Course Blocks

2nd 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!

2nd Grade Handbook of Nature Study

News forum

Week 1

Topics:

- Creation
- Days of Creation
- Day 2

Words to Remember:

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

Textbook reference and written work:

- Read Genesis 1, then reread Genesis 1:6-8 (verses 6-8 are the theme verses for 2nd 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 second 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 1:6-8
    - 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 2nd Day? (verse 6-8)
            - 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 2nd 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)?

Week 2

Topics:

- Temperature
- Thermometers
- Galileo

Words to Remember:

- Temperature: the degree or intensity of heat present in a substance or object (ORIGIN late Middle English: from French température or Latin temperatura, from temperare ‘restrain.’ The word originally denoted the state of being tempered or mixed, later becoming synonymous with temperament. The modern sense dates from the late 17th cent.)
- Thermometer: an instrument for measuring and indicating temperature (ORIGIN mid 17th cent.: from French thermomètre or modern Latin thermometrum, from thermo-‘of heat’ + -metrum ‘measure.’)
- Galileo: (1564–1642), Italian astronomer and physicist
- Celcius (or Centigrade): the scale of temperature in which water freezes at 0° and boils at 100° under standard conditions.
- Fahrenheit: a scale of temperature on which water freezes at 32° and boils at 212° under standard conditions (ORIGIN mid 18th cent.: named after Gabriel Daniel Fahrenheit (1686–1736), German physicist.)

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 790-791 (Temperature and thermometers)
- 2nd Grade Handbook of Nature Study p. 781-782 (Galileo)
- Teacher reference (

Materials:

- Thermometer visual
- Coloring tools
- Plastic water bottle
- Modeling clay
- Clear plastic straw
- Food coloring
- Rubbing Alcohol
- Thermometer

Suggested Daily Schedule:

Day 1:

- Famous scientist: Galileo
  - Show picture of Galileo (optional)
  - Discuss: Who was Galileo? What did he contribute to the study of air temperature?
- Discuss: Temperature
  - What is temperature?
    What are some different situations in which we use temperature?
    - Deciding what to wear, cooking, deciding if you should swim, etc.
    - Using the thermometer visual, have students draw things that happen when it is hot and when it is cold
- Discuss: Measuring temperature
  - Define Fahrenheit (where did it get it's name, where is it used, etc.)
  - Define Celsius (centigrade) (where did it get it's name, where is it used, etc.)
  - Note: if students are familiar with inches and centimeters, use them as a comparison point for Fahrenheit and Celcius)- two different ways to measure the same thing
- Discuss: Thermometer
  - Did you see the little picture on each side of your temperature chart? Does anyone know what that is?
  - What do we use thermometers for?

Day 2: Make a thermometer

- Review discussion about thermometers from previous session
- Science experiment:
  - Put a few drops of food coloring into the water bottle and fill it to the top with lukewarm water.
  - Insert the straw a couple inches into the bottle and mold the clay around it to seal the bottle and hold it in place. When you have a tight seal, water should go up into the straw.
  - Use a marker to mark the level of the water in the straw.
  - Set the bottle in a bowl of hot water. Watch the water level for awhile and then mark the level again.
  - Set the bottle in a bowl of ice and watch what happens, then mark the level.

  - What's happening?

    As water heats up, it expands and becomes less dense, rising to the surface. When it cools down, it contracts, becoming more dense and sinking down. This cycle is called **convection**. (Water is unique, however - when it gets cold enough to freeze, the molecules line up in an open crystalline structure that is actually less dense than the liquid form. This is why ice floats.) When the water in your bottle thermometer heated up, it expanded. But since the bottle was sealed, it had nowhere to go but up through the straw.

    Real thermometers don't use water inside because it doesn't respond to temperature change very quickly. Try filling your bottle with 50% rubbing alcohol and 50% water. Does the liquid move up and down the straw faster? Why do you think this is?

    With your homemade thermometer you aren't actually measuring temperature, just seeing temperature changes. If you have a real thermometer, you can use it to make a scale on your homemade thermometer: let your bottle get to room temperature and then mark the straw with what the actual room temperature is. Then set the bottle in the sun and do the same. Mark several different temperature levels and then watch your thermometer for a day and see how accurate it is.

Week 3

Topics:

- Air pressure
- Barometer
- Torricelli

Words to Remember:

- Barometer: an instrument measuring atmospheric pressure, used esp. in forecasting the weather and determining altitude. ORIGIN mid 17th cent.: from Greek baros ‘weight’ + -meter.
- Torricelli, Evangelista |ˌtôrə'CHelē| (1608–47), Italian mathematician and physicist. He invented the mercury barometer, with which he demonstrated that the atmosphere exerts a pressure sufficient to support a column of mercury in an inverted closed tube.
- Atmospheric pressure: the pressure exerted by the weight of the atmosphere, which at sea level has a mean value of 101,325 pascals (roughly 14.6959 pounds per square inch). Also called barometric pressure.
- Isobar: a line on a map connecting points having the same atmospheric pressure at a given time or on average over a given period. ORIGIN mid 19th cent.: from Greek isobaros ‘of equal weight,’ from isos ‘equal’ + baros ‘weight.’

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 781-789 (atmospheric pressure and barometers)
- 2nd Grade Handbook of Nature Study p. 781 (Toricelli)
- Teacher reference (

Materials:

- Barometer instructions
- glass jar or tin can
- large round balloon
- rubber band
- scissors
- tape
- small stirring stick
- 5x7 index card

Suggested Daily Schedule:

Day 1:

- Famous scientist: Toricelli
  - Show picture of Toricelli (optional)
  - Read: Read about Toricelli's life here
  - Discuss:
    - Who was Toricelli? What did he contribute to the study of weather?
    - Many of the famous scientists who discovered great things were also teachers. Who was Toricelli's teacher?
- Discuss: Atmospheric pressure
  - What is atmospheric pressure?
  - When do we use atmospheric pressure?
    - When forecasting changes in weather
- Discuss: Measuring atmospheric pressure
  - Define barometer
  - Define atmospheric pressure
  - Define isobar
    - Look especially at the origin of isobar and barometer. Why does it make sense that the barometer and isobar both contain weight in their origin?
- Explore: Measuring atmospheric pressure
  - Look up a map showing atmospheric pressure for your location (the isobar only maps work well in conjunction with maps with temperature only)
  - What patterns or similarities do you see between various maps?

Day 2: Make a barometer

- Review discussion about barometers from previous session
- Scientists use barometers to get atmospheric pressure readings. These help them do many things, including forecast the weather.
- Science exploration:
  - Use the Barometer instructions to make and observe a simple barometer
  - Take readings for several days.
  - Note also the temperature, any precipitation, etc.
  - What correlations do you see between pressure, precipitation, etc.?

Week 4

Topics:

- Storms
- Structure and movement of storms

Words to Remember:

- Eddies
- Benjamin Franklin

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 781-783
- (Teacher reference) Memoirs of Benjamin Franklin- excerpt about water spouts and whirlwinds

Materials:

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Suggested Daily Schedule:

Day 1:

- Make weather observations with your barometer
- Famous scientist: Benjamin Franklin
  - Show picture of Franklin (optional)
  - Explore: Look at this picture of Benjamin Franklin
    - What can we learn about Franklin from this painting? (The pen symbolizes his writing. The lightning symbolizes his scientific work)
- Benjamin Franklin made several contributions to science. Another contribution he made was mapping the gulf stream.
  - Look at this writing and map from Franklin
    - Note: Remember that s's look like f's in many writings
  - Look at the map. What do you observe?
  - Read Franklin's writeup next to the map. Why was knowing about and mapping the Gulf Stream important?
- Bonus reading: The Autobiography of Benjamin Franklin

- Bonus reading: Memoirs of Benjamin Franklin- excerpt about water spouts and whirlwinds
- Discuss:
  -

Day 2: Founding Fathers and weather

- Make weather observations with your barometer
- Benjamin Franklin was not the only Founding Father with an interest in weather. Thomas Jefferson was also very interested in weather. In fact, we can observe his weather observations from 1776-1818
  - Take a look at the observations
  - What things did Jefferson record? (you will have to click 'Next Record' at the top of the page to turn the pages)
  - What things were going on during this time?
  - What is the value of making weather observations over time?
  -

Week 5

Topics:

- History of Weather and Storm Reporting

Words to Remember:

- Cooperative Weather Observing program

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p.
-

Materials:

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Suggested Daily Schedule:

Day 1:

- Review: What role did Thomas Jefferson and Benjamin play in the history of weather observation and reporting?
- Famous scientist: John Campanius Holm
  - Read a bit about Holm
  - Explore more: Holm
- Discuss:
  - Based on all of your readings, what were some of the many things that Holm did during his life?

Day 2:

- Read: Signal Service Years (see below)
- Discuss:
  - How did the Signal Service change over the years?

- What did the members of the Signal Service do to serve their neighbor? (discuss as many as you are able)
- Look up 'science' in Webster's 1828 Dictionary
  - Based on this definition, which part of the work of Signal Service workers is art and which is science?

Signal Service Years (1600 - 1891)

Week 6

Topics:

- Weather maps

Words to Remember:

- Weather: the state of the atmosphere at a place and time as regards heat, dryness, sunshine, wind, rain, etc. ORIGIN Old English weder, of Germanic origin; related to Dutch weer and German Wetter, probably also to the noun wind
- Meteorologist: a person who studies the branch of science concerned with the processes and phenomena of the atmosphere, especially as a means of forecasting the weather. ORIGIN early 17th cent.: from Greek meteōrologia, from meteōron 'of the atmosphere'
- Cold Front - a zone separating two air masses, of which the cooler, denser mass is advancing and replacing the warmer.
- Warm Front - a transition zone between a mass of warm air and the cold air it is replacing.
- Stationary Front - a front between warm and cold air masses that is moving very slowly or not at all.
- Occluded Front - a composite of two fronts, formed as a cold front overtakes a warm or quasi-stationary front. Two types of occlusions can form depending on the relative coldness of the air behind the cold front to the air ahead of the warm or stationary front. A cold occlusion results when the coldest air is behind the cold front and a warm occlusion results when the coldest air is ahead of the warm front.
- Trough - an elongated area of relatively low atmospheric pressure; the opposite of a ridge.
- Squall Line - a line of active thunderstorms, either continuous or with breaks, including contiguous precipitation areas resulting from the existence of the thunderstorms.
- Dry Line - a boundary separating moist and dry air masses. It typically lies north-south across the central and southern high Plains states during the spring and early summer, where it separates moist air from the Gulf of Mexico (to the east) and dry desert air from the southwestern states (to the west).
- Tropical Wave - a trough or cyclonic curvature maximum in the trade wind easterlies.
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Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 799-805
-

Materials:

- Weather maps
  - Note: use of resources, such as maps from NOAA, is not an endorsement of the organizations producing the resources
- Weather map symbols

Suggested Daily Schedule:

Day 1:

- In the coming weeks we will be learning about many aspects of weather. Scientists take a snapshot of the weather with a weather map. This week we will learn about the different pieces of information on a weather map and in the coming weeks we will learn about each piece.
- Define:
  - the Words to Remember
- Read:
  - Look at the weather map symbols.
  - Discuss what each symbol means
- Look at the weather map.
- Discuss:
  - Identify the symbols on the map.
  - What do these symbols tell you about the weather around the country?

Day 2:

- Read: 2nd Grade Handbook of Nature Study p. 799-805
- Explore:

    - Using your Weather map symbols, look at a weather map. Specifically, look for the weather where you live, look at where relatives live (especially if they live in a different part of the country).
    - If you don't have relatives around the country, look at the weather for some other category (favorite sports team, landmark, somewhere you have visited, etc.)
    - Who might receive the air mass after you?
    - What air temperature might you receive next?
    - Feel free to answer these questions for additional locations you found before.
- Note:
    - For warm fronts and cold fronts, the triangles or circles are pointing in a direction the air mas is moving.
    -

Week 7

Topics:

- Composition of air

Words to Remember:

- Oxygen (O_2): 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) ORIGIN late 18th cent.: from French (principe) oxygène ‘acidifying constituent’ (because at first it was held to be the essential component in the formation of acids).
- Nitrogen (N_2): the chemical element of atomic number 7, a colorless, odorless unreactive gas that forms about 78 percent of the earth's atmosphere. (Symbol: N) ORIGIN late 18th cent.: from French nitrogène (see nitro-,-gen) .
- Carbon dioxide (CO_2): a colorless, odorless gas produced by burning carbon and organic compounds and by respiration. It is naturally present in air (about 0.03 percent) and is absorbed by plants in photosynthesis.
- Water vapor (H_2O): gaseous phase of water
- Ozone (O_3): a colorless unstable toxic gas with a pungent odor and powerful oxidizing properties, formed from oxygen by electrical discharges or ultraviolet light. It differs from normal oxygen (O_2) in having three atoms in its molecule (O_3). ORIGIN mid 19th cent.: from German Ozon, from Greek ozein ‘to smell.’
- Methane (CH_4): a colorless, odorless flammable gas that is the main constituent of natural gas. It is the simplest member of the alkane series of hydrocarbons.
- Polyatomic: consisting of many atoms

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 783-788
- A Unique Blend
-

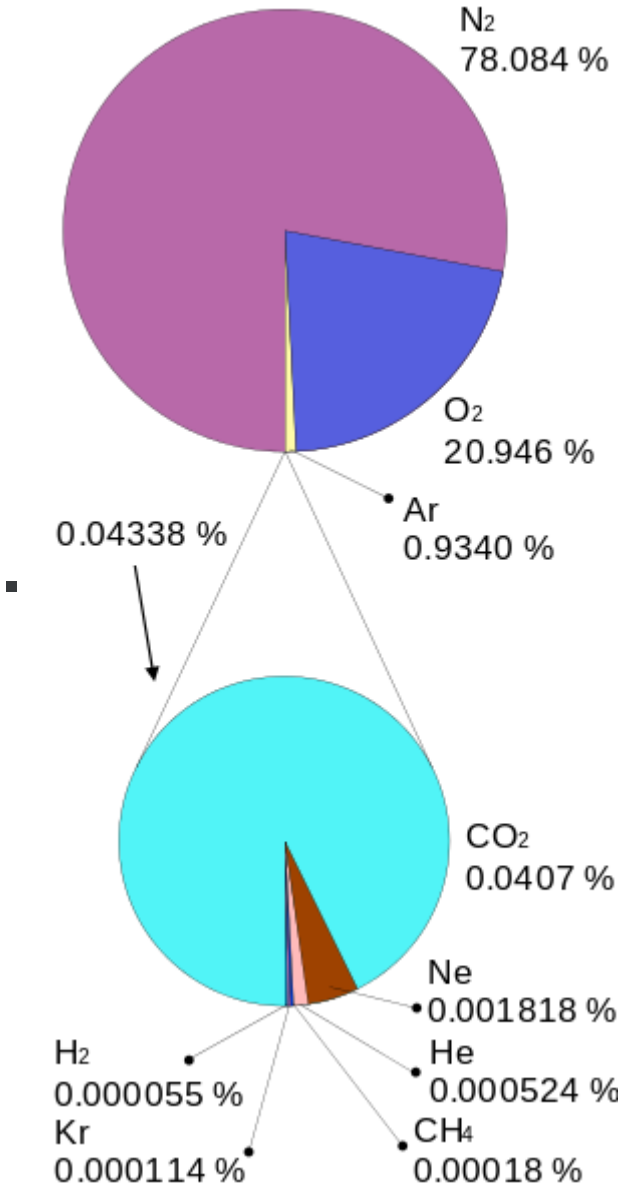
Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle

Suggested Daily Schedule:

Day 1:

- Weather happens in the atmosphere. The atmosphere is made of many different elements.
- Define:
    - Oxygen (O_2)
    - Nitrogen (N_2)
    - Carbon dioxide (CO_2)
    - Water vapor (H_2O)
    - Ozone (O_3)
    - Methane (CH_4)
    - Polyatomic
- Read:
    - A Unique Blend
- Discuss:
    - Of what is Earth's atmosphere composed?
    - What makes Earth's atmosphere unique?
    - How does God sustain life with the atmosphere He created?
    - Reference graphic:



Day 2:

- Read: 2nd Grade Handbook of Nature Study p. 799-805
- Read the Fourth Petition of the Lord's Prayer from *Luther's Small Catechism*.
- Explore:
  - Look at the following diagrams:
    - Oxygen Cycle
    - Nitrogen Cycle
    - Water Cycle
  - Define the words on the diagrams that are unfamiliar.
  - After looking at the diagrams, discuss all of the things God orders in order to provide "everything that has to do with the support and needs of the body."
    - Think about how these things impact food, drink, clothing, shoes, etc.
    - This is a great opportunity to discuss vocation, too!
- Explore further:
  - Put a bucket of water outside for several days. Draw a line with a marker to note the water level on the first day. Check the water each day and make marks as the water level drops (or rises if it rains!).
  - Using the diagrams you studied earlier, explain why the water level changes.

Week 8

Topics:

- Composition of air

Words to Remember:

- Water vapor (H_2O): gaseous phase of water
- State: a physical condition as regards internal or molecular form or structure ORIGIN Middle English: partly a shortening of estate, partly from Latin status ‘manner of standing, condition’

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 783-788
- A Unique Blend
-

Materials:

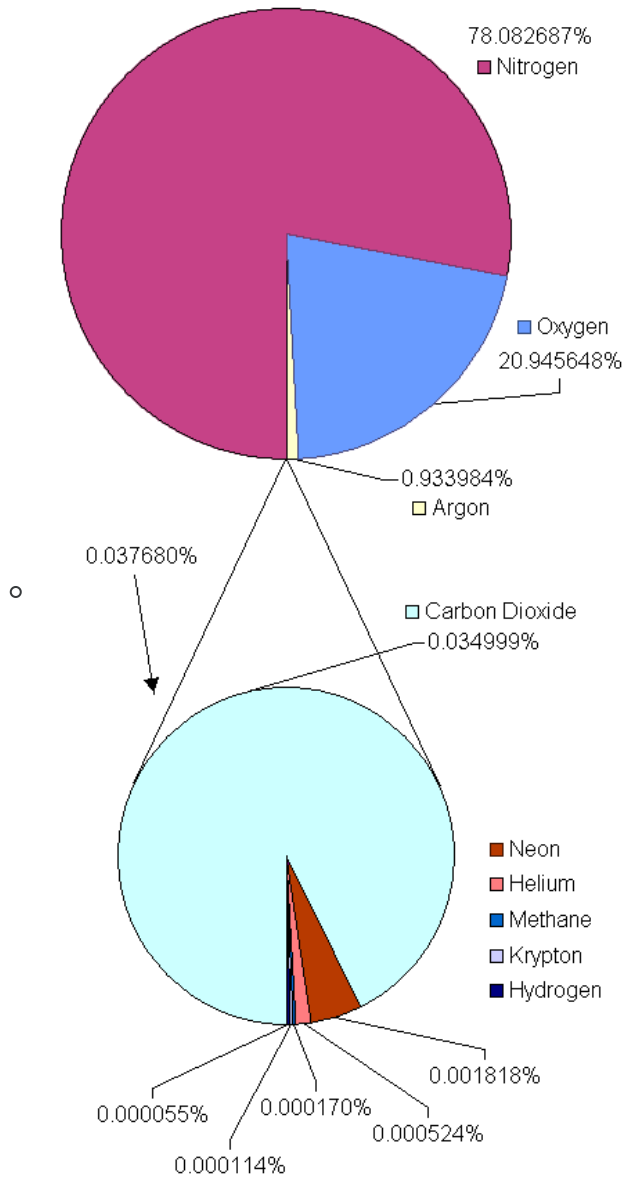
- Oxygen Cycle

- Nitrogen Cycle
- Water Cycle
- Large bowl
- Rubber band that will fit around the large bowl
- small bowl that will fit in the large bowl
- plastic wrap
- small weight or rock

Suggested Daily Schedule:

Day 1:

- Review:
  - What gasses make up the atmosphere?
- Define:
  - Water vapor
  - State
- Discuss:
  - The percentages of gasses in the atmosphere are relatively stable.



  - However, the amount of water vapor in the atmosphere (H_20) is variable.
- Read: Global Warming and Earth's Design
- Discuss:
  - What is the role of water vapor in the atmosphere?
  - What different forms can water vapor take? (solid, liquid, gas)

Day 2:

- Review the Water Cycle.
- Explore:
  - Watch the water cycle in action:
    - Put an inch of water in the bottom of the large bowl
    - Put the empty smaller bowl in the center of the large bowl
    - Cover the large bowl with plastic wrap and secure it with the rubber band. The plastic wrap should be loose (for the next step), but there should be no gaps between the plastic wrap and the edge of the bowl
    - Place the rock or weight in the center of the plastic wrap so that it creates a dip right above the small bowl (the condensed water will run down the plastic wrap and drip into the small bowl)
    - Carefully place the large bowl in the sun for several hours
    - Check back every 30 minutes and record your observations.

Week 9

Topics:

- Precipitation

Words to Remember:

- Evaporation: turn from liquid into vapor ORIGIN late Middle English: from Latin evaporat- ‘changed into vapor,’ from the verb evaporare, from e- (variant of ex-)‘out of’ + vapor ‘steam, vapor.’
- Condensation: the conversion of a vapor or gas to a liquid ORIGIN early 17th cent.: from late Latin condensatio(n-), from condensare ‘press close together’
- Precipitation: rain, snow, sleet, or hail that falls to the ground. ORIGIN late Middle English (denoting the action of falling or throwing down): from Latin praecipitatio(n-), from praecipitare ‘throw down or headlong’
- Atmosphere—especially the troposphere, where weather happens
- Hydrosphere—oceans, lakes, rivers, and so on
- Biosphere—plants and animals
- Cryosphere—frozen ground, especially in high elevations and high latitudes.

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 808-813
- Paper
- Crayons or colored pencils
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
-

Suggested Daily Schedule:

Day 1:

- Review:
  - What did you observe in your water cycle experiment?
  - Describe what you observed using the Words to Remember after you define them.
- Define:
  - Evaporation
  - Condensation
  - Precipitation
- Read: Global Warming: When Politics and Science Collide
  - Note: teachers may want to just summarize the article, especially as it relates to the following discussion
- Define:
  - Atmosphere—especially the troposphere, where weather happens
  - Hydrosphere—oceans, lakes, rivers, and so on
  - Biosphere—plants and animals
  - Cryosphere—frozen ground, especially in high elevations and high latitudes.
- Discuss:
  - Thinking about the water cycle and the other cycles about which you have learned, how do these relate to the earth systems you just defined?
  - Can the earth systems exist without one another?

Day 2:

- Review
  - Atmosphere
  - Hydrosphere
  - Biosphere
  - Cryosphere
  - Oxygen cycle
  - Water cycle
  - Nitrogen cycle
- Explore:
  - With your paper and colored pencils, demonstrate how one or more of the "cycles" unites the "'spheres."
  -

Week 10

Topics:

- Precipitation- Rain

Words to Remember:

- Evaporation: turn from liquid into vapor ORIGIN late Middle English: from Latin evaporat- ‘changed into vapor,’ from the verb evaporare, from e- (variant of ex-)‘out of’ + vapor ‘steam, vapor.’
- Condensation: the conversion of a vapor or gas to a liquid ORIGIN early 17th cent.: from late Latin condensatio(n-), from condensare ‘press close together’
- Precipitation: rain, snow, sleet, or hail that falls to the ground. ORIGIN late Middle English (denoting the action of falling or throwing down): from Latin praecipitatio(n-), from praecipitare ‘throw down or headlong’
- Rain: moisture condensed from the atmosphere that falls visibly in separate drops

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 808-813
- God's Water Cycle Protects and Provides

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Jar
- Hot water
- Ice cubes
- Plate

Suggested Daily Schedule:

Day 1:

- Review:
  - The water cycle
- Define:
  - Rain
- Read:
  - God's Water Cycle Protects and Provides
- Discuss:
  - Earlier we briefly discussed states of matter. Water exists in three states: solid, liquid, and gas. As a solid, we call water ice. As a liquid, we call water water. As a gas, we call water water vapor.
  - Water freezes at 32°F (0°C)
  - Water boils at 212° F (100°C)
  - We know that water can change states and we can observe that in science activities or with weather. Sometimes it is raining and the rain turns to hail. Sometimes it is raining and the rain turns to snow.
  - You have also looked at weather maps and have seen where fronts exist. (Review cold fronts, warm fronts, and stationary fronts)
  - Think back to God's Water Cycle Protects and Provides.
    - What happens for water to get from the sky back to land?

Day 2:

- Discuss:
  - If you were to draw a raindrop, how would it look?
  - Have students draw a raindrop (or many).
- Observe:

- Discuss:
  - After watching the videos of rain in slow motion, what do you observe about raindrops?
- Explore:
  - The next time it rains, take time to make a close, extended observation of the rain.
  - What do you observe?
- Explore more:
  - Pour hot water into the jar (the hotter the better).
  - Cover the jar with the plate.
  - Place the ice cubes on the top of the plate.
  - Observe what happens in the jar (be patient!).
    - Students should observe water droplets form on the bottom of the plate.
  - Using recent Words to Remember, explain what happened during your observation.
  - Think back to learning about weather maps. When a cold front and a warm front collide, what happens?

Week 11

Topics:

- Air pressure

Words to Remember:

- Air pressure: the force per unit area exerted on a surface by the weight of air above that surface in the atmosphere of Earth
- Molecule: a group of atoms bonded together, representing the smallest fundamental unit of a chemical compound that can take part in a chemical reaction. ORIGIN late 18th cent.: from French molécule, from modern Latin molecula, diminutive of Latin moles ‘mass.’

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 783-786
- Air Mass Experiment
- More Air Pressure Experiments
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle

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Suggested Daily Schedule:

Day 1:

- Review:
  - Oxygen Cycle
  - Nitrogen Cycle
  - Water Cycle
- Define:
  - Air pressure
  - Molecule
- Read:
  - 2nd Grade Handbook of Nature Study p. 783-786
- Discuss:
  - What molecules are in the air?
  - What molecules are involved in the water cycle, nitrogen cycle, and oxygen cycle?

Day 2:

- Discuss:
  - What is a molecule?
  - What are some examples of molecules?
- Read:
  - Air Mass Experiment (note: we will do the experiments next week)
  -
- Discuss:
  - According to the article, what accounts for differences in air pressure? (location)
- Explore:
  - Look at a weather map that shows air pressure (sometimes the map is called surface analysis). The map can be local or you can use a national map such as the one here.
  - If you use the national map that loops, be sure to click stop at the top of the page and click forward one day at a time to observe the changes in air pressure.
  - What do you observe?
  - Find approximately where you live. How did the air pressure change where you live? Do you recall the weather (temperature, precipitation, etc.) changing at all over the past days?
- Explore more:
  - Here is another lesson on using weather maps to analyze air pressure.

Week 12

Topics:

- Air pressure

Words to Remember:

- Air pressure: the force per unit area exerted on a surface by the weight of air above that surface in the atmosphere of Earth
- Molecule: a group of atoms bonded together, representing the smallest fundamental unit of a chemical compound that can take part in a chemical reaction. ORIGIN late 18th cent.: from French molécule, from modern Latin molecula, diminutive of Latin moles ‘mass.’

Textbook reference and written work:

- Read Genesis 1. After you are done, reread vs. 3-5
- 2nd Grade Handbook of Nature Study p. 783-786
- Air Mass Experiment
- More Air Pressure Experiments
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Clothes hanger
- Two balloons of the same size
- Two clothes pins

- Drinking glass
- Index card (that covers the entire mouth of the glass)
- Water
- Empty plastic bottle
- Table or flat surface
- Wadded ball of paper
-

Suggested Daily Schedule:

Day 1:

- Review:
  - What is air pressure?
- Define:
  -
- Read:
  - 2nd Grade Handbook of Nature Study p. 783-786
- Explore:
  - Air Mass Experiment
  - What did you observe?

Day 2:

- Discuss:
  -
- Explore:
  - More Air Pressure Experiments
  -
- Discuss:
  - What did you observe?
- Explore:
  -
- Explore more:
  -

Week 13

Topics:

- Air currents

Words to Remember:

- Prevailing Westerlies
- Northeast Trade Winds
- Southeast Trade Winds
- The six principles of convectional circulation:
  - 1. Low pressure at warm center.
  - 2. High pressure at cool margins.
  - 3. Ascending currents at warm center.
  - 4. Descending currents at cool margins.
  - 5. Surface winds from high pressure to low pressure.
  - 6. Upper currents from low pressure to high pressure.

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 791-798
- Air Mass Experiment
- More Air Pressure Experiments
-

Materials:

  - Oxygen Cycle
  - Nitrogen Cycle
  - Water Cycle
  - Matthew Fontaine Maury

-

Suggested Daily Schedule:

Day 1:

- Review:
  - What is air pressure?
- Discuss:
  - When we map land, we can look at it and measure it. There are instruments to measure long distances. Long before satellites could give us pictures of oceans, people wanted to make maps of winds and currents. Why might this have been important? (transportation and exploration was accomplished largely by ships)
  - One of the most influential people in the mapping of winds and currents was Matthew Fontaine Maury.
- Read: Matthew Fontaine Maury
- Discuss:
  - In what different ways did Maury serve his neighbor during his life?
- Define:
  -
- Read:
  -
- Explore:

Day 2:

- Review:
  - What is a molecule?
  -
- Read: 2nd Grade Handbook of Nature Study p. 791-798
- Define:
  - Prevailing Westerlies
  - Northeast Trade Winds
  - Southeast Trade Winds
  - The six principles of convectional circulation:
    - 1. Low pressure at warm center.
    - 2. High pressure at cool margins.
    - 3. Ascending currents at warm center.
    - 4. Descending currents at cool margins.
    - 5. Surface winds from high pressure to low pressure.
    - 6. Upper currents from low pressure to high pressure.
- Discuss:
  - What makes hot air rise and cold air fall? (p. 792-793)
  - Take your time working through the text. Use maps to point out the locations mentioned.
  - The diagrams from the text are also available here:
    - Prevailing winds
    - Air currents- sun
    - Pressure belts
    - Isobars of the world
    - Air currents- meridians
    - Circumpolar whirl
- Explore:
  -
- Discuss:
- Explore:
  -
- Explore more:
  -

Week 14

Topics:

- Frost

Words to Remember:

- Frost: a deposit of small white ice crystals formed on the ground or other surfaces when the temperature falls below freezing

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- The Six-Cornered Snowflake
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Kepler Snowflake template 1
- Kepler Snowflake template 2
- 2 tin cans without a lid
- Salt
- Crushed ice
- Cold tap water

Suggested Daily Schedule:

Day 1:

- Review:
  - What are the six principles of convectional circulation?
- Discuss:
  - We know that precipitation is rain, snow, sleet, or hail that falls to the ground.
  - We also know that water is ordered through the water cycle. Point out and discuss/review where precipitation happens during the water cycle.
  - Snow, rain, and sleet are all kinds of precipitation.
- Read: 2nd Grade Handbook of Nature Study p. 808-814
- Discuss:
  - You read about several water forms. What is frost?
  - As you are able, given the weather where you are, look for frost in the morning. If you do see frost, look very closely. What do you observe?
- Define:
  - Frost
  -
-

Day 2:

- Review: What is frost?
- View:

  -
- Discuss:
  - Read and discuss the questions 1-8 on p. 812-813.
- Explore: (from https://smartypots.wordpress.com/2012/12/11/easy-frost-science-experiment/)
  - Half fill one of the tin cans with the crushed ice, add 4 tablespoons of salt, and then mix it well for at least 30 seconds. Put this to one side, and let it stand.

- Half fill the other can with crushed ice, and then top it up with just enough cold water to cover the ice. Stand this next to the other can and watch what happens.

- Discuss:
  - What do you observe? (you should see frost forming on the outside of the can with the salt and ice mixture, but only dew forming on the outside of the ice and water mixture.)
  - What causes the differences between the surfaces of the two cans? (Salt naturally absorbs water to make a salt solution, but as the water is frozen, the salt tries to melt it first. The very odd thing is that as the salt tries to melt the ice, it actually makes the mixture cooler! This takes the salt/water mixture to below freezing level, and the moisture in the air which settles on the can turns into frost. The other can forms dew because the ice and water inside is only just at freezing level, and the can is warmer so the dew on the outside will not turn to frost.)
  - Salt lowers the freezing point. This is why people put salt on their sidewalks in the winter and why crews put salt or brine on roads in the winter.

Week 15

Topics:

- Snow

Words to Remember:

- Frost: a deposit of small white ice crystals formed on the ground or other surfaces when the temperature falls below freezing
- Snow: atmospheric water vapor frozen into ice crystals and falling in light white flakes or lying on the ground as a white layer

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- The Six-Cornered Snowflake
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Kepler Snowflake template 1
- Kepler Snowflake template 2

Suggested Daily Schedule:

Day 1:

- Review:
  - What causes frost to form?
- Read:
  - Begin The Six-Cornered Snowflake
- Discuss:
  - What questions did Kepler ask as he was pondering snowflakes?
  - What other examples did he use when describing God's ordered creation?

Day 2:

- Review:
  - What is snow?
- Read:
  - Finish The Six-Cornered Snowflake
- Discuss:
  - What questions did Kepler ask as he was pondering snowflakes?
  - What other examples did he use when describing God's ordered creation?
- Explore:
  - Using the Kepler Snowflake Templates, create these two example structures:
    - Kepler Snowflake template 1
    - Kepler Snowflake template 2
- Discuss:
  -

Week 16

Topics:

- Snow

Words to Remember:

- Frost: a deposit of small white ice crystals formed on the ground or other surfaces when the temperature falls below freezing
- Snow: atmospheric water vapor frozen into ice crystals and falling in light white flakes or lying on the ground as a white layer

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
- The Six-Cornered Snowflake
- Snowflake Bentley
- Photographing Snowflakes
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Kepler Snowflake template 1
- Kepler Snowflake template 2

Suggested Daily Schedule:

Day 1:

- Review:
  - What causes frost to form?
- Read:
  - Snowflake Bentley
- Discuss:
  - What questions did Bentley ask as he was pondering snowflakes?
  - Science is the intellectual and practical activity encompassing the systematic study of the structure and behavior of the physical and natural world through observation and experiment.
    - Systematic: done or acting according to a fixed plan or system
    - Observation: the process of watching (someone or something) carefully and attentively
    - Experiment: a scientific procedure undertaken to make a discovery, test a hypothesis, or demonstrate a known fact
- Read:
  - Photographing Snowflakes
- Discuss:
  - Did Bentley "do" science? In other words, did he systematically study snowflakes through observation and experiment?
  - Earlier you discussed the questions he asked. Now discussed his process of observation.

Day 2:

- Review:
  - What is snow?
- View:
  - Photographing snowflakes

- Discuss:
  - How has snowflake photography changed since Bentley's time?
- View:
  - Snowflake Watching

- Discuss:
  - In observation God's creation apart from the acknowledgement of God, scientists are missing out on some key pieces of information. Without the acknowledgement that creation was created by God, who is a God of order, scientists wonder and marvel at the created, rather than the creator.
  - What differences do you notice between how Kepler or Bentley and Ken Libbrecht discuss snowflakes?
- View:
  - Snowflakes Under the Microscope

- Discuss:
  - What do you observe about these snowflakes?

Week 17

Topics:

- Snow

Words to Remember:

- Frost: a deposit of small white ice crystals formed on the ground or other surfaces when the temperature falls below freezing
- Snow: atmospheric water vapor frozen into ice crystals and falling in light white flakes or lying on the ground as a white layer

- Sublime: (of a solid substance) change directly into vapor when heated

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Snowflakes- The Patron's Gift

Suggested Daily Schedule:

Day 1:

- Review:
  - What is snow?
- Discuss:
  - Thus far, you have studied snow relatively thoroughly.
  - The following article provides an excellent summary for our time with snow.
- Read:
  - Snowflakes- The Patron's Gift
- Discuss:
  - What are the two main variables impacting the shape and direction of snowflakes? (temperature and humidity)

Day 2:

- Review:
  - What are the two main variables impacting the shape and direction of snowflakes? (temperature and humidity)
- Discuss:
  - (From intellicast.com) Snow remains on the ground until it melts or sublimes. In colder climates this results in snow lying on the ground all winter; when the snow does not all melt in the summer it becomes glaciers.
  - This is often called snowpack, especially when it does persist a long time. The deepest snowpacks occur in mountainous regions. It is influenced by temperature and wind events which determine melting, accumulation and wind erosion.
  - The water equivalent of the snow is the thickness of a layer of water having the same content. For example, if the snow covering a given area has a water equivalent of 50 centimeters (20 in), then it will melt into a pool of water 50 centimeters (20 in) deep covering the same area. This is a much more useful measurement to hydrologists than snow depth, as the density of cool freshly fallen snow widely varies. New snow commonly has a density of between 5% and 15% of water. Snow that falls in maritime climates is usually denser than snow that falls in mid-continent locations because of the higher average temperatures over oceans than over land masses. Cloud temperatures and physical processes in the cloud affect the shape of individual snow crystals. Highly branched or dendritic crystals tend to have more space between the arms of ice that form the snow flake and this snow will therefore have a lower density, often referred to as "dry" snow. Conditions that create columnar or plate like crystals will have much less air space within the crystal and will therefore be more dense and feel "wetter".
- Explore:
  - Given that temperature and humidity impact the shape and direction of snowflakes, compare the average winter temperatures and percent humidity to hypothesize what shape snowflakes most commonly fall in each state. Use the chart in Snowflakes- The Patron's Gift to aid you.
  - USA state map of average winter temperatures
State	Avg ° F	Avg ° C	Rank
Alabama	46.5	8.1	7
Alaska	2.6	-16.3	50
Arizona	43.6	6.4	10
Arkansas	41.5	5.3	12
California	46.2	7.9	8
Colorado	25.8	-3.4	35
Connecticut	28.5	-1.9	30
Delaware	36.1	2.3	16
Florida	59.4	15.2	2

State	Avg ° F	Avg ° C	Rank
Georgia	47.8	8.8	5
Hawaii	67.4	19.7	1
Idaho	25.4	-3.7	37
Illinois	28.3	-2.1	32
Indiana	29.4	-1.4	29
Iowa	21.7	-5.7	39
Kansas	31.9	-0.1	26
Kentucky	35.9	2.2	18
Louisiana	50.9	10.5	3
Maine	16.8	-8.4	47
Maryland	34.7	1.5	19
Massachusetts	27.4	-2.6	34
Michigan	21.7	-5.7	39
Minnesota	12.4	-10.9	48
Mississippi	46.7	8.2	6
Missouri	32.3	0.2	24
State	**Avg ° F**	**Avg ° C**	**Rank**
Montana	21.2	-6.0	41
Nebraska	25.7	-3.5	36
Nevada	32.2	0.1	25
New Hampshire	21.1	-6.1	43
New Jersey	33.0	0.6	21
New Mexico	36.1	2.3	16
New York	23.3	-4.8	38
North Carolina	42.1	5.6	11
North Dakota	12.2	-11.0	49
Ohio	29.5	-1.4	28
Oklahoma	39.1	3.9	13
Oregon	34.0	1.1	20
Pennsylvania	28.4	-2.0	31
Rhode Island	31.4	-0.3	27
South Carolina	46.1	7.8	9
South Dakota	19.5	-6.9	44
Tennessee	39.1	3.9	13
Texas	47.9	8.8	4
Utah	28.2	-2.1	33
Vermont	19.4	-7.0	45
Virginia	36.8	2.7	15
Washington	33.0	0.6	21
West Virginia	32.8	0.4	23
Wisconsin	17.2	-8.2	46
Wyoming	21.2	-6.0	41

Average relative humidity (%) in winter

State	Place	Morning	Afternoon
Alabama	Birmingham	80	54
Alaska	Anchorage	75	72
Arizona	Tucson	61	30
Arkansas	Fort Smith	81	52
California	San Diego	71	57
Colorado	Grand Junction	75	56
Connecticut	Hartford	72	56
Delaware	Wilmington	74	57
Florida	Tampa	86	56
Georgia	Macon	81	51

State	Place	Morning	Afternoon
Hawaii	Honolulu	77	60
Idaho	Boise	79	64
Illinois	Peoria	81	66
Indiana	Indianapolis	80	66
Iowa	Des Moines	77	63
Kansas	Wichita	79	56
Kentucky	Louisville	75	59
State	**Place**	**Morning**	**Afternoon**
Louisiana	New Orleans	83	61
Maine	Portland	74	59
Maryland	Baltimore	70	54
Massachusetts	Boston	68	58
Michigan	Lansing	83	71
Minnesota	Minneapolis	75	64
Mississippi	Jackson	87	57
Missouri	Springfield	78	56
Montana	Helena	71	60
Nebraska	Lincoln	79	59
Nevada	Reno	77	47
New Hampshire	Concord	77	58
New Jersey	Atlantic City	77	59
New Mexico	Albuquerque	69	38
New York	Syracuse	77	68
North Carolina	Greensboro	77	52
North Dakota	Bismarck	76	65
State	**Place**	**Morning**	**Afternoon**
Ohio	Columbus	76	64
Oklahoma	Oklahoma City	77	51
Oregon	Portland	85	73
Pennsylvania	Harrisburg	70	56
Rhode Island	Providence	71	57
South Carolina	Columbia	81	49
South Dakota	Huron	77	64
Tennessee	Nashville	80	57
Texas	Dallas	79	51
Utah	Salt Lake City	78	66
Vermont	Burlington	74	64
Virginia	Richmond	77	53
Washington	Seattle	81	73
West Virginia	Beckley	78	64
Wisconsin	Madison	81	66
Wyoming	Lander	68	59

Week 18

Topics:

- Blizzards

Words to Remember:

- Blizzard: a severe snowstorm with high winds and low visibility.

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man

-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Blizzard of 1888
- The Long Hungry Winter of Laura Ingalls Wilder
- Blizzard of 1975

Suggested Daily Schedule:

Day 1:

- Review:
  - What is snow?
- Define:
  - Blizzard
- Discuss:
  - God provides us with all we need to support this body and life. We pray for seasonable weather for seed time and harvest. Yet, we live in a fallen world and thus we are faced with a world corrupted by sin. While a blizzard can be a good opportunity to cuddle with your family inside a warm house, blizzards can also be deadly.
  - Laura Ingalls Wilder, in *The Long Winter*, recounts several blizzards between October 1880 and April 1881. The Ingalls family faced hardships we cannot fathom during the long winter.
  - This is not the only time in history that blizzards put people in harm's way.
- Read:
  - The Long Hungry Winter of Laura Ingalls Wilder
  - Blizzard of 1888
- Discuss:
  - These were certainly terrible experiences for those involved.
  - From a scientific perspective, what conditions existed that caused these blizzards? (Think temperature change, etc.)
- Explore More:
  - Read *The Long Winter*

Day 2:

- Review:
  - What are the two main variables impacting the shape and direction of snowflakes? (temperature and humidity)
- Discuss:
  - Blizzards happen in more modern times, too.
- Read:
  - Blizzard of 1975
- Discuss:
  - What differences were there between the 1880s blizzards and the 1975 blizzard (almost exactly 100 years later!)

Week 19

Topics:

- Ice

Words to Remember:

- Ice: frozen water, a brittle, transparent crystalline solid

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

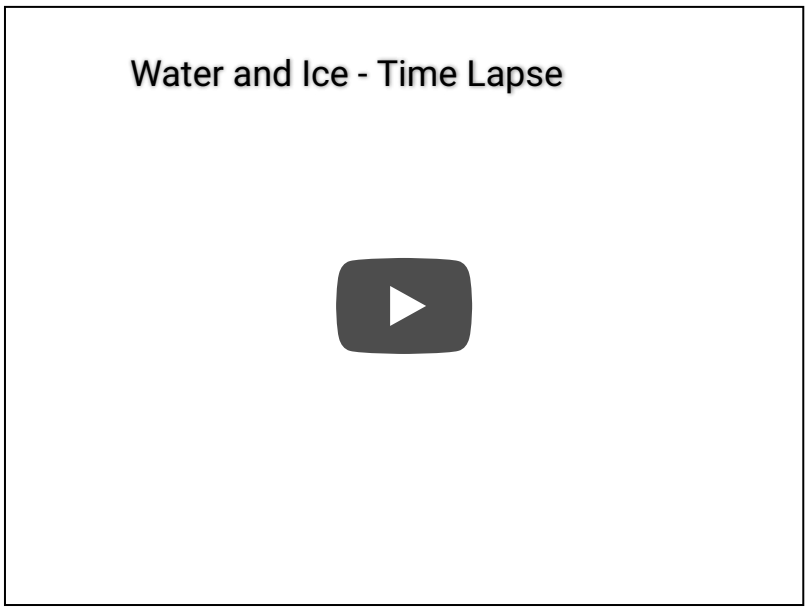
Materials:

- Oxygen Cycle

- Nitrogen Cycle
- Water Cycle
- Hot water
- Cold Water
- Two identical plastic containers
- A flat tray or cookie sheet
- Freezer

Suggested Daily Schedule:

Day 1:

- Review:
  - What is snow?
- Define:
  - Words to Remember
- Discuss:
  - Water comes in three forms: solid, liquid, and gas.
  - When water is a gas, we call is water vapor. When water is a liquid, we call it water. When water is a solid, we call it ice.
  - We know from the water cycle how water gets from the ground to the air and from the air back to the ground. But what if water is already on the ground and the air temperature drops? How does ice form?
- View:
  - 

- Discuss:
  - What did you observe about the ice formation? Did you notice a pattern in when the most freezing or melting occurred? (night, day, etc.)
- Explore:
  - Which freezes faster, Hot water or cold water? (Take a guess before trying this activity)
    - Place the two identical plastic containers on the tray.
    - Put 1 cup of hot water in one of the plastic containers and 1 cup of cold water in the other plastic container.
    - Place the tray in the freezer.
    - Check the water after 15 minutes, 30 minutes, 45 minutes, and 60 minutes. (Depending on the temperature of your freezer, you may need to continue checking)
    - What do you observe?

Day 2:

- Review:
  - What are the three forms of water?
- Discuss:
  - Just as darkness is the absence of light, so cold is the absence of heat. So, things do not "get cold," they simply lose heat. When water loses heat, it freezes. When water gains heat, it evaporates and becomes water vapor. When water vapor loses heat, it condenses and becomes water.
- View:

- Discuss:
  - How do you see the loss and gain of heat in the formation of icicles?
  - Watch the video again and note when you observe heat loss or heat gain.

Week 20

Topics:

- Ice

Words to Remember:

- Ice: frozen water, a brittle, transparent crystalline solid

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Hot water
- Cold Water
- Two identical plastic containers
- A flat tray or cookie sheet
- Freezer

Suggested Daily Schedule:

Day 1:

- Review:
  - What is ice?
- Discuss:
  - Ice can be a great hazard to people trying to travel. Ice can also be of great benefit for food preservation or making frozen treats.
  - How can we lower the risks of ice in travel and raise the benefits of ice in making some kinds of frozen treats?
  - Salt.
- View:

- Discuss:
  - What impact does salt have on ice on the roadway? What limitations does ice have in terms of helping people?
- Read:
  - How Does Road Salt Work?

Day 2:

- Review:
  - What are the three forms of water?
- Read:
  - The Science of Ice Cream
- View:

- Discuss:
  - What is the role of salt in making ice cream?
- Explore:
  - Try the SciGuys experiment!
  - Equipment and Ingredients:
    - 1/2 cup Milk
    - 1/2 cup Whipping Cream
    - 1/4 cup Sugar
    - 1/4 Teaspoon Vanilla
    - 2 cups of Ice
    - 1/2 to 1 cup Kosher Salt (NaCl) or Rock Salt
    - Measuring Cups and Spoons
    - Mixing Bowl
    - Medium Ziplock Bag
    - Large Ziplock Bag
  - Watch the video again and follow their process to make ice cream.

Week 21

Topics:

- Ice

Words to Remember:

- Ice: frozen water, a brittle, transparent crystalline solid

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Ice cube tray
- Various liquids (milk, orange juice, water, etc.)
- Bowl of water

Suggested Daily Schedule:

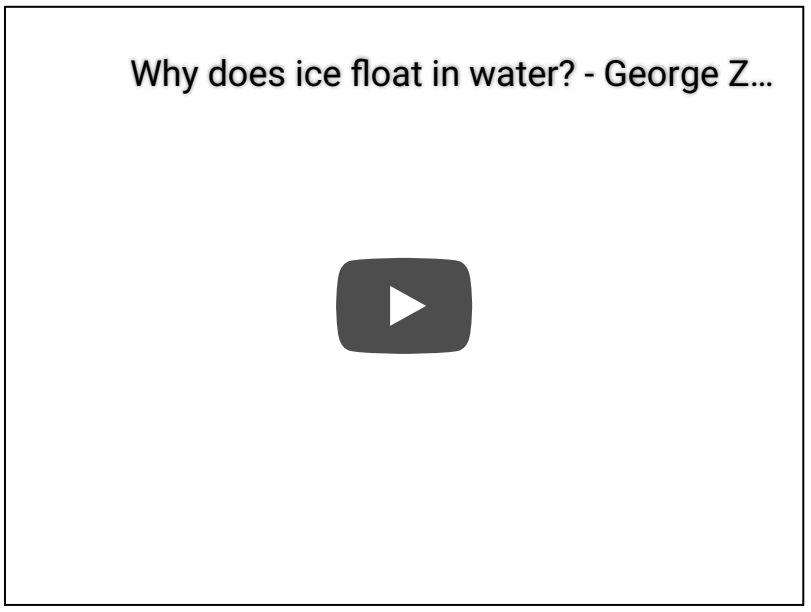
Day 1:

- Review:
  - What is ice?
- Discuss:
  - Ice, as we have learned, can be helpful or harmful. It can also be beautiful.
  - Our first week discussing ice, we saw time-lapse videos of ice forming. That was certainly exquisitely beautiful.
  - Ice sculptures are also beautiful.
- View:
  - 
  - 

  -
- Discuss:
  - Think about what you have learned about ice. Why is a blowtorch (or iron) used to "polish" the ice?

Day 2:

- Review:
  - What are the three forms of water?
- Read:
  - Properties of Water
- View:



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- Discuss:
  - Why does ice float on water?
- Explore:
  - Are other liquids more or less dense than water?
  - Fill each cube of the ice cube tray with a different liquid.
  - Put the tray in the freezer.
  - Once all of the liquids are frozen, break them out of the ice cube tray and place them in the bowl of water. Which sink and which float?

Week 22

Topics:

- Hail

Words to Remember:

- Ice: frozen water, a brittle, transparent crystalline solid
- Hail: pellets of frozen rain that fall in showers from cumulonimbus clouds.

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

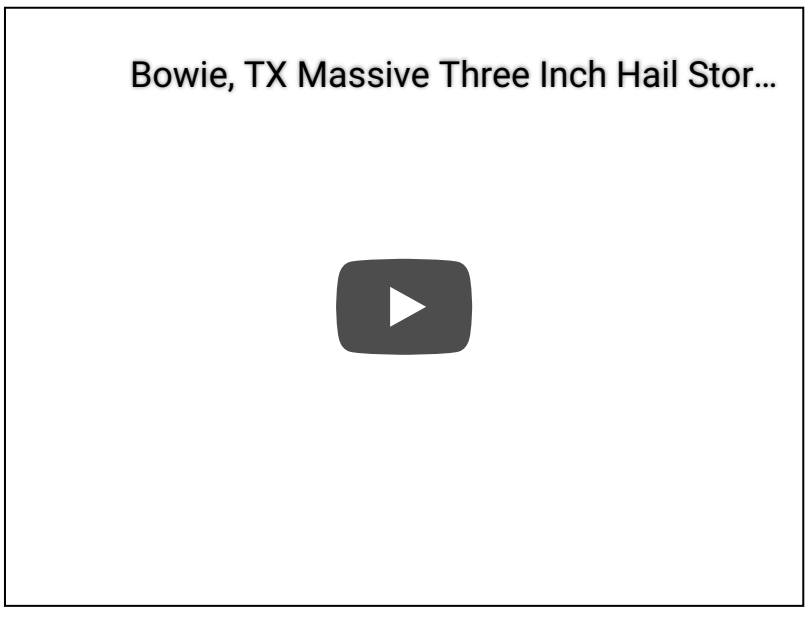
Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
-

Suggested Daily Schedule:

Day 1:

- Review:

    - What is ice?
- Discuss:
    - Ice on land can be dangerous, but it can also be beautiful. Ice hurtling through the air can be intriguing, but it can also cause significant damage.
- View:
    - 

- Discuss:
    - Hail forms when thunderstorm updrafts are strong enough to carry water droplets well above the freezing level. This freezing process forms a hailstone, which can grow as additional water freezes onto it. Eventually, the hailstone becomes too heavy for the updrafts to support it and it falls to the ground. (from nasa.gov)

Day 2:

- Review:
    - What is hail?
- View:
    - 

- Discuss:
    - How does hail form?
    - Why is some hail small and other hail large?

Week 23

Topics:

- Clouds

Words to Remember:

- Cloud: a visible mass of condensed water vapor floating in the atmosphere, typically high above the ground
- Stratiform: arranged in layers
- Cirriform: a broken layer of fleecy clouds
- Stratocumuliform: cloud forming a low layer of clumped or broken gray masses.
- Cumuliform: (of a cloud) developed in a predominantly vertical direction.
- Cumulonimbiform: a cloud forming a towering mass with a flat base at fairly low altitude and often a flat top, as in thunderstorms.

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)

- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
-

Suggested Daily Schedule:

Day 1:

- Review:
  - What is ice?
- Define:
  - Words to Remember
- Discuss:
  - Clouds are a fascinating part of creation. Every moving and changing, they can provide endless hours of observatory entertainment.
  - Looking at your cloud diagram and cloud descriptions
- View:
  -

- Discuss:
  - Of what are clouds formed?
  - What impacts the shape of a cloud? What makes categorizing clouds difficult?
  - How do clouds fit in the water cycle?

Day 2:

- Review:
  - What are clouds?
- Explore:
  - Go outside and observe the clouds. Can you identify the clouds according to your Words to Remember for this week?

Week 24

Topics:

- Clouds

Words to Remember:

- Cloud: a visible mass of condensed water vapor floating in the atmosphere, typically high above the ground
- Stratiform: arranged in layers
- Cirriform: a broken layer of fleecy clouds
- Stratocumuliform: cloud forming a low layer of clumped or broken gray masses.
- Cumuliform: (of a cloud) developed in a predominantly vertical direction.
- Cumulonimbiform: a cloud forming a towering mass with a flat base at fairly low altitude and often a flat top, as in thunderstorms.

- Cumulonimbus: a cloud forming a towering mass with a flat base at fairly low altitude and often a flat top, as in thunderstorms.
- Cirrocumulus: cloud forming a broken layer of small fleecy clouds at high altitude, usually 16,500–45,000 feet (5–13 km), typically with a rippled or granulated appearance (as in a mackerel sky).
- Cirrostratus: cloud forming a thin, more or less uniform, semitranslucent layer at high altitude, usually 16,500–45,000 feet (5–13 km).
- Cirrus: cloud forming wispy filamentous tufted streaks (“mare's tails”) at high altitude, usually 16,500–45,000 feet (5–13 km).
- Altostratus: cloud forming a continuous uniform layer that resembles stratus but occurs at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Altocumulus: cloud forming a layer of rounded masses with a level base, occurring at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Cumulus: a cloud forming rounded masses heaped on each other above a flat base at fairly low altitude.
- Stratocumulus: cloud forming a low layer of clumped or broken gray masses.
- Stratus: cloud forming a continuous horizontal gray sheet, often with rain or snow.
- Nimbostratus: a type of cloud forming a thick uniform gray layer at low altitude, from which rain or snow often falls (without any lightning or thunder).
-

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
-

Suggested Daily Schedule:

Day 1:

- Review:
  - What are clouds?
- Define:
  - Words to Remember
- Discuss:
  - How do clouds help us understand changes in the weather?
- Discuss:
  - Look at your Words to Remember. Especially relating to the specific kinds of clouds, which part of the name tells us the height and which part of the name tells us the shape?

Day 2:

- Review:
  - What are clouds?
- Explore:
  - Go outside and observe the clouds. Can you identify the clouds according to your Words to Remember for this week?

Week 25

Topics:

- Clouds

Words to Remember:

- Cloud: a visible mass of condensed water vapor floating in the atmosphere, typically high above the ground
- Stratiform: arranged in layers
- Cirriform: a broken layer of fleecy clouds

- Stratocumuliform: cloud forming a low layer of clumped or broken gray masses.
- Cumuliform: (of a cloud) developed in a predominantly vertical direction.
- Cumulonimbiform: a cloud forming a towering mass with a flat base at fairly low altitude and often a flat top, as in thunderstorms.
- Cumulonimbus: a cloud forming a towering mass with a flat base at fairly low altitude and often a flat top, as in thunderstorms.
- Cirrocumulus: cloud forming a broken layer of small fleecy clouds at high altitude, usually 16,500–45,000 feet (5–13 km), typically with a rippled or granulated appearance (as in a mackerel sky).
- Cirrostratus: cloud forming a thin, more or less uniform, semitranslucent layer at high altitude, usually 16,500–45,000 feet (5–13 km).
- Cirrus: cloud forming wispy filamentous tufted streaks (“mare's tails”) at high altitude, usually 16,500–45,000 feet (5–13 km).
- Altostratus: cloud forming a continuous uniform layer that resembles stratus but occurs at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Altocumulus: cloud forming a layer of rounded masses with a level base, occurring at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Cumulus: a cloud forming rounded masses heaped on each other above a flat base at fairly low altitude.
- Stratocumulus: cloud forming a low layer of clumped or broken gray masses.
- Stratus: cloud forming a continuous horizontal gray sheet, often with rain or snow.
- Nimbostratus: a type of cloud forming a thick uniform gray layer at low altitude, from which rain or snow often falls (without any lightning or thunder).
-

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Explore:
  - Practice identifying clouds by name.
  - Remember that one part of the name gives you a clue as to the height and one part of the name gives you a clue as to the shape.

Day 2:

- Review:
  - What are clouds?
- Explore:
  - Practice identifying clouds by name.
  - Remember that one part of the name gives you a clue as to the height and one part of the name gives you a clue as to the shape.

Week 26

Topics:

- Clouds

Words to Remember:

- Cloud: a visible mass of condensed water vapor floating in the atmosphere, typically high above the ground
- Stratiform: arranged in layers
- Cirriform: a broken layer of fleecy clouds
- Stratocumuliform: cloud forming a low layer of clumped or broken gray masses.
- Cumuliform: (of a cloud) developed in a predominantly vertical direction.
- Cumulonimbiform: a cloud forming a towering mass with a flat base at fairly low altitude and often a flat top, as in thunderstorms.
- Cumulonimbus: a cloud forming a towering mass with a flat base at fairly low altitude and often a flat top, as in thunderstorms.
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- Cirrostratus: cloud forming a thin, more or less uniform, semitranslucent layer at high altitude, usually 16,500–45,000 feet (5–13 km).
- Cirrus: cloud forming wispy filamentous tufted streaks (“mare's tails”) at high altitude, usually 16,500–45,000 feet (5–13 km).
- Altostratus: cloud forming a continuous uniform layer that resembles stratus but occurs at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Altocumulus: cloud forming a layer of rounded masses with a level base, occurring at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Cumulus: a cloud forming rounded masses heaped on each other above a flat base at fairly low altitude.
- Stratocumulus: cloud forming a low layer of clumped or broken gray masses.
- Stratus: cloud forming a continuous horizontal gray sheet, often with rain or snow.
- Nimbostratus: a type of cloud forming a thick uniform gray layer at low altitude, from which rain or snow often falls (without any lightning or thunder).
-

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- How Clouds Form
- The Core Four
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Read:
  - How Clouds Form
  - The Core Four
- Explore:
  - Practice identifying clouds by name.
  - Remember that one part of the name gives you a clue as to the height and one part of the name gives you a clue as to the shape.
- Explore More:
  - An essay published in 1865 is still influential in terms of how we categorize clouds. Read Luke Howard's essay, On the Modifications of Clouds.

Day 2:

- Review:
  - What are clouds?
- Read:

    - Height of Clouds
    - Color of Clouds
- Explore:
    - Practice identifying clouds by name.
    - Remember that one part of the name gives you a clue as to the height and one part of the name gives you a clue as to the shape.

Week 27

Topics:

- Clouds

Words to Remember:

- Cloud: a visible mass of condensed water vapor floating in the atmosphere, typically high above the ground
- Stratiform: arranged in layers
- Cirriform: a broken layer of fleecy clouds
- Stratocumuliform: cloud forming a low layer of clumped or broken gray masses.
- Cumuliform: (of a cloud) developed in a predominantly vertical direction.
- Cumulonimbiform: a cloud forming a towering mass with a flat base at fairly low altitude and often a flat top, as in thunderstorms.
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- Altocumulus: cloud forming a layer of rounded masses with a level base, occurring at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Cumulus: a cloud forming rounded masses heaped on each other above a flat base at fairly low altitude.
- Stratocumulus: cloud forming a low layer of clumped or broken gray masses.
- Stratus: cloud forming a continuous horizontal gray sheet, often with rain or snow.
- Nimbostratus: a type of cloud forming a thick uniform gray layer at low altitude, from which rain or snow often falls (without any lightning or thunder).
-

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- How Clouds Form
- The Core Four
-

Suggested Daily Schedule:

Day 1:

- Review:
    - Words to Remember
- Explore:

    - Sometimes we like to see the weather that is going on around us, but further than the eye can see. To do so, we use satellite and radar.
    - Explore this radar .
    - Feel free to zoom in on your region by clicking the map.
    - Compare the map to what you see outside.
    - What are benefits to radar maps?
    - What are drawbacks to radar maps?
- Explore:
    - Practice identifying clouds by name.
    - Remember that one part of the name gives you a clue as to the height and one part of the name gives you a clue as to the shape.

Day 2:

- Review:
    - What are clouds?
- Explore:
    - Practice identifying clouds by name.
    - Remember that one part of the name gives you a clue as to the height and one part of the name gives you a clue as to the shape.
    - Compare what you see to the radar map. What appears to be coming down the pike in terms of future weather for your location?

Week 28

Topics:

- Clouds

Words to Remember:

- Cloud: a visible mass of condensed water vapor floating in the atmosphere, typically high above the ground
- Stratiform: arranged in layers
- Cirriform: a broken layer of fleecy clouds
- Stratocumuliform: cloud forming a low layer of clumped or broken gray masses.
- Cumuliform: (of a cloud) developed in a predominantly vertical direction.
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- Cirrostratus: cloud forming a thin, more or less uniform, semitranslucent layer at high altitude, usually 16,500–45,000 feet (5–13 km).
- Cirrus: cloud forming wispy filamentous tufted streaks (“mare's tails”) at high altitude, usually 16,500–45,000 feet (5–13 km).
- Altostratus: cloud forming a continuous uniform layer that resembles stratus but occurs at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Altocumulus: cloud forming a layer of rounded masses with a level base, occurring at medium altitude, usually 6,500–23,000 feet (2–7 km).
- Cumulus: a cloud forming rounded masses heaped on each other above a flat base at fairly low altitude.
- Stratocumulus: cloud forming a low layer of clumped or broken gray masses.
- Stratus: cloud forming a continuous horizontal gray sheet, often with rain or snow.
- Nimbostratus: a type of cloud forming a thick uniform gray layer at low altitude, from which rain or snow often falls (without any lightning or thunder).
-

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- How Clouds Form
- The Core Four
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Explore:
  - Practice identifying clouds by name.
  - Remember that one part of the name gives you a clue as to the height and one part of the name gives you a clue as to the shape.
  - Compare what you see to the radar map. What appears to be coming down the pike in terms of future weather for your location?
- Explore more:
  - A popular game played by families for centuries is identifying imaginary shapes in the clouds. For example, one person might see a horse. Another might see a pancake, another the state of Illinois. What shapes do you see in the clouds? Take turns pointing out what you see in the clouds.

Day 2:

- Review:
  - Words to Remember
- Explore:
  - Practice identifying clouds by name.
  - Remember that one part of the name gives you a clue as to the height and one part of the name gives you a clue as to the shape.
  - Compare what you see to the radar map. What appears to be coming down the pike in terms of future weather for your location?
- Explore more:
  - A popular game played by families for centuries is identifying imaginary shapes in the clouds. For example, one person might see a horse. Another might see a pancake, another the state of Illinois. What shapes do you see in the clouds? Take turns pointing out what you see in the clouds.

Week 29

Topics:

- Hurricane

Words to Remember:

- Hurricane: a storm with a violent wind, in particular a tropical cyclone in the Caribbean. ORIGIN mid 16th cent.: from Spanish huracán, probably from Taino hurakán ‘god of the storm.’
-

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle

- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- How Clouds Form
- The Core Four
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Read:
  - Acts of God?
- Discuss:
  - What is needed for hurricanes to form?
  - From where do hurricanes and all storms originate? (the Fall)

Day 2:

- Review:
  - Words to Remember
- Explore:
  - Take a look at the Hurricane Center maps. What, in particular, is highlighted in the study of hurricanes? (water surface temperature)

Week 30

Topics:

- Hurricane

Words to Remember:

- Hurricane: a storm with a violent wind, in particular a tropical cyclone in the Caribbean. ORIGIN mid 16th cent.: from Spanish huracán, probably from Taino hurakán ‘god of the storm.’
- Cyclone: a system of winds rotating inward to an area of low atmospheric pressure, with a counterclockwise (northern hemisphere) or clockwise (southern hemisphere) circulation; a depression. ORIGIN mid 19th cent.: probably from Greek kuklōma ‘wheel, coil of a snake,’ from kuklos ‘circle.’ The change of spelling from -m to -n is unexplained.

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- Hurricane History
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Discuss:
  - Hurricanes have a long history in the United States, but a relatively short history of being recorded by the National Oceanic and Atmospheric Administration.

- Read:
  - Hurricane History
- Discuss:
  - What conditions generally existed for each hurricane?

Day 2:

- Review:
  - Words to Remember
- Read:
  - Tropical Cyclone Naming History
- Discuss:
  - Why are cyclones/hurricanes named? Why are some names retired?
  - An interesting fact about hurricane names is that unless a name is retired (and then another name is chosen to replace that list), the names are reused every six years.
- Explore:
  - Is your name on the retired hurricanes list? What about the current six year cycle list?

Week 31

Topics:

- Tornado

Words to Remember:

- Tornado: a mobile, destructive vortex of violently rotating winds having the appearance of a funnel-shaped cloud and advancing beneath a large storm system. ORIGIN mid 16th cent. (denoting a violent thunderstorm of the tropical Atlantic Ocean): perhaps an alteration of Spanish tronada ‘thunderstorm’ (from tronar ‘to thunder’) by association with Spanish tornar ‘to turn.’

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- Cloudy with a chance of awesome 1
- Cloudy with a chance of awesome 2
- Cloudy with a chance of awesome 3
- 25 Deadliest US tornadoes
- Tornado basics
- Tornado alley
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Discuss:
  - Hurricanes, we have learned, are deadly storms that occur mainly in tropical water.
  - Tornadoes are another deadly storm. These occur on land. Instead of being fueled by the heat of water like hurricanes, tornadoes are fueled by the heat of air.
- Read:
  - Tornado basics

- Discuss:
  - What conditions need to exist for tornadoes to occur?

Day 2:

- Review:
  - Words to Remember
- Discuss:
  - Tornadoes and other storms can sometimes be frightening, mainly because there are many unknowns about weather. We tend to fear that which is unknown.
  - However, tornadoes and other storms also remind us that we live in a fallen world and we rely on God to preserve our lives in the midst of storms, should that be His will.
  - Even with modern forecasting, storms can be unpredictable, and they can certainly still cause damage and death.
  - Yet, even so, we pray boldly and confidently Thy Will Be Done. If you look through the prayers in Lutheran Service Book or Stark's Prayer Book, considerable time is given to commending the weather and things thus related to God.
  - If weather comes from God, does it not make sense to commend all these things to God?
- Explore:
  - Read Tornado alley and 25 Deadliest US tornadoes.
  - How many of these tornadoes occurred in Tornado Alley?

Week 32

Topics:

- Tornado

Words to Remember:

- Tornado: a mobile, destructive vortex of violently rotating winds having the appearance of a funnel-shaped cloud and advancing beneath a large storm system. ORIGIN mid 16th cent. (denoting a violent thunderstorm of the tropical Atlantic Ocean): perhaps an alteration of Spanish tronada ‘thunderstorm’ (from tronar ‘to thunder’) by association with Spanish tornar ‘to turn.’

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- Cloudy with a chance of awesome 1
- Cloudy with a chance of awesome 2
- Cloudy with a chance of awesome 3
- 25 Deadliest US tornadoes
- Tornado basics
- Tornado alley
- Watch vs. Warning
- clear plastic or glass jar with a lid
- water
- dish soap
- glitter or bits of tin foil (optional)
-
-

Suggested Daily Schedule:

Day 1:

Review:

- Words to Remember

Discuss:

- To stand in awe of someone or something is to have a feeling of reverential respect mixed with fear or wonder. Scripture directs us to stand (or kneel or lie prostrate) before God. As we are in awe of God, we are also many times in awe of His creation

Read:

- Cloudy with a chance of awesome 1
- Cloudy with a chance of awesome 2
- Cloudy with a chance of awesome 3

Discuss:

- What is awe-inspiring about storms?
- How can our awe for storms teach us to rightly stand in awe of God?

Explore:

- Make a tornado!
  - Fill the jar with water.
  - Add two drops of dish soap.
  - Put the lid on the jar.
  - Shake up the jar.
  - What do you observe?
  - Add glitter or bits of tin foil to the jar. Shake it again.
  - What do you observe?

Day 2:

Review:

- Words to Remember

Discuss:

- God has given some people to serve their neighbor through weather forecasting. These people help to keep people safe in preparation for or in the midst of a storm.

Read:

- Watch vs. Warning

Discuss:

- If a watch is issued, how should we respond?
- If a warning is issued, how should we respond?

Explore:

- Does your family have a tornado plan?
- Discuss what you would do in the event of a tornado.

Week 33

Topics:

- Lightning

Words to Remember:

- Lightning: the occurrence of a natural electrical discharge of very short duration and high voltage between a cloud and the ground or within a cloud, accompanied by a bright flash and typically also thunder

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- Lightning FAQ
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Discuss:
  - To stand in awe of someone or something is to have a feeling of reverential respect mixed with fear or wonder. Scripture directs us to stand (or kneel or lie prostrate) before God. As we are in awe of God, we are also many times in awe of His creation.
  - Lightning is a beautiful and fascinating part of God's creation.
- Read:
  - Lightning FAQ
- Discuss:
  - Which comes first, the lightning or the thunder?
- Explore:
  - How do you estimate the distance between you and the lightning you just heard?
  - Count the number of seconds between the lightning bolt and the thunder crack you hear. Divide that number by 5. The result of your calculation is the number of miles the lightning is from you.

Day 2:

- Review:
  - Words to Remember
- View: (please note that the end of these videos contains credit footage that is less than desirable. Feel free to stop the video when Pecos Hank comes on the video).
  - 

  - 

Week 34

Topics:

- Floods

Words to Remember:

- Lightning: the occurrence of a natural electrical discharge of very short duration and high voltage between a cloud and the ground or within a cloud, accompanied by a bright flash and typically also thunder
- Flood: an overflowing of a large amount of water beyond its normal confines, especially over what is normally dry land

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- Lightning FAQ
- Flood FAQ
- Flood Basics
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- View:

  -
- Discuss:
  - When we see lightning, there is generally, though not always, rain involved.
  - Sometimes, there is more rain than the ground or bodies of water can handle. When that is the case, we end up with a flood.
- Read:
  - Flood Basics
  - Flood FAQ

Day 2:

- Review:
  - Words to Remember
- View:

Week 35

Topics:

- Rainbows

Words to Remember:

- Rainbow: an arch of colors formed in the sky in certain circumstances, caused by the refraction and dispersion of the sun's light by rain or other water droplets in the atmosphere.

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- Lightning FAQ
- Flood FAQ
- Flood Basics
- Rainbows
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Read:
  - Genesis 6-9
- Discuss:
  - What did God cause to cover the whole earth?
  - What did God give as a sign that he would never again flood the whole earth?
  - It is interesting to ponder that while God destroyed the earth and all its inhabitant, save the 8 souls in the ark, in that destruction, God also provided many means of preservation (think oil and coal).

Day 2:

- Review:
  - Words to Remember
- Read:
  - Rainbows

Week 36

Topics:

- Day Two

Words to Remember:

- Genesis 1:3-5

Textbook reference and written work:

- Read Genesis 1:3-5
- 2nd Grade Handbook of Nature Study p. 808-814
- (Teacher)
- (Teacher) Microscopic Masterpieces
- (Teacher) The Snowflake Man
-
-

Materials:

- Oxygen Cycle
- Nitrogen Cycle
- Water Cycle
- Cloud types diagram
- Cloud types quiz
- Cloud types descriptions
- Lightning FAQ
- Flood FAQ
- Flood Basics
- Rainbows
-

Suggested Daily Schedule:

Day 1:

- Review:
  - Words to Remember
- Write:
  - Based on what you have learned this year, write a narrative about how God provides for us through all He created on the Second Day.

Day 2:

- Review:
  - Words to Remember
- Write:
  - Finish your Narrative.