Grades 2-7

Exploring Chemistry

Learning Lapbook with Study Guide

A Journey Through Learning

www.ajourneythroughlearning.com

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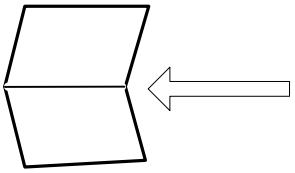
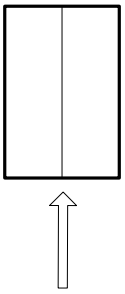
Things to Know

Hamburger Fold-Fold horizontally



Hotdog Fold-Fold vertically



Dotted Lines-These are the cutting lines.

Accordion Fold-This fold is like making a paper fan. Fold on the first line so that title is on top. Turn over and fold on next line so that title is on top again. Turn over again and fold again on the next line so that title is on top. Continue until all folds are done.

Cover Labels-Most of the booklets that are folded look nicer with a label on top instead of just a blank space. They will be referred to as "cover label."

How Long Does it Take to Complete the Lapbook?

Doing a study guide page and mini-booklet a day, a 3-folder lapbook takes about one month to complete. However, you can expand the study portion and make it last as long as you like! That's the beauty of homeschooling! Do it YOUR way!

Lapbook Assembly Choices

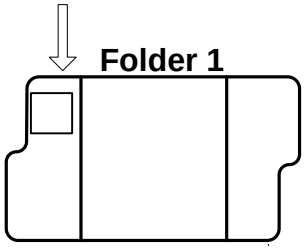
(see photos on how to fold and glue your folders together)

We recommend using Zip Dry Glue or Elmer's Extreme.

Choice #1 -Do not glue your folders together until you have completely finished all three folders. It is easier to work with one folder instead of two or three glued together.

Choice #2-Glue all of your folders together before beginning. Some children like to see the entire project as they work on it. It helps with keeping up with which folder you are supposed to be working in. The choices are completely up to you and your child!

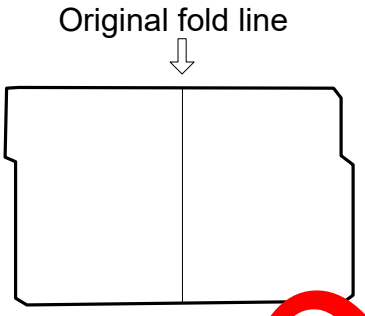
How do I know where to place each template in the folder?



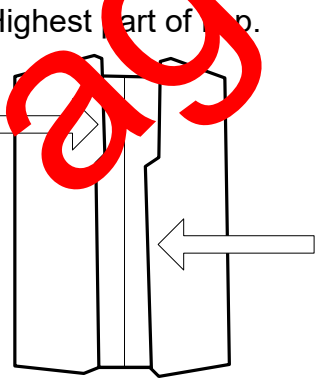
This placement key tells you the template goes in the first folder at the top of the left flap.

Folding a Lapbook Base

Gather the number of folders required for the project. Fold them flat as seen here.



For each folder, fold the left and right sides inward toward the original line to create two flaps. Crease so that the highest part of each flap is touching the original line. It is important not to let the two flaps overlap. *You may want to take a ruler and run it down each crease to make it sharper.*



Glue your folders together by putting glue (or you may staple) on the inside of the flaps. Then press the newly glued flaps together with your hands until they get a good strong hold to each other. Follow this step to add as many folders as you need for your project. Most of our lapbooks have either 2 or 3 folders.

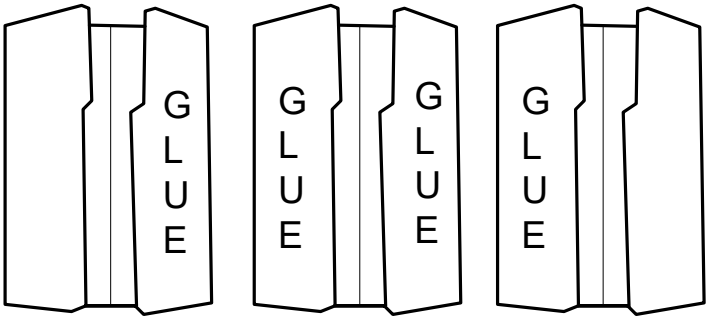


Photo of a completed lapbook base

Supplies and Storage

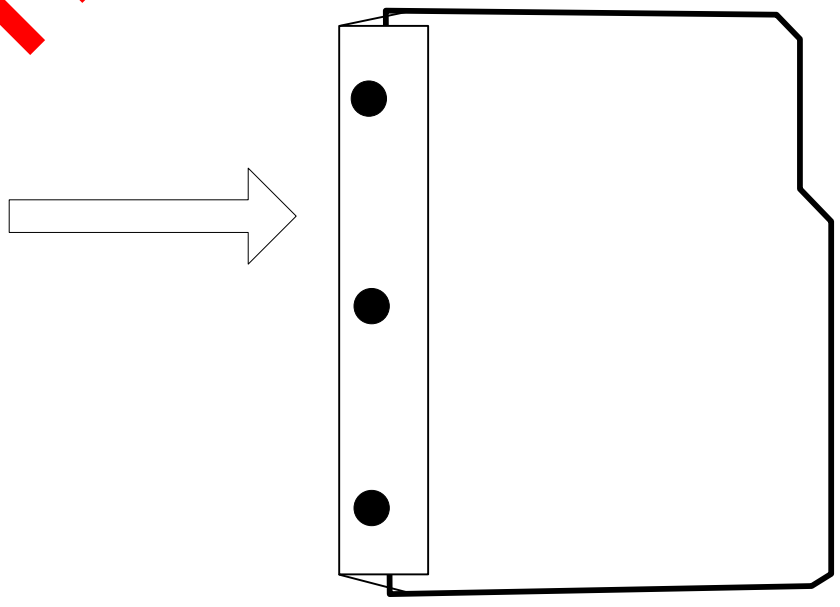
*Lapbook Pages
*3 Colored File Folders
*Scissors
*Glue
*Stapler
*Brads (not needed for every lapbook. If brads are not available, a stapler will do.)
*Hole Puncher (again, not needed for every lapbook.)

To make the storage system (optional)
See details below about the use of a storage system.
*Duct tape (any color)
*One 3-ring binder
*Hole Puncher

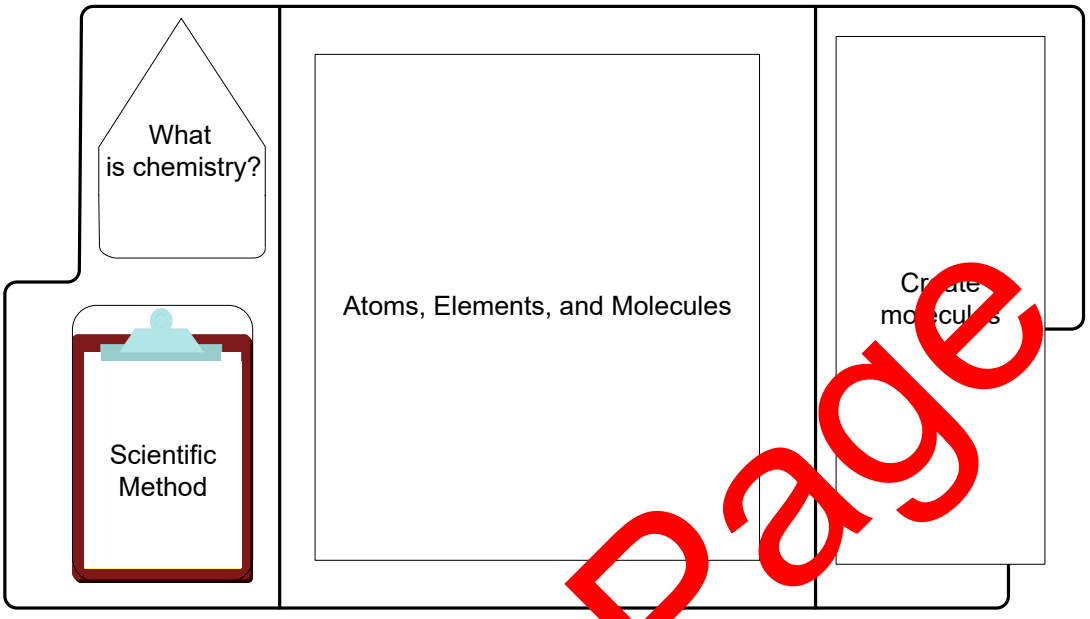
My child has made several lapbooks. Can I store all of the lapbooks together in one place?

Yes! A three-ring binder serves as a great place to keep your lapbooks. This method of storage not only keeps your lapbooks from getting lost but also keeps them neat and readily available to share with dad, grandparents, friends, etc. When you are through sharing your lapbooks, just place the three-ring binder back on your bookshelf! Below are step-by-step directions of how to prepare each lapbook to be placed a in a three-ring binder.

Close the lapbook. Measure a piece of duct tape that is as long as the lapbook. Place the edge of the duct tape on the top edge of the lapbook. Then fold the duct tape over so that it can be placed on the bottom edge. Make sure to leave enough duct tape sticking out from the edges to punch three holes. Be careful when punching the holes that you do not punch the holes in the folder. If you do, that's okay. Then place in three-ring binder. Depending on the size of your three-ring binder, you can store many lapbooks in it.



Folder 1



Folder 2

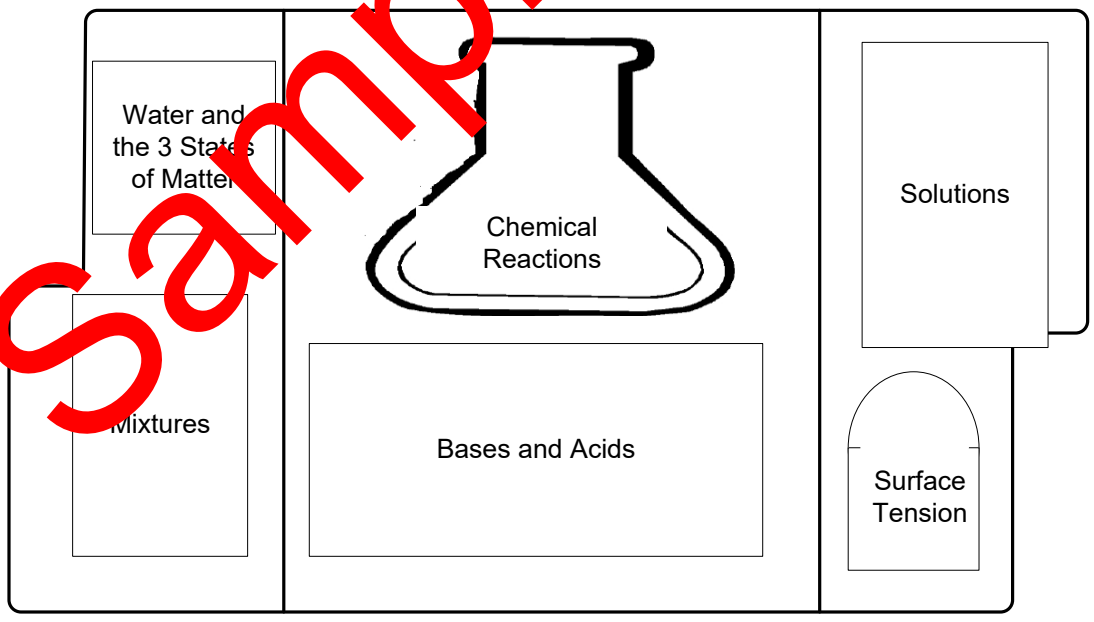


Table of Contents

Cut out around the dotted lines and glue to the front of your closed lapbook. Add a sample to the slide.

Chemistry

What is Chemistry?

The easy answer is that chemistry is the study of matter. What is matter? Everything. Everything in the universe is made up of matter. Studying that matter and the way it reacts and changes is the science of chemistry.

Although we often think of dangerous substances when we talk about chemicals, they are simply the substances that our universe is made out of. Chemicals have properties, which are the specific ways that those chemicals look, act, and behave. For example, salt has the physical properties of hardness, crystallization (forming specific shapes), taste, smell, and the way it behaves. These are the properties of salt. Every chemical has its own set of properties.

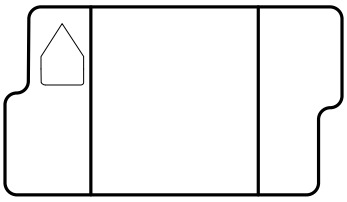
In the ancient times, there were several different thoughts about matter. Many people thought that there were four main things which everything was built out of- water, earth, air, and fire. Some people thought that everything was made out of one all-encompassing liquid or gas. Others, such as a man named Democritus, said that things are made out of tiny pieces with space between them.

During the middle ages a new science called alchemy developed in Europe and the middle east. These scientists were interested in changing and creating matter and in magic. They spent years trying to discover a way to change common metals into gold. These men discovered some important things, such as sulfuric acid and how to make drugs from plants. Today, we get the word chemistry from the word alchemy. During these years, most scientists still followed the idea of the four main elements, water, air, earth, and fire.

In the 17th century, the old ideas about atoms, small pieces with space between them, were revived by an Irish scientist. Robert Boyle said that instead of the four elements of earth, air, water, and fire, matter is made up of a set of basic chemicals that combine in many different ways to make thousands of compounds. He said that each of these basic elements can be found in either a solid, liquid, or gas state. Many chemists began doing experiments with Boyle's ideas and started discovering the elements. They found that both water and air were combinations of basic chemicals, not elements of their own as people believed for hundreds of years. This was really the beginning of modern chemistry.

There are many different branches of chemistry, and really all science is involved in chemistry, since it is the study of all matter. Medical chemists work to make new drugs and medicines. Physical chemists study physics, which is the way molecules and things move, along with chemistry. Geochemistry is the study of rocks, minerals, and other aspects of our earth as it relates to chemistry. Biochemistry is a combination of the sciences of biology (living things) and chemistry. Environmental chemists learn about the way our environment works, and how different things effect it on a chemical level. There are many more branches of chemistry, and the more we learn about matter the more all branches of science become interconnected with each other.

Folder 1



Read What is Chemistry?
Cut out each booklet. Stack on top of each other. Fasten with a brad or staple. Glue into lapbook.
Directions: On each booklet, write what you have learned.

What is chemistry?

What do properties of a chemical do?

What are some different branches of chemistry?

What is the universe made up of?

Atoms, Elements and Molecules

You already learned that matter is the word scientists use for everything in the universe. Everything is built out of matter. But what is matter made of? Atoms. Atoms are the building blocks for everything. Plant and animal cells, rocks, water, air, everything is made out of atoms. These atoms are like tiny (very, very tiny) puzzle pieces, that when put together in the right ways, create something.

Atoms are really tiny. You cannot see them, even with the most powerful microscopes. Instead, scientists use something called a scanning tunneling microscope to learn more about the way they are put together. An atom is almost like a tiny solar system. The center of our solar system is the sun, and everything else orbits it, held in place by its massive gravity. Similarly, the center of an atom is a ball of tightly intertwined electrons and neutrons. These are called particles. The orbiting 'planets' in our tiny atom 'solar system' are called electrons. These are like bits of energy, darting around the center proton and neutron 'sun.' Unlike our orderly, consistent planets, the electrons in an atom do not always do the same thing. They follow the same path, but how fast they move may not be the same.

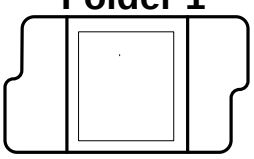
What is created by these atoms depends on what kind they are. These specific kinds of atoms are called elements, and everything in the universe is made out of about 120 elements. Of these 120 elements, only a few are common and these few are the building blocks for most things that we see and use every day.

So what makes one atom, or element, different from another? The number and location of the electrons in a given element are specific only to it. Every iron element is exactly like every other iron element, and unlike any other element in the world. These elements are basically a specific pattern of electrons. Nitrogen has one pattern of electrons, while carbon has another.

The periodic table is a chart that scientists use to organize and compare the elements. Each element has an abbreviation and is located in a specific place on the chart. The elements are organized based on the number of neutrons and electrons in each atom. Some of the elements on the periodic table were invented by chemists in laboratories and never appear in nature.

Elements combine with other elements to make molecules. A molecule is a cluster of elements combined in a specific way. If you have one hydrogen atom and two oxygen atoms, you have a water molecule. If you instead have two hydrogen atoms and two oxygen atoms, you have hydrogen peroxide, that fizzy stuff in the brown bottle that your mom or grandma might put on your knee after you crash your bike in the driveway.

Some things may have many different combinations of molecules and elements, all mixed up in one great intricate creation. Living things especially, have many complex and varied substances which also have very complex series of chemical reactions. A simple thing such as blinking your eye or swallowing a bite of food sets off a complicated pattern of chemical reactions, changing chemicals, and energy use and creation.



Folder 1

Read Atoms, Elements and Molecules.
Cut out the booklet. Glue into lapbook.
Directions: Cut out the labels. Glue them into the correct location on the booklet.

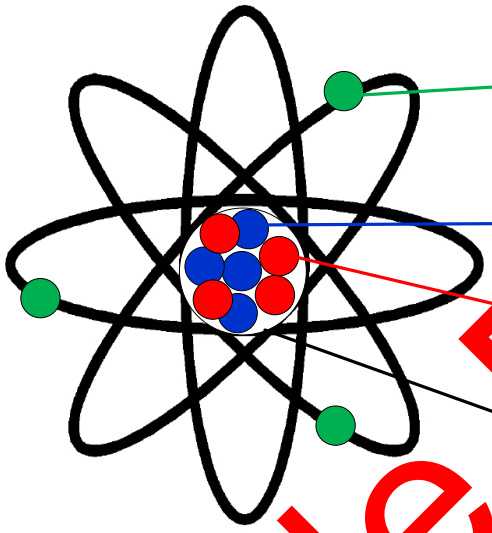
Nucleus

Electron

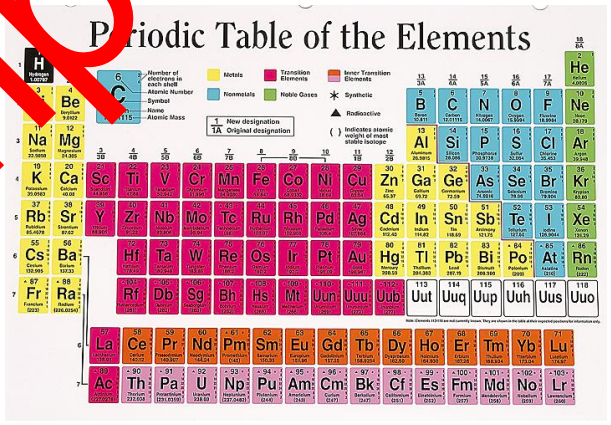
Proton

Neutron

Atoms



Elements



Molecules

Draw the molecule in the box.

Water

Hydrogen Peroxide