyclopedia* p. 11 "Atomic Structure, part 2"
  - ? What is an atom?
  - ? Can you describe what an atom look likes?
- ❑ *Usborne Science Encyclopedia* p. 13 "Isotopes and Atomic Theory"
  - ? What is an isotope?

{Optional} Memory Work

🗣 This week, begin memorizing the *Atoms and Molecules* poem. (SW p. 120)

{Optional} Additional Resources

Encyclopedias

- 🕮 *Basher Science Chemistry* p. 26 "Atom," p. 28 "Isotope"
- 🕮 *Usborne Children's Encyclopedia* p. 186 (section entitled "What is an atom?")
- 🕮 *DK Children's Encyclopedia* p. 187 "Atoms"

Library Books

- 🕮 *What Are Atoms? (Rookie Read-About Science)* by Lisa Trumbauer
- 🕮 *Atoms and Molecules (Building Blocks of Matter)* by Richard and Louise Spilsbury
- 🕮 *Atoms (Simply Science)* by Melissa Stewart

Do - Demonstration and Activities

Demonstration - Model Atom

You will need the following:

- ✓ 4 Pipe cleaners
- ✓ Round beads in three different colors (at least 3 of each color)

Demonstration Instructions

1. Read the following introduction to the students.

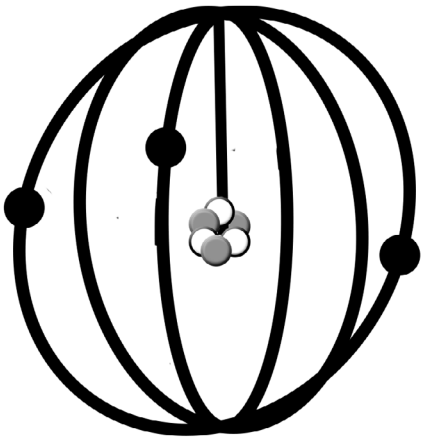
   Never trust an atom.

   They make up everything!

   Seriously, atoms are tiny particles that are so small that we can't see them, but they make up everything we see. Inside these atoms, we find three different pieces called subatomic particles. Protons are positively-charged particles found

the nucleus or center of the atom. They like to hang out with neutrally-charged particles called neutrons in the nucleus. Then, flying around the outside of the nucleus are the electrons, which are negatively charged. Different combinations of these subatomic particles make up different atoms, and these atoms make up everything we see! In today's demonstration, we are going to make a model of the atom that we can see.

2. Have the students select which beads will be electrons, protons, and neutrons.
3. Next, have them string three protons beads and three neutrons beads on one of the pipe cleaners, alternating between the two. Once done, have the students wrap this portion of the pipe cleaner into a ball to form a nucleus, leaving a straight end to connect to the electron rings they will make in the next step.
4. Then, have the students place one electron bead on a pipe cleaner and twist the pipe cleaner closed to form a ring. Repeat this process two more times so that they have three electron rings.
5. Finally, fit the rings inside each other and then hang the nucleus ball in the center, using the pipe cleaner tail left in step two to attach the nucleus and hold the rings together. (*See image for reference.*)



6. Read the demonstration explanation to the students, take a picture of their atoms, and have the students complete the demonstration sheet on SW p. 11.

Demonstration Explanation

The purpose of this demonstration was for the students to see what an atom looks like. As they are finishing their observations, ask the following questions:

? Can you point to the electrons? The protons? The neutrons?

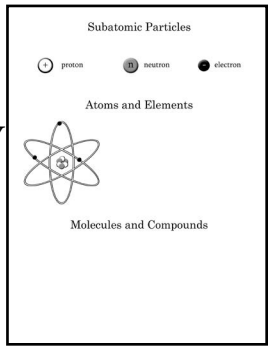
{Optional} Take the Demonstration Further

Have the students make a fruit atom model. In the center of a plate, have the students build a mound of raspberries and grapes for the protons and neutrons in the nucleus. Then, they can roll blueberries in a circle around the nucleus for the electrons. Once, they are done playing, let the students gobble their atoms up!

{Optional} Unit Project

✂ **Atoms and Molecules Poster** – During this unit, the students will create a poster about atoms and molecules, giving them a visual representation of the basics of chemistry. The poster will have three main sections: subatomic particles, atoms and elements, and molecules. This week, have the students add the electron, proton, and neutron to the "subatomic particle" section. They can draw or paint circles with charges for each or use pompoms. Then,

have them use the same circles or pompoms to represent an atom on the left-hand side of the "atoms and elements" section. (*See the included image.*) After the students finish the artwork, have them write a sentence or two about each subatomic particle. (*This has been done for you in the SW on p. 8.*)



{Optional} Projects for This Week

- ✂ **Atomic Cookie** – Make some subatomic cookies with your students using a sugar cookie, white icing, and three different colors of M&M's. See the following website for directions:
  - http://technoprairie.blogspot.com/2009/02/atomic-cookies.html
- ✂ **Atoms and Isotopes Game** – Have the students play an atoms and isotopes game. You can get directions for this game from the following blog post:
  - http://elementalscience.com/blogs/science-activities/60317571-free-chemistry-game

Write – Notebooking

Writing Assignments

- ☐ **Student Workbook** – Have the students dictate, copy, or write two to four sentences on subatomic particles, atoms, and isotopes on *Chemistry for the Grammar Stage Student Workbook* (SW) p. 10.
- ☐ **{Optional} Lapbooking Templates** – Have the students begin the Atoms and Molecules lapbook by cutting out and coloring the cover on p. 8 of *Chemistry for the Grammar Stage Lapbooking Templates* (LT).
- ☐ **{Optional} Lapbooking Templates** – Have the students complete the Atoms wheel-book on LT p. 9. Have them cut along the solid lines, punch a hole in the center, and use a brad fastener to fasten the two circles together. Have the students write their electron narration to the left of the picture, their proton narration above the picture, and their neutron narration to the right of the picture. Finally, have them glue their mini-book into the lapbook.
- ☐ **{Optional} Lapbooking Templates** – Have the students complete the Isotopes shutterfold book on LT p. 10. Have them cut out and fold the template. Have the students color the pictures on the cover. Have them write their narration about the isotopes inside the mini-book. Then, have them glue the mini-book into the lapbook.
- ☐ **{Optional} Coloring Pages** – Have the students color the following pages from *Chemistry for the Grammar Stage Coloring Pages* (CP): Atoms CP p. 6, Isotopes CP p. 7.

Vocabulary

Have the students look up and copy the definitions for the following words:

- **Electron** – A negatively charged particle in an atom. (SW p. 109)
- **Proton** – A positively charged particle in an atom. (SW p. 115)
- **Neutron** – A neutral particle in an atom. (SW p. 113)

- **Isotope** – An atom that has a different number of neutrons and so has a different mass number from the other atoms of an element. (SW p. 112)

{Optional} Weekly Review Sheet

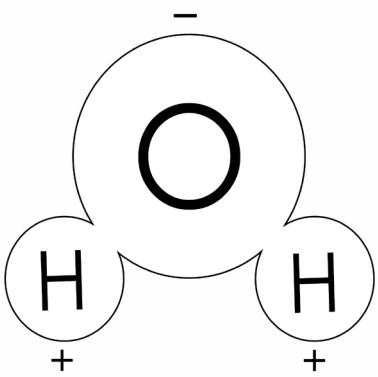
- "Atoms and Molecules Weekly Review Sheet 1" on SW p. 135.

Answers:

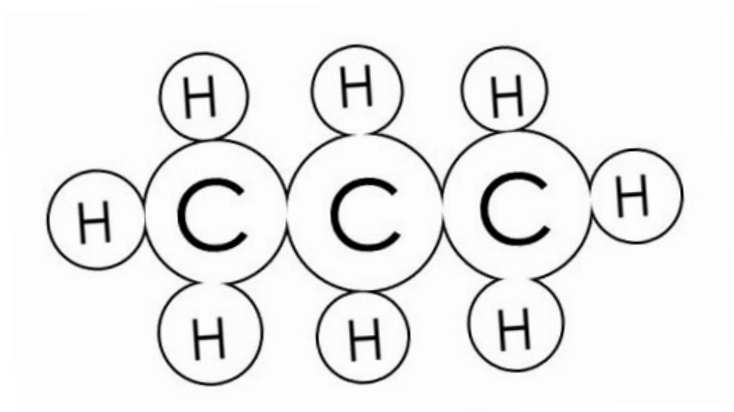
1. Positive, Negative, Neutral
2. Protons, Neutrons, Electrons
3. True
4. Answers will vary

Polar and Non-polar Molecules

There are two different types of molecules: polar and nonpolar. In a nutshell, polar molecules have a charge, whereas nonpolar molecules do not.



A polar molecule has two ends, just like a magnet: one end of the molecule is positive, and the other end of the molecule is negative. Water is an example of a polar molecule. Polar molecules are attracted to other polar molecules.



A nonpolar molecule does not have a positive or a negative end. These molecules are known as neutral molecules. Oil is an example of a nonpolar molecule. Nonpolar molecules are attracted to other nonpolar molecules.

In solutions, we say that like dissolves like. Polar molecules can dissolve other polar molecules. Nonpolar molecules can dissolve nonpolar molecules. Polar and nonpolar molecules do not dissolve in each other, which is why oil and water do not mix.

Week 2: Molecules Lesson Plans

2-Days-a-week Schedule		
	Day 1	**Day 2**
Read	❑ Read "Molecules, part 1 and part 2" ❑ *{Choose one or more of the additional resources to read from this week}*	❑ Read "Polar or Nonpolar Molecules" ❑ *{Work on memorizing the "Atoms and Molecules" poem}*
Do	❑ *{Have a Polarity Race or Complete the Atoms and Molecules Poster}*	❑ Do the Scientific Demonstration: Moving Molecules
Write	❑ Add information about molecules to the students' notebook or lapbook ❑ Define electron shell and molecule	❑ Add information about molecules to the students' notebook or lapbook ❑ Complete the demonstration sheet ❑ *{Work on the Atoms and Molecules Weekly Review Sheet 2}*

5-Days-a-week Schedule					
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Read	❑ Read "Molecules, part 1"	❑ Read "Molecules, part 2"	❑ *{Work on memorizing the "Atoms and Molecules" poem}*	❑ Read "Polar or Nonpolar Molecules"	❑ *{Choose one or more of the additional resources to read from this week}*
Do	❑ *{Make a few LEGO Molecules}*	❑ *{Complete the Atoms and Molecules Poster}*	❑ Do the Scientific Demonstration: Moving Molecules	❑ *{Have a Polarity Race}*	
Write	❑ Add information about molecules to the students' notebook or lapbook	❑ Add information about molecules to the students' notebook or lapbook	❑ Complete the demonstration sheet ❑ Define electron shell and molecule	❑ Add information about molecules to the students' notebook or lapbook	❑ *{Work on the Atoms and Molecules Weekly Review Sheet 2}*

Read - Information Gathering

Reading Assignments

- ❑ *Usborne Science Encyclopedia* p. 14 "Molecules, part 1"
  - ? What is a molecule?
  - ? Do you remember how many electrons fit in the first shell? The second shell? The third shell?
- ❑ *Usborne Science Encyclopedia* p. 15 "Molecules, part 2"
  - ? Do you remember one or two examples of molecules?
  - ? What are two ways, or models, of showing molecules?
- ❑ "Polar and Nonpolar Molecules" article p. 27 of this guide
  - ? What is a nonpolar molecule?
  - ? What is a polar molecule?

Additional Explanantion: Molecules or Compounds

Molecules are formed when two or more atoms join together. Compounds are formed when two or more elements join together. For example H_2 (hydrogen gas) is a molecule because two atoms of hydrogen are joined together. However, because there is only one type of element present, H_2 is not a compound. On the other hand, H_2O (water) is a molecule because the three atoms, one oxygen atom and two hydrogen atoms, have been joined together to form it. It is also a compound because it contains two different elements, hydrogen and oxygen. So, all compounds are molecules, but not all molecules are compounds.

{Optional} Memory Work

🗣 This week, begin memorizing the *Atoms and Molecules* poem. (SW p. 120)

{Optional} Additional Resources

Encyclopedias

- 🕮 *Basher Science Chemistry* p. 32 "Molecules"
- 🕮 *Usborne Children's Encyclopedia* pp. 186-187 "Atoms and Molecules"
- 🕮 *DK Children's Encyclopedia* p. 184 "Chemistry"

Library Books

- 🕮 *Atoms and Molecules (Building Blocks of Matter)* by Richard and Louise Spilsbury
- 🕮 *Atoms and Molecules (Why Chemistry Matters)* by Molly Aloian
- 🕮 *Atoms and Molecules (My Science Library)* by Tracy Nelson Maurer

Do - Demonstration and Activities

Demonstration - Moving Molecules

You will need the following:

- ✓ Jar with lid, Water, Food coloring

Demonstration Instructions

1. Read the following introduction to the students.

   > Last week we learned about atoms, the tiny particles that make up everything. These atoms like to get together to form molecules. Even though we can't see them, these molecules are always doing something! In today's demonstration, we are going to see molecules in motion.

2. Have the students fill the jar almost to the top with room-temperature water and drop several drops of food coloring into the water.
3. Observe what happens within the first 30 seconds and draw what you see in the box on the demonstration sheet on SW p. 13.
4. Wait an hour and observe the jar again. Draw what you see in the box on the demonstration sheet.
5. Read the demonstration explanation to the students and have the students complete the demonstration sheet.

Demonstration Explanation

The purpose of this demonstration was for the students to visualize molecules in motion. When they are done, read the following to them:

> In the beginning, we could clearly see the drops of food coloring moving through the water. After an hour, the whole cup was full of colored water. This is because the atoms and molecules that make up these two liquids are in constant motion. Even though we can't see them moving, the water molecules are bumping into the food coloring molecules. Eventually, the two will be evenly mixed in the jar. This type of molecular movement is called diffusion.

{Optional} Take the Demonstration Further

Have the students look at how temperature affects molecular motion by repeating the demonstration with a glass each of ice-cold and hot-to-the-touch water. (*They should see that the food coloring molecules move much faster in the hot-to-the-touch water.*)

{Optional} Unit Project

✂ **Atoms and Molecules Poster –** This week, have the students add a picture of molecules to the "molecules and compounds" section of their poster. This can be as simple as the written formula for water (H_2O) or methane (CH_4) or as complicated as a drawing of one of the molecules they saw in their readings. After the students finish the artwork, have them write a sentence or two about molecules.

{Optional} Projects for This Week

✂ **LEGO Molecules –** Have the students make molecules models out of LEGOs using the examples from the following pin:

🖱 https://www.pinterest.com/pin/192036371586132562/

✂ **Polarity Race** – Have the students have a molecule race using a polar substance (water) and a nonpolar one (wax paper). Use an eyedropper to sprinkle a drop of water at the end of a wax paper sheet in front of each student. Then, give each of the students a straw and have them blow through it to move their water "molecule" drop to the finish line at the other end of the wax paper.

Write – Notebooking

Writing Assignments

- ☐ **Student Workbook** – Have the students dictate, copy, or write two to four sentences on electron shells, molecules, and nonpolar and polar molecules on SW p. 12. (**Note –** *The information for the electron shells is not super clear. You can share with the students that the first shell can contain two electrons, the second shell can contain eight electrons, and the third shell generally carries eight electrons, but can carry as many as 18 for certain atoms.*)
- ☐ **{Optional} Lapbooking Templates** – Have the students work on the Electron Shell Diagram on LT p. 10. Have the students cut out the sheet, color the shells different colors, and add the information they have learned about how many electrons the first three shells can carry. Finally, have them glue their sheets into their lapbooks.
- ☐ **{Optional} Lapbooking Templates** – Have the students work on the Molecules tab-book on LT p. 11. Have the students write the definition of a molecule on the definition page and then add any molecules they have learned about to the samples page. Set the mini-book aside and save it for next week.
- ☐ **{Optional} Coloring Pages** – Have the students color the following pages: Electron Shells CP p. 8, Molecules CP p. 9, Polar and Nonpolar Molecules CP p. 10.

Vocabulary

Have the students look up and copy the definitions for the following words:

- **Electron Shell** – The region around an atom's nucleus in which a certain number of electrons can reside. (SW p. 109)
- **Molecule** – A substance made up of two or more atoms that are chemically bonded. (SW p. 113)

{Optional} Weekly Review Sheet

- "Atoms and Molecules Weekly Review Sheet 2" on SW p. 136.

  Answers:

  1. 2, 8, 8 to 18
  2. False (*A molecule can be made up of more than one element.*)
  3. Charged, Not charged
  4. Answers will vary

Chemistry for the Grammar Stage

Student Workbook

Third Edition by Paige Hudson

Classical SCIENCE

A Quick Welcome from the Author

Dear Student,

Welcome to chemistry! This workbook will serve as a scrapbook of sorts for you to share what you have learned about the principles of chemistry. You will be learning about atoms, the periodic table, and so much more.

Each week you and your teacher will do the following:

- **Read** the assigned pages together. Your teacher will then ask you a few questions as you discuss what was read. Be sure to share what you found interesting.
- **Do** the weekly demonstration with your teacher. This is the super fun part of science, plus you get to exercise your observation muscles. Be sure to pay close attention and help out when your teachers ask you to do so.
- **Write** down what you have learned and seen. Your teacher may help you with the actual writing, but be sure to record the facts that you want to remember.

Your teacher has the tools to add in more each week, things like memory work, library books, and extra activities. Be sure to let them know if you want to dig deeper into a topic.

And, if you have a question or want to share your work with me, please have your teacher send us an email (support@elementalscience.com) or tag us (@elementalscience) in a photo you share online. I would love to see what you have learned!

I hope that you enjoy learning about chemistry this year!

Paige Hudson

Table of Contents

Chemistry for the Grammar Stage

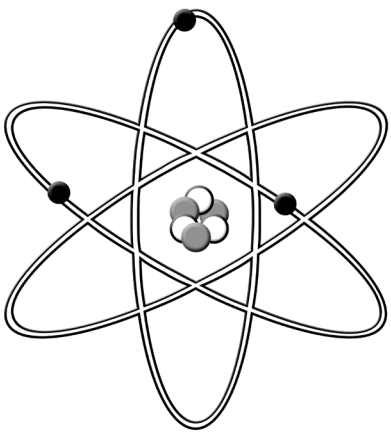
Atoms and Molecules Unit

Atoms and Molecules Poster

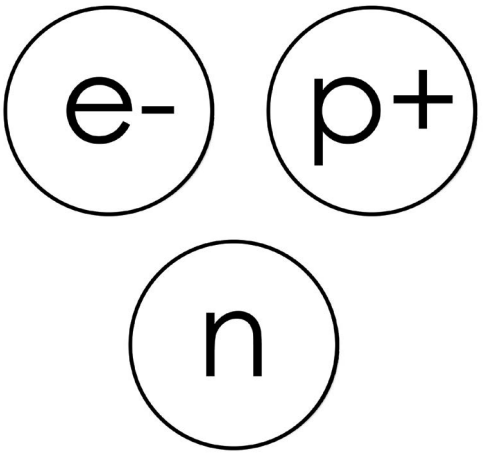
Subatomic Particles

Atoms and Elements

Molecules and Compounds

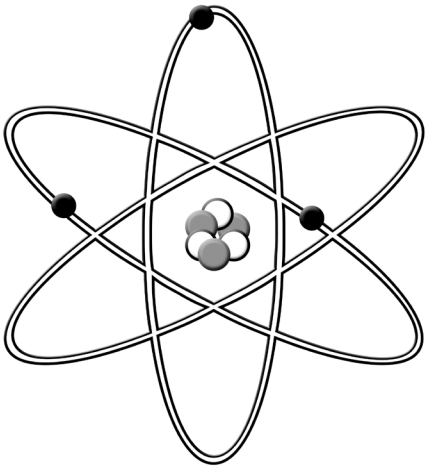


Atoms



Subatomic Particles

Atoms



Isotopes

Demonstration Sheet: Model Atom

Our Tools

_____ _____

_____ _____

Our Method

_____

_____

_____

_____

Our Outcome

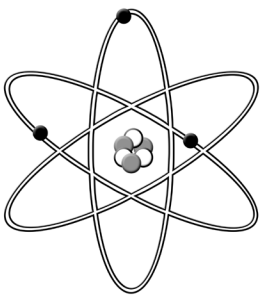
My Model

Our Insight

_____

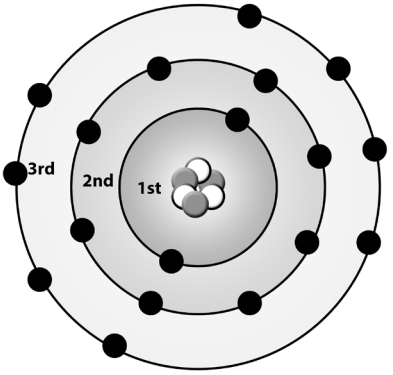
_____

_____



Molecules

Electron Shells



_____ electrons fit in the first shell.

_____ electrons fit in the second shell.

_____ electrons fit in the third shell.

Molecules

_____

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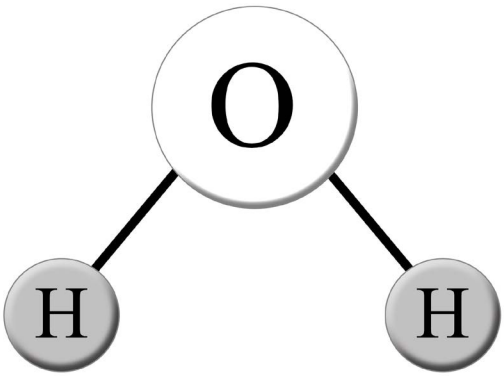

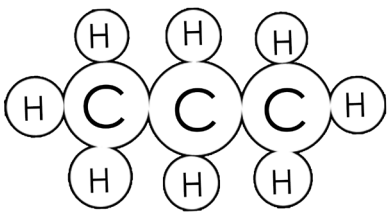

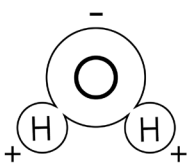

Polar and Nonpolar

_____

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_____

Demonstration Sheet: Moving Molecules

Our Tools

_____ _____

_____ _____

_____ _____

Our Method

_____

_____

_____

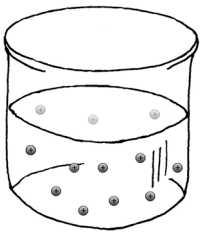
Our Outcome

First Observation	After 1 Hour

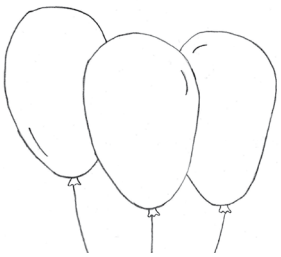
Chemistry for the Grammar Stage

Glossary

Acid —



Air —

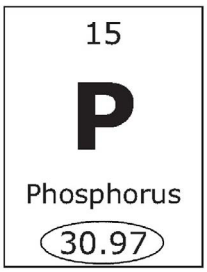


Alloy —


Pure Metal


Alloy

Atomic Mass —



Chemistry for the Grammar Stage

Memory Work

Atoms and Molecules Unit

Atoms and Molecules

Atoms are the stuff that makes what we got,
Forming molecules found in your teapot.

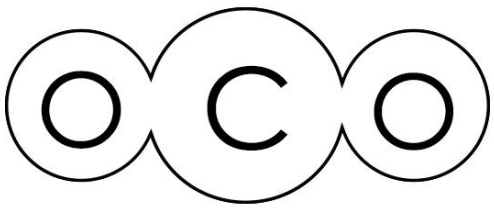
Inside the atom are three little specks,
Subatomic particles kept in check.

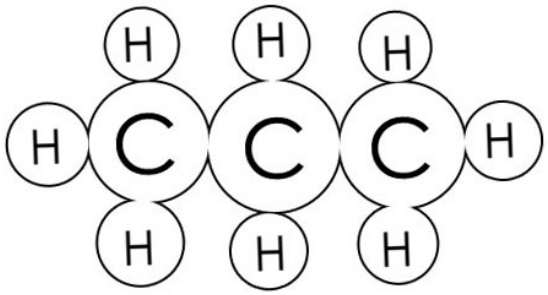
At the center are neutrons and protons,
Spinning around in shells are electrons.

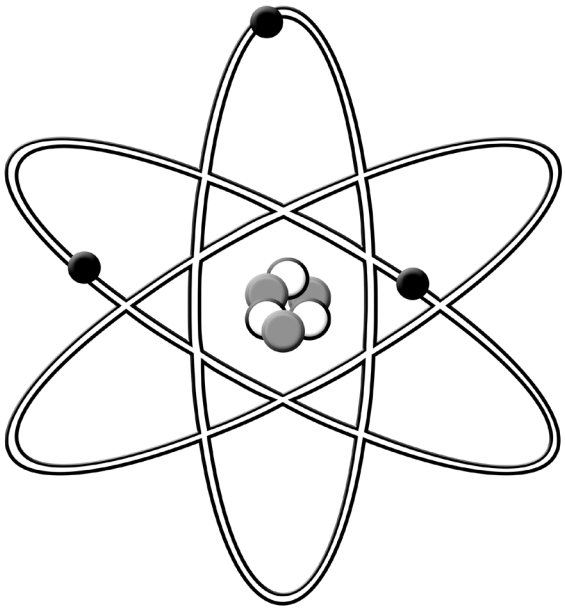
All three parts, balanced in equality,
Give the atom its own frivolity.

One or more atoms uniquely combine,
Creating a molecular design.

These molecules we can breathe, eat, and wear.
Meet them every day in water and air.







Chemistry for the Grammar Stage

Quizzes

Atoms and Molecules Week 1 Quiz

1. Match the following subatomic particles with their charge.

Proton	Neutral
Electron	Negative
Neutron	Positive

2. An atom has _____ and _____ in a mass at the center with _____ spinning around the outside.

3. **True or False:** An isotope is an atom that has a different number of neutrons.

4. What is the most interesting thing you learned this week?

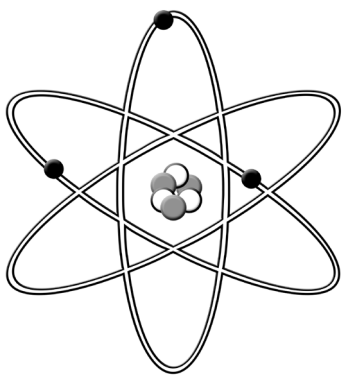
_____

_____

_____

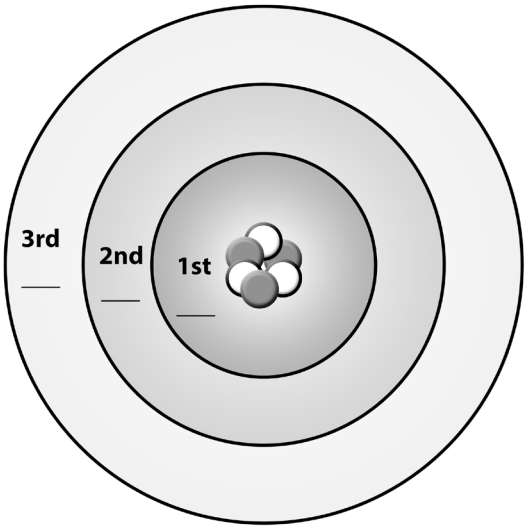
_____

_____



Atoms and Molecules Week 2 Quiz

1. Fill in the blanks with the number of electrons found in the shell.



2. **True or False:** A molecule is always made up of only one element.

3. Polar molecules are (not charged / charged), while nonpolar molecules are (not charged / charged).

4. What is the most interesting thing you learned this week?

_____

_____

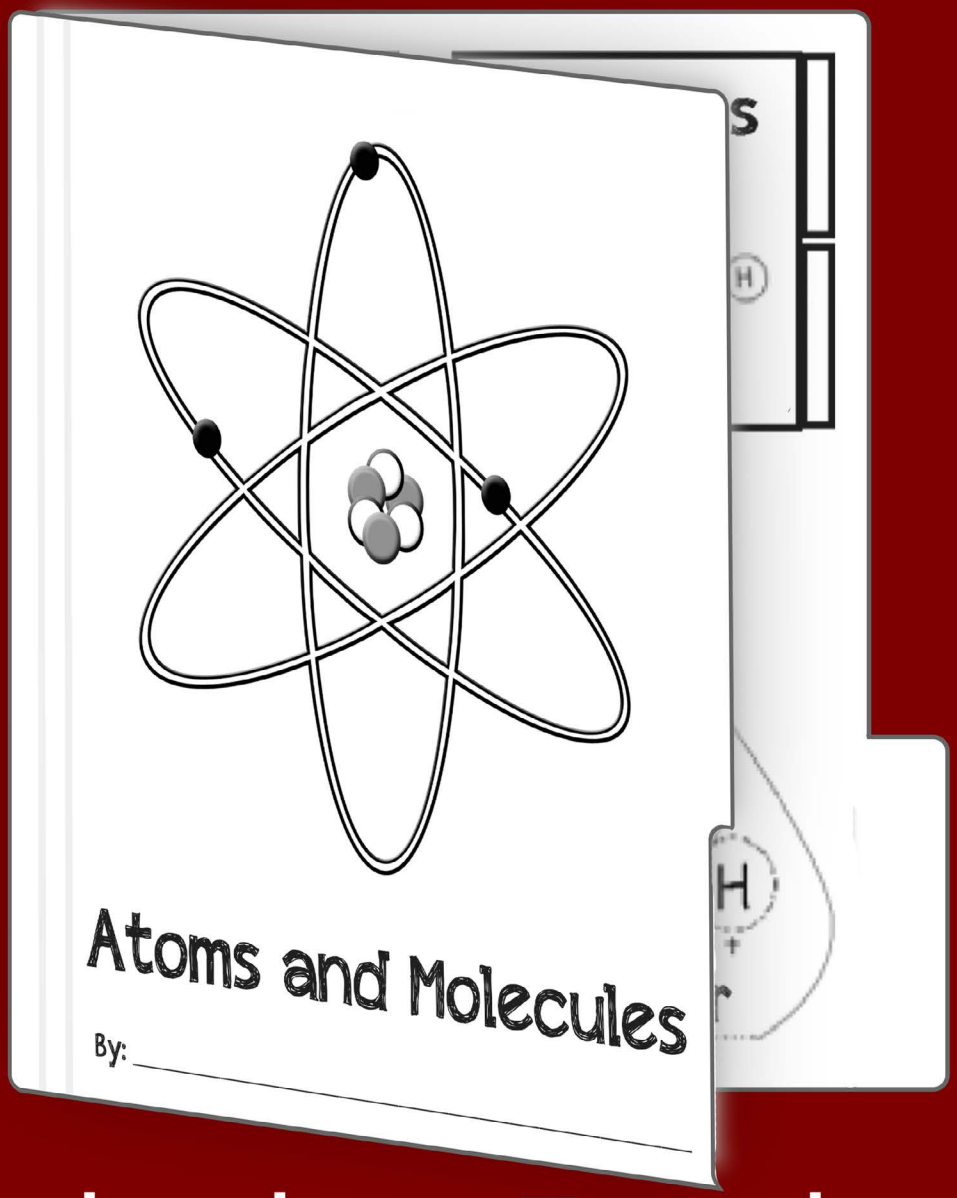
_____

_____

_____

_____

Chemistry for the Grammar Stage



Lapbooking Templates

(Third Edition)

Table of Contents

Introduction

The lapbooking templates provided in this eBook are meant to coordinate with *Chemistry for the Grammar Stage*. They are ***not*** designed to be used independently because you need the coordinating teacher guide to know how to complete each mini-book. See more about the features of these templates on p. 3.

What is Included

There are templates for five lapbooks contained in this eBook:

1. Atoms and Molecules (begins on p. 7)
2. Periodic Table (begins on p. 15)
3. Physical and Chemical Changes (begins on p. 33)
4. Mixtures (begins on p. 42)
5. Organic Chemistry (begins on p. 51)

You can have your students create five separate lapbooks or combine them to create one larger lapbook. (**Note -** *If you decide to create the larger complete lapbook, we have included a different cover page for you to use on p. 61.*)

The directions for assembling the overall lapbook are found on the overview page. However, the directions for completing each of the mini-books in this document are included in the *Chemistry for the Grammar Stage Teacher Guide.*

How to Use the Lapbooking Templates

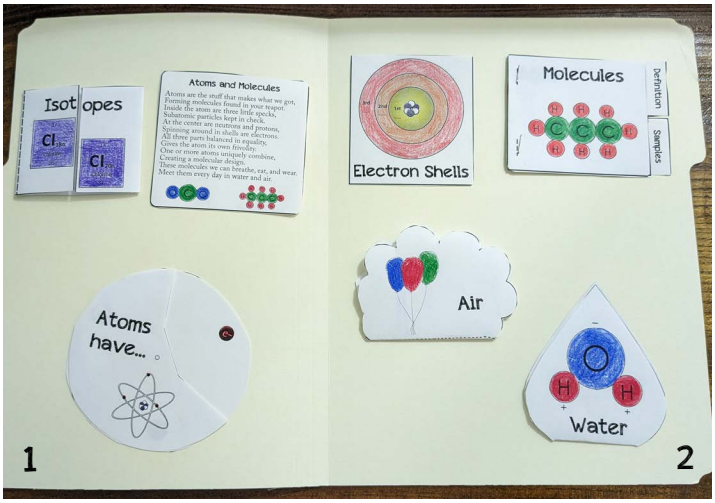
You can use the lapbook templates to review the concepts learned. Alternatively, you can have the student create a lapbook for each unit in lieu of completing the *Chemistry for the Grammar Stage Student Workbook*.

However you choose to use these lapbooking templates, please let us know if you have questions or would like to share feedback by emailing support@elementalscience.com.

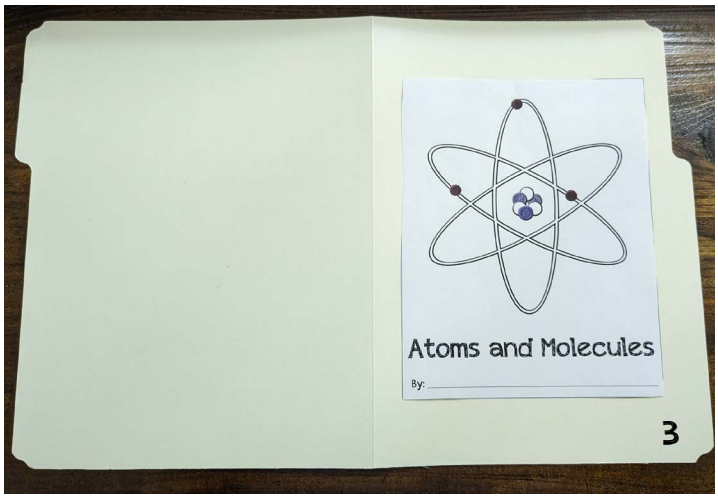
Atoms and Molecules Lapbook

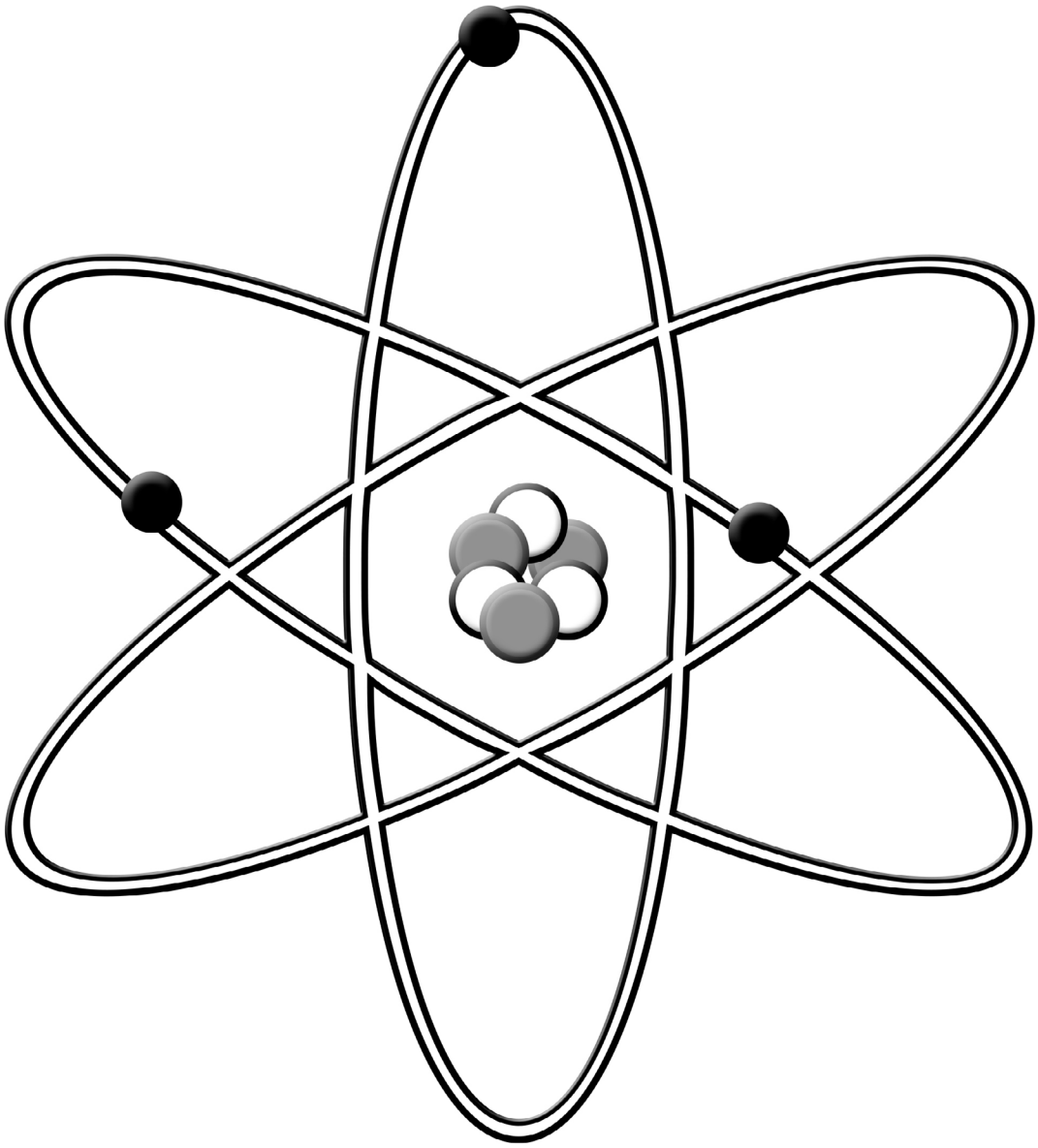
You will need two sheets of card stock or one file folder. See the complete lapbook pictures below.

Inside



Outside





Atoms and Molecules

By: _____

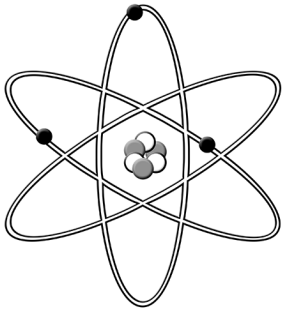
Instructions: Cut out along the solid lines.

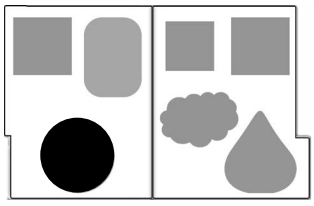
Atoms Wheel-book

Instructions: Cut out along the outer solid lines and punch a hole where the holes are in the center. Stack the pages with the cover on top, insert a brad faster into the hole and secure it on the underside so that the cover can freely move around the bottom page.

Atoms have...

Cut this portion out





Inside

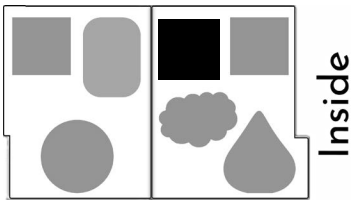
e-

n

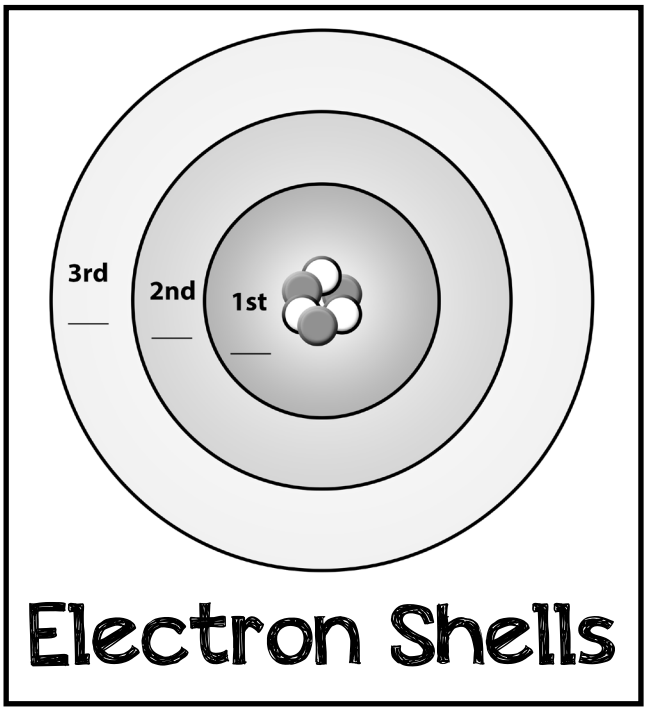
p+

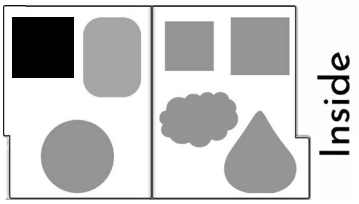
Isotopes Shutterfold Book and Electron Shell Diagram

Instructions: Cut out along the solid lines and fold on the dashed lines.



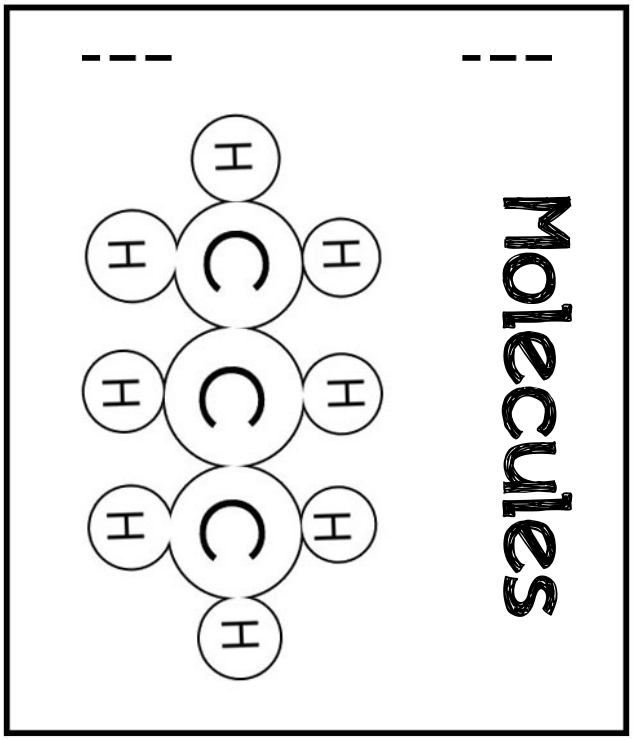
Instructions: Cut out along the solid lines.

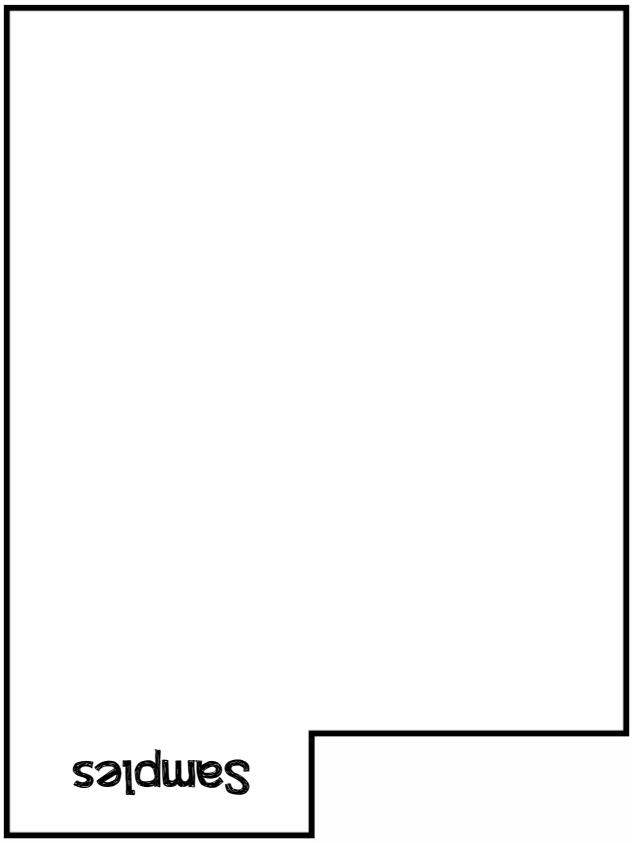


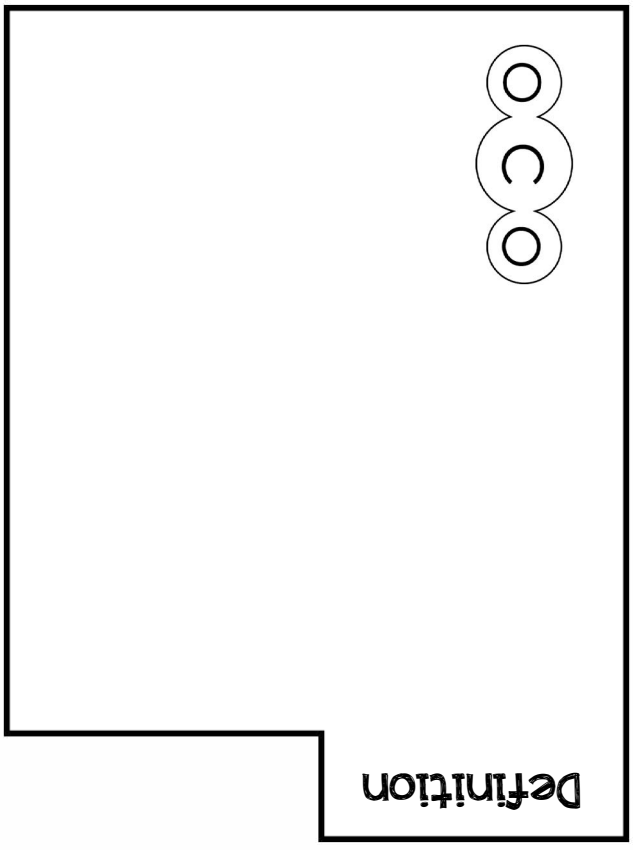


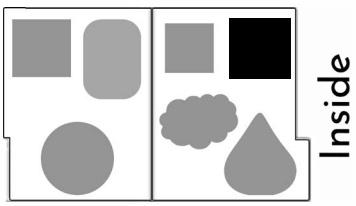
Molecules Tab-book

Instructions: Cut out along the solid lines, stack the pages so the tabs are visible, and staple together on the dashed lines.







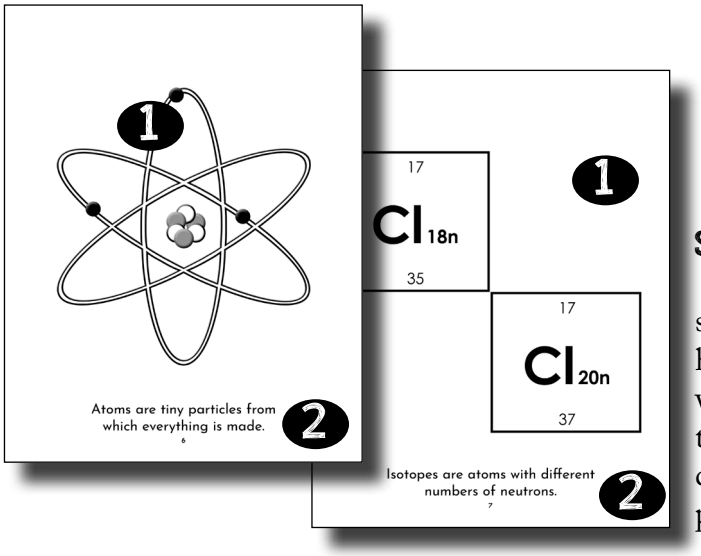


Chemistry for the Grammar Stage

Coloring Pages

(Third Edition)

Chemistry for the Grammar Stage Coloring Pages



Use the coloring pages to add a bit of art to your science plans or to engage younger students.

Simple Coloring Pages

Color your way through learning about science with these coloring pages. Each page has a large, black-line illustration (1) along with a key fact sentence (2) for the students to learn about the topic. The specific directions for when to use these coloring pages are found in the teacher guide.

Introduction

The coloring pages provided in this eBook are meant to coordinate with *Chemistry for the Grammar Stage*. There is one coloring page for almost every narration topic assigned in the program.

Each page has a large, black line illustration along a key fact sentence for the students to learn about the topic. Simply have the students color the picture as they desire using crayons, colored pencils, or watercolor paints. As they work, you can read the fact out loud several times.

You can use these pages with your younger "follow-along" students, with students who love to color, or with reluctant writers. We have scheduled these pages under the "Writing Assignments" section in the *Chemistry for the Grammar Stage Teacher Guide*.

Our goal at Elemental Science is to provide you with the information you need to be successful in your quest to educate your students in the sciences at home, which is why I encourage you to contact us with any questions or problems that you might have concerning this program at support@elemental-science.com. I, or a member of our team, will be more than happy to answer them as soon as we are able. I hope that you enjoy these coloring pages!

- Paige Hudson

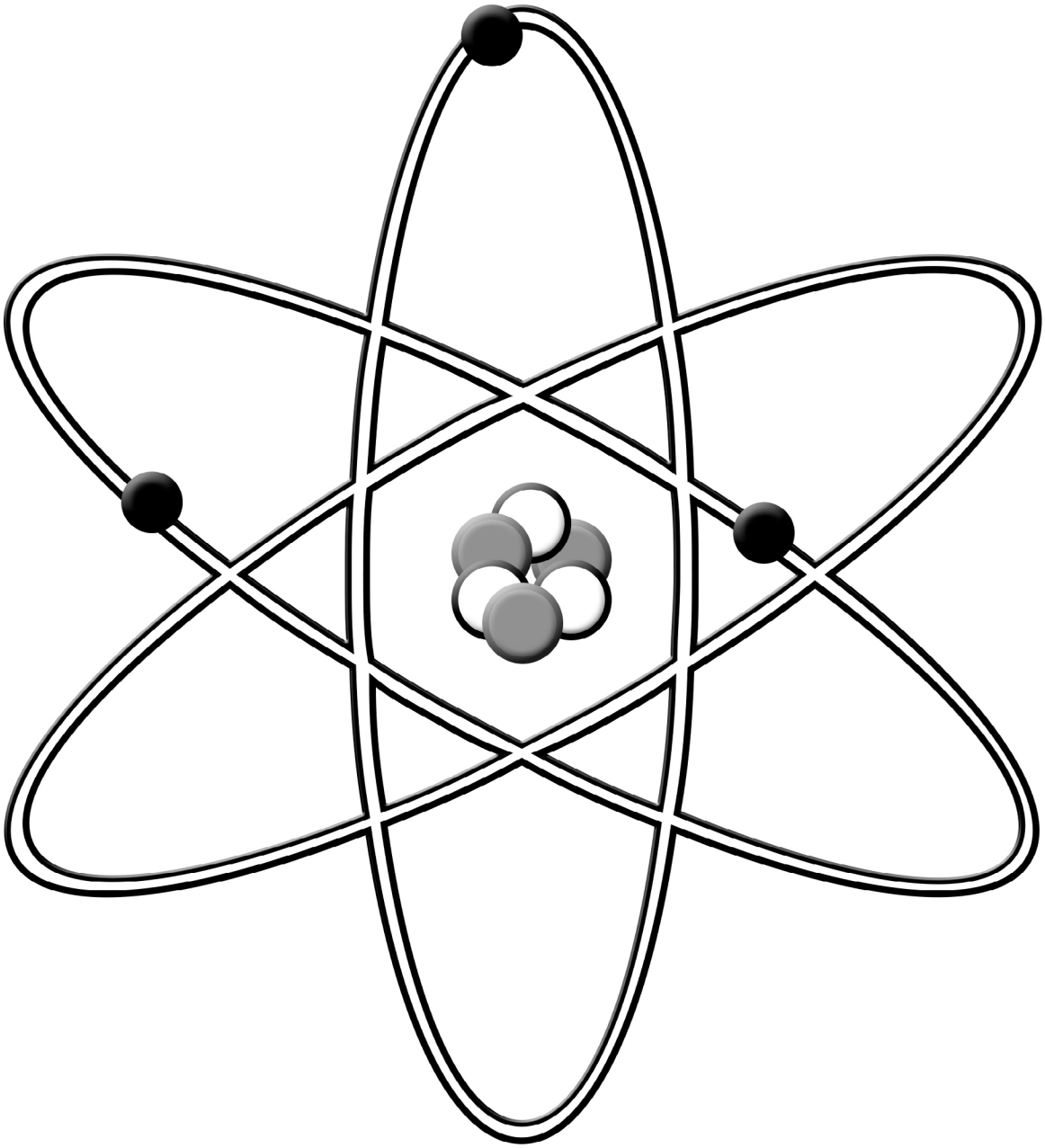
Table of Contents

Chemical Changes Unit

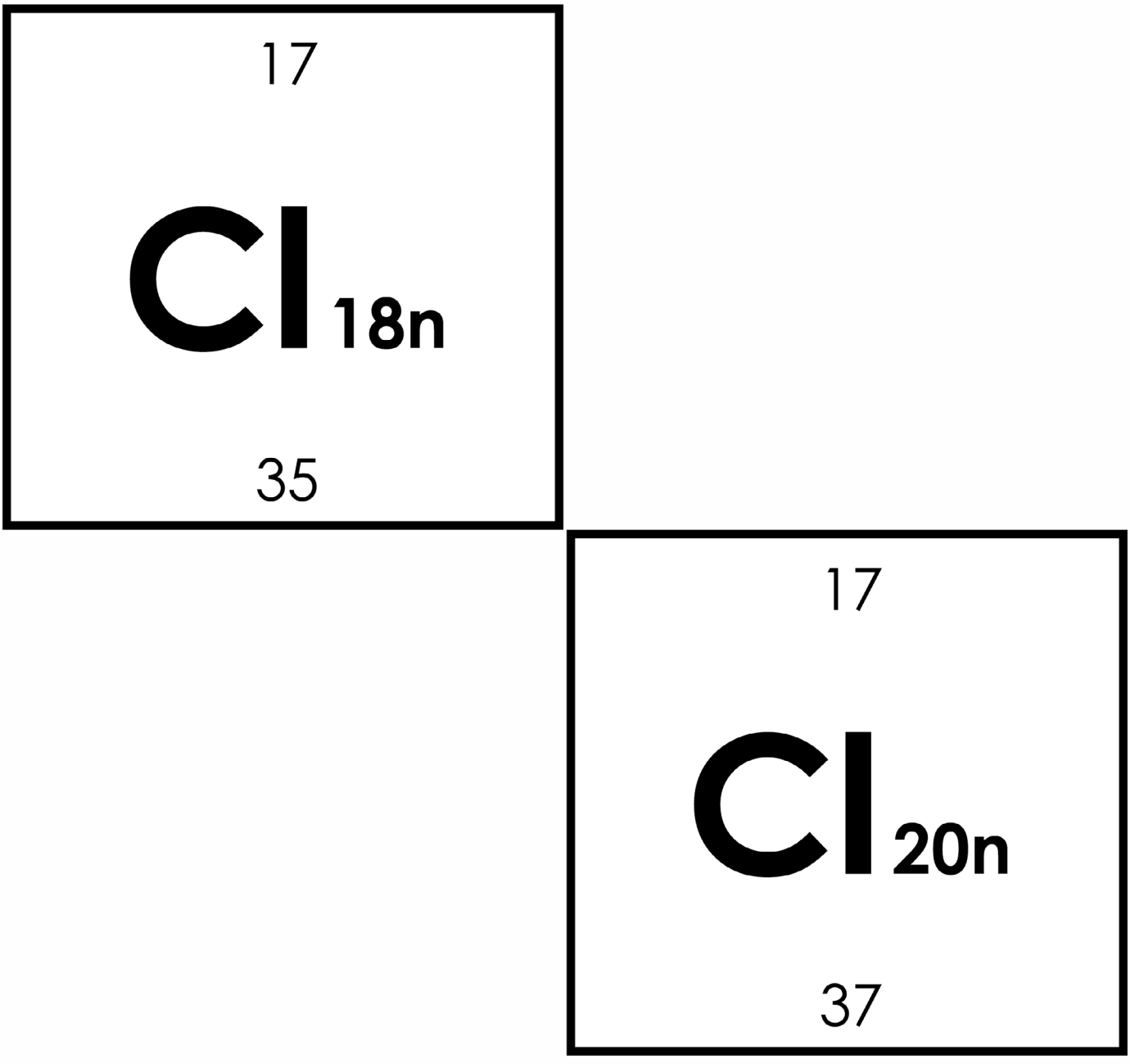
Mixtures Unit

Acids and Bases Unit

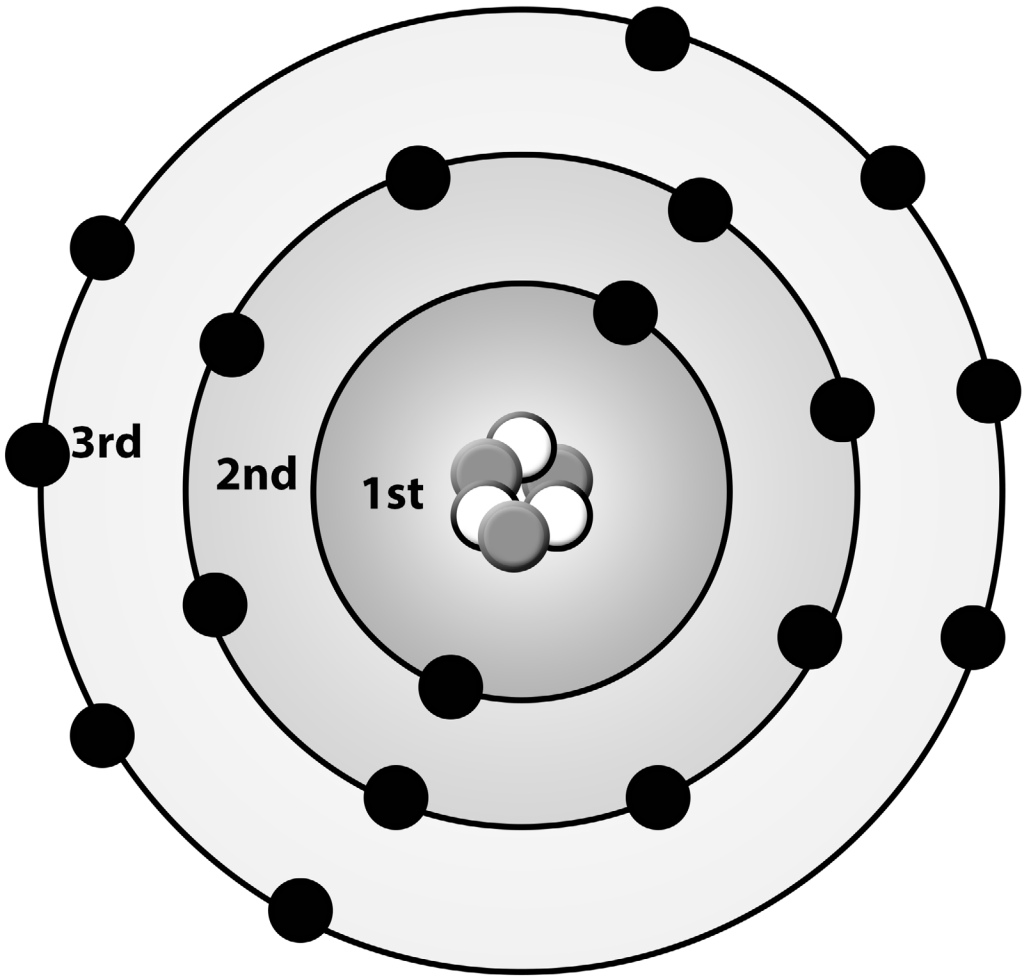
Organic Chemistry Unit



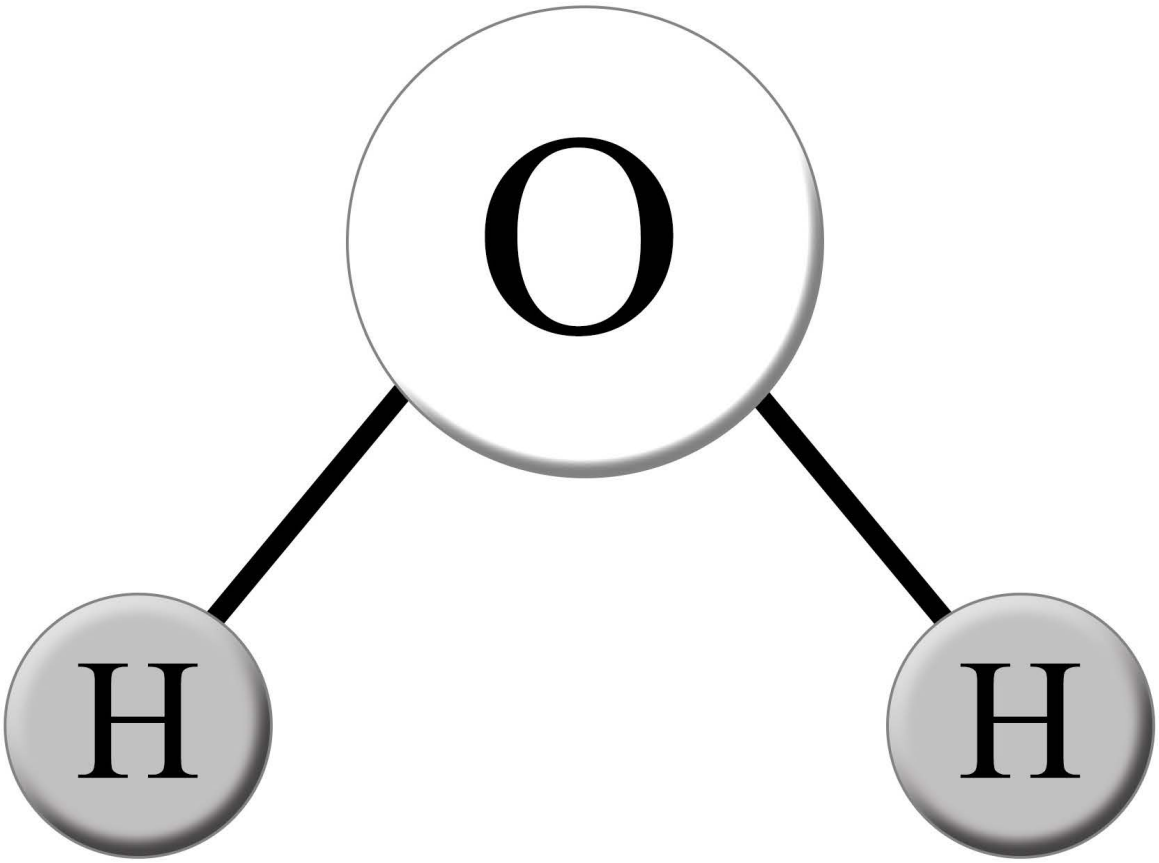
Atoms are tiny particles from
which everything is made.



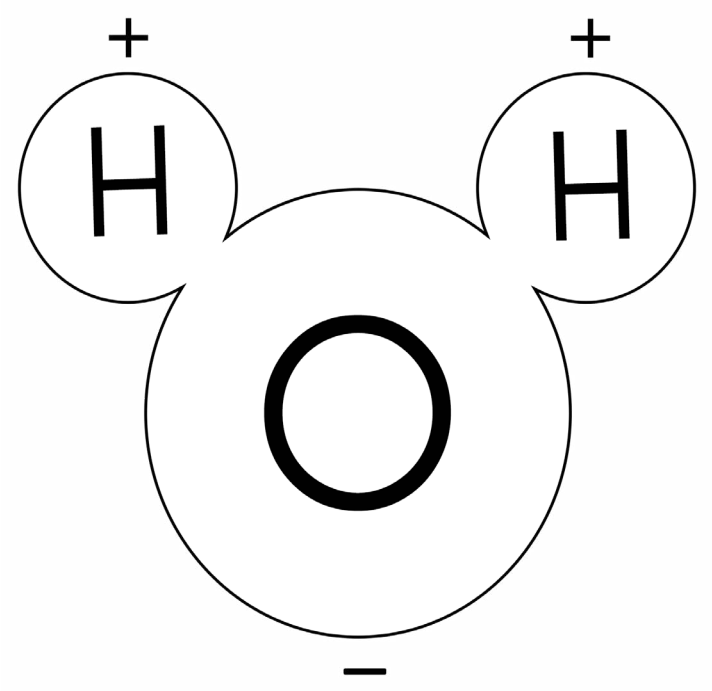
Isotopes are atoms with different numbers of neutrons.

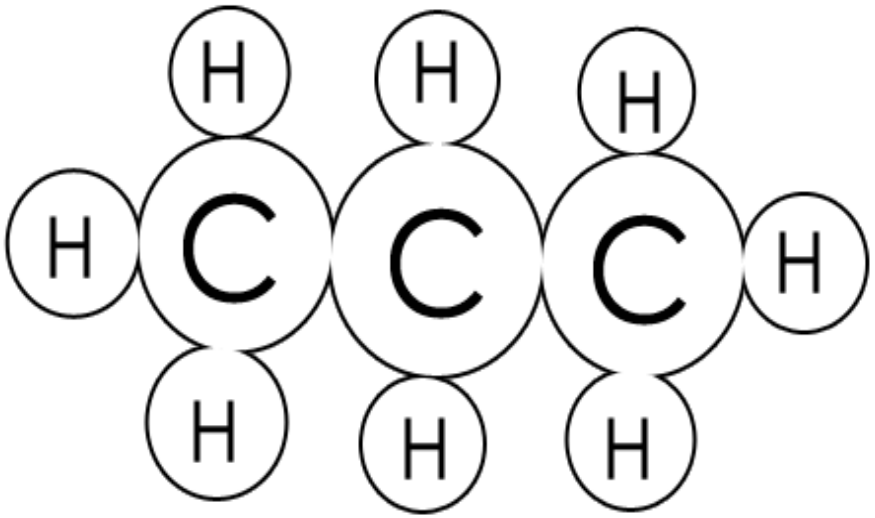


Electron shells are the areas in an atom where the electrons live.

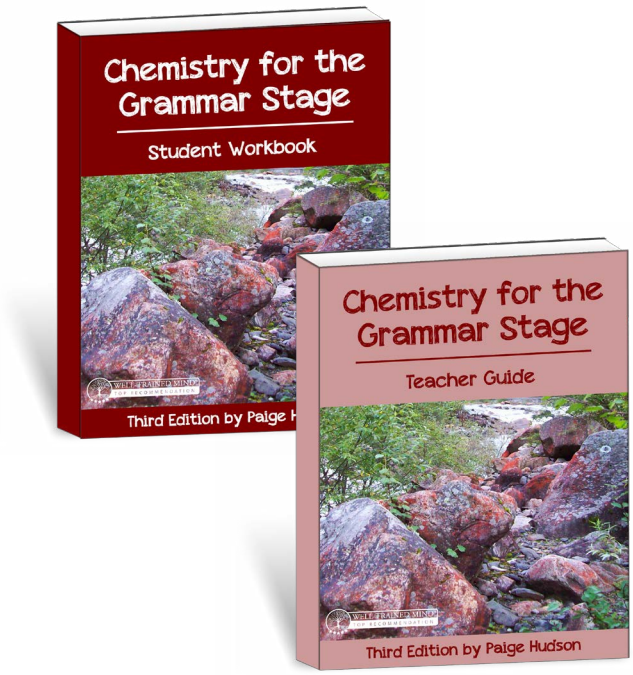


Molecules are made of two or more atoms bonded together.





Polar molecules have a charge, nonpolar molecules do not.



Are you ready to start?

Learn about the basic principles of chemistry by purchasing *Chemistry for the Grammar Stage* here:

https://elementalscience.com/collections/chemistry-for-the-grammar-stage

elemental science

Or check out the rest of our award-winning Classical Science sereies here:

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