

Easy Peasy — All in One Homeschool

Chemistry and Physics

Course Description – Students will study chemistry and physics through experimentation, demonstration, readings, videos and a variety of online activities. They will learn about the periodic table and many of the elements, studying their structure and use. Students will model the structure of atoms and molecules and will explore the states of matter, discovering the properties of solids, liquids and gases. They will create and observe different types of chemical reactions and experiment with acids and bases. Physics topics include: light, sound, aerodynamics, forces, the Three Laws of Motion, energy, heat, electricity, magnetism, simple machines and engineering. Students will learn but also apply their learning by building a roller coaster, bridge and dome as well as circuits and solar oven.

Atoms, Molecules, Steam Engines, Matter, States of Matter

Day 1* (Materials L and M: small piece of aluminum foil)

1. Take a small piece of aluminum foil. Rip it in half. Again. And again and again and again until you can't any more. If you could keep ripping it until it was the smallest piece of aluminum in the world, that would be an **atom**, an aluminum **atom**. Everything in the world is made up of atoms, or atoms make up the **matter** that everything is made of. Different types of atoms come together in different combinations called **molecules** to make up everything you see in the world.
2. Take a look at [how small atoms are](#). (Move the slider to the right and left. If it's not working, you can watch this [video](#). Get permission to watch it on youtube.)
3. Atoms are so small that five million million hydrogen atoms would fit on the head of a pin. That's 5,000,000,000,000 atoms.
4. *Print out [Elements Lapbook](#) (L is using this too) You can cut out H and the hydrogen pocket if you can make sure to not lose them before tomorrow. You can place pocket in a lapbook, notebook or on a wall poster, but you'll write in it tomorrow. In the print out there are notebooking pages you can use to attach the piece to. You can place the pocket on the alkali metals page.

Day 2

1. Watch [hydrogen video](#).
2. Fill in Hydrogen booklet. Need an idea of what to put inside about hydrogen? [Read this](#).
3. *Look at this [example of a periodic table](#) (or a list of all the atoms we know about). (You can print it if you like. It is in color.)

Day 3

1. Watch video about how steam engines work
2. [Watch this animation](#) of steam engines.
3. Explain how a steam engine works.

Day 4

1. [Watch and read](#) about steam engines.
2. Draw a diagram of how it works and explain it to someone.
3. [Copy this sentence](#) about steam engines and tell what it means in your own words.

Day 5*

1. What makes water turn into steam? [Play this game to learn](#).
2. *Print out this [worksheet on water changing](#) and fill in. Make sure you put it in your notebook.
3. Just about everything in this world is either a solid, a liquid or a gas. These are called "the states of matter."
4. You just learned that by changing the temperature of a type of matter you can change its state. For example by heating the solid ice you change it into a liquid.

Sound, Molecules

Day 6* (Materials for M: metal hanger, 2 foot-long pieces of thread — if you don't have a metal hanger, use something metal like a spoon)

1. *Bell realized that the sound carried better if he used a liquid. Conduct a sound experiment. Does sound travel better through a solid or a gas (the air)? Do [Hang In There](#). Try it a few times with different tables. If you can get what you need together, you could do any of the other experiments too. Print out the science experiment page and fill it out with your experiment details. I wrote the experiment question above. [Experiment worksheet](#) Think of a way to test if sound travels better through a liquid or a gas? Try it. What's your result? Present your conclusions from today's experiments at the dinner table.

Day 7 (Materials for L : two cans and string and a nail and hammer to poke the hole — can use disposable cups and a thumbtack if you don't have cans, might want to have a paper clip on hand)

1. Read about how a [telephone works](#). Click on Next Page when you get to the bottom. And again on the next page. On this page, after you read, click on the image to see it animated. Just a reminder not to click on anything else on these pages. The advertisements are just to get your money. They will not improve your life 😊 Have self-control and stay focused.
2. Describe how Alexander Graham Bell's telephone worked.

Day 8

1. Watch [video on oxygen](#).
2. Cut out your O and Oxygen pocket. Oxygen is part of what we breathe. We need oxygen for our bodies to work. It is another **element** in our world and is number 8 on the **periodic table** because one atom of oxygen has 8 protons in it. We'll learn later about protons. Write or draw inside your oxygen card. And place in your pocket.
3. Not everything in the world is hydrogen or oxygen or carbon or whatever else is on the periodic table. Those are the elements that other things are made from. When different **atoms** come together to make something new, they are called **molecules**. Probably the most famous **molecule** is H₂O. Have you ever heard of it? It means two hydrogen atoms and one oxygen atom getting together. When they do, they make water! All water you see is made up of H₂O molecules. Here's a [picture of a water molecule](#).

Day 9 (Materials for M: grape, microwave—there's a video of the experiment if you can't do it)

1. Remember **molecules**? A water molecule is made up of two hydrogen atoms and one oxygen atom, H₂O. When molecules heat up, they get really excited and move around a lot! That's a gas. When molecules cool down enough, they barely move at all; that's a solid.
2. Do this [online activity](#) on states of matter.
3. Take this [online quiz](#).
4. If you have a grape and a microwave, then you can create plasma. Plasma is another state of matter. It's what you get when you excite molecules even more than in a gaseous state. Slice a grape in half longways but leave a little skin so you can open it like a book. Open it and place it in the microwave. Turn the microwave on and be ready to turn it off. In 10-15 seconds you should see plasma shooting off the grape! Turn off your microwave after those 10-15 seconds. Don't let the grape cook longer. If you don't have a microwave, you can watch a video of the experiment.

Day 10 (Materials for L: bar of Ivory soap, microwave—there's a video of the experiment to watch if you can't do it)

1. In your science notebook write the following words and their definitions: atom, molecule, matter, state of matter, liquid, gas, solid, periodic table.
2. As a reward for your hard work writing great definitions, here's a video of what fun chemistry can be.

Day 11 (Materials for M: tongue depressor, rubber band about 3 in. by 1/4 in., 2 index cards, 3 feet of string or yarn, scissors, tape or hot glue)

1. Read about [this experiment](#), watch the video and try it if you have what you need.
2. Write in your science notebook what you learned from the experiment. Please put the date at the top of the page.

Day 12

1. Watch the first half hour of the film, [The Case of the Deafening Sound](#)

Day 13

1. Watch the second half hour of the film, [The Case of the Deafening Sound](#).

Day 14

1. Read about [the speed of sound](#) and traveling faster than the speed of sound.
2. Watch a video about breaking the sound barrier. Then listen to a plane breaking the sound barrier.

Day 15

1. Read about [the phonograph](#).
2. If you have a record player at home, observe it in use. You can also watch the video below. While records are flat, Edison's played from grooves in a spinning cylinder.
3. Draw a diagram of how a phonograph works.

Light

Day 16

1. The light in a bulb basically is a fine wire, called a **filament**, that gives off light because it is heated up and gets hot. It's actually atoms that are giving off light. Remember how they get excited when they heat up? The electricity travels into the bulb, heats up the atoms in the filament, causes them to jump around which gives off the light.

2. Watch [video on argon](#). Argon is the gas used in most light bulbs. Thomas Edison learned that leaving air in the bulb would cause the filament (the thin carbon wire inside) to burn up. He used a vacuum to take out the air. Now we remove the air and put in argon.
3. Read about the [group of noble gases](#).
4. Cut out and fill in your argon piece.

Day 17

1. We see because light travels from the light source to an object, reflects off that object and hits our eye.
2. Watch this [video about how light travels](#).
3. Try this [quiz about light](#).
4. (If you can't answer the questions, go and [read here](#).)

Day 18* (Materials for M: coin, bowl)

1. Watch this video below about how light bends and slows.
2. Then try this [experiment on bending light](#). (If you don't have blu tac, just pour the water carefully so you don't disturb the coin. It won't float!)
3. *Write up an [experiment worksheet](#). Question: Can light bend?

Day 19 (Materials for L and M: metal spoon)

1. Read this page about [reflection](#).
2. Read this page about [light refraction](#).
3. Place a glass of water on the end of a white sheet of paper near a sunny window. Let the light shine through the water. What do you see on the paper?
4. Light is made up of colors. The light waves of different colors travel at different speeds and so bend in different ways going through the water. The water demonstrates **light refraction**, the change in direction due to a change in speed. The water slows the light waves and causes them to bend.
5. Play with this [color mixer](#). Make sure you try mixing all three at their highest levels. You can see how light is white, but it is really made up of many colors.

Day 20*

1. Read about the [structure of a light bulb](#).
2. The "electrical foot contact" is what **conducts**, or carries, the electricity into the bulb. [Play this game](#) to experiment with different conductors and receivers.
3. [Play this electrical circuit game](#).
4. Write circuit, conduct and filament in your science notebook and write definitions for the words.

EXTRA — if you want to and are able to... How to [make a periscope](#).

Atoms and Molecules

Day 21*

1. Watch the video below and take notes of any new vocabulary. When you hear a new word, jot it down on this [notebooking page](#). (You just need page one.) After the video is done fill in more about each word you wrote down. Also write in your notes the explanation as to why atoms join together. Watch it again if you can't remember!
2. *Print out just [page one of this worksheet on atoms](#). Read it and fill it in. Keep it in your science notebook.

Day 22

1. In a small, deep container (small jam jar would work well) pour 1/2 cup of the hottest water that comes from your faucet. Stir in 1/2 cup of Epsom salt. Stir for one minute (there should be some Epsom salt crystals at the bottom still) and then place in the refrigerator. In three hours you should have crystals. (In case you can't grow them, here's a picture of Epsom salt crystals. You can click on it to see it bigger.)
2. Epsom salt is magnesium sulfate, MgSO₄ That means that each molecule of magnesium sulfate is made up of one atom of magnesium, one atom of sulfur and 4 atoms of oxygen. The crystals are lots and lots of molecules joining together.
3. Draw a picture of what a magnesium atom might look like. It is number 12 on the periodic table so it has 12 protons and electrons. Draw a nucleus with 12 + signs in it for the protons. Now draw a ring around it with two electrons (-) on it. That's all the first level can hold. Now draw a second ring around that. The second level can hold 8 electrons, remember? Draw eight electrons on the second ring. That's 10 electrons. Now draw a third ring around the atom. How many electrons should you draw on this one? It needs 12 and you've only drawn 10 so far. This last level or its **valence shell** needs 2 more drawn in, but it wants 18! That's why it will bond with the other atoms.
4. Look at this picture of [enormous crystals](#).

5. Have Epsom salt left over? [Try this!](#) (You can save some for later as well, a tablespoon should do.)

Day 23

1. Read about helium. [Page 1](#) [Page 2](#)
2. Watch the [video on helium](#). Helium is number 2 on the periodic table because it has 2 protons.
3. Check out this site on [helium](#). Use the different links on the right.
4. Cut out the helium pieces. Write inside about helium. Draw a helium atom inside as well.
5. Helium belongs to the group of noble gases. Every element in a group has the same number of electrons in its valence shell, except for helium, which only has 2. How many electrons do they each have in their valence shell? Use neon to figure it out. How many are in its outer shell? First shell 2, second shell 8, right? Now check it with argon, number 18. Does it work? Remember argon? It's what is put in regular light bulbs.

Day 24*

1. *Fill in [this chart](#) for helium. We know that the atomic number is 2. We also know that the atomic number is also the number of protons. Fill in that information on your chart. Periodic table charts tell us that its atomic mass is 4.002602. Fill that number in. Its mass number is 4. Now protons are the positive charge in the nucleus. There has to be an even negative charge to balance it out. That means there the same number of electrons (the negative) as protons (the positive). Fill in the number of electrons on your chart. Now to find the neutrons take the mass number and subtract the number of protons to see what's left over. So in this case $4-2=2$. There are 2 neutrons in a helium atom. Fill in the number of neutrons on your chart.

Day 25* (Materials for L: as many pennies as you can find—20 would be great — or any coin you have the most of, or something like checkers would work too)

1. *Print out [pages 1 and 2 of this worksheet](#). Fill in page one. Save page two. You can check your answers later by scrolling down, but there is an error. It should say atomic mass where it says, "symbol."

Day 26 (Materials for L: cup of water, coins — or something small you can drop a lot of in water)

1. Fill in page two of the [worksheet](#) from day 25. Skip the "Lewis Structure." Check your answers.

Day 27* (Materials for L: O or ball shaped cereal, milk, bowl, water, oil, dish detergent; Materials for M: paper clip or pin, wax paper or other water proof surface — some book covers, rain coat..., tablespoon or just a spoon)

1. Drop water onto a water proof surface. What shape does it sit in? Water **cohesion**, or how water molecules are attracted to each other, is why the water beads up. Do you think it's also why rain falls in drops? (picture of how [water beads up](#))
2. Fill a tablespoon with water. Fill the tablespoon so that the water seems to mound up over the top of the spoon. Why doesn't the water spill over? **Cohesion**. The molecules on top are attracted to those underneath and hold onto each other. This creates **surface tension**.
3. Fill a cup with water. Place a paper clip or pin on top of the water. It's heavier than water, but it floats. Why? The cohesion builds up a strong **surface tension**. It holds the water in place and the paper clip on top.
4. Read about [water cohesion](#) on the first page of this (don't need to print unless you want to). (We did a different experiment than they did so don't worry about the first paragraph.)
5. *Print out this [water cohesion notebooking page](#) and write why a too full cup of water doesn't spill. Make sure you start with an introduction sentence that says what you are going to write about. (Example: Did you ever wonder why you can fill a cup to the brim and it doesn't spill?) Use all the words/phrases listed.

Day 28

1. Watch this [video on carbon](#).
2. Read about [carbon](#).
3. Cut out your carbon pieces and write about carbon inside.

Day 29 (Materials M: balloon — mouth of balloon needs to fit over mouth of bottle, small bottle, baking soda 2 tablespoons, at least 1/2 cup of vinegar)

1. We've talked about water molecules bonding and being attracted and getting exciting by heat and turning into steam, etc. But all molecules do these things.
2. If you have younger siblings, they're doing this experiment today too. Put vinegar in a small bottle, like a drinking water bottle. Fill it up halfway or at least get a significant amount in there. If you just have a small balloon, you'll need less. Put two tablespoons of baking soda into the balloon. A funnel would be an easy way to do that. Without spilling any baking soda into the bottle, stretch the balloon opening over the bottle opening and let the balloon hang down to one side. Ready? Take hold of the top of the balloon and hold it up so that all of the baking soda falls into the bottle.
3. What happens? The molecules in the baking soda (NaHCO_3) and the molecules in the vinegar (CH_3COOH) react together. They atoms bond in different ways. Look at those molecules. They are more complicated than H_2O , but it is

the same idea. The atoms, the hydrogen, the oxygen, etc. find new ways to bond, or come together, once added with different types of molecules.

4. Look at the baking soda molecule. The Na (sodium) gets separated. An H (hydrogen) from the vinegar joins with the H in the baking soda and steals an O (oxygen). That makes H₂O, right? That leaves CO₂.
5. CO₂ is carbon dioxide. That's the gas that is filling your balloon and is also what's making the fizzing and bubbling.
6. This is called a **chemical reaction**, or simply a change in a chemical.
7. Chemical reactions can be described by chemical equations. We're not going to be working with these. I just want you to take a look at one for [this experiment](#).
8. Explain the chemical reaction in this experiment. Here are some [notebooking pages](#) to choose from if you like.

Day 30

1. Let's look at another **chemical reaction**. Fill a glass halfway with seltzer water. (If you don't have what our family calls, "bubble water," then just use regular water. The reaction just takes a bit longer. Add a drop of food coloring. Pour in bleach and watch the color disappear.
2. The color disappears because the oxygen molecules in the bleach and the oxygen molecules in the water bond together.
3. Write a definition of chemical reaction.
4. Watch this video of a neat chemical reaction. This is sulfuric acid being poured into sugar. Sugar is C₁₂H₂₂O₁₁. Do you see that H₂₂ and O₁₁ could make 11 water molecules (H₂O)? The acid reacts with the sugar causing the atoms to bond in a new way and the hydrogen and oxygen combine to make water (you'll see it as smoke in the video). That leaves only carbon! You'll notice the black carbon in the video!

Aerodynamics

Day 31

1. Read this page on [flight](#). Remember, if scientists don't believe God exists, they can't believe that God created the world. Any scientific evidence that points to a created world that's only be around for about 7000 years gets tossed aside or explained away. They can only accept ideas that fit their guess as to how the world was created even when evidence shows them wrong!
2. Explain the different kinds of flight.

Day 32

1. Read about the [principles of flight](#). Stop when you get to "How Air Moves."
2. Take notes on the aeronautics page.
3. *Here's a [notebooking page](#) with no lines if you want it.

Day 33 (Materials for L: piece of string, just like 12 inches, and a straw, you can make substitutions for these)

1. Read this page about [how air moves](#).
2. Read this page on [forces in flight](#).
3. Draw a diagram of the four forces which control an airplane. We'll learn about each of these forces separately. This is an overview. (Okay, if you want, you can make a paper airplane like the elementary school kids are doing.)

Day 34 (Materials for M: 2 coins, ruler)

1. Watch this video.

<http://www.youtube.com/watch?v=zMF4CD7i3hg>

1. Describe what happened.
2. Did you expect something dropped and something shot out to land at the same time?
3. Do you want to try it?
4. Place a coin on the edge of a table. Place your ruler half on / half off the table. Put a finger in the middle of it to hold it to the table. Place the other coin (same type of coin) on the edge of the part of the ruler that is hanging off the table. (Works best where you can hear the coins hitting the floor.)
5. You are going to quickly hit the very end of the ruler that is hanging off the table. When you do that, you will be knocking it out from under the one coin so that it drops and you will be striking the other coin so that it flies off. Try it several times.

Day 35*

1. *Print out [page one](#), read it and fill in the chart.
2. Here's a video of an astronaut falling "in slow motion." He falls more slowly in space because the moon is smaller than earth so it has less of a gravitational pull. His mass is the same, but his weight (gravity pulling on his mass) is different. He is pulled

to the moon with less force than on earth. Since the force, the speed at which gravity pulls is less. Makes it seem to us like it is slow motion.

3. Explain to someone why you would weigh less on Venus.
4. Explain in writing how mass, weight and gravity are connected. [Mass / Weight Notebooking Page](#)

Day 36 (Materials for L: straw, cup of water, Materials for M: cup of water, index card or cardboard or stiff paper)

1. Do this [lesson on lift](#).
2. Can air really hold things up? Do the experiment below.
3. Experiment: fill a glass 2/3 full of water and cover with an index card (or cardboard or stiff paper). Hold the card in place securely and flip the cup over. Remove your hand. The 14.7 pounds per square inch of air pressure will hold the water in it's place.

Day 37 (Materials for L and M optional: balloon, 2 liter bottle — empty ; also M — ziplock bag-or other plastic bag you can seal super well)

1. Try this experiment. Blow a ziplock bag. Seal it almost all the way. Give it another big puff and seal it closed. Put it in the freezer. Check on it in 10-15 minutes. Did it deflate some? Why? Air expands when it is hot, increasing the pressure it's putting on the bag. Air pressure is lower when the air is cooler.
2. Fill out an [experiment worksheet](#).
3. Watch the video below on air pressure. (You can try it if you like.) Can you answer the questions?

Day 38 (Materials for M: 2 paint stirrers and two rubber bands, may be able to use popsicle sticks or even paper folded over and over on itself to make a stiff "stick")

1. Make a [boomerang](#).
2. Tell how lift is created with your boomerang.
3. Here is a youtube video with directions for an [origami boomerang](#). Get permission before going to youtube.

Day 39 (Materials for M: paper towel tube, flexible straw, paper cup, aluminum foil)

1. Today you will learn about thrust, the push that moves the plane forward.
2. Read through [part 1](#). You don't have to try the experiments, but you can.
3. Build an engine (part 2 of the booklet).

Day 40

1. Do this [lesson on the forces](#) involved in flight. Click on "To learn how planes fly."
2. Go ahead and play the game afterwards.

Day 41

1. Review [flight forces](#).
2. [Build a glider](#). Read and follow the directions. Answer the questions. Experiment!

Day 42

1. Go to the different [learning stations](#), build a plane, test it to see if it flies.

Day 43

1. Click on [PlaneMath Enterprises](#). Click on the "students" links on the first two pages. Click on PlaneMath Enterprises. Click on training department. Complete the training.

Day 44

1. Click on [PlaneMath Enterprises](#). Click on the "students" links on the first two pages. Click on PlaneMath Enterprises. Click on the design department. Complete a design that works!

Day 45

1. Try these [activities](#). Click on the Pioneer Program Guide. There are two videos and two activities.
2. Read about [sodium](#). Use [this link](#) as well.
3. Cut out your sodium piece and add it with your others.
4. If you want, you can watch the [sodium video](#).

Acids and Bases

Day 46

1. Read about [chemical reactions](#).
2. Take the [quiz](#). It's okay if you get some wrong. Read about the correct answer and try and understand.
3. Write another definition of chemical reaction in your binder with your previous one.
4. (You may want to ask your mom if she can help you make the [red cabbage indicator](#) today to be ready for tomorrow. See tomorrow's lesson.)

Day 47* (Materials for M: red/purple cabbage, coffee filters)

1. Read about [acids and bases](#).
2. Take the [quiz](#).
3. Make [ph testing strips](#).

Day 48* (Materials for M: disposable cups)

1. Use your paper to test a series of liquids in your home: cleaners, drinks from the fridge, egg whites, sauces, whatever else you can think of (with permission). Use goggles and rubber gloves if you have them.
2. Pour the different liquids into disposable cups. Place the liquid behind the cup or label it so you know what you are testing! (You could test things like sugar, cream of tartar, baking soda, just put a teaspoon in the cup.)
3. Dip the test paper into each one.
4. *Observe the color change and record the result. [PH test sheet](#)
5. If you can't do this at home, here's a [video of a similar experiment](#).

Day 49

1. Play at the [juice bar](#). Do all three challenges.
2. Read about [neon](#); [read here too](#).
3. Cut out your neon piece and fill it in and add with your others.

Day 50

1. Watch the movie on [acids and bases](#).
2. *Fill in this worksheet, [Acids and Bases](#).

Day 51 (Materials for L: hard-boiled egg, chicken bone—for tomorrow, vinegar—at least one cup, jar or container for vinegar)

1. You are going to keep reading about [chemical reactions](#). I know this isn't easy stuff. Take your time and get what you can from it.
2. Take the [quiz](#).
3. Watch this video on [fireworks](#).
4. Do concentration, temperature and pressure contribute to the reaction? How?

Day 52 (Materials for L: diet coke or other carbonated drink, salt)

1. Here's another page on [chemical reactions](#).
2. Take the [quiz](#).
3. Let's combine reactants to make a new product!
4. Do this [experiment](#).
5. If you can't do it, here's a video to watch.

6. The experiment in this link was done with borax which is a type of laundry detergent. Listen to her [explanation](#).

Day 53 (Materials for M: clean plastic 16 oz. soda bottle (best but not only size), one packet dry yeast, liquid dish washing soap, 1/2 c. hydrogen peroxide — can get it at a pharmacy, tray or do it somewhere it can overflow onto)

1. Here's another page on [chemical reactions](#).
2. Find someone else and act out being their **catalyst** and **inhibitor**.
3. Do [this experiment](#). The yeast is the **catalyst**.
4. If you can't do it, [watch this video](#).

Day 54

1. See how much of this [chemical reactions worksheet](#) you can fill in.
2. Watch the [top ten chemical reactions](#).

Day 55

1. Watch the [video on magnesium](#).
2. Read about magnesium: [here](#) and [here](#).
3. Cut out your magnesium piece and fill it in and add it to your collection.
4. Do this [periodic table jigsaw puzzle](#) if you like. The picture you are trying to make is on the left.

Properties of Liquids

Day 56

1. We're going to go back and look at the different states of matter. Specifically, we're going to look first at solids.
2. Read about [solids](#).
3. Play the [game](#). I think you are supposed to use each material once in the game.

Day 57* (Materials for M: candle, glass, baking soda, vinegar)

1. Today you're going to read about [gases](#).
2. Take the [quiz](#).
3. *This experiment shows gas being produced and taking up space. Read and do the [experiment](#) and write it up. [experiment worksheet](#)

Day 58

1. Today you are going to read about [liquids](#).
2. Take the [quiz](#).
3. **Viscosity** is the measure of how a liquid flows. Actually, it measures how much it resists flowing. Liquids move right? You put them in a container and they spread out and fill it. If you poured water in a bowl, it would spread out quickly and fill the space. Water has **low viscosity**. Honey you got from the fridge and poured into a bowl has a **high viscosity**. It resists flowing. It moves slowly.
4. Watch this video. Which one has the lowest **viscosity**? The one at the end on the right or left? (answer:) There is one more activity below the video.

Day 59

1. Yesterday you were introduced to **viscosity**.
2. Try [this experiment](#) or design a similar one to test the **viscosity** of different liquids. Record your experiment. [experiment worksheet](#)
3. Do you think temperature would affect the viscosity of a liquid? (Hint:) Test your hypothesis, test a liquid at two different temperatures to see if its **viscosity** changes.

Day 60

1. [Watch the video on aluminum](#).
2. Cut out and write inside your aluminum piece.
3. Add it with your others. It is in the Boron Group, Group 13.

Day 61 (Materials for L: slice of bread, water, cooking oil, dish detergent, jar or tall clear glass, three glasses; Materials for M: salt, 3 clear glasses, food coloring)

1. Take a slice of bread (no crust). Squash it. Your slice of bread became **denser** when you squashed it. **Density** is the measure of how much something weighs for the space it takes up. Your bread didn't change its weight, but it changed how much space it took up. It became **denser**. The bread was less **dense** to begin with.
2. A rock is **denser** than water. It is heavier for the space it takes up than water is. So a rock sinks in water.
3. We can compare the **density** of liquids by seeing if one sinks into the other.
4. The official formula for density is mass divided by volume. One gram of water takes up one milliliter. One divided by one is one. Water's density is one.
5. Gather three glasses you can see through. Fill one with hot water, one with cold water and one with salt water. Put a few drops of food coloring into each glass. Make observations. Which is the densest? Which is the least dense? How are density and viscosity related? Explain.
6. [Video](#) if you need it.
7. Do the first page of this [density worksheet](#). You can use a calculator. $\text{Density} = \text{Mass (grams)} / \text{Volume}$ That means that means that $\text{Volume} = \text{Mass} / \text{Density}$ and also that $\text{Mass} = \text{Density} * \text{Volume}$

Day 62 (Materials for L: bowl of water, 10 things you can drop in that bowl of water; M: plastic bottle, eye dropper or pen cap and oil-based clay — maybe you could use a piece of crayon instead of clay?)

1. Do the [experiment](#).
2. Read [what is going on](#).
3. You may be thinking, don't people sink? Water's density is 1. Salt water's density is 1.025. The average human body's density is 1.01. Can you see why people can float and sink?
4. The experiment page talked about a "buoyancy compensator." **Buoyancy** is just a word that means the capability to float.

Day 63 (Materials L and M: cups, food coloring—optional, paper towels; M can use books or something else instead of the blocks in the picture—just don't spill!)

1. **Capillary action** is the movement of a liquid along the surface of a solid caused by the attraction of molecules of the liquid to the molecules of the solid. (from thefreedictionary.com)
2. Read [this and do the experiment](#) to see it in action. Start at step 3. In a couple of places it says, "Click here." Go ahead and click when you are ready.

Day 64*

1. Define each of the terms - [Properties of Water](#).

Day 65

1. Watch the video on [silicon](#).
2. Cut out your silicon piece and write about silicon inside. Add it to your others. Silicon is in the carbon family.

Science Fair

Day 66 – Day 70

1. Choose a question to answer.
2. Design an experiment to answer the question. You can use an existing experiment, but think of a way to expand it and try it with new things or in a new way.
3. Do the experiment.
4. Record the experiment.
5. Present your experiment. Make a video, poster, book...show others what you did. Include your question, your hypothesis, best guess as to what the answer will be, and a complete list of materials. Include as many detailed steps as possible for how you did it. Include as many observations as possible. Make a chart of any data you collected, measurements you took. Write a great paragraph explaining your conclusion.
6. Upload your experiment. Take pictures of your project and put them on your computer. Email your pictures and description to me and I'll add them to our Science Fair page. Write to me through the contact page and I'll send you my email address. (By sending me pictures you are giving me permission to make a video out of your pictures and post it online.)
7. Take a look at other [kids' experiments](#).
8. Here are some [experiment ideas](#) based on what we've just been learning.

Chemical Reactions

Day 71* (M: baking soda, vinegar, if you can: Epsom salt, smelling salt, calcium chloride—see below)

1. Exothermic/Endothermic — **Exothermic** reactions give off heat—the chemical reaction makes heat.**Endothermic** reactions lower the temperature of the product. You are going to combine different materials and test to see if the reaction is **exothermic** or **endothermic**.
2. Print out this worksheet for [one experiment](#).
3. Print out this worksheet for the [second experiment](#). To make the baking soda solution combine 1/2 cup of water with 1 Tablespoon of baking soda. Calcium chloride — can be found as a laundry booster, road salt—check to make sure it is only calcium chloride, or as DampRid at a hardware store—if you use that, you need to increase your amount you use)
4. If you have them, you can test epsom salt (magnesium sulfate) and smelling salts (ammonium carbonate). Remember chemicals are toxic. Use your goggles and gloves if you have them and be careful. Don't smell the ammonium carbonate! If you can get nothing except vinegar and baking soda, then try that and regular table salt in water. Try something!
5. Fill in/make charts of your observations.
6. Write a paragraph stating your conclusions about what produces either an exothermic or endothermic reaction.
7. Watch this [exothermic reaction](#).

Day 72

1. Watch “How to Make Cotton Candy.”
2. Write out the steps or draw a diagram of the process.

Day 73

1. Watch the [video on chlorine](#).
2. Cut out and fill in your chlorine piece.
3. Chlorine is part of the halogens or fluorine family

Day 74 (L: baking powder, ingredients for any quick bread if you like; M: yeast, ingredients for baking bread if you like)

1. Read about [yeast and bread making](#). Go ahead and “[explore gluten](#).”
2. Yeast releases CO₂ (what's that? carbon dioxide, the same thing we release when we breathe out).
3. The gas gets trapped in the dough, filling it. We call it rising.
4. **If you want to make bread**, here's a [recipe to follow](#). You don't need to use a mixer. After step five, punch down the dough, divide it in half, and put it in the shape you want. Skip to step 8. After step two—after adding the warm liquid—stop and observe for awhile. Observe the CO₂ being released.
5. **If you don't want to make bread**, mix together a packet or tablespoon of active dry yeast, 1 c. of very warm water and 2 tablespoons of sugar. Observe the release of CO₂.

Day 75 (Materials for science: lemons , [tiny light bulb](#) or small LED clock, [galvanized nail](#) — coated with zinc, copper pennies or nails or wire, at least 3 alligator clip wires — with clips on each end of a wire — **FOOD WILL BE INEDIBLE AFTERWARDS**)

1. [Make a battery](#).
2. Experiment with different things.
3. Write an experiment report — [experiment worksheet](#).
4. Watch a [video of this experiment](#). If an ad pops up, click on “No thanks, just play the video.”

Electricity

Day 76

1. Play a [science review game](#).
2. Play this [circuit game](#) you played when you were learning about the light bulb.

Day 77*

1. You will be completing [this lapbook](#). Print it out and read through it. You don't have to do the last two pieces. The younger kids are going to use them.
2. You will need to be finished on day 85.
3. Here are [websites that go along with the lapbook](#).
4. We will do experiments after the lapbook is complete.

Day 78

1. Do your timeline piece today.

Day 79

1. Do your circuits piece today.

Day 80 (M: balloon, tissue)

1. So your static electricity piece today. (Do the experiment.)
2. Do you want to play your [science review game](#) again?

Day 81

1. Do your magnet piece.

Day 82

1. Do your AC/DC piece.
2. Take a look at [this website](#). Make sure you scroll down to the animated picture and see how the alternating current changes the poles so that the rotor is attracted to the north than the south and in that way keeps spinning.

Day 83

1. Do your electrical outlet piece.

Day 84

1. Do your vocabulary piece.
2. Find words from your other pieces and fill in at least five light bulbs with the word and definition.

Day 85 (M: 9 volt, copper wire, magnetic compass, metal thumbtacks, paper clips –it says lid of small cardboard box and block of wood but could be substituted–)

1. Try and [build this experiment](#).
2. Do your experiment piece.
3. Here's a video related to this experiment.

Magnetism

Day 86*

1. You saw in your last experiment how magnets and electricity go together. Now let's learn more about magnetism.
2. Print out [this lapbook](#). You will be using half the pieces. The Ls will be using the other half.
3. Here's a website to get [information](#).
4. If you need directions for any pieces, click on the lapbook link and look at pages 3 and 4.
5. Today do the page 5 piece, vocabulary.

Day 87

1. Today you will do the page 9 pieces. Temporary magnets, electromagnets

Day 88

1. Do the page 11 Grippers piece.

Day 89

1. Do the page 12 earth's magnetic field pieces.

Day 90 (Materials for M: three of the same magnets, optional: aluminum cookie sheet)

1. Read [this page](#), [watch the video](#) and try the experiment.
2. Explain what you learned.

Day 91

1. [Magnet activity](#)
2. Draw a diagram of how magnetism works.
3. If you want to explore [electricity and magnetism](#) more, go to this website.

Circuits

Day 92 (Materials: battery, mini light bulb, 3 alligator clip wires, aluminum foil, paper clip—plain metal; M+ motor, wires, batteries)

1. Draw a circuit with a source of electricity, a switch and at least two small things that use electricity like a mini light bulb and motor or small LED clock. Make sure the electricity will go all the way around the circuit. If you need a circuit review, [play this game](#).
2. Build the circuit. Does it work? If not, change it. Does it need more power?
3. Draw a circuit with two electrical objects, two sources of power and two switches so that you can turn on and off each thing (like a lightbulb)
4. Build the circuit.

Day 93*

1. Build a circuit.
2. Add in an extra wire so you can test **conductors**. You are going to [experiment like this game did](#).
3. Gather up items to test. Get a variety. Try some foods.
4. Test each one and [record the results](#). Which ones conduct, carry, electricity?

Day 94

1. Read about [series and parallel circuits](#).
2. Draw a circuit of each kind. (Series: the electricity flows to one and then the other; Parallel: the electricity flows to both at the same time)
3. Build them.
4. Did they work?
5. What's the difference in power levels between the two circuits?

Day 95

1. You decide what to do. You could...
2. Build some more circuits.
3. Play some [circuit games](#).
4. Try another [experiment](#).

Day 96 (Materials for L: salt, pepper, cornstarch, flour, oil, juice/milk, a clear cup, spoon — just a small amount of each)

1. Read through these [Chemistry Review](#) pages. (It's okay if some of it is new.) Click on the right arrow. Watch the salt and sugar dissolving videos (put your mouse on the picture and a play button will appear.)
2. Write down all the words that are a different color and their definitions. (Put your mouse on the words and a definition will pop up.)

Day 97 (salt, sugar, flour, cornstarch, small pot, spoon for stirring in pot, clear cup, spoon)

1. Read through these [Chemistry Review](#) pages. Click on the right arrow.
2. Write all the colored words and their definitions.

Day 98

1. Read through these [Chemistry Review](#) pages.
2. Write all the colored words and their definitions.

Day 99

1. Read through these [Chemistry Review](#) pages.
2. Write all the colored words and their definitions.

Day 100

1. Read over your words and definitions.
2. Play this [definition game](#).

Day 101 (Materials for M: balloon, strip of plastic from grocery store plastic bag)

1. Play the [definition game](#).
2. We're going to do some more chemistry review. Let's go back and look at atoms again. Remember they have neutrons and protons in the nucleus and electrons in the outer shells. The electrons have a negative charge and the protons have a positive charge—like magnets and electricity.
3. Read through [these pages](#) and click on the numbers on the pictures to see the different images. Click on the “Start” and “Play” buttons. The one with the faucet should have a play button—you don't need to download anything. Click on the arrows to turn the pages. Try rubbing the plastic bag between your fingers and the balloon on your hair and watch how you can see the electrons have moved causing the attraction.
4. Draw or write explaining the attraction either between the water and balloon or the plastic and your fingers.

Day 102

1. [Read these pages](#). All of the pictures with a science experiment are videos. There should be a play button.
2. Draw a 2-D model of a sodium atom.

Day 103

1. [Read these pages about covalent bonds](#). Click on all the numbers and start and play buttons and arrows.
2. Draw two oxygen atoms bonded. Write the type of bond and describe what is happening in the picture.
3. Oxygen basically never exists alone. It is always found bound to another oxygen atom.

Day 104* (Materials for M: two colors of gummy candy, toothpicks)

1. Read these pages about [ionic bonds](#). Click on the numbers and start and play buttons and arrows.
2. *Print out these worksheets. Answer the questions. See below for the activities.
3. Here is an image of [sodium chloride](#).
4. Use your candy to build a model like described. Use one color for positive and one color for negative.
5. Here is an [image of what you built](#).
6. [Answers to the worksheet](#). Check and make sure you understand.

Day 105*

1. Read about [diagramming atoms](#).
2. *Print and complete these [worksheets](#).
3. When you are finished, [check your answers](#) and make sure you understand.

Forces

Day 106

1. Remember these words? **thrust, lift, drag, weight** Thrust pushes the plane forward. Drag is the air pushing back on the plane. Lift is the air pushing up on the plane. Weight is gravity pulling down on the plane. When thrust is greater than drag, the plane moves forward. When lift is greater than weight, the plane goes up. When all these **forces** pushing on the plane in every direction are equal. The plane is still.
2. Put your hands together. Push harder with your right hand. What happens? Push harder with your left hand. What happens? Push the same with both hands. What happens?
3. Play this [little game](#). It involves weight, drag, thrust.

Day 107*

1. Play this [cannonball game](#). You will consider weight (gravity pulling on an object's mass), thrust (size of the charge/explosion), drag (air resistance)
2. *Read and fill in the first five pages of this [forces worksheet](#). Print out the whole thing. You will finish it tomorrow.

Day 108

1. Play this [forces in action game](#).
2. Read and fill in the last three pages of this [forces worksheet](#). The answer to number 1 is **4n right**. You can do this. It's a diagram of your two hands pushing against each other. Your left hand pushes and your right hand pushes more. Which way do your hands move? Do they move more when you push harder? Yes. That's all these diagrams are showing.

Day 109

1. Play this [friction game](#).
2. Write about how friction effects your life everyday. What would your world be like without friction?

Day 110

1. Read about [potassium](#).
2. Watch the [potassium video](#).
3. Fill in your potassium mini book.

Laws of Motion

Day 111 (Materials for L: rubber band, pretty strong plastic spoon, balled up aluminum foil or mini marshmallows or something else little and light, 2 thumbtacks, base — small wood block or something firm and heavy)

1. Read about [motion](#) and [forces](#). Take the quiz at the end of each lesson.
2. Read about [vectors](#).
3. Write a word problem and solve it with vectors.

Day 112*

1. Read about Newton's [Three Laws of Motion](#).
2. Write about Newton's [Three Laws of Motion](#). (Print 2 copies and save one for tomorrow.)
3. Explain how does this video show the first law of motion.

Day 113

1. Think of a way to demonstrate each of the three laws. (Example: When someone is not wearing a seat belt and the car is suddenly stopped, that person will keep moving forward, right through the windshield.)
2. Demonstrate each with objects in your home. Write about each demonstration on your [Three Laws of Motion](#) paper.

Day 114*

1. Read about [velocity](#).
2. Fill in these [definition grids](#).

Day 115

1. Read about [calcium](#). It will tell you what family it belongs to.
2. Cut out and fill in your calcium piece.
3. Play [launchball](#).

Day 116*

1. Review the [three laws and vocabulary](#). Click on the words to the left to go through the slides.
2. Match the [laws to the examples](#). Print out page 3. Write on each card which of the three laws it is an example of. The answers are on page 2.

Day 117 (Materials for M: box like shoe box lid, about seven index cards, masking tape, 2 marbles—after you read the directions you can figure how to make due with other materials/types of balls if you need to)

1. Build a [marble maze](#) and demonstrate the three laws of motion. Demonstrate to your parents and show them each of the three laws of motion in action.
2. Here's a [really hard maze](#) to make but only uses paper. Get permission before you choose this because it prints A LOT of pages.

Day 118

1. Answer these [forces questions](#). The next slide is the answer. Say your answer out loud before you click on the next slide.

Day 119

1. Read about [momentum](#).
2. Take the [quiz](#).
3. I failed at building one of these momentum machines, but if you want to try, here are the [instructions](#).
4. [Puck Chuck!](#)

Day 120

1. Read about [iron](#).
2. Watch a [video about iron](#).
3. Cut out and fill in your lapbook piece.

Simple Machines

Day 121* (Materials for M: long rubber band, "heavy load" in small bag, meter or yard stick, books, regular ruler)

1. Watch this experiment and try it at home.
1. *Write up your experiment results. [Experiment Worksheet](#)
2. Where are some inclined planes in your world? Here's [one example](#).
3. Draw a picture of an inclined plane or write examples of inclined planes on this [graphic organizer](#).

Day 122

1. The next **simple machine** we are going to learn about is the **wedge**.
2. Scroll down and read the [definition of wedge](#).
3. A **wedge** is like an inclined plane. It is slanted and comes to a point. The difference is that an inclined plane stays where it is put. The **wedge** does the moving. It is used to split things apart. How is a nail a wedge? Do you ever use your fingernail as a wedge?
4. Where else can you find wedges in your world? You can find [wedges in these pictures](#).
5. Draw a wedge or list examples of wedges on your simple machines graphic organizer.

Day 123

1. Watch this video about levers.
2. Add levers onto your graphic organizer.

Day 124

1. The next simple machine is the **screw**.
2. Scroll down and read the [definition of a screw](#).
3. Turn an [inclined plane into a screw](#).
4. [Examples of screws](#)
5. Add screw to your simple machines paper.
6. Watch this video showing how a screw can help move things.

Day 125

1. Read about [nickle](#).
2. Watch a [video about nickle](#).
3. Cut out and fill in your lapbook piece.

Day 126 (Materials for M: 10 pencils, brick/heavy wood/big book)

1. Today's simple machine is the **wheel and axel** .
1. Look at how a [doorknob works](#).
2. Make a [conveyor belt of pencils](#). The pencils are your wheels. Choose something heavy to push. (Because books are usually smooth, choose a really heavy one or a stack of a few.) How different is it pushing something heavy across a rug and pushing something across your pencil conveyor belt?
3. How is your conveyor belt make your work (your work of pushing your heavy object) easier?
4. If you take one of those pencils and poke it through two bottle caps, you have created an axel.
5. Look at these examples of [wheels](#) and axels.
6. Add wheel and axel to your simple machines graphic organizer.

Day 127

1. Watch this video on **pulleys**.
2. See examples of [pulleys](#).
3. Make a pulley system. Here's an [example](#) with a milk jug, rope and a broom, but you can do any way you like.
4. Add pulleys to your simple machines graphic organizer.

Day 128

1. We're going to look at one more simple machine even though your paper is full. This is not always listed as a separate simple machine. It's a type of wheel. It's the **gear**.
2. Find a **gear** in your house to look at—a bike, an egg beater, a toy car...
3. Gears have teeth the interlock . The big gear turns a smaller gear. You turn the big gear around once, and it turns the little wheel lots of times. Like the inclined plane, pulley and others, it spreads out your effort to do your work.
4. Read about [gears](#).

Day 129

1. Take these simple machine quizzes. [Quiz 1](#) [Quiz 2](#)

Day 130

1. Read about [copper](#).
2. Watch a [video about copper](#).
3. Cut out and fill in your lapbook piece.

Day 131

1. First stop by the [House](#) to practice identifying simple machines.
2. Learn about [compound machines](#).

Day 132

1. L/M Design a compound machine. Draw it. Describe what it does and how it works. Can you build it? Put your paper(s) into your binder when you are done.

Day 133

1. Design a device that puts a marble into a cup. It must use at least 10 steps. Here is an [example](#). Really fancy example of this type of device: <http://embed.break.com/MjMzMTkx>

Day 134

1. Build [Fantastic Contraptions](#). Click on skip ad at the beginning.

Day 135

1. Read about [zinc](#).
2. Watch a [video about zinc](#).
3. Cut out and fill in your lapbook piece.

Day 136

1. We're going to be engineers. Engineers design and build everything man-made in your world. They don't just design airplanes and cars, but they design the cabinets in your kitchen. Here are a few design games to get you started.
2. Design a [cell phone](#).
3. Design a [car](#).

Day 137

1. Now let's look at building big! First, let's look at bridges. Read about [different types of bridges](#).
2. Play with different [forces on the bridges](#).
3. Online [bridge challenge](#)
4. Look at how important it is to build your bridge right! Here's a physics failure bridge!

Day 138

1. Today let's build our own bridges.
2. You can use these directions and layout to build a [file-folder bridge](#). (Under contents download learning activity 1.)
3. You can build your own out of balsa wood and wood glue or any other materials. (Don't destroy your bridge after you are done. Make sure you do tomorrow's lesson before it's damaged.)
4. You should try and build a physical bridge. If you want, ask a parent to go to this site for you and download this [bridge building game](#). (Our family has downloaded it.)

Day 139

1. Test your bridge's strength. Create and conduct an experiment to see how much weight it will hold. Record all of your observations and results. Write up your experiment. [Experiment worksheet](#)

Day 140

1. Read about [silver](#).
2. Watch a [video about silver](#).
3. Cut out and fill in your lapbook piece.

Day 141

1. Read about [domes](#).
2. Then take the [dome challenge](#).
3. Stop at the [materials lab](#).
4. Gather materials for building a dome on day 142, either [newspapers](#) or [gumdrops and toothpicks](#).

Day 142 (Materials: either newspapers and tape or gumdrops and toothpicks)

1. Build a dome. Use either [newspapers](#) or [gumdrops and toothpicks](#). Here's a youtube video of a [newspaper dome](#); get permission before you watch a youtube video. Note: The directions on the youtube video are a little off. It should be 71 cm and 63 cm.

Day 143

1. Read about [skyscrapers](#).
2. Then take the [skyscraper challenge](#).
3. Stop by the [loads lab](#).

Day 144 (Materials: paper clips and straws)

1. Do this [straw activity](#) and then build a skyscraper out straws.

Day 145

1. Read about [iodine](#).
2. Watch a [video about iodine](#).
3. Cut out and fill in your lapbook piece.

Day 146

1. Read about [dams](#).
2. Take the [dam challenge](#).
3. Stop by the [shapes lab](#).

Day 147

1. Read these [Hoover Dam](#) facts.
2. Design a dam. Where is it going to be? How big does it need to be? Label the height, width and depth on your diagram.

Day 148

1. Read about [tunnels](#).
2. Take the [tunnel challenge](#).
3. Stop by the [forces lab](#).

Day 149

1. Design a tunnel. Where is it going to be? How long does it need to be? What kind of forces will effect it?

Day 150

1. Read about [gold](#).
2. Watch a [video about gold](#).
3. Cut out and fill in your lapbook piece.

Day 151 (Materials: At least two 6 foot (183 cm) sections of 1-1/2 in (about 4 cm) diameter foam [pipe insulation](#), marble)

1. Our last physics topic for this year is **energy**. Energy is what enables us to do our work. A roller coaster needs a certain amount of energy to do its work of pulling the weight of the cars from the beginning to the end.
2. Read about [energy](#).
3. [Build a roller coaster](#). Scroll down to see the picture. Read the questions. Play around and make observations.
4. Explain your observations to your parents.
5. Play this [roller coaster game](#) if you can't build one.

Day 152

1. There is **potential energy** and **kinetic energy**. In what you read it was explained as energy stored and energy used.
2. Look at the [picture](#) toward the top of this page and read the caption about the ball and arrow.
3. Kinetic energy is the energy of an object in motion—the ball swinging or the arrowing flying through the air.
4. There is a formula to figure out the kinetic energy of an object. Physicists use this to figure out if their roller coaster will work. The formula is kinetic energy equals one half of the mass of the object times its speed squared. The equation looks likes this.
 $KE = 1/2 mv^2$ (.5 times mass times speed times speed)
5. Go to [this page](#) and try problems 1 and 2 at the bottom. You can use a calculator.

Day 153 (Materials for M: **thermometer, marshmallow, candle**)

1. Watch this video on [heat and temperature](#).
2. Measure the air temperature about 10 cm. above the candle.
3. Light the candle and hold the marshmallow where you recorded the temperature.
4. Watch and observe the marshmallow.
5. Then record the temperature again in that same place.
6. What were your observations?
7. How did the heat from the flame effect the marshmallow without touching it?
8. Explain your observations.

Day 154

1. Watch these videos on radiation. [Heat Radiation](#) [Heat Spectrum](#)
2. The sun's heat got into the water through **radiation**.
3. Draw a diagram that shows something on earth heating up due to radiation from the sun.

5. Play your game.

Day 166*

1. Your job for the last fifteen days of school is to make a science project. I recommend you pick a topic that you can use for your history project as well, and even English. That way you'll become an expert on the subject. The Panama Canal is one suggested topic. You could build a working model of a canal. On the history page on day 166 I listed some other ideas.
2. You are going to learn about the science and history of your topic. You are going to make a 3D project to explain or demonstrate your topic. If you want to make a poster about it, it has to contain 3D elements. On Day 180 you will present your project. You will show it to your family and/or friends and will tell them all about it, explain all about it and demonstrate it.
3. You also have to conduct at least one experiment related to your topic. If you can, do the experiment in front of the group. If you can't, explain the experiment and results. Here is an [experiment worksheet](#) and [experiment book](#) you could use.
4. Today choose a topic and do some research about what experiment you could do.

Day 167*

1. Do some research and learn about the science aspects of your topic. How does it work? Here are [Research Note Taker](#) sheets.

Day 168

1. Continue your research. If you think you are done, go explain to a parent how the science of your topic works. If you can't, learn some more.

Day 169

1. Continue your research. Is there any expert in the field that you could email and ask questions? That would be a great source of information!
2. When you are done your research, decide on what experiment or experiments you are going to do.
3. Also, you need to decide how you are going to present what you learned. It's gotta be 3D! What can you build to demonstrate your topic?

Day 170

1. Keep working on your project. Your assignment has four parts: research, 3D project, experiment (written up), demonstration

Day 171*

1. Keep working on your project. Print out this [End of the Year Project](#) checklist to make sure you are thinking about everything that needs to be done.

Day 172-174

1. Keep working on your project. Use your checklist.

Day 175

1. Keep working.
2. Make sure you have an experiment. Do you have all the things you need for it?

Day 176

1. Keep working. You should finish your project tomorrow.
2. Do your experiment.

Day 177

1. Finish your project.
2. Write down your experiment. You can use the worksheet or book or type it up. It needs to be displayed with your project. Make it look good!

Day 178

1. Use the checklist to make sure you did everything you are supposed to do. On day 179 you will write your bibliography. On day 180 you will present.
2. Today practice what you will say to explain your project. Write it down if that helps you. Practice saying it out loud.
3. Read over this [grading sheet](#) for presenting a project. You would want to score a 4 for every category. The last one is only if you are working together with siblings.

Day 179

1. Write your [bibliography](#).

Day 180

1. Present your project and demonstrate your experiment. Take pictures or videos, send them to me! I'll post them on the Hall of Fame page. (Contact me through the about page.)