Course Blocks

# 3rd Grade Science

Dear teacher,

Science, especially for the younger students, should rely heavily on observation and discussion.  Many times children notice things that adults miss, but likewise, many times adults can clarify the questions that children have.  As such, both teacher and child are able to be scientists together.

The text chosen as a guide for this course is *Handbook of Nature Study* by Anna Botsford Comstock.  It was chosen not for its Christian worldview or because it avoids talk of evolution, for neither are true of the text.  Instead, it was chosen because of its unwavering zeal for observation of nature.  In the observation of nature, even the youngest child can see the wonder and beauty of God's creation.

Do not use the text as a student textbook.  Even a handbook of nature study can soon become an obstacle between students and their observation of nature, for soon the student relies on the words they see rather than the nature they can observe.  As a teacher, however, it is many times helpful to arm yourself with additional information, especially when it comes to teaching the students the correct vocabulary of nature observation.

Enjoy your study of God's creation!

Link to **3rd Grade Science** text

News forum

## Week 1

**Topics:**

- Creation
- Days of Creation
- Day 3

**Words to Remember:**

- Create(d)
- Called (as in "named")
- Genesis 1:1-5 (review from 1st grade)
- Genesis 1:6-8 (review from 2nd grade)
- Genesis 1:9-13

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- (Teacher resource) Read The Meaning of Day
- (Teacher resource) Read Did God create in 6 days or billions of years?
- (Teacher resource) Read On the third day

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Blank paper or Creation chart template (link below in Suggested Daily Schedule)
- Coloring/drawing tools (Crayons, colored pencils, markers, etc.

**Suggested Daily Schedule:**

- Day 1:
  - Read Genesis 1
    - (Class activity) Discuss:
      - What does the word CREATE mean?
        - Have some examples ready if the students don't know: If I put Legos together, what did I do?  If I draw a picture, what did I do?  Feel free, if time allows, to have students demonstrate any of these things.  In coming days/weeks, you can reference how when we create things we have to go step by step, but when God created, with the exception of creating man, He spoke things into being rather than having to go step by step.

        - What does the word CALLED mean?
            - Have some examples ready if the students don't know: What do your parents call you? (son, daugther, by my name) So, you are called (insert child's name).  Feel free to use other examples.
        - (Class activity) Write out what was created on each day as it was recorded in the Bible passage you just read
        - (Individual activity) Referencing the list you made, draw/color the 7 days of creation- be sure to practice your numbers and label the days!
            - Click here for a chart template you can print and copy for the students
- Day 2: Read Genesis 1:9-13
    - Begin memorizing these verses (you have all year to get it done, but the sooner they get it done the better as then you can have them recite it at the beginning of each Science session)
    - Have students get out or finish their drawings from the previous class session
    - (Class activity) Discuss:
        - What existed before creation? (verses 1-2)
            - Look for answers like God, nothing, dark, etc.  If you aren't getting any answers, read it again, make a list of the words they hear, and then work through that list to help them think about what existed before creation.
        - What did God make on the 3rd Day? (verse 9-13)
            - Have students look at their drawings
            - Make a list of words on the board- feel free to reread the passage if need be- of the things God created on the 3rd Day
            - Reference your previous discussion of the words CREATE(D) and CALLED
            - Ask the students again, "Which of these did God CREATE?"
            - Which of these things did God CALL (name)?

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## Week 2

**Topics:**

- Earth
- Hydrogen
- Carbon
- Nitrogen
- Oxygen

**Words to Remember:**

- Element: each of more than one hundred substances that cannot be chemically interconverted or broken down into simpler substances and are primary constituents of matter. Each element is distinguished by its atomic number, i.e., the number of protons in the nuclei of its atoms. ORIGIN Middle English (denoting fundamental constituents of the world or celestial objects): via Old French from Latin elementum ‘principle, rudiment,’ translating Greek stoikheion ‘step, component part.’
- Hydrogen: a colorless, odorless, highly flammable gas, the chemical element of atomic number 1.(Symbol: H) ORIGIN late 18th cent.: coined in French from Greek hudro- ‘water’ + -genēs ‘-born, of a specified kind,’
- Carbon: the chemical element of atomic number 6, a nonmetal that has two main forms (diamond and graphite) and that also occurs in impure form in charcoal, soot, and coal.(Symbol: C) ORIGIN late 18th cent.: from French carbone, from Latin carbo, carbon- ‘coal, charcoal.’
- Nitrogen: the chemical element of atomic number 7, a colorless, odorless unreactive gas that forms about 78 percent of the earth's atmosphere. (Symbol: N)
- Oxygen: a colorless, odorless reactive gas, the chemical element of atomic number 8 and the life-supporting component of the air. Oxygen forms about 20 percent of the earth's atmosphere, and is the most abundant element in the earth's crust, mainly in the form of oxides, silicates, and carbonates.(Symbol: O)
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- (Teacher resource)
- (Teacher resource)

**Materials:**

- Bible
- Binder and paper on which to take notes
    - Suggested dividers:
        - Words to Remember

        - Elements
        - Water
        - Plants
- Printed Periodic Table
- Blank Periodic Table

**Suggested Daily Schedule:**

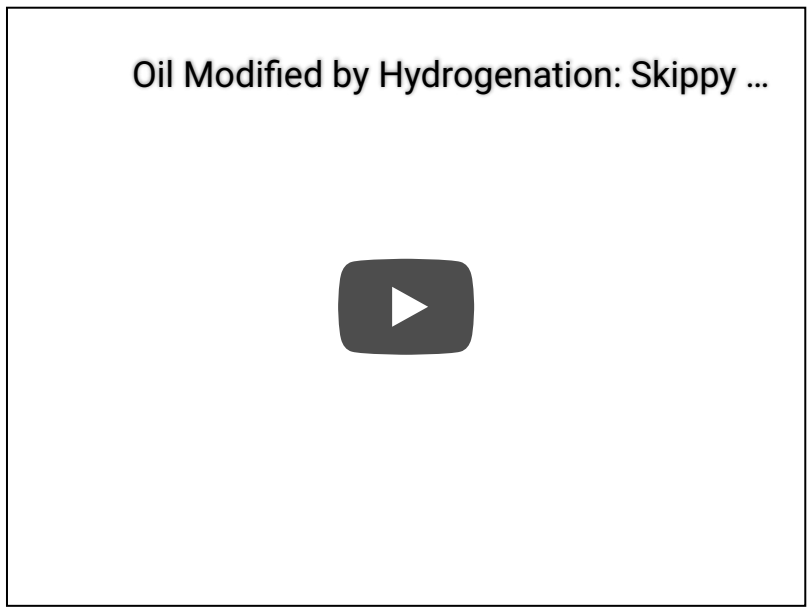
Day 1: What is earth?

- Discuss:
    - What did God do on days one and two?
    - We can think about the days of creation in two categories: separating and filling
        - On days one and two, God separated (review what he separated). Day three, God separated and began filling: He separated the water from the land and He began filling the land- first with plants
    - What is earth? (see **Major Elements in the Earth's Crust** below)
        - Over the next weeks we will be learning about many of these elements.
        - Define: element
    - Genesis 2:7 says that God "formed the man of dust from the ground..."
    - On Ash Wednesday, we hear the words, "Remember you are dust and to dust you shall return."
    - What was that dust? (see **Elements in the Human Body** below)
- Explore:
    - Compare Major Elements in the Earth's Crust to Elements in the Human Body
        - What similarities and differences do you see?
- Explore:
    - Over the next weeks, we will be using the Periodic Table of Elements quite frequently.
    - Just like a map, there is a certain way to read the Periodic Table of Elements.
        - Each square on the table contains different parts:
            - Atomic number: the number of protons in the nucleus of an atom, which determines the chemical properties of an element and its place in the periodic table.
            - Symbol
            - Name
            - Atomic weight: the mass of an atom of a chemical element expressed in atomic mass units. It is approximately equivalent to the number of protons and neutrons in the atom
        - The squares are arranged by atomic number (number of protons in the nucleus) and group (nonmetals, metalloids, halogens, noble gasses, transition metals, etc.)
    - What else do you notice on the Periodic Table? (solid, liquid, gas, etc.)
- Explore more:
    - To understand how elements are categorized as solid, liquid, or gas, explore Charles' Law
        - Charles' Law: a law stating that the volume of an ideal gas at constant pressure is directly proportional to the absolute temperature. ORIGIN late 19th cent.: named after Jacques A. C. Charles (1746–1823), the French physicist who first formulated it.

Day 2: Hydrogen, Carbon, Nitrogen, Oxygen (this may require more than one session)

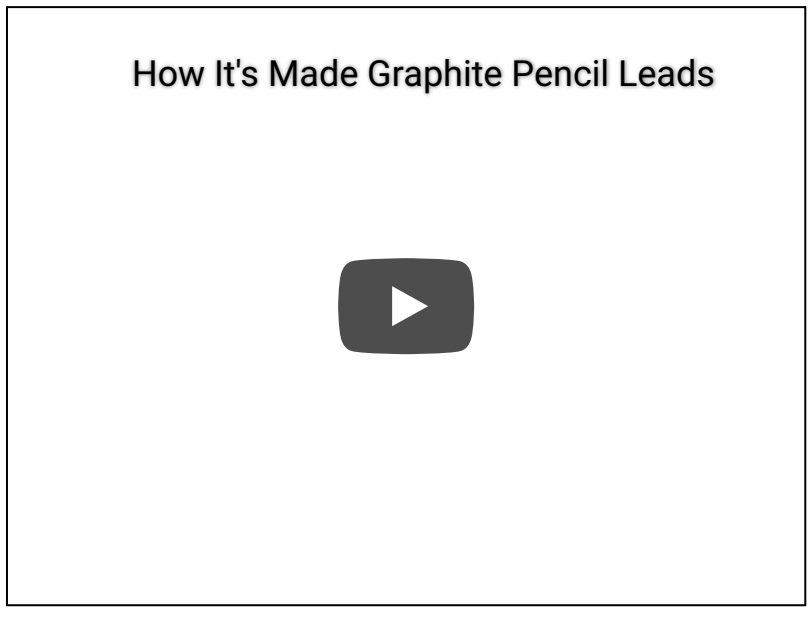
- Define:
    - Hydrogen
    - Carbon
    - Nitrogen
    - Oxygen
- Explore:
    - Look at the Periodic Table of Elements or PTable and find Hydrogen, Carbon, Nitrogen, and Oxygen
        - What do they all have in common? (nonmetals)
        - What differences do you see? (symbols are different colors, etc.)
- Explore: Hydrogen
    - About:
        - Discovered by Henry Cavendish in 1776
    - Uses:
        - Cryogenics
        - Rocket fuel
        - Welding
        - Producing hydrochloric acid
        - Reducing metallic ores
        - Filling balloons.
        - Hydrogenation
- Explore more:

- What is hydrogenation?
- Skippy Peanut Butter Ad from 1950



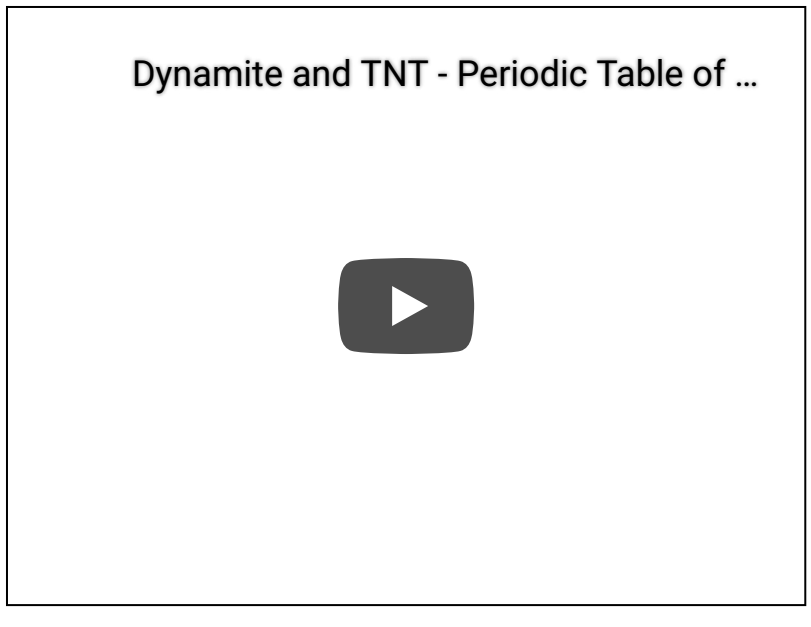

- The Making of Margarine


  - Discuss:
    - What do you observe about Hydrogen?
- Explore: Carbon
  - About:
    - Three common forms: graphite, diamond, and fullerenes
    - Found in vast amount of compounds (carbon dioxide, etc.)
  - Uses:
    - charcoal (from wood) and coke (from coal) is used in metal smelting, especially for the iron and steel industry
    - Industrial diamonds are used for cutting rocks and drilling
    - hardware developments in the electronics industry
    - etc.
- Explore more:
  - Graphite pencil lead




  - Diamonds


    - Discuss:
        - What do you observe about carbon?
- Explore: Nitrogen
    - About:
        - Discovered by chemist and physician Daniel Rutherford in 1772
    - Uses:
        - Nitrogen cycle
        - Annealing stainless steel and other steel mill products
        - Fertilizer
        - Plastic
        - Dyes
        - Explosives
        - Etc.
- Explore more:
    - Dynamite and TNT




    - Discuss:
        - What do you observe about Nitrogen?
- Explore: Oxygen
    - About:
        - Joseph Priestley and Scheele discovered it independent of one another (1774).
        - Oxygen and its compounds make up 49.2%, by mass of the Earth’s crust, about two-thirds of the human body and nine-tenths of water
    - Uses:
        - Respiration
        - Steel industry
        - Compounds (hydrogen peroxide, etc.)
        - Etc.
- Explore more:
    - 
    - This is an ongoing activity for your entire study of elements in 3rd Grade Science
        - As you learn about elements, cut them out of the Printed Periodic Table and glue or tape them on Blank Periodic Table.
        - Be sure to note the patterns of the atomic weight
        - 

Major elements in the Earth's crust

Elements in the Human Body

## Week 3

**Topics:**

- Earth
- Phosphorus
- Sulfur
- Selenium

**Words to Remember:**

- Element: each of more than one hundred substances that cannot be chemically interconverted or broken down into simpler substances and are primary constituents of matter. Each element is distinguished by its atomic number, i.e., the number of protons in the nuclei of its atoms. ORIGIN Middle English (denoting fundamental constituents of the world or celestial objects): via Old French from Latin elementum ‘principle, rudiment,’ translating Greek stoikheion ‘step, component part.’
- Phosphorus: the chemical element of atomic number 15, a poisonous, combustible nonmetal that exists in two common allotropic forms, white phosphorus, a yellowish waxy solid that ignites spontaneously in air and glows in the dark, and red phosphorus, a less reactive form used in making matches.(Symbol: P) ORIGIN late 17th cent.: from Latin, from Greek phōsphoros, from phōs ‘light’ + -phoros ‘-bringing.’
- Sulfur: the chemical element of atomic number 16, a yellow combustible nonmetal.(Symbol: S)
- Selenium: the chemical element of atomic number 34, a gray crystalline nonmetal with semiconducting properties.(Symbol: Se) ORIGIN early 19th cent.: modern Latin, from Greek selēnē ‘moon.’
- Semiconductor: a solid substance that has a conductivity between that of an insulator and that of most metals, either due to the addition of an impurity or because of temperature effects.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- (Teacher resource)
- (Teacher resource)

**Materials:**

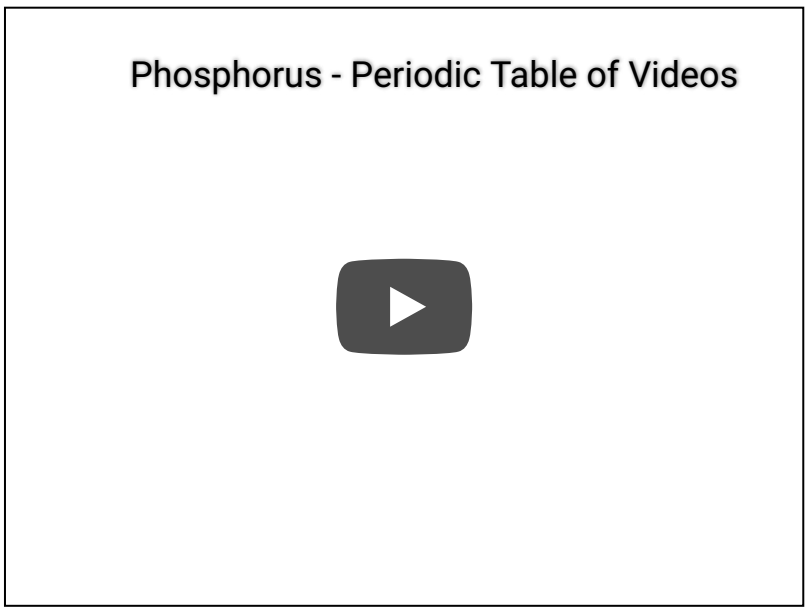
- Bible
- Science binder in which to take notes
- Computer to watch videos

**Suggested Daily Schedule:**

Day 1: Phosphorus

- Discuss:
  - God created the world to support life.
  - You recently learned about the chemical composition of the earth's crust.
  - As you continue to learn about the elements, keep in mind how each element supports life (plant, animal, human).
- Define:
  - Phosphorus
- Explore:

  Look at the Periodic Table of Elements or PTable and find Phosphorus
  - What can you learn about Phosphorus from the Periodic Table?
- Explore: Phosphorus
  - About: Discovered by Hennig Brand in 1669
  - Uses:
    - Fertilizer
    - Flares
    - Matches
    - Etc.
- Explore:
  - Video about phosphorus

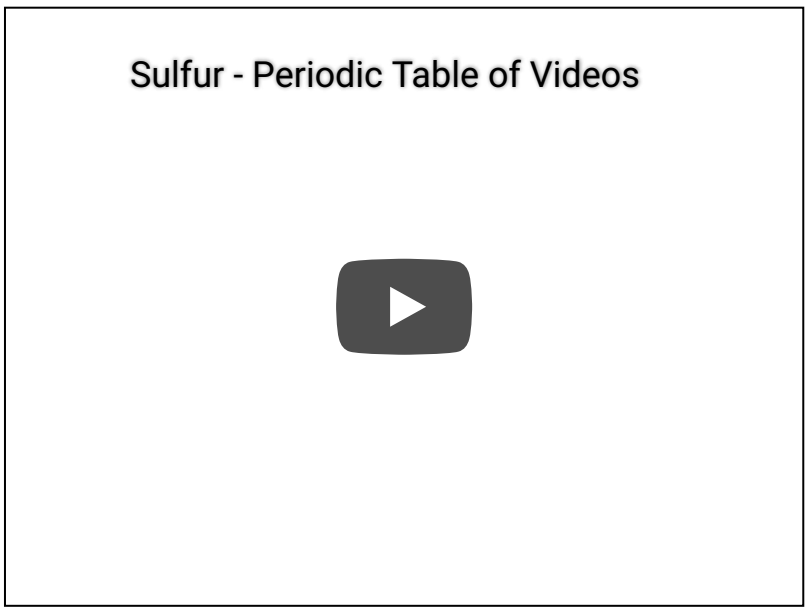



- How matches are made

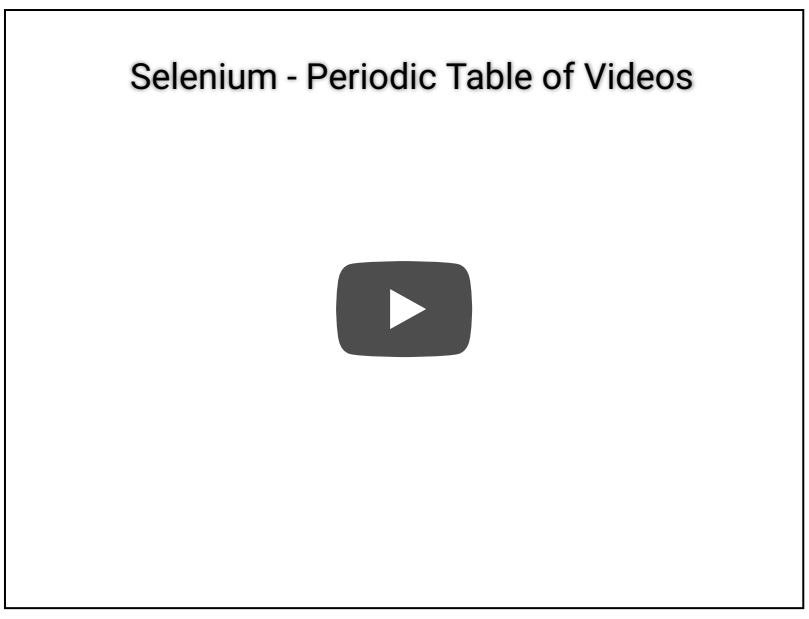

- Discuss:
  - What did you observe about Phosphorus?
- Explore more:
  - Based on what you have learned, why would Phosphorus be a good ingredient for fireworks?
  - Read the list of Chemical Elements in Fireworks (see below)
  - Find all of the elements on the Periodic Table
    - What similarities between the elements do you observe?
    - What differences between the elements do you observe?

Day 2: Sulfur, Selenium

- Define:
  - Sulfur, Selenium
- Explore:
  - Look at the Periodic Table of Elements or PTable and find Sulfur and Selenium
    - What do they have in common?
    - What differences do you see?
- Explore: Sulfur
  - About:
    - Known to the ancients- referred to as brimstone (ORIGIN late Old English brynstān, probably from bryne‘burning’ + stān ‘stone.’)
  - Uses:
    - black gunpowder
    - produce sulfuric acid
    - vulcanization of natural rubber
    - etc.
- Explore:
  - Chemical reaction that makes sulfur (and some bonus footage)




- Discuss:
  - What do you observe about sulfur? (it burns blue, sulfur is yellow, etc.)
- Explore more:
  - Read: Genesis 19
  - Read: Deuteronomy 29:22-24
  - Discuss:
    - What impact did God's punishment on Sodom and Gommorah have on future generations? (ex. the land could not produce plants)
    - From this, what can we learn about God's provision for life? (the chemical makeup of the soil is important for growing plants/supporting life)
- Explore: Selenium
  - About:
    - Discovered by Berzelius in 1817
  - Uses:
    - Xerography: reproducing and copying documents, letters, etc
    - glass industry to decolorize glass and to make ruby-colored glasses and enamels
    - photographic toner
    - make stainless steel
- Explore:
  - Video about selenium




  - Discuss:
    - What do you observe about selenium? (it is black, it smells, etc.)

Chemical Elements in Fireworks

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## Week 4

**Topics:**

- Earth
- Lithium
- Sodium
- Potassium

**Words to Remember:**

- Element: each of more than one hundred substances that cannot be chemically interconverted or broken down into simpler substances and are primary constituents of matter. Each element is distinguished by its atomic number, i.e., the number of protons in the nuclei of its atoms. ORIGIN Middle English (denoting fundamental constituents of the world or celestial objects): via Old French from Latin elementum ‘principle, rudiment,’ translating Greek stoikheion ‘step, component part.’
- Lithium: the chemical element of atomic number 3, a soft silver-white metal. It is the lightest of the alkali metals.(Symbol: Li) ORIGIN early 19th cent.: modern Latin, alteration of earlier lithion, from Greek, neuter of litheios, from lithos ‘stone,’ on the pattern of words such as soda .
- Sodium: the chemical element of atomic number 11, a soft silver-white reactive metal of the alkali metal group.(Symbol: Na) ORIGIN early 19th cent.: from soda + -ium. (soda: ORIGIN late Middle English ( sense 2): from medieval Latin, from Arabic suwwad ‘saltwort.’)
- Potassium: the chemical element of atomic number 19, a soft silvery-white reactive metal of the alkali metal group.(Symbol: K) ORIGIN early 19th cent.: Latinization of potash or earlier potass (from French potasse) by Sir Humphry Lowry, who first separated the element from potash.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- (Teacher resource)
- (Teacher resource)

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos

**Suggested Daily Schedule:**

Day 1: Lithium, Sodium, and Potassium

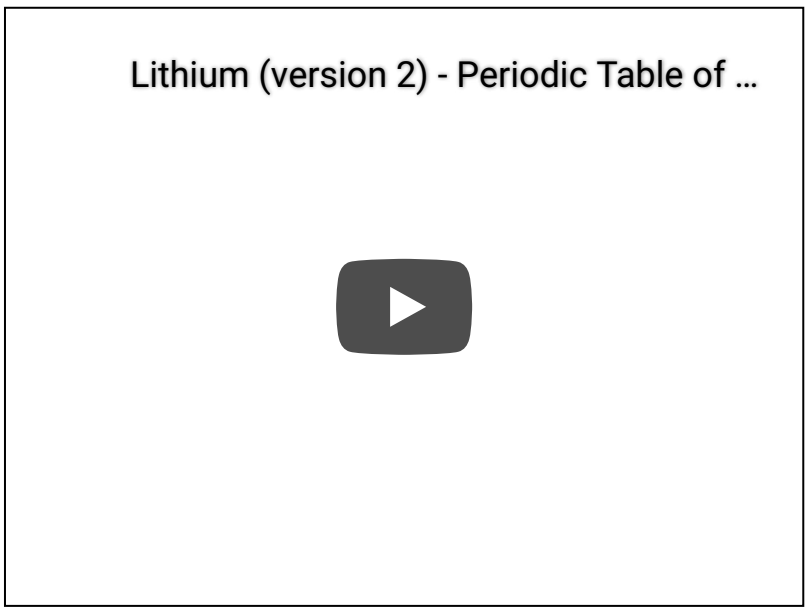
- Define:
  - Lithium
  - Sodium
  - Potassium
- Discuss:
  - Look at the definitions of Lithium, Sodium, and Potassium
  - What can you learn about the elements from looking at the origin of the definitions?
- Explore:

  Look at the Periodic Table of Elements or PTable and find Lithium
  - What can you learn about Lithium, Sodium, and Potassium from the Periodic Table?
- Explore: Lithium
  - About: From the Greek word *lithos,* stone. Johan August Arfwedson discovered lithium in 1817. Lithium batteries have lithium metal or lithium compounds as an anode.
  - Uses:
    - Batteries
    - special glasses and ceramics
    - bipolar medication
- Explore: Sodium
  - About: From the English word, *soda*; Medieval Latin, *sodanum*: a headache remedy. Long recognized in compounds, sodium was first isolated by Davy in 1807 by electrolysis of caustic soda.
  - Uses: (in compound)
    - common salt (NaCl)
    - soda ash ($Na_2CO_3$)
    - baking soda ($NaHCO_3$)
    - caustic soda (NaOH)
    - Chile saltpeter ($NaNO_3$)
    - di- and tri-sodium phosphates
    - sodium thiosulfate (hypo, $Na_2S_2O_3 \bullet 5H_2O$)
    - borax ($Na_2B_4O_7 \bullet 10H_2O$).
- Explore: Potassium
  - About: From the English word, *potash* - pot ashes; Latin *kalium*, Arab *qali*, alkali. Discovered in 1807 by Davy, who obtained it from caustic potash (KOH); this was the first metal isolated by electrolysis. Potassium is the seventh most abundant metal in the Earth’s crust making up 2.4% by mass.
  - Uses:

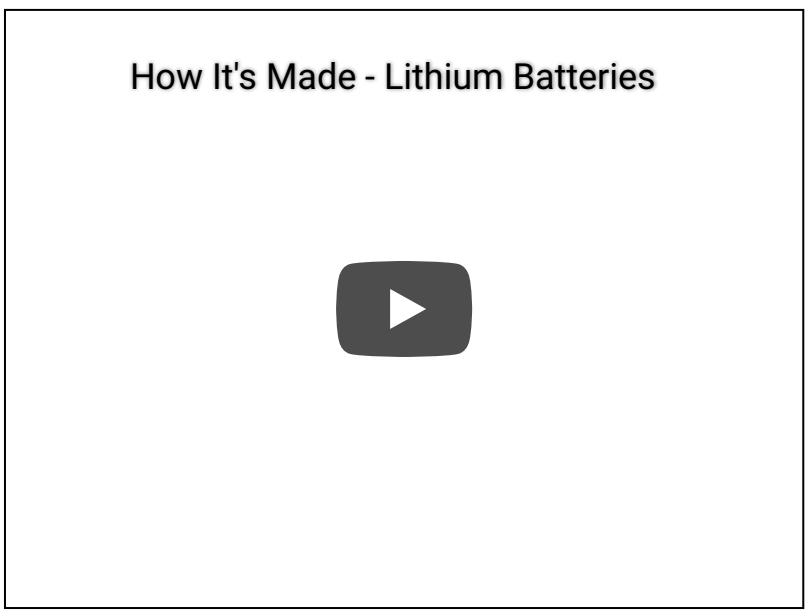
    - Fertilizers
    -

Day 2: Lithium, Sodium, Potassium

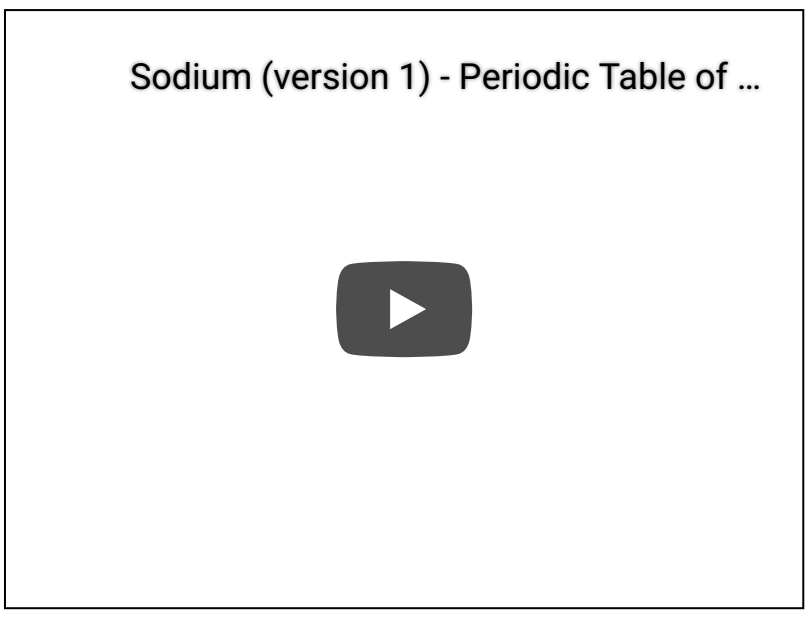
- Review:
  - What previous observations did you make about Lithium, Sodium, and Potassium?
- Explore:
  - Video about Lithium




  - Video about making Lithium batteries

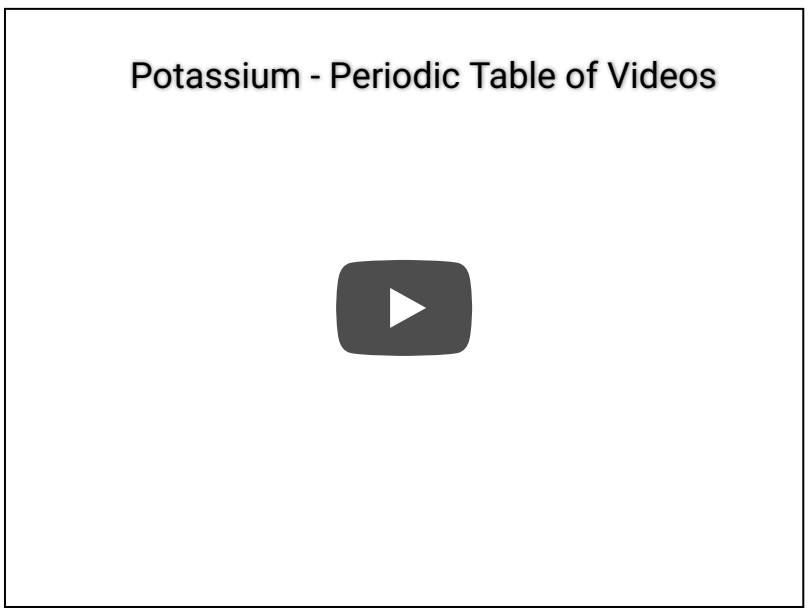



- Discuss:
  - What did you observe about Lithium?
- Explore:
  - Video about Sodium




  - Video about how salt is made/harvested


- Discuss:
  - What did you observe about Sodium
- Explore:
  - Video about Potassium




- Discuss:
  - What did you observe about Potassium?

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## Week 5

**Topics:**

- Earth
- Beryllium
- Magnesium
- Calcium

**Words to Remember:**

- Element: each of more than one hundred substances that cannot be chemically interconverted or broken down into simpler substances and are primary constituents of matter. Each element is distinguished by its atomic number, i.e., the number of protons in the nuclei of its atoms. ORIGIN Middle English (denoting fundamental constituents of the world or celestial objects): via Old French from Latin elementum ‘principle, rudiment,’ translating Greek stoikheion ‘step, component part.’
- Beryllium: the chemical element of atomic number 4, a hard gray metal.(Symbol: Be)
- Magnesium: the chemical element of atomic number 12, a silver-white metal of the alkaline earth series. (Symbol: Mg)
- Calcium: the chemical element of atomic number 20, a soft gray metal.(Symbol: Ca) ORIGIN early 19th cent.: from Latin calx, calc- ‘lime’ (see calx) + -ium.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- (Teacher resource)
- (Teacher resource)

**Materials:**

- Bible
- Science binder in which to take notes

- Computer to watch videos
- Egg
- Vinegar
- Clear jar or glass
- Paper or notebook on which to record observations

**Suggested Daily Schedule:**

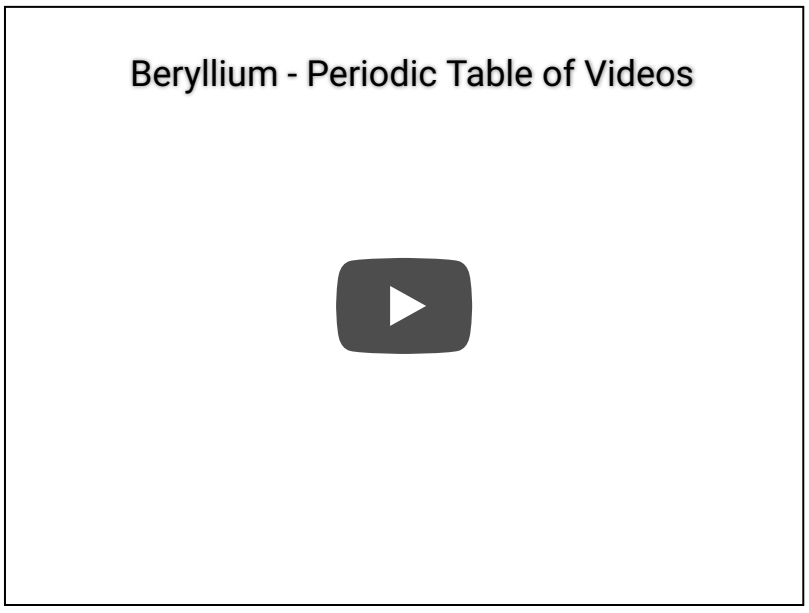
Day 1: Beryllium, Magnesium, Calcium

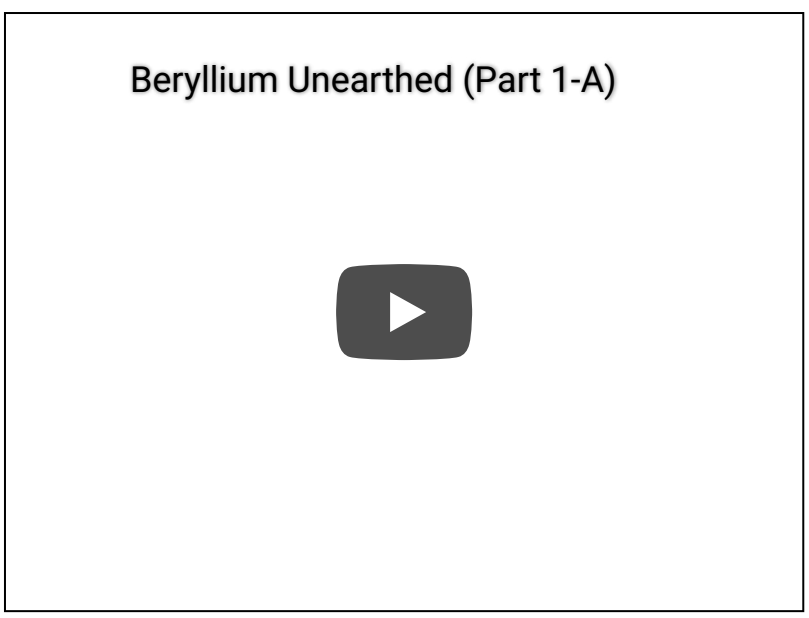
- Define:
  - Beryllium
  - Magnesium
  - Calcium
- Explore:

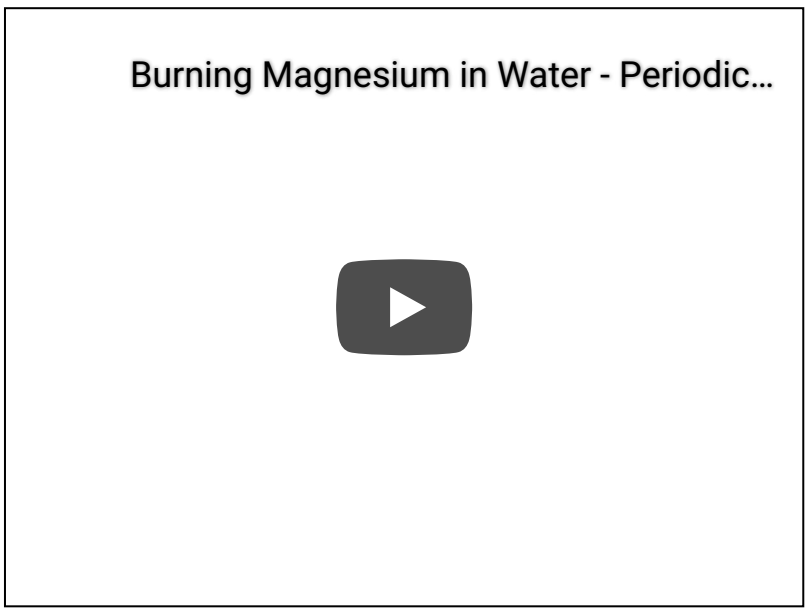
  Look at the Periodic Table of Elements or PTable and find Beryllium, Magnesium, and Calcium
  - What can you learn about Beryllium, Magnesium, Calcium from the Periodic Table?
- Explore: Beryllium
  - About: From the Greek word *beryllos,* beryl; also called glucinium or glucinum, Greek *glykys,* sweet. Discovered in the oxide form by Vauquelin in both beryl and emeralds in 1798.
  - Uses:
    - gears and cogs particularly in the aviation industry
    - found in aquamarine and emerald
    - cell phone and computer parts
    - non-sparking tools
- Explore: Magnesium
  - About: From Magnesia, district in Thessaly. Compounds of magnesium have long been known. Black recognized magnesium as an element in 1755. Davy isolated it in 1808 and Bussy prepared it in coherent form in 1831. Magnesium is the eighth most abundant element in the earth's crust.
  - Uses:
    - photography
    - flares
    - pyrotechnics
    - airplane and missile construction
    - luggage
    - car seats
    - bicycle frames
    - milk of magnesia
    - epsom salt
- Explore: Calcium
  - About: From the Latin word *calx*, lime. Though lime was prepared by the Romans in the first century under the name calx, the metal was not discovered until 1808. After learning that Berzelius and Pontin prepared calcium amalgam by electrolyzing lime in mercury, Davy was able to isolate the impure metal.
  - Uses:
    - limestone (calcium carbonate) used directly as a building stone
    - cement
    - as a soil conditioner
    - in water treatment to reduce acidity
    - in the chemicals industry
    - Gypsum
    - ‘plaster of Paris’, for setting bones
- Explore more: Soft Shell Eggs (adapted from http://www.kidzone.ws/science/egg.htm)
  - What we know:
    - Eggs contain something called "calcium carbonate".  This is what makes them hard.
    - Vinegar is an acid known as acetic acid.
  - Activity:
    - Pour 1 cup of vinegar into jar
    - Add the egg
    - Record what you see (bubbles rising from the egg)
    - Leave the egg in the vinegar for one day.
    - Remove the egg and feel it.
    - Record your observations (the egg shell will be soft)
  - What we observed:

        - When calcium carbonate (the egg) and acetic acid (the vinegar) combine, a chemical reaction takes place and carbon dioxide (a gas) is released.  This is what the bubbles are made of.
        - The chemical reaction keeps happening until all of the carbon in the egg is used up -- it takes about a day.
        - When you take the egg out of the vinegar it's soft because all of the carbon floated out of the egg in those little bubbles.
    - Explore more:
        - Leave the same egg sitting out on the table for another day.
        - Now feel it again.
        - What do you observe?
            - It's hard!
        - What we observed:
            - The calcium left in the egg shell stole the carbon back from the carbon dioxide that's in the air we breath.
        -

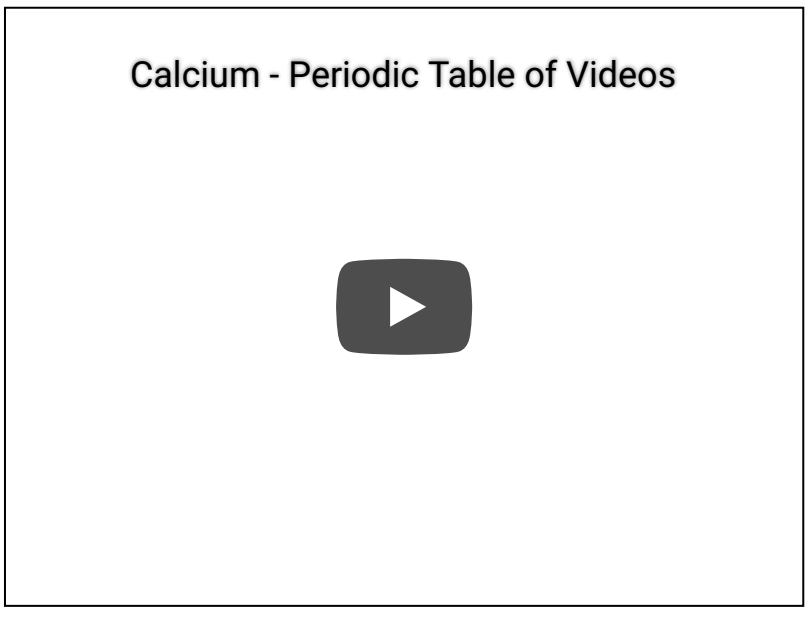
Day 2: Beryllium, Magnesium, Calcium

- Review:
    - What previous observations did you make about Lithium, Sodium, and Potassium?
- Explore:
    - Video about Beryllium
    - 

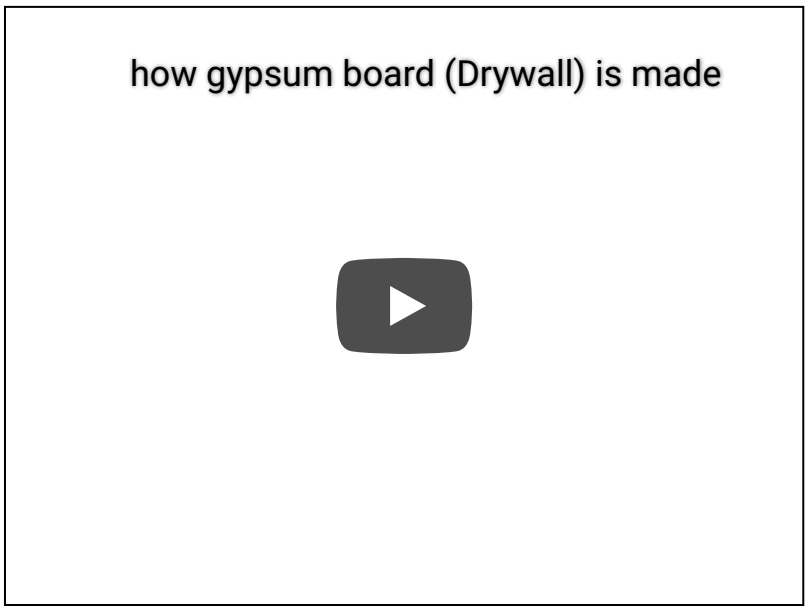
    - Video about mining and using Beryllium
    - 

- Discuss:
    - What did you observe about Beryllium?
- Explore:
    - Video about Magnesium
    - 

- 
- Discuss:
  - What did you observe about Magnesium?
- Explore:
  - Video about Calcium




  - Video about how drywall (gypsum board) is made




  - 
  - 
- Discuss:
  - What did you observe about Calcium?

---

## Week 6

**Topics:**

- Earth
- Boron
- Silicon

**Words to Remember:**

- Element: each of more than one hundred substances that cannot be chemically interconverted or broken down into simpler substances and are primary constituents of matter. Each element is distinguished by its atomic number, i.e., the number of protons in the nuclei of its atoms. ORIGIN Middle English (denoting fundamental constituents of the world or celestial objects): via Old French from Latin elementum ‘principle, rudiment,’ translating Greek stoikheion ‘step, component part.’
- Boron: the chemical element of atomic number 5, a nonmetallic solid.(Symbol: B)
- Silicon: the chemical element of atomic number 14, a nonmetal with semiconducting properties, used in making electronic circuits. Pure silicon exists in a shiny dark gray crystalline form and as an amorphous powder.(Symbol: Si) ORIGIN early 19th cent.: alteration of earlier silicium, from Latin silex, silic- ‘flint,’ on the pattern of carbon and boron
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- (Teacher resource)
- (Teacher resource)

**Materials:**

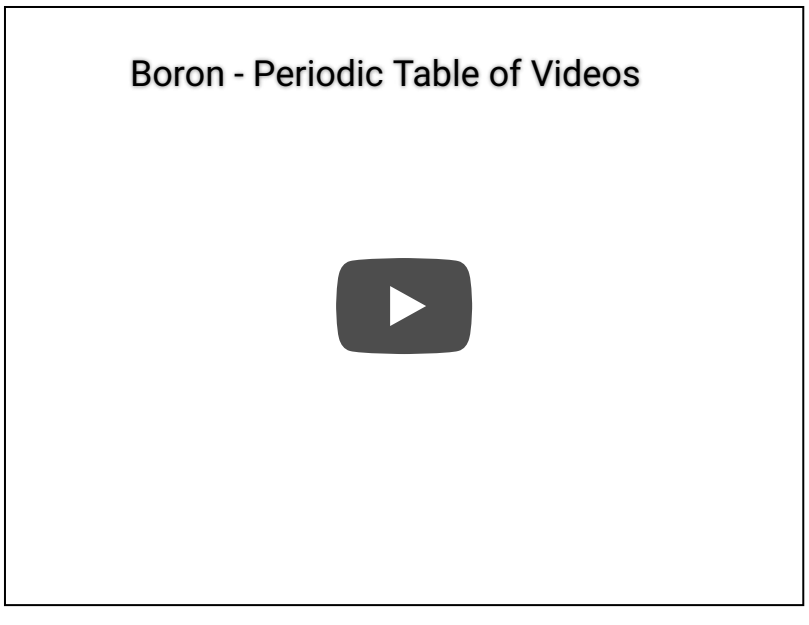
- Bible
- Science binder in which to take notes
- Computer to watch videos
- Wide-mouth glass jar Pipe Cleaner
- String
- Pencil
- Scissors
- Borax (available in the detergent aisle.)
- Boiling Water
- Food Coloring
- Tablespoon

**Suggested Daily Schedule:**

Day 1: Boron

- Define:
  - Boron
- Explore:

  Look at the Periodic Table of Elements or PTable and find Boron
  - What can you learn about Boron from the Periodic Table?
- Explore: Boron
  - About: From the Arabic word *Buraq*, Persian *Burah*. Boron compounds have been known for thousands of years, but the element was not discovered until 1808 by Sir Humphry Davy and by Gay-Lussac and Thenard.
  - Uses:
    - pyrotechnic flares to provide a distinctive green color
    - in rockets as an igniter
    - insulation fiberglass
    - Borax
- Explore:
  - Video about Boron




- Discuss:
  - What did you observe about Boron?
- Explore More: Borax Crystals
  - Follow the instructions here to grow crystals
  - What did you observe?

Day 2: Silicon

- Review:
  - What previous observations did you make about Boron?
- Define:
  - Silicon
- Explore:

  Look at the Periodic Table of Elements or PTable and find Silicon
  - What can you learn about Silicon from the Periodic Table?
- Explore: Silicon
  - About: From the Latin. word *silex*, silicis, flint. In 1800, Davy thought silica to be a compound and not an element; but in 1811, Gay Lussac and Thenard probably prepared impure amorphous silicon by heating potassium with silicon tetrafluoride.

    Uses:
    - concrete
    - bricks

    - glass
    - enamels
    - pottery
    - materials for high temperature work
- Explore:
  - Video about Silicon


  -
- Discuss:
  - What did you observe about Silicon?

## Week 7

**Topics:**

- Earth
- Fluorine
- Chlorine
- Bromine
- Iodine

**Words to Remember:**

- Element: each of more than one hundred substances that cannot be chemically interconverted or broken down into simpler substances and are primary constituents of matter. Each element is distinguished by its atomic number, i.e., the number of protons in the nuclei of its atoms. ORIGIN Middle English (denoting fundamental constituents of the world or celestial objects): via Old French from Latin elementum ‘principle, rudiment,’ translating Greek stoikheion ‘step, component part.’
- Fluorine: the chemical element of atomic number 9, a poisonous pale yellow gas of the halogen series. It is the most reactive of all the elements, causing severe burns on contact with skin.(Symbol: F)
  ORIGIN early 19th cent.: from fluor (see fluorspar) + -ine
- Chlorine: the chemical element of atomic number 17, a toxic, irritant, pale green gas.(Symbol: Cl) ORIGIN early 19th cent.: named by Sir Humphrey Davy, from Greek khlōros ‘green’ + -ine
- Bromine: the chemical element of atomic number 35, a dark red fuming toxic liquid with a choking, irritating smell. It is a member of the halogen group and occurs chiefly as salts in seawater and brines.(Symbol: Br)
  ORIGIN early 19th cent.: from French brome, from Greek brōmos ‘a stink,’ + -ine
- Iodine: the chemical element of atomic number 53, a nonmetallic element forming black crystals and a violet vapor.(Symbol: I)
  ORIGIN early 19th cent.: from French iode (from Greek iōdēs ‘violet-colored,’ from ion ‘violet’ + -eidēs ‘like’) + -ine
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- (Teacher resource)
- (Teacher resource)

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
-

**Suggested Daily Schedule:**

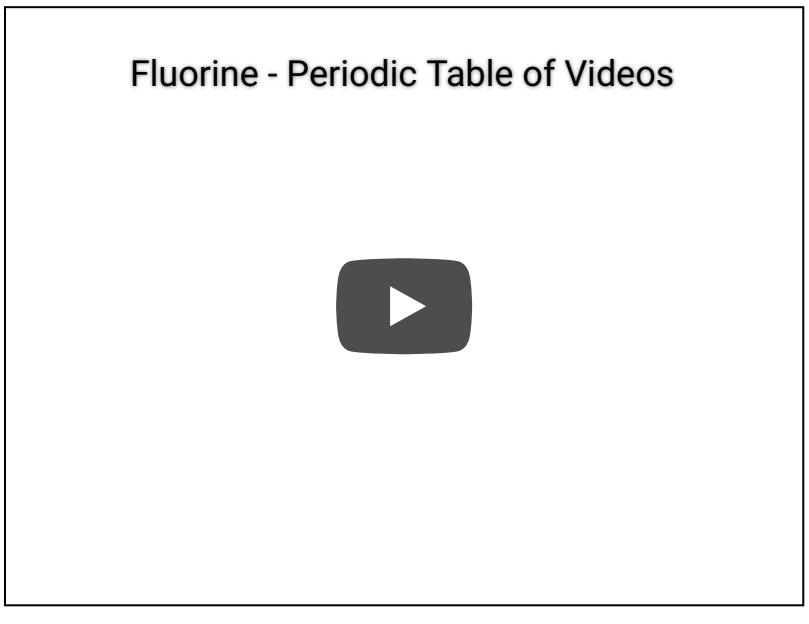
Day 1: Fluorine, Chlorine, Bromine, Iodine

- Define:
  - Fluorine
  - Chlorine
  - Bromine
  - Iodine
- Explore:

  Look at the Periodic Table of Elements or PTable and find Fluorine, Chlorine, Bromine, Iodine
  - What can you learn about Fluorine, Chlorine, Bromine, Iodine from the Periodic Table?
- Explore: Fluorine
  - About: From the Latin and French *fluere*: flow or flux. The element was finally isolated in 1866 by Moissan after nearly 74 years of continuous effort.
  - Uses:
    - nuclear power industry to separate uranium isotopes
    - insulating gas for high-power electricity transformers
    - Teflon
- Explore: Chlorine
  - About: Discovered in 1774 by Scheele, who thought it contained oxygen. Chlorine was named in 1810 by Davy, who insisted it was an element.
  - Uses:
    - sanitize water
    - paper products
    - insecticides
    - paints
    - plastics
    - etc.
- Explore: Bromine
  - About: Discovered by Balard in 1826, but not prepared in quantity until 1860.
  - Uses:
    - fumigants
    - flameproofing agents
    - water purification compounds
    - dyes
    - etc.
- Explore: Iodine
  - About: Discovered by Courtois in 1811, Iodine, a halogen, occurs sparingly in the form of iodides in sea water from which it is assimilated by seaweeds, Chilean saltpeter, nitrate-bearing earth (known as caliche), brines from old sea deposits, and in brackish waters from oil and salt wells.
  - Uses:
    - antiseptic
    - photography
    - etc.

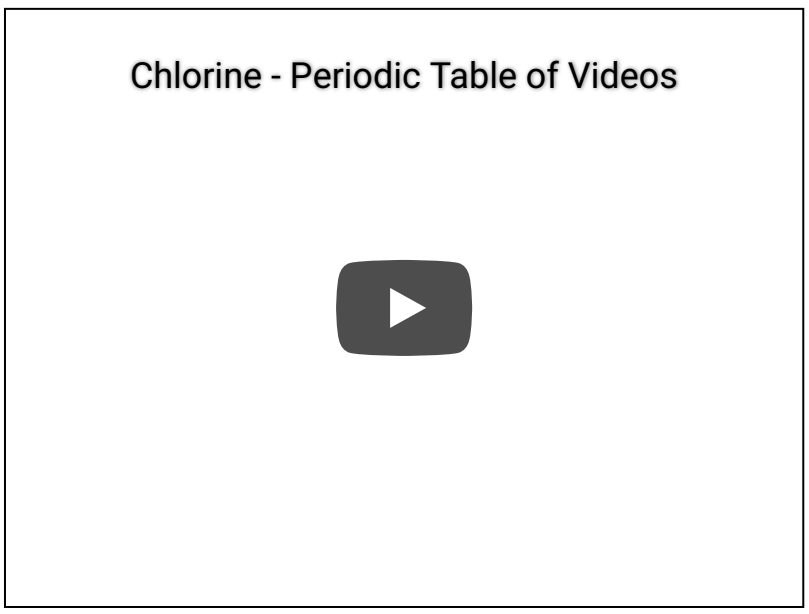
Day 2: Fluorine, Chlorine, Bromine, Iodine

- Review:
  - What previous observations did you make about Fluorine, Chlorine, Bromine, Iodine?
- Explore:
  - Video about Fluorine



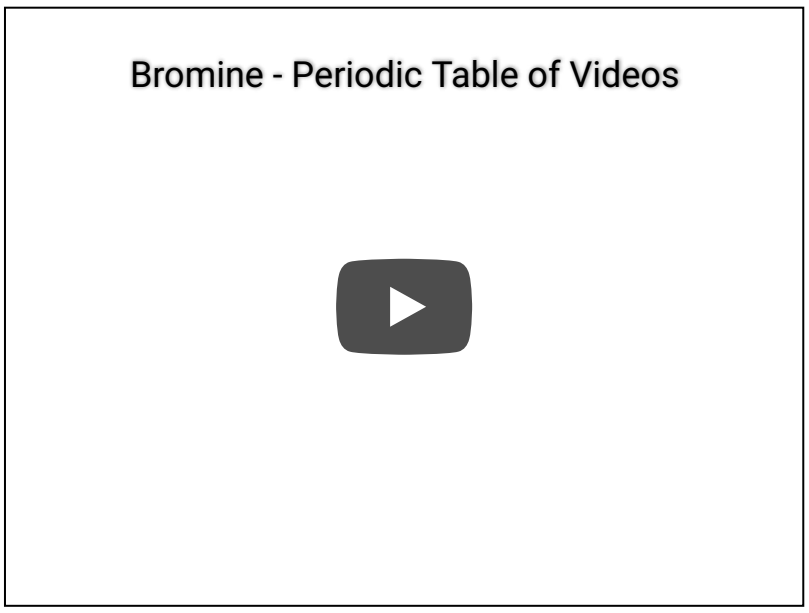

  - Video about making Teflon pans


- Discuss:
  - What did you observe about Fluorine?
- Explore:
  - Video about Chlorine

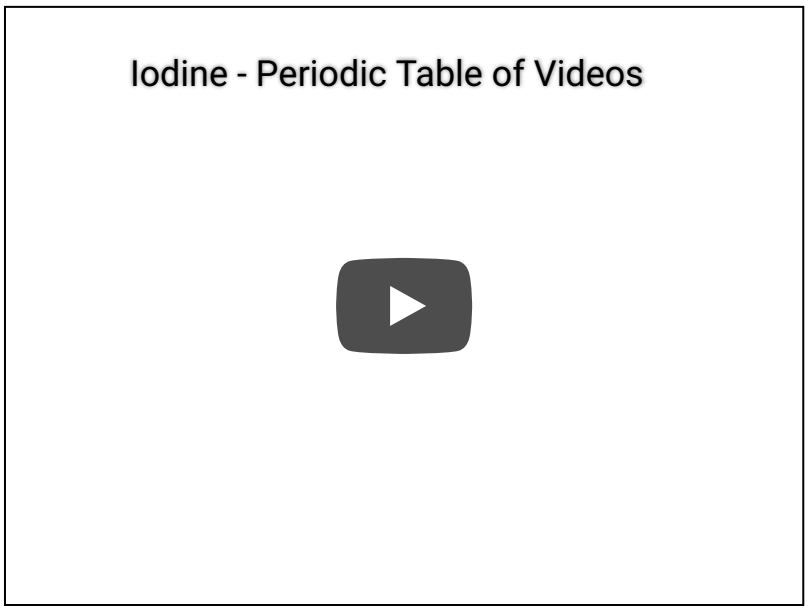



  - Video about making frozen fruit


- Discuss:
  - What did you observe about Chlorine?
    - What is its role in the process of making frozen fruit?
    - What other ways is chlorine used as a sanitizer? (Pools, drinking water, etc.)
- Explore:
  - Video about Bromine




- Discuss:
  - What did you observe about Bromine?
- Explore:
  - Video about Iodine




  - Video about Solar Salt


- Discuss:
  - What did you observe about Iodine?
  - How does Iodine work with salt?

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## Week 8

**Topics:**

- Earth
- Helium
- Neon
- Argon
- Krypton

**Words to Remember:**

- Element: each of more than one hundred substances that cannot be chemically interconverted or broken down into simpler substances and are primary constituents of matter. Each element is distinguished by its atomic number, i.e., the number of

protons in the nuclei of its atoms. ORIGIN Middle English (denoting fundamental constituents of the world or celestial objects): via Old French from Latin elementum ‘principle, rudiment,’ translating Greek stoikheion ‘step, component part.’

- Helium: the chemical element of atomic number 2, an inert gas that is the lightest member of the noble gas series.(Symbol: He) ORIGIN late 19th cent.: modern Latin, from Greek hēlios ‘sun,’ because its existence was inferred from an emission line in the sun's spectrum.
- Neon: the chemical element of atomic number 10, an inert gaseous element of the noble gas group. It is obtained by the distillation of liquid air and is used in fluorescent lamps and advertising signs.(Symbol: Ne) ORIGIN late 19th cent.: from Greek, literally ‘something new,’ neuter of the adjective neos .
- Argon: the chemical element of atomic number 18, an inert gaseous element of the noble gas group. Argon is the most common noble gas, making up nearly one percent of the earth's atmosphere.(Symbol: Ar) ORIGIN late 19th cent.: from Greek, neuter of argos ‘idle,’ from a- ‘without’ + ergon ‘work.’
- Krypton: the chemical element of atomic number 36, a member of the noble gas series. It is obtained by distillation of liquid air and is used in some kinds of electric light.(Symbol: Kr) ORIGIN late 19th cent.: from Greek krupton, neuter of kruptos ‘hidden.’
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- (Teacher resource)

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
-

**Suggested Daily Schedule:**

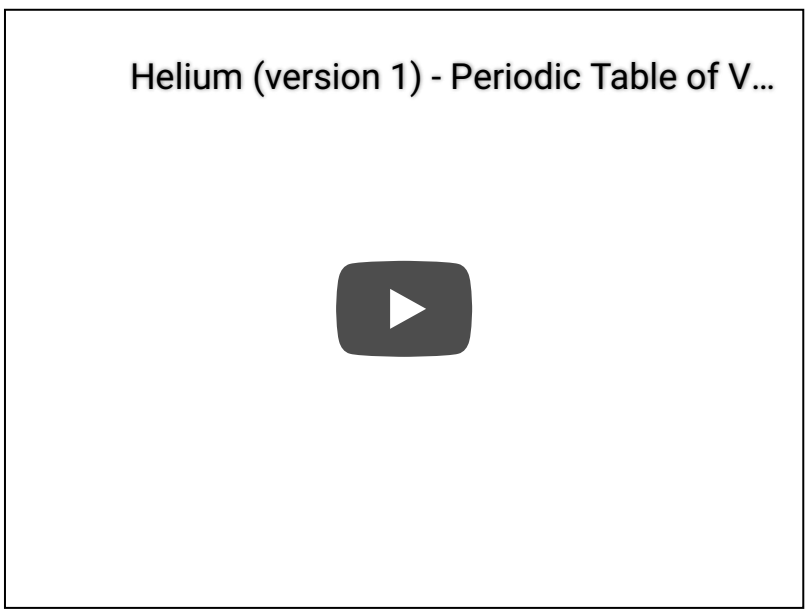
Day 1: Helium, Neon, Argon, Krypton

- Define:
  - Helium
  - Neon
  - Argon
  - Krypton
- Explore:
  Look at the Periodic Table of Elements or PTable and find Helium, Neon, Argon, and Krypton
  - What can you learn about Helium, Neon, Argon, and Krypton from the Periodic Table?
- Explore: Helium
  - About: Discovered by Sir William Ramsay in London, and independently by P.T. Cleve and N.A. Langlet in Uppsala, Sweden.
  - Uses:
    - coolant
    - fill decorative balloons, weather balloons, and airships
    - used to inflate car airbags
    - etc.
- Explore: Neon
  - About: Discovered by Sir William Ramsay and Morris Travers  in 1898
  - Uses:
    - neon signs
    - diving equipment
    - lasers
    - etc.
- Explore: Argon
  - About: Discovered by Lord Rayleigh and Sir William Ramsay in 1894
    - fluorescent bulbs
    - low-energy bulbs
    - double-pane windows
    - neon signs
    - etc.
- Explore: Krypton
  - About: Discovered by Sir William Ramsay and Morris Travers  in 1898
  - Uses:

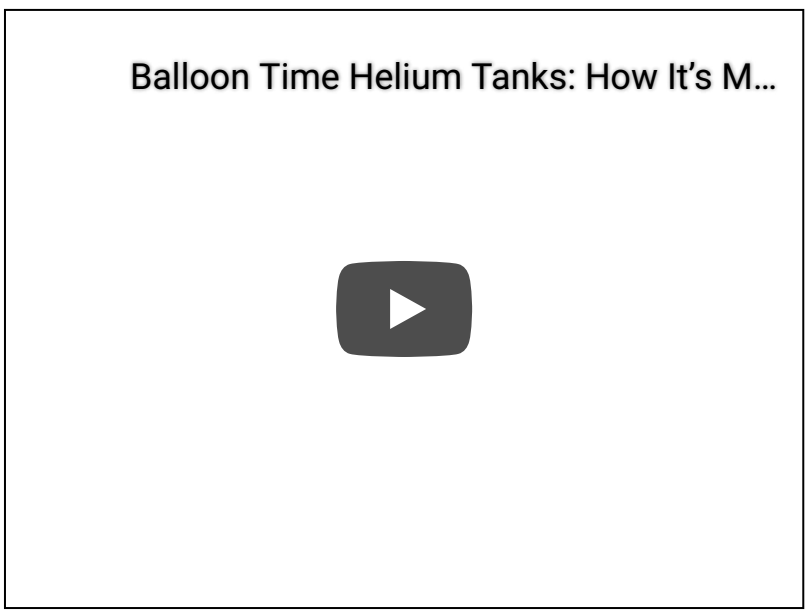
        - fluorescent lights
        - lasers
        - etc.

Day 2: Helium, Neon, Argon, Krypton

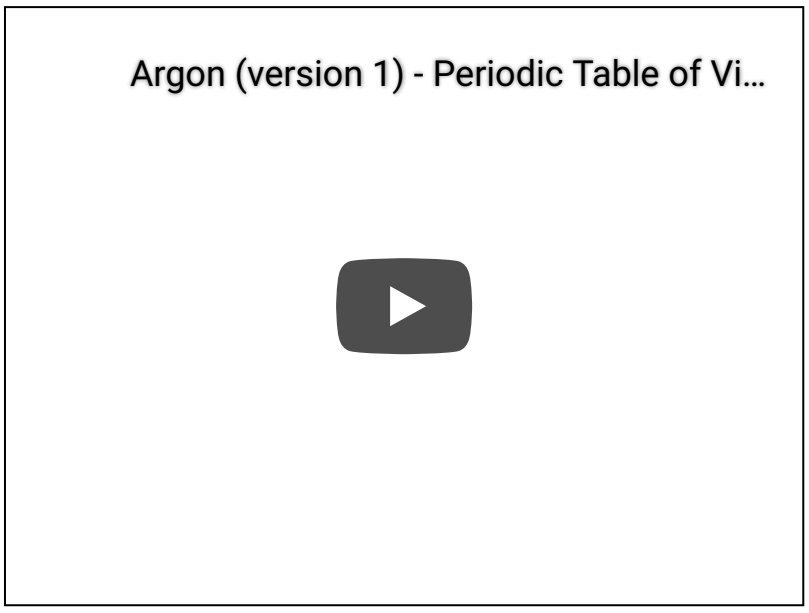
- Review:
    - What previous observations did you make about Helium, Neon, Argon, and Krypton?
- Explore:
    - Video about Helium




    - Video about making helium balloon tanks




- Discuss:
    - What did you observe about Helium?
- Explore:
    - Video about Neon
    - https://www.youtube.com/watch?v=wzv0pb7mzaw&list=PLBB52D59BE0C7B658&index=2
    - Video about Argon




    - Video about neon signs


- Discuss:
  - What did you observe about Neon and Argon?
- Explore:
  - Video about Krypton


- Discuss:
  - What did you observe about Krypton?

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## Week 9

**Topics:**

- Earth
- Silver
- Gold
- Platinum
- Mercury

**Words to Remember:**

- Element: each of more than one hundred substances that cannot be chemically interconverted or broken down into simpler substances and are primary constituents of matter. Each element is distinguished by its atomic number, i.e., the number of protons in the nuclei of its atoms. ORIGIN Middle English (denoting fundamental constituents of the world or celestial objects): via Old French from Latin elementum ‘principle, rudiment,’ translating Greek stoikheion ‘step, component part.’
- Silver: a precious shiny grayish-white metal, the chemical element of atomic number 47.(Symbol: Ag) ORIGIN Old English seolfor, of Germanic origin; related to Dutch zilver and German Silber .
- Gold: a yellow precious metal, the chemical element of atomic number 79, valued especially for use in jewelry and decoration, and to guarantee the value of currencies.(Symbol: Au) ORIGIN Old English, of Germanic origin; related to Dutch goud and German Gold, from an Indo-European root shared by yellow.
- Platinum: a precious silvery-white metal, the chemical element of atomic number 78. It was first encountered by the Spanish in South America in the 16th century and is used in jewelry, electrical contacts, laboratory equipment, and industrial catalysts. (Symbol: Pt) ORIGIN early 19th cent.: alteration of earlier platina, from Spanish, diminutive of plata ‘silver.’
- Mercury: the chemical element of atomic number 80, a heavy silvery-white metal that is liquid at ordinary temperatures. (Symbol: Hg) ORIGIN Middle English: from Latin Mercurius
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- (Teacher resource)
- (Teacher resource)

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
-

**Suggested Daily Schedule:**

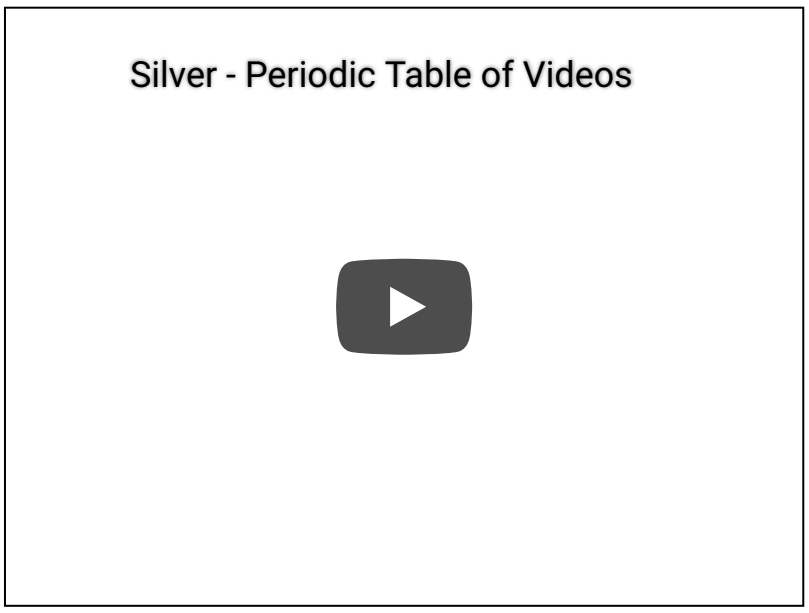
Day 1: Silver, Gold, Platinum, Mercury

- Define:
  - Silver, Gold, Platinum, Mercury
- Explore:

  Look at the Periodic Table of Elements or PTable and find Silver, Gold, Platinum, and Mercury
  - What can you learn about Silver, Gold, Platinum, and Mercury from the Periodic Table?
- Explore: Silver
  - About: Known to be used in Biblical times
  - Uses:
    - sterling silver
    - mirrors
    - jewelry
    - batteries
    - etc.
- Explore: Gold
  - About: Known to be used in Biblical times
  - Uses:
    - jewelry
    - architecture
    - currency
    - dentistry
    - etc.
- Explore: Mercury
  - About: Known to be used in Biblical times
    - thermometers
    - batteries
    - dental work
    - electronics
    - "neon" signs
    - etc.
- Explore: Platinum
  - About: Discovered in South America by Ulloa in 1735 and by Wood in 1741
  - Uses:
    - jewelry
    - wire
    - thermocouple elements
    - etc.

Day 2: Silver, Gold, Platinum, Mercury

- Review:
  - What previous observations did you make about Silver, Gold, Platinum, and Mercury?
- Explore:
  - Read Exodus 25.  How were gold and silver used?
  - Video about Silver




- Note: the professor mentions that silver has perhaps been mined for thousands or tens of thousands of years.  Mention to students that it is impossible for silver to be mined prior to Creation.

- Video about making silver cutlery

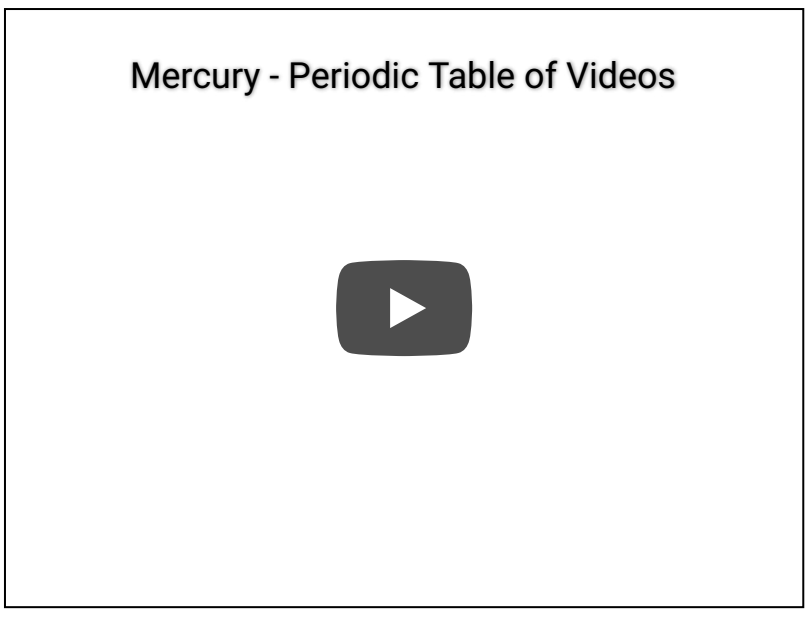

- Discuss:
  - What did you observe about Silver?
- Explore:
  - Video about Gold

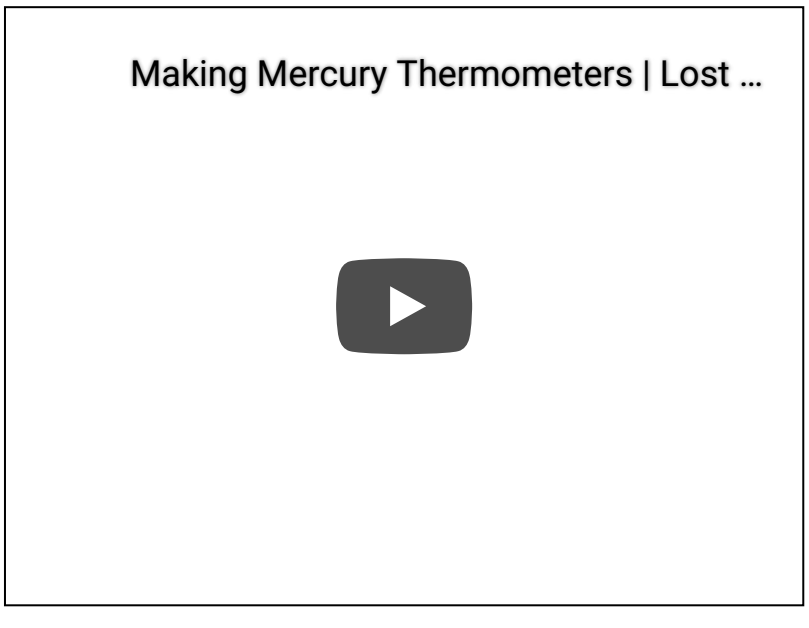

- Video about making gold chains


- Discuss:

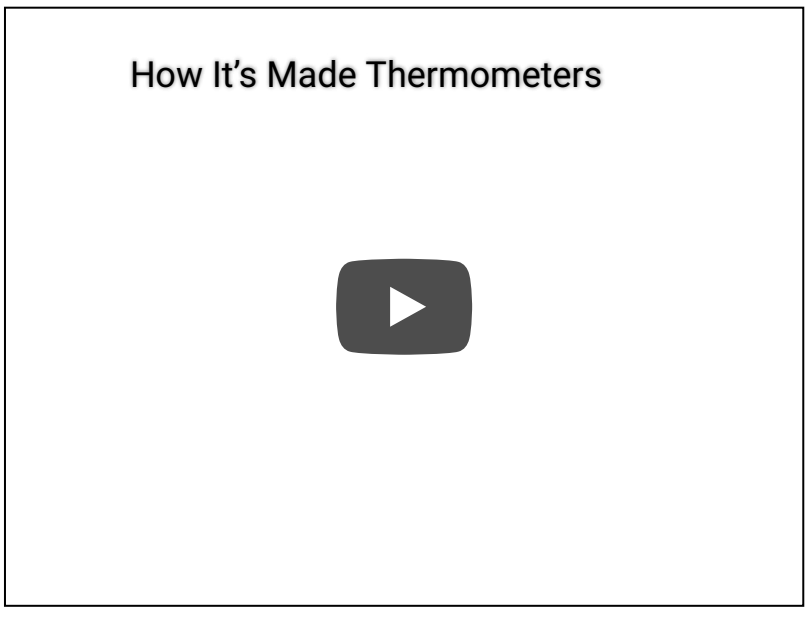
    - What did you observe about Gold?
- Explore:
    - Video about Platinum
    - 

    - Video about making platinum rings
    - 

- Discuss:
    - What did you observe about Platinum?
- Explore:
    - Video about Mercury
    - 

    - Video about making thermometers (mercury)
    - 

    - Video about making thermometers (mercury alternative)




- Discuss:
- What did you observe about Mercury?

## Week 10

**Topics:**

- Earth
- Atmosphere
- Hydrosphere
- Biosphere
- Cryosphere

**Words to Remember:**

- Atmosphere:  the envelope of gases surrounding the earth or another planet ORIGIN mid 17th cent.: from modern Latin atmosphaera, from Greek atmos ‘vapor’ + sphaira ‘ball, globe.’
- Hydrosphere: all the waters on the earth's surface, such as lakes and seas, and sometimes including water over the earth's surface, such as clouds.
- Biosphere: the regions of the surface, atmosphere, and hydrosphere of the earth (or analogous parts of other planets) occupied by living organisms. ORIGIN late 19th cent.: coined in German from Greek bios ‘life’ + sphaira
- Cryosphere: frozen ground, especially in high elevations or lattitudes ORIGIN from Greek kruos ‘frost.’
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- Global Warming- When Politics and Science Collide
- A Unique Blend

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
-

**Suggested Daily Schedule:**

Day 1: Atmosphere

- Define:
  - Words to Remember
- Review:
  -
  - Read:
    - A Unique Blend
  - Discuss:
    - Of what elements is the atmosphere composed?
    - What do you know about these elements from previous study?
- Read:
  - Global Warming- When Politics and Science Collide
- Discuss:

- Why is important to understand science when discussing controversial topics?

Day 2: And God formed man...

- Discuss:
  -
  - Review the elements you have learned using your Periodic Table and notes.
  - How do these elements support life?
- Read:
  - From Dust to Dust
- Discuss:
  - What different arguments are made for the materials involved in the creation of man?
  - What evidence exists for the connection between man and earth from Scripture?
  - What evidence exists for the connection between man and earth from Science?

---

## Week 11

**Topics:**

- Water

**Words to Remember:**

- Water: Water is a compound of oxygen and hydrogen (chem. formula: H 2O) with highly distinctive physical and chemical properties: it is able to dissolve many other substances; its solid form (ice) is less dense than the liquid form; its boiling point, viscosity, and surface tension are unusually high for its molecular weight, and it is partially dissociated into hydrogen and hydroxyl ions.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- The Miracle of Water
- Experiment- Water's Life-Saving Secret
- Experiment- Climbing Water

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Candle
- Matches
- Two rubber balloons
- Water
- Large bowl
- Small bowl
- Food coloring
- Ice tray
- Water
- ½ cup of water
- Clear glass or vase
- Tube of red or blue liquid food coloring
- Three or four white carnations
- Sharp knife
- Camera
-

**Suggested Daily Schedule:**

Day 1: Water

- Define:
  - Words to Remember
-
- Read:

    - The Miracle of Water
    - Discuss:
        - What is unique about water?
- Explore:
    - Experiment- Water's Life-Saving Secret
- Discuss:
    - What are some unique and important qualities of water?
    - How does God use water to "support this body and life?"

Day 2: Water

- Discuss:
    - In the coming weeks we will be learning about water and then we will be learning about plants.
    - Water is necessary not only for human life, but also for plant life.
- Explore:
    - Experiment- Climbing Water
- Discuss:
    - How has God uniquely created plants to utilize water?

---

## Week 12

**Topics:**

- Brooks

**Words to Remember:**

- Brook: a small stream ORIGIN Old English brōc; related to Dutch broek and German Bruch ‘marsh.’
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Glass jar
- Water
- Gravel
- Sand
- Mud
-

**Suggested Daily Schedule:**

Day 1: Brook

- Define:
    - Words to Remember
-
- Read:
    - 3rd Grade Handbook of Nature Study: p. 736-739
- Explore:
    - Find a brook to explore
- Discuss:
    - Work through the questions in Lesson 207

Day 2: Brook

- Read:
    - 3rd Grade Handbook of Nature Study: p. 740-742
- Explore:
    - Lesson 208 (p. 741-742)
- Discuss:
    - How does a brook drop its load?

- Think about the "work" of brooks.  What impact do brooks have on God's creation? (Think big!  What about all the brooks that run through farms, etc.)
- Why is it important that some of the water in creation is generally always moving?

- Explore:
  - Use a local map or a map app on the computer or device to find brooks in your area.
  - To where do they run?

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## Week 13

**Topics:**

- Rivers

**Words to Remember:**

- River: a large natural stream of water flowing in a channel to the sea, a lake, or another such stream ORIGIN Middle English: from Anglo-Norman French, based on Latin riparius, from ripa ‘bank of a river.’
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation

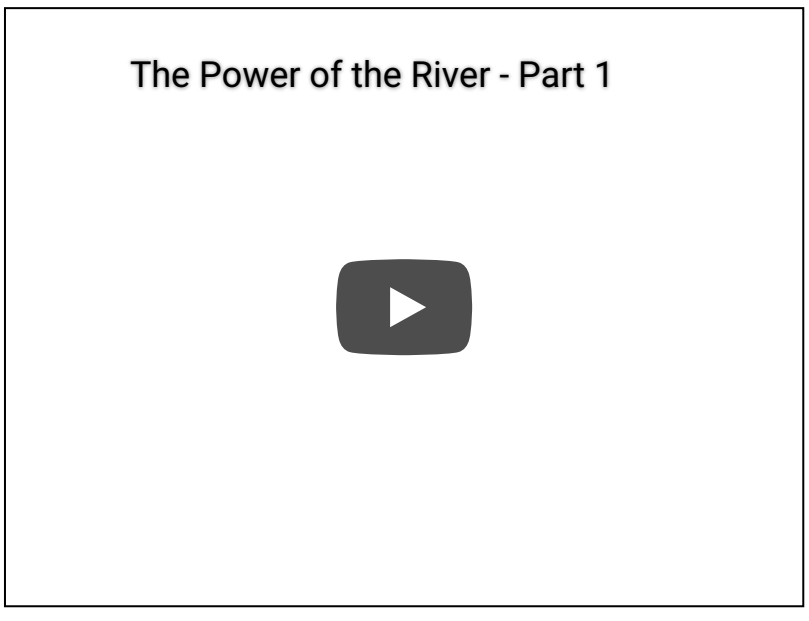
**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Map
-

**Suggested Daily Schedule:**

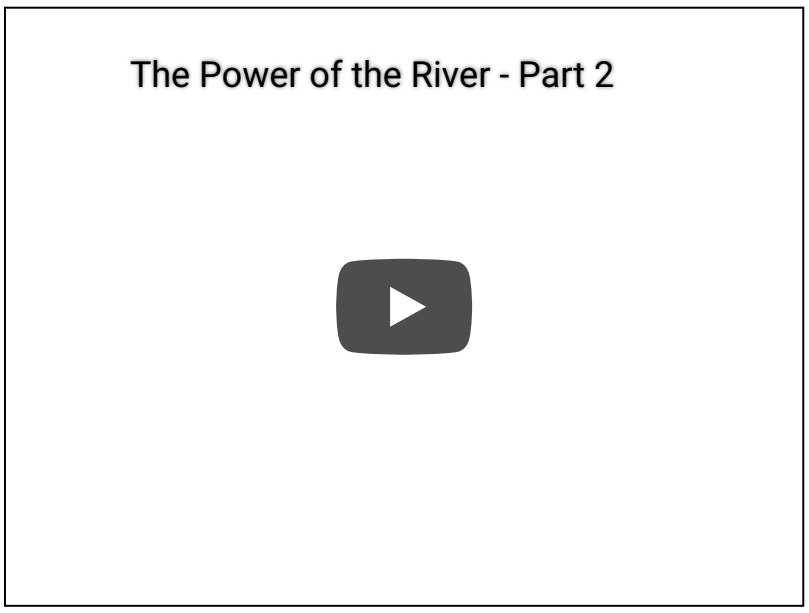
Day 1: River

- Define:
  - Words to Remember
-
- Explore:
  - Look at a map.
  - Find the Mississippi River.
  - Where is the beginning?
  - Where is the end?
  - What observations can you make about the Mississippi River? (towns, other bodies of water, etc.)
- Explore:
  - Watch:
    - The Power of the River- Part I

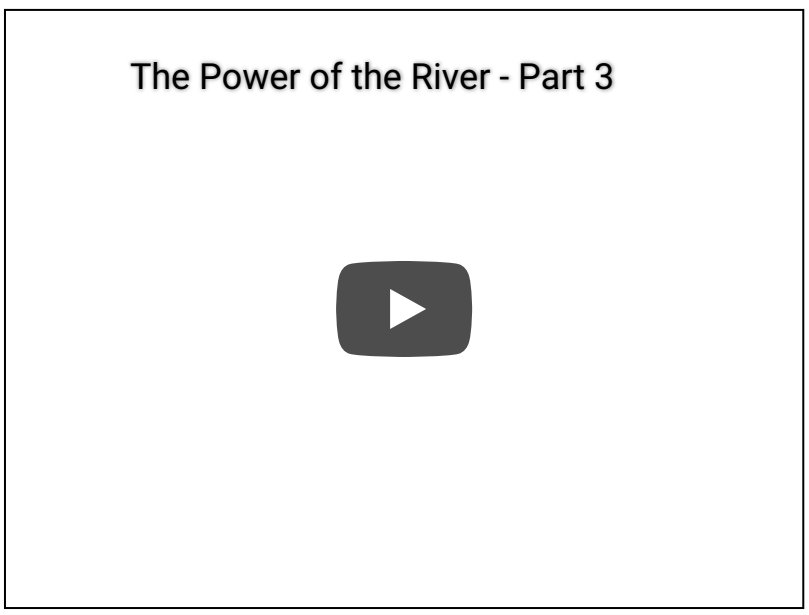



Day 2: Rivers

- Watch:
  - The Power of the River- Part II




- Discuss:
  - In what ways does God use rivers to support life?
  - How has God skilled man to serve his neighbors using rivers? (shipping, energy, etc.)
  - Think about and list all the ways people can serve their neighbors in relation to rivers. (engineers, boat captains, dock workers, boat builders, etc.)
  - How do we see evidence of a fallen world when studying rivers? (floods, etc.)
- Explore more:
  - Optional viewing:
  - The Power of the River- Part III




- Explore more:
  - If you live near a river, go exploring!

## Week 14

**Topics:**

- Lakes
- Oceans

**Words to Remember:**

- Lake: a large body of water surrounded by land ORIGIN late Old English (denoting a pond or pool), from Old French lac, from Latin lacus ‘basin, pool, lake.’
- Ocean: a very large expanse of sea, in particular, each of the main areas into which the sea is divided geographically ORIGIN Middle English: from Old French occean, via Latin from Greek ōkeanos ‘great stream encircling the earth's disk.’
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation
- Earth's Water Cycle Protects and Provides

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos

- Map
-

**Suggested Daily Schedule:**

Day 1: Lake

- Define:
  - Words to Remember
-
- Explore:
  - Look at a United States map.
  - Find major lakes. (Great Lakes, etc.)
  - List out their names
  - Simply from observation, how are lakes different from rivers?
- Review:
  - Think back to your study of the Water Cycle in 2nd Grade Science.
  - List the steps in the Water Cycle
- Read:
  - Earth's Water Cycle Protects and Provides
- Discuss:
  - How do lakes fit in the water cycle?
- Explore:
  - If you live near a lake, go exploring!
  -
-

Day 2: Oceans

- Define:
  - Words to Remember
  -
- Explore:
  - Look at Globe or World Map
  - Find and name the oceans
- Discuss:
  - How are oceans different from lakes and rivers?
  - How do oceans fit in the Water Cycle?
  - Earth is nearly 70% water and 30% land.
  - The ocean contains plants, animals, and many elements.
- Explore more:
  -
  - View:
  - https://vimeo.com/107287735
- Explore more:
  - If you live near an ocean, go exploring!
  -

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## Week 15

**Topics:**

- Plants

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Photosynthesis: the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water. Photosynthesis in plants generally involves the green pigment chlorophyll and generates oxygen as a byproduct.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Map
-

**Suggested Daily Schedule:**

Day 1: Growing plants

- Define:
  - Words to Remember
- Read:
  - 3rd Grade Handbook of Nature Study p. 453-456
- Discuss:
  - What do flowers need in order to grow?
-
- Explore:
  - Do the Experiments on p. 454-455
  - Keep a log of the plants and the variables involved with each (type of plant, soil type, light conditions, etc.)
  - What do you observe?
-
  -
-

Day 2: Photosynthesis

- Define:
  - Words to Remember
  -
- Read:
  - The Unselfish Green Gene
- Discuss:
  - How does God's creation of plants and the process of photosynthesis "support and needs of the body?"
  - Read the 4th Petition of the Lord's Prayer.
  - Many times when we think about our daily bread, we think only of food.  Thinking of your studies in Science, what other things does God specifically provide to protect and preserve your life? (Atmosphere in just the right proportions, photosynthesis, etc.)
- Explore more:
  -
  - View:
  -

## Week 16

**Topics:**

- Plants

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Photosynthesis: the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water. Photosynthesis in plants generally involves the green pigment chlorophyll and generates oxygen as a byproduct.
- Chlorophyll: a green pigment, present in all green plants and in cyanobacteria, responsible for the absorption of light to provide energy for photosynthesis. Its molecule contains a magnesium atom held in a porphyrin ring. ORIGIN early 19th cent.: coined in French from Greek khlōros ‘green’ + phullon ‘leaf.’
- Genesis 1:9-13

**Textbook reference and written work:**

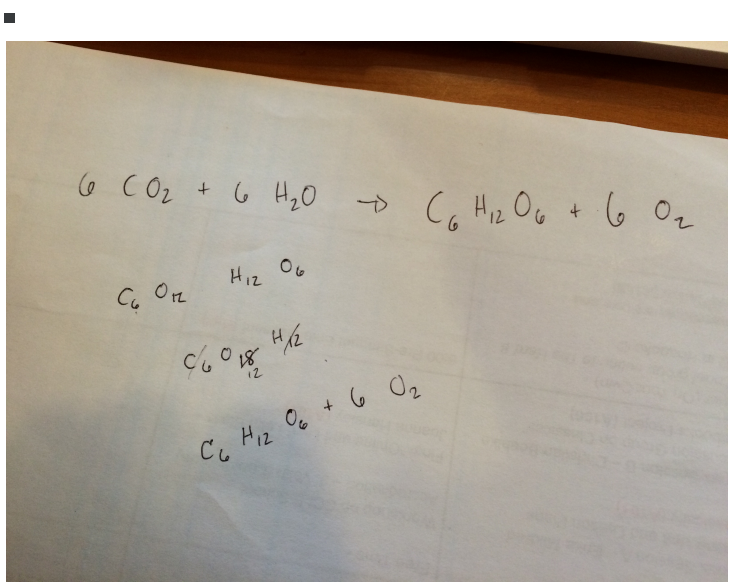
- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Photosynthesis diagram
- Photosynthesis diagram- chemistry
- Photosynthesis
- Origin of Photosynthesis

**Suggested Daily Schedule:**

Day 1: Photosynthesis

- Review:
  - Words to Remember
- View:
  - Photosynthesis diagram
  - Photosynthesis diagram- chemistry
- Discuss:
  - What is the role of photosynthesis in the life of a plant and in the life of people?
  - What is needed for photosynthesis to occur?
  - What is produced by photosynthesis?
    - Be sure students are able to use the correct terminology and understand the scientific conversion of the elements.
    - Add the elements on the left side of the equation.  Do you get the elements on the right side of the equation?
    - Reference:
      - 

- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Alabama state flower
    - Alaska state flower

Day 2:

- Define:
  - Words to Remember
  -
- Read:
  - Photosynthesis
  - Origin of Photosynthesis
- Discuss:
  - What are some of the details provided for by God's design? (example, sunlight can be intermittent)
  - What challenges do evolutionists try to give those who stand on the truth of God's design?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Arizona state flower
    - Arkansas state flower

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## Week 17

**Topics:**

- Seeds

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Seed: a flowering plant's unit of reproduction, capable of developing into another such plant.
- Germination: begin to grow and put out shoots after a period of dormancy. ORIGIN late 16th cent.: from Latin germinat- ‘sprouted forth, budded,’ from the verb germinare, from germen, germin- ‘sprout, seed.’
- Seed coat: the protective outer coat of  as
- Hypocotyl: the part of the stem of an embryo plant beneath the stalks of the seed leaves, or cotyledons, and directly above the root.
- Cotyledon: an embryonic leaf in seed-bearing plants, one or more of which are the first leaves to appear from a germinating seed.  ORIGIN mid 16th cent. (denoting a patch of villi on the placenta of mammals): from Latin‘navelwort’ (which has cup-shaped leaves), from Greek kotulēdōn ‘cup-shaped cavity,’ from kotulē ‘cup.’
- Plumule: the rudimentary shoot or stem of an embryo plant. ORIGIN early 18th cent.: from French plumule or Latin plumula ‘small feather,’ diminutive of pluma ‘down.’
-
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- 6 tablespoons (90 ml) plaster of Paris
- 2 small cups
- 4 dried lima beans
- pen or marker
- masking tape or labels
- 2 paper towels
- water
- Experiment- Those Swell Seeds
- How the Plant Produces Seed

**Suggested Daily Schedule:**

Day 1: Seeds

- Review:
  - Words to Remember
- Read:
  - Experiment- Those Swell Seeds
- Explore:
  - Conduct the activity at the bottom of the Those Swell Seeds article.
  - What do you observe?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - California state flower
    - Colorado state flower
  -
-

Day 2:

- Review:
  - Words to Remember
- Read:
  - How the Plant Produces Seed (p. 259-266)
- Discuss:
  - What are the parts of the seed or plant and what is the job or each part?
  - How are seeds produced?
  - What is the difference between fertilization and germination?
- View:
  - Mung Bean plant germination
    - 

  - Pinecone
    - 

- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Connecticut state flower
    - Delaware state flower

# Week 18

**Topics:**

- Seeds

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Seed: a flowering plant's unit of reproduction, capable of developing into another such plant.
- Monocotyledon (Monocot): a flowering plant with an embryo that bears a single cotyledon (seed leaf). Monocotyledons constitute the smaller of the two great divisions of flowering plants, and typically have elongated stalkless leaves with parallel veins (e.g., grasses, lilies, palms).
- Dicotyledon (Dicot): a flowering plant with an embryo that bears two cotyledons (seed leaves). Dicotyledons constitute the larger of the two great divisions of flowering plants, and typically have broad, stalked leaves with netlike veins (e.g., daisies, hawthorns, oaks).
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Basic Chemistry: A Test of Creation

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Various types of seeds (provided by teacher, students, or both)
- Germination diagram
- Monocot vs. dicot

**Suggested Daily Schedule:**

Day 1: Seeds

- Review:
  - Words to Remember
- View:
  - Germination diagram
  - Monocot vs. dicot
- Discuss:
  - While we established last week that germination and pollination are different, how do they relate?
  - Note whether the plants in your diagrams, readings, and videos are monocot or dicot.
- Read:
  - How the Plant Produces Seed p. 266-270
- Explore:
  - Have students or the teacher bring in one or more types of seeds.  (Their goal is to stump the class, so bring a variety of seeds, both recognizable and more challenging!)
  - Students should guess the type of seed/what plant will grow from the seed.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Florida state flower
    - Georgia state flower
  -
-

Day 2:

- Define:
  - Words to Remember
  -
- View:


- Discuss:
  - What did you observe in the video of the pumpkin growing?
  - What things were provided for the pumpkin to grow? (water, sun, soil, air, etc.)
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Hawaii state flower
    - Idaho state flower

## Week 19

**Topics:**

- Seeds
- Tropism

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Tropism: the turning of all or part of an organism in a particular direction in response to an external stimulus. ORIGIN  late 19th cent.: from Greek tropos ‘turning’ (from trepein ‘to turn’) + -ism.
- Phototropism: the orientation of a plant or other organism in response to light, either toward the source of light (positive phototropism) or away from it (negative phototropism).
- Thigmotropism: the turning or bending of a plant or other organism in response to a touch stimulus. ORIGIN early 20th cent.: from Greek thigma ‘touch’ + tropism.
- Geotropism: the growth of the parts of plants with respect to the force of gravity. The upward growth of plant shoots is an instance of negative geotropism; the downward growth of roots is positive geotropism. ORIGIN  late 19th cent.: from geo-‘earth’ + Greek tropē ‘turning’ + -ism.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Creepy Crawly Plants

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Small pot with soil
- Grass seeds
- 4–5 sweet pea or morning glory seeds
- 1 small pot with soil
- 4 sticks, about 12" long and ¼" thick
- 4–5 small dried lima beans
- 1 clear plastic CD case
- paper towel or blotting paper

- What is Plant Tropism?
- Creepy Crawly Plant Experiments

**Suggested Daily Schedule:**

Day 1:

- Define:
  - Words to Remember
- Read:
  - What is Plant Tropism?
- View:
  - https://youtu.be/G4Mo9-JAeok
  - https://youtu.be/Ze8NV7cvW8k
- Discuss:
  - What do you observe in the radish and tomato plants?
- Explore:
  - Read and follow the directions for the exploration in the What is Tropism? article.
  - At the conclusion of the exploration be sure to discuss your observations.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Illinois state flower
    - Indiana state flower
  -
-

Day 2:

- Review:
  - Words to Remember
- Explore:
  - Read and follow the directions in Creepy Crawly Plant Experiments.
  - At the conclusion of the exploration, be sure to discuss the results.
  - What kind of tropism did you observe?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Iowa state flower
    - Kansas state flower

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## Week 20

**Topics:**

- Parts of a plant

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Root: the part of a plant that attaches it to the ground or to a support, typically underground, conveying water and nourishment to the rest of the plant via numerous branches and fibers
- Taproot: a straight tapering root growing vertically downward and forming the center from which subsidiary rootlets spring.
- Lateral roots: extend horizontally from the primary root (radicle) and serve to anchor the plant securely into the soil. This branching of roots also contributes to water uptake, and facilitates the extraction of nutrients required for the growth and development of the plant.
- Apical bud: the growing point of a shoot.
- Petiole: the stalk that joins a leaf to a stem; leafstalk
- Blade: the broad thin part of a leaf apart from the stalk.
- Axillary bud: a bud that grows from the axil of a leaf and may develop into a branch or flower cluster.

- Vegetative shoot: of, relating to, or denoting reproduction or propagation achieved by asexual means, either naturally (budding, rhizomes, runners, bulbs, etc.) or artificially (grafting, layering, or taking cuttings)
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz

**Suggested Daily Schedule:**

Day 1:

- Review:
  - What is tropism?  What are some different kinds of tropism?
- Define:
  - Words to Remember
- Discuss:
  - We have explored many varieties of seeds and how each is unique in its own way.  You have watched seeds grow into plants.  We are now going to learn about the different parts of these plants.
  - How do negative geotropism and positive geotropism impact the growth of a plant? (The upward growth of plant shoots is an instance of negative geotropism; the downward growth of roots is positive geotropism.)
- View:
  - https://youtu.be/eDA8rmUP5ZM


- Discuss:
  - What do you observe about the roots in the radish and pea plants?
  - Relate this back to the Plant Parts diagram and use the correct words to describe the growth you observed.
- Explore:
  - If you buy a plant from a greenhouse, a tomato plant for example, the root system is firmly established when you buy the plant.
  - If you have a plant from the greenhouse (or use one of the plants you grew in previous weeks), examine the root system and identify the taproots and lateral roots.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Kentucky state flower
    - Louisiana state flower

Day 2:

- Review:
  - Words to Remember

- View:
    - 

    - 
- Discuss:
    - As you watch the videos, call out the part of the plant as it is formed.
- Explore:
    - Using a plant from the greenhouse or a plant you have grown, identify the
    - If plants are growing outside where you live (especially in the Spring), go for a walk to find budding and growing plants. Identify the parts of the plants using your Words to Remember.
- Explore more:
    - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
    - State flowers
        - Maine state flower
        - Maryland state flower

## Week 21

**Topics:**

- Parts of a plant
- Roots

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Root: the part of a plant that attaches it to the ground or to a support, typically underground, conveying water and nourishment to the rest of the plant via numerous branches and fibers
- Taproot: a straight tapering root growing vertically downward and forming the center from which subsidiary rootlets spring.
- Lateral roots: extend horizontally from the primary root (radicle) and serve to anchor the plant securely into the soil. This branching of roots also contributes to water uptake, and facilitates the extraction of nutrients required for the growth and development of the plant.
- Annual:  living for a year or less, perpetuating itself by seed
- Biennial: living or lasting for two years.
- Perennial:  produce herbage, flowers, and seeds every year, for an indefinite period of time
- Fusiform root: tapering at both ends; spindle-shaped.

- Premorse root: terminates as though it had been bitten off under the ground
- Branched root:  having lateral extensions or subdivisions extending from the main part
- Fibrous root: consisting of or characterized by fibers
- Tuberous root: a thick and fleshy root like a tuber but without buds
- Bulbous root: growing from a bulb
- Repent root: creeps along, either on the surface of the ground, or just under throwing out fibers which pierce the earth at intervals, and now and then shooting up its fruit stalk and leaves^
- Floating root: not fixed to any solid substance, but floating in the water.
- Genesis 1:9-13

**Textbook reference and written work:**

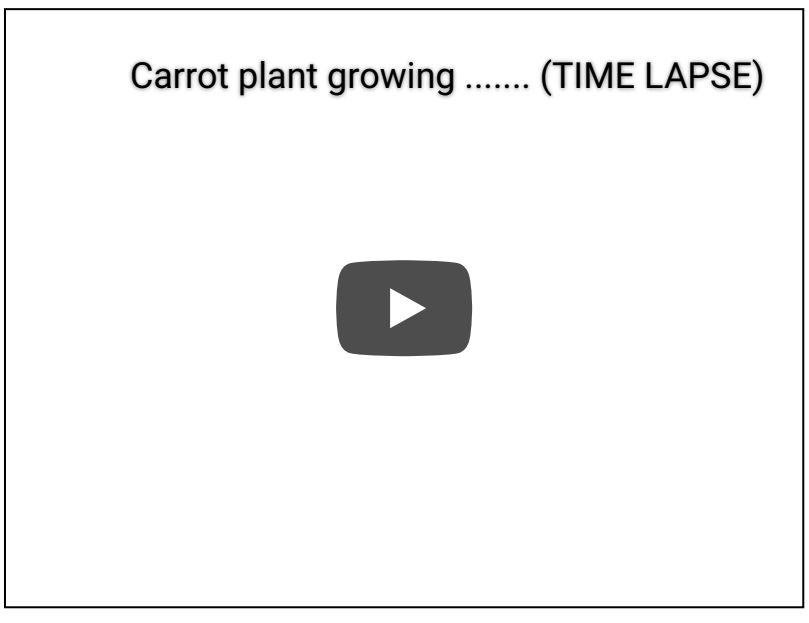
- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Roots- From The Young Botanist
- Bowl
- Water
- Carrot top

**Suggested Daily Schedule:**

Day 1:

- Review:
  - What are roots?
- Define:
  - Words to Remember
- Read:
  - #258-265 in Roots- From The Young Botanist
- Discuss:
  - If something is annual, how often does it happen?  What are some examples of things happening annually?  (birthday, Easter, etc.)
  - If something is biennial, how often does it happen?  What are some examples of things happening biennially? (perhaps local events happening every other year, etc.)
  - How is perennial different from annual and biennial?
  - Now look back at the section you read from The Young Botanist.  What are examples of each variously occurring root?
- View:
  - 

- Discuss:
  - What do you notice about the carrots?
- Explore:
  - Recreate the activity from the video.
    - Slice the top off a carrot (be sure the stem (green part) is intact)

    - Place the carrot in a bowl of shallow water
    - Watch the roots grow and discuss your observations (this takes about a week)
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Massachusetts state flower
    - Michigan state flower

Day 2:

- Review:
  - Words to Remember
- Read:
  - #266-288 of Roots- From The Young Botanist
- Discuss:
  -
- Explore:
  - Examine pictures or specimens from the various shapes of roots.
  - Can you find the taproot and lateral root?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Minnesota state flower
    - Mississippi state flower

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## Week 22

**Topics:**

- Parts of a plant
- Stems

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Stem: the main body or stalk of a plant or shrub, typically rising above ground but occasionally subterranean.
- Woody stem: solid stems of wood
- Pithy stem: The pith is the well known soft, elastic, light substance, contained in the center of many woody plants.
- Tubular stem: hollow or tubular stem
- Simple stem: unbranched stem
- Branched stem: stem is divided into limbs or branches
- Naked stem: stem without leaves or thorns
- Spiral stem:  stem that spirals to the right or left
- Culm: the hollow stem of a grass or cereal plant, especially that bearing the flower. ORIGIN mid 17th cent.: from Latin culmus ‘stalk.’
- Scape: a long, leafless flower stalk coming directly from a root. ORIGIN early 19th cent.: via Latin from Greek skapos ‘rod’; related to scepter.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts

- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Stems- From The Young Botanist
- Food coloring
- Celery with leafy tops
- Clear glasses or jars
- Water

**Suggested Daily Schedule:**

Day 1:

- Review:
  - What are roots?
- Define:
  - Words to Remember
- Read:
  - #233-243 in Stems- From The Young Botanist
- Explore:
  - How do stems work? Part I
    - Place 2 inches of water in the jars/glasses.
    - Add food coloring.  Bright/bold colors work the best.
    - Cut off the very bottom of the celery stalk
    - Place full celery stalks in the jars.
    - Check the stalks after 20 minutes.  What do you observe?
    - Continue checking every 20-30 minutes and record your observations.
    - What eventually happens to the leaves?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Missouri state flower
    - Montana state flower

Day 2:

- Review:
  - Words to Remember
- Read:
  - #244-257 of Stems- From The Young Botanist
- Discuss:
  -
- Explore:
  - Examine pictures or specimens from the various types of stems
- Explore:
  - How do stems work? Part II
    - Using the same method as in How do stems work? Part I, prepare your food coloring jars/glasses.
    - Instead of using full celery stalks, introduce variables to your activity (varying length, for example) and try to predict what will happen.  Does varying the stalk length change the amount of time it takes for the color to get to the leaves?
    - Record your observations.  Consider taking pictures to use as part of your observation recordings!
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Nebraska state flower
    - Nevada state flower

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## Week 23

**Topics:**

- Parts of a plant
- Stems

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Stem: the main body or stalk of a plant or shrub, typically rising above ground but occasionally subterranean.
- Woody stem: solid stems of wood
- Pithy stem: The pith is the well known soft, elastic, light substance, contained in the center of many woody plants.
- Tubular stem: hollow or tubular stem
- Simple stem: unbranched stem
- Branched stem: stem is divided into limbs or branches
- Naked stem: stem without leaves or thorns
- Spiral stem:  stem that spirals to the right or left
- Culm: the hollow stem of a grass or cereal plant, especially that bearing the flower. ORIGIN mid 17th cent.: from Latin culmus ‘stalk.’
- Scape: a long, leafless flower stalk coming directly from a root. ORIGIN early 19th cent.: via Latin from Greek skapos ‘rod’; related to scepter.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Stems- From The Young Botanist
- Tomato plant
- Clear glasses or jars
- Water

**Suggested Daily Schedule:**

Day 1:

- Review:
  - What are stems?
- View:
  - https://youtu.be/xRDt7640btk
- Discuss:
  - What was needed to create a new rose plant from the stem?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - New Hampshire state flower
    - New Jersey state flower

Day 2:

- Review:
  - Words to Remember
- View:
  - https://youtu.be/bpk3Ukbtnt0
- Explore:
  - With your tomato plant (or basil, if you prefer), root your own plant following the instructions in the video.
  - Be sure to make observations about the stem and roots as the days pass.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)

    - State flowers
        - New Mexico state flower
        - New York state flower

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## Week 24

**Topics:**

- Parts of a plant
- Leaves

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Leaf: a flattened structure of a higher plant, typically green and bladelike, that is attached to a stem directly or via a stalk. Leaves are the main organs of photosynthesis and transpiration.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Stems- From The Young Botanist
- Leaves
- Leaves- From The Young Botanist
-

**Suggested Daily Schedule:**

Day 1:

- Review:
    - What are stems?
- View:
    - 

- Discuss:
    - In these time-lapses, what do you notice about the relationship between roots, stems, and leaves?
- Explore more:
    - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
    - State flowers

    - North Carolina state flower
    - North Dakota state flower

Day 2:

- Review:
  - Words to Remember
- Read:
  - Leaves- From The Young Botanist
- Discuss:
  - How are leaves categorized?
- Explore:
  - Take a walk and see how many types of leaves you can find.  As you come across leaves, discuss the categories in which they fit.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Ohio state flower
    - Oklahoma state flower

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## Week 25

**Topics:**

- Parts of a plant
- Leaves

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Leaf: a flattened structure of a higher plant, typically green and bladelike, that is attached to a stem directly or via a stalk. Leaves are the main organs of photosynthesis and transpiration.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Stems- From The Young Botanist
- Leaves
- Leaves- From The Young Botanist
-

**Suggested Daily Schedule:**

Day 1:

- Review:
  - How can we categorize leaves?
- View:


- Discuss:
  - In these time-lapses, what do you notice about the leaves?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Oregon state flower
    - Pennsylvania state flower

Day 2:

- Review:
  - Words to Remember
- View:

- Discuss:
  - What did you notice about the leaves?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Rhode Island state flower
    - South Carolina state flower

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## Week 26

**Topics:**

- Parts of a plant
- Flowers

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Flower: the seed-bearing part of a plant, consisting of reproductive organs (stamens and carpels) that are typically surrounded by a brightly colored corolla (petals) and a green calyx (sepals).
- Stigma:  the part of a pistil that receives the pollen during pollination.

- Style: a narrow, typically elongated extension of the ovary, bearing the stigma.
- Filament: the slender part of a stamen that supports the anther.
- Perianth: the outer part of a flower, consisting of the calyx (sepals) and corolla (petals). ORIGIN early 18th cent.: from French périanthe, from modern Latin perianthium, from Greek peri ‘around’ + anthos ‘flower.’
- Petal/Corolla: the petals of a flower, typically forming a whorl within the sepals and enclosing the reproductive organs. ORIGIN late 17th cent. (in the sense ‘little crown’): from Latin, diminutive of corona ‘wreath, crown, chaplet.’
- Sepal/Calyx: the sepals of a flower, typically forming a whorl that encloses the petals and forms a protective layer around a flower in bud. ORIGIN late 17th cent.: from Latin, from Greek kalux ‘case of a bud, husk,’ related to kaluptein ‘to hide.’
- Ovule: the part of the ovary of seed plants that contains the female germ cell and after fertilization becomes the seed.
- Ovary: the hollow base of the carpel of a flower, containing one or more ovules. ORIGIN mid 17th cent.: from modern Latin ovarium, from Latin ovum ‘egg.’
- Nectary: a nectar-secreting glandular organ in a flower (floral) or on a leaf or stem (extrafloral).
- Floral axis: stem holding the reproductive parts of a flower
- Articulation: the part of a plant at which natural separation occurs, such as the joint between leaf and stem
- Pedicel: a small stalk bearing an individual flower in an inflorescence. ORIGIN late 17th cent.: from modern Latin pedicellus ‘small foot,’ diminutive of pes, ped- ‘foot.’
- Anther: the part of a stamen that contains the pollen.
- Microsporangium: a sporangium containing microspores.
- Stamen: the male fertilizing organ of a flower, typically consisting of a pollen-containing anther and a filament. ORIGIN mid 17th cent.: from Latin, literally ‘warp in an upright loom, thread.’
- Connective: the tissue joining the two cells of the anther.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Flowers- from The Young Botanist
-

**Suggested Daily Schedule:**

Day 1:

- Review:
  - How can we categorize leaves?
- Read:
  - Flowers- from The Young Botanist p. 17-20
- Define:
  - Words to remember
- Discuss:
  - Look at the flower structure and the words used for each structure.  How does the etymology of the word help us understand the structure or function of a particular part?
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - South Dakota state flower
    - Tennessee state flower

Day 2:

- Review:
  - Words to Remember
- Read:
  - Flowers- from The Young Botanist p. 21-40

- Explore:
  - Go on  a walk and see how many different kinds of flowers you can see.  Be sure to describe the flowers using the language of a botanist.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Texas state flower
    - Utah state flower

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## Week 27

**Topics:**

- Parts of a plant
- Flowers

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Flower: the seed-bearing part of a plant, consisting of reproductive organs (stamens and carpels) that are typically surrounded by a brightly colored corolla (petals) and a green calyx (sepals).
- Stigma:  the part of a pistil that receives the pollen during pollination.
- Style: a narrow, typically elongated extension of the ovary, bearing the stigma.
- Filament: the slender part of a stamen that supports the anther.
- Perianth: the outer part of a flower, consisting of the calyx (sepals) and corolla (petals). ORIGIN early 18th cent.: from French périanthe, from modern Latin perianthium, from Greek peri ‘around’ + anthos ‘flower.’
- Petal/Corolla: the petals of a flower, typically forming a whorl within the sepals and enclosing the reproductive organs. ORIGIN late 17th cent. (in the sense ‘little crown’): from Latin, diminutive of corona ‘wreath, crown, chaplet.’
- Sepal/Calyx: the sepals of a flower, typically forming a whorl that encloses the petals and forms a protective layer around a flower in bud. ORIGIN late 17th cent.: from Latin, from Greek kalux ‘case of a bud, husk,’ related to kaluptein ‘to hide.’
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- Ovary: the hollow base of the carpel of a flower, containing one or more ovules. ORIGIN mid 17th cent.: from modern Latin ovarium, from Latin ovum ‘egg.’
- Nectary: a nectar-secreting glandular organ in a flower (floral) or on a leaf or stem (extrafloral).
- Floral axis: stem holding the reproductive parts of a flower
- Articulation: the part of a plant at which natural separation occurs, such as the joint between leaf and stem
- Pedicel: a small stalk bearing an individual flower in an inflorescence. ORIGIN late 17th cent.: from modern Latin pedicellus ‘small foot,’ diminutive of pes, ped- ‘foot.’
- Anther: the part of a stamen that contains the pollen.
- Microsporangium: a sporangium containing microspores.
- Stamen: the male fertilizing organ of a flower, typically consisting of a pollen-containing anther and a filament. ORIGIN mid 17th cent.: from Latin, literally ‘warp in an upright loom, thread.’
- Connective: the tissue joining the two cells of the anther.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Flowers- from The Young Botanist

- 

**Suggested Daily Schedule:**

Day 1:

- Review:
  - Words to Remember
- View:


- Discuss:
  - What do you observe in the video?  Be sure to use the language of a botanist.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Vermont state flower
    - Virginia state flower

Day 2:

- Review:
  - Words to Remember
- View:

- Discuss:
  - What do you observe in the videos?  Be sure to use the language of a botanist.
- Explore more:

- As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
- State flowers
  - Washington state flower
  - West Virginia state flower

## Week 28

**Topics:**

- Parts of a plant
- Flowers

**Words to Remember:**

- Plants: a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. ORIGIN Old English plante‘seedling,’ plantian (verb), from Latin planta ‘sprout, cutting’ (later influenced by French plante) and plantare ‘plant, fix in a place.’
- Flower: the seed-bearing part of a plant, consisting of reproductive organs (stamens and carpels) that are typically surrounded by a brightly colored corolla (petals) and a green calyx (sepals).
- Stigma:  the part of a pistil that receives the pollen during pollination.
- Style: a narrow, typically elongated extension of the ovary, bearing the stigma.
- Filament: the slender part of a stamen that supports the anther.
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- Stamen: the male fertilizing organ of a flower, typically consisting of a pollen-containing anther and a filament. ORIGIN mid 17th cent.: from Latin, literally ‘warp in an upright loom, thread.’
- Connective: the tissue joining the two cells of the anther.
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Flowers- from The Young Botanist
-

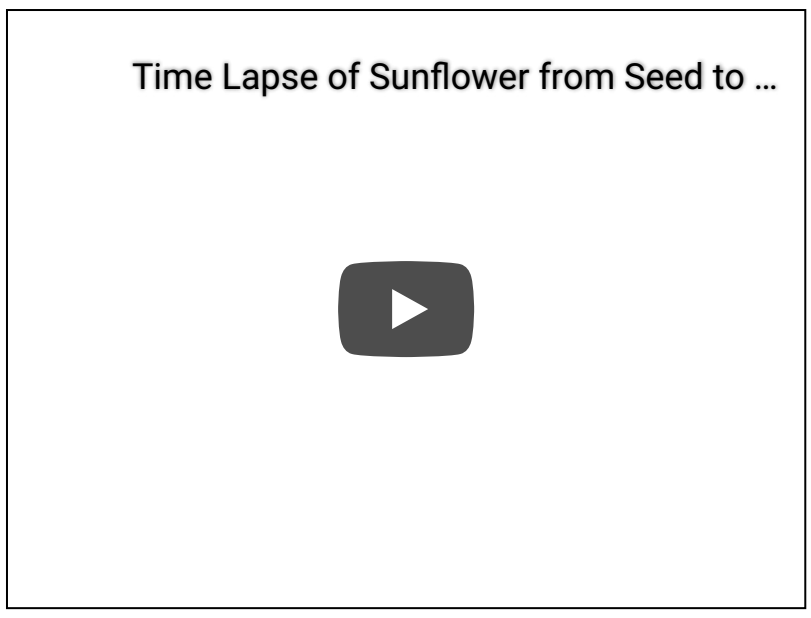
**Suggested Daily Schedule:**

Day 1:

- Review:
  - Words to Remember
- Discuss:
  - A plant's number one priority is always to reproduce.
  - We know the structures of a plant that are involved in reproduction, but how does it happen?
  - One plant with a fairly straight-forward pollination method is corn.  The following video explains how these structures work and why they do what they do.
- View:
  - 


- Discuss:
  - What do you observe in the video?  Be sure to use the language of a botanist.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Wisconsin state flower

Day 2:

- Review:
  - Words to Remember
- View:
  - 


- Discuss:
  - What do you observe in the video?  Be sure to use the language of a botanist.
- Explore more:
  - As we study plants, we will learn that certain plants are important to certain states.  Why might certain flowers grow in certain states and not others? (climate, soil, etc.)
  - State flowers
    - Wyoming state flower

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## Week 29

**Topics:**

- Soil

**Words to Remember:**

- Soil: the upper layer of earth in which plants grow, a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles ORIGIN late Middle English: from Anglo-Norman French, perhaps representing Latin solium ‘seat,’ by association with solum ‘ground.’
-

- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Flowers- from The Young Botanist
-

**Suggested Daily Schedule:**

Day 1:

- Review:
  - Words to Remember
- Discuss:
  - Plants need sun and water to grow, but they also need soil.
  - Recall the parable of the sower.  The seed was scattered over many types of soil.  Yet, some types of soil were better than others for growing the plants.
  - Modern agronomists also categorize soil by its characteristics.  Here are the twelve orders of soil according to the U.S. Department of Agriculture:
    - Gelisols: Frozen
    - Histosols: Organic, wet
    - Spodosols: Sandy, acidic
    - Andisols: Volcanic ash
    - Oxisols: Very weathered
    - Vertisols: Shrink and swell
    - Aridisols: Very dry
    - Ultisols: Weathered
    - Mollisols: Deep, fertile
    - Alfisols: Moderately weathered
    - Inceptisols: Slightly developed (young)
    - Entisols: Newly formed
- Explore:
  - Look at the orders of soil above.  Notice that each words ends in sols.  That, as you recall, is the Latin word for ground and from which we get the word soil.  But what about the beginning of each word?
  - With a good dictionary (or a Latin dictionary), look up each word and discover how the Latin fits with the English.

Day 2:

- Review:
  - Words to Remember
- Discuss: *(some information from http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=stelprdb1236841)*
  - There are different orders of soil and there are different layers of these soils.
  - The surface layer, sometimes called the horizon layer, is the layer we see.  Sometimes we call this the topsoil.  The topsoil has the greatest accumulation of organic matter.  Farmers are always concerned with the organic matter and nutrients of the topsoil.
  - Below the topsoil is the subsoil.  The subsoil contains the maximum accumulation of clay minerals, iron and aluminum oxides and other compounds.
  - Finally, the substratum is an underlying layer or substance, in particular, a layer of rock or soil beneath the surface of the ground.

    - Recall all of the minerals we studied at the beginning of the academic year.  Many of these elements are contained in the soil and needful for the growth of plants.
- Explore:
    - Did you know that each state has a state soil?  Just as we have state flowers, each state also has a state soil.  While soil certainly varies within a state, just as the bird population varies within the state, these are the soils that each state hold up as significant to their state.
    - Visit http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=stelprdb1236841 , find your state, and learn about your state soil.  Find the state soil of neighboring states.  How is it similar or different than the soils around it?
- Explore more:
    - Print out all of the state soil pages and arrange so that when you are done, they are all geographically correct.  In other words, the Iowa soil page should have the Minnesota soil page north of it, the Illinois soil page to the east of it, the Missouri soil page to the south, and the Nebraska soil page to the west.  Keep going until it looks like a United States map of soil.
        - If you want, cut the soil picture into the shape of the state and make an actual map.
    - What trends or patterns do you see in the soils?

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## Week 30

**Topics:**

- Soil

**Words to Remember:**

- Soil: the upper layer of earth in which plants grow, a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles ORIGIN late Middle English: from Anglo-Norman French, perhaps representing Latin solium ‘seat,’ by association with solum ‘ground.’
-
- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz
- Flowers- from The Young Botanist
- Bean seeds
- Sand
- Potting soil
- Gravel
- Clay (from the ground, not modeling clay)
- Water
- Sun
- Cups
- 8 ounces each of tap water, milk, iced tea, vinegar (either white or cider), orange juice, and club soda
- One package of bean seeds
- Six (10- or 12-ounce) glass or plastic cups, all the same color and size
- Permanent marker
- Tray or shallow pan
- Metric ruler
- Paper towels
- Which soil? chart
- Which liquid? chart

**Suggested Daily Schedule:**

Day 1:

- Review:
  - Words to Remember
- Discuss:
  - You have learned that there are many variations within soil.  Which soils are capable of growing a plant?
- Explore:
  - Label one cup sand, one cup soil, one cup gravel, and one cup clay
  - Plant 3 bean seeds in each cup.
  - Water your seeds and set them by a window in the sun.
  - Hypothesize which types of soil will produce bean plants.
  - Make observations of your beans each day and record them on the Which Soil? chart

Day 2:

- Review:
  - Words to Remember
- Explore: *(from http://www.infoplease.com/cig/science-fair-projects/liquids-do-seeds-grow-best.html)*
  - Taste each of the liquids.  Which do you think will allow the bean seeds to germinate?f
  - Using the permanent marker, label each of the six cups with the name of the liquid it will contain.
  - Place the cups on the tray or shallow pan.
  - Pour 8 fluid ounces (240 ml) of water (your control liquid) into the cup labeled *water*.
  - Pour 8 fluid ounces (240 ml) of each of the other liquids into its proper cup.
  - Open the package of seeds and divide them evenly into six piles. You might have a few seeds left over that you won't use.
  - Slowly add the seeds from the first pile into the cup labeled *water*.
  - Continue putting the other piles of seeds into each of the five remaining cups.
  - Place the tray with the cups where you can easily observe the seeds. You'll want to keep the temperature as constant as possible, so make sure the seeds are in an area where there are no drafts. And, make sure the seeds won't get bumped or knocked over.
  - Keep a daily record of your observations. To do so, write down how many seeds are in each cup, and how many seeds break their shells and begin growing, or germinating, every day. Use the Which liquid? chart.
  - A week after you placed the seeds in the various liquids, measure each sprout. If your seeds haven't sprouted yet, sit tight and begin measuring them at two weeks. You'll need to record the length of each sprout in every cup. You can make it easier to measure the sprouts by removing each one, placing it on a paper towel, and measuring its length with a metric ruler. Once you've measured every sprout, you'll need to figure out the average length of the sprouts in each liquid.
  - Once the seeds sprout, use the other page of the Which liquid? chart to record the lengths of the sprouts in each liquid.
  - Which liquid was best for germinating beans?

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## Week 31

**Topics:**

- Soil

**Words to Remember:**

- Soil: the upper layer of earth in which plants grow, a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles ORIGIN late Middle English: from Anglo-Norman French, perhaps representing Latin solium ‘seat,’ by association with solum ‘ground.’
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- Genesis 1:9-13

**Textbook reference and written work:**

- Genesis 1:9-13 (verses 9-13 are the theme verses for 3rd Grade)
- Periodic Table of Elements or PTable
- (Teacher resource) Are Plants Alive?
- (Teacher resource) Plant Kingdom

**Materials:**

- Bible
- Science binder in which to take notes
- Computer to watch videos
- Plant Parts
- Plant Parts Quiz
- Mature Flower
- Mature Flower Quiz

- Flowers- from The Young Botanist

**Suggested Daily Schedule:**

Day 1:

- Review:
  - Be sure to continue recording observations about your beans
- View:
  - 
  - 

- Discuss:
  - Are you observing anything like in the videos with your bean seeds?

Day 2:

- Review:
  - Words to Remember
- Explore: *(from http://www.infoplease.com/cig/science-fair-projects/liquids-do-seeds-grow-best.html)*
  - People have said many things about soil over the years.  Choose one or more of the statements and write a Chreia.
    - "I bequeath myself to the dirt, to grow from the grass I love; If you want me again, look for me under your boot-soles." --- *Walt Whitman*
    - "For all things come from earth, and all things end by becoming earth." --- *Xenophanes, 580 B.C.*
    - "We know more about the movement of celestial bodies than about the soil underfoot." --- *Leonardo DaVinci, circa 1500s*
    - "To be a successful farmer one must first know the nature of the soil." --- *Xenophon, Oeconomicus, 400 B.C.*
    - "I would rather be tied to the soil as a serf ... than be king of all these dead and destroyed." --- *Homer, Odyssey*

## Week 32

Not available

## Week 33

Not available

## Week 34

Not available

## Week 35

Not available

## Week 36

Not available