Course Blocks

# 1st 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!

News forum

## Week 1

**Topics:**

- Creation
- Days of Creation
- Day 1

**Words to Remember:**

- Create(d)
- Called (as in "named")
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Did God create in 6 days or billions of years?
- (Teacher resource) Read On the first 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 1:1-5
    - 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 1st Day? (verse 3-5)
            - 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 1st Day (You will get answers like light, Day, Night, perhaps even evening and morning
            - 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:**

- Nothing

**Words to Remember:**

- Without form
- Void
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Did God create in 6 days or billions of years?
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Box
- Dark room or closet
- Play-doh or Clay or Silly Putty

**Suggested Daily Schedule:**

- Day 1:
    - Read/say Genesis 1:1-5
    - Introduce the words void and without form
        - Write them on the board and have the students say the words
        - Ask students if they know what the words mean (chances are they will not)
    - Remind students that they just heard those words in Genesis.  If necessary, reread vs. 1 and 2.
        - Ask students if they know what void and without form are describing in those verses (cross-curricular opportunity to talk about adjectives!)
    - Tell students that today we are going to figure out what "without form" means.
    - Science experiment:
        - Give each student a piece of clay/play-doh/silly putty
        - Ask what the piece looks like (answers will vary, but hopefully someone will say "nothing")
        - Give each student a new piece of clay/play-doh/silly putty
        - Ask the students to make something out of their new piece.

        - Have students identify their creation when they are done
    - Help the students draw comparisons between the two pieces.
        - After all the ideas are written on the board, draw student attention back to the first piece and explain what "without form" means.
        - Help students articulate what it might have been like for the earth to be "without form."
- Day 2:
    - Read/say Genesis 1:1-5
    - Review what "without form" means
    - Remind students that they just heard those words in Genesis.  If necessary, reread vs. 1 and 2.
        - Ask students if they know what void and without form are describing in those verses (cross-curricular opportunity to talk about adjectives!)
    - Tell students that today we are going to figure out what "void" means.
    - Science experiment:
        - Show students the empty box.
        - Ask what is in the box.
            - Students will probably say "nothing."
            - Ask "are you sure?"  Have them look again.
            - Help them get to answers such as light, air, etc. (Ex. is there anything you can't see?)
        - Take the students and the box into a completely dark room or closet.
            - Ask the students "Now what is in the box?"
            - Students may hesitate to say "nothing," but at least help them articulate that there is no light, but there are other things (air, etc.)
    - Wrap-up: Re-read Genesis 1:1-2
        - Ask students: "When it says the earth was without form and void, what does that mean?"
        - Students should be able to articulate that there was nothing but God (simplistic, but gets the point across)

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## Week 3

**Topics:**

- Darkness
- Light

**Words to Remember:**

- Darkness
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Did God create in 6 days or billions of years?
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Box
- Dark room or closet

**Suggested Daily Schedule:**

- Day 1:
    - Read/say Genesis 1:1-5
    - Review "void" and "without form"
        - Remind students about their discussion of "nothing"
    - Introduce the word "darkness"
        - Write the word on the board and have the students say the word
        - Ask the students to explain what darkness is
    - Science activity (part 1):
        - Have students close their eyes
        - Ask what they see
        - Ask if they can still kind of see light
    - Science activity (part 2):

        - Take students into a dark room or closet- take special care that there is absolutely no light (you may want to have the students sit down, if there is room, as you will spend a bit of time in discussion while in the dark)
        - Have students close their eyes
        - Ask what they see
        - Ask if they can still kind of see light (hopefully not!)
        - Have students open their eyes
        - Ask if they can see now (hopefully they say no)
        - Ask why they can't see (hopefully you get answers like "because it is dark"
        - Ask the students what they would need in order to see
            - If you get answers like "flashlight" or "candle" or "a light," help them to get to the general term of "light" (rather than sources of light they are mentioning). This can be done by asking what comes from a flashlight? What comes from a candle?
- Day 2:
    - Read/say Genesis 1:1-5
    - Review what "darkness" means
    - Ask students if they know what opposites are
        - Latin oppositus, past participle of opponere ‘set against.’ (always good to teach the kids some Latin)
    - On the board, make a list of opposites
        - Note to teacher: this list can be half-generated by you if time does not allow students to come up with both halves of the opposite pair
        - Examples:
            - hot/cold
            - bottom/top
            - inside/outside
            - wet/dry
            - good/bad
            - full/empty
            - etc.
        - If students are struggling with the list, give them a few halves of the pair and once they are rolling, have them come up with the entire pair on their own
        - Don't be afraid to tell students that something is not an opposite (for example, if they say red is the opposite of blue, that does not fit the definition of opposite- just be sure to help them understand why it is not an opposite
    - When a sufficient list has been made, ask students what they talked about in the previous session (darkness)
    - Ask what is the opposite of darkness? (light)
        - If they cannot come up with the answer, remind them of the final discussion of the previous session when you were in the dark room and you asked what they would need in order to see
    - Finish by reading Genesis 1:1-2
        - Ask the students what was not yet there- prompt them with "there was darkness, but there was no ____." (light)
        - Tell the students that "next week we will begin studying light"

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## Week 4

**Topics:**

- Energy

**Words to Remember:**

- Energy
- Friction
- Attract
- Repel
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Definition of energy: ORIGIN mid 16th cent. (denoting force or vigor of expression): from French énergie, or via late Latin from Greek energeia, from en- ‘in, within’ + ergon ‘work.’
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Box
- Dark room or closet
- Matches
- Candle
- A blown-up balloon for each student
- Piece of felt or wool
- Plastic comb
- Water faucet

**Suggested Daily Schedule:**

- Day 1:
  - Read/say Genesis 1:1-5
  - Review "darkness"
    - Write the word on the board and have the students say the word
    - Ask the students to recall what darkness is
  - Discuss "energy"
    - Write the word on the board and have the students say the word
    - Ask if anyone knows what energy is
      - Students may come up with a variety of answers, even answers like "my mom says I have too much energy"
      - After hearing their answers, tell the students that today we are going to begin finding out what energy is
  - Science experiment:
    - Take students into a dark room or closet- take special care that there is absolutely no light (you may want to have the students sit down, if there is room, as you will spend a bit of time in discussion while in the dark)
    - Ask the students how they would describe the room (dark, etc.)
    - Ask how they could make the room light (dig for answers beyond turn on the light with questions like- what if we didn't have a light or light switch?)
    - Tell students to look in the direction of your voice (since it is dark, they may be looking elsewhere)
    - Light a match
      - Ask students what they saw- what colors, etc. (you may need to light more than one match to help them catch more details- spark, shape, etc.))
    - Light a candle with one of the matches (still in the dark)
      - Ask the students what they see- let them study the candle for a bit (colors, shape, etc.)
    - Return to the classroom (or area where you can make a list)
    - Ask students to list characteristics of matches/match lighting
    - Ask students to list characteristics of candles/candle lighting
    - Ask students to note differences
  - Discuss:
    - What happened to make the match light? (feel free to light another match in the light so they can see what happens)
      - New word to learn: **friction**- ORIGIN mid 16th cent. (denoting chafing or rubbing of the body or limbs, formerly much used in medical treatment): via French from Latin frictio(n-), from fricare **'to rub.'**
        - To light a match, what is rubbed (or what experiences friction)?
        - If energy is activity or work, what is the activity or work going on with the match being lit? (don't get into the work of the human, just the work of the striking)
        - What happened to make the candle stay lit?
        - What is the activity or work happening for the candle to stay lit?
    - Write on the board: Light is a type of energy.  Work or activity is happening for light to exist/occur.
- Day 2:
  - Read/say Genesis 1:1-5
  - Review what "energy" means
  - Review how light fits into the category of energy
  - Tell students that today they are going to continue learning about energy
  - Science experiment: Charged balloons
    - Give each student a blown up balloon and a piece of felt or wool (or, if the students are adventerous, they can just rub the balloon in their hair)
    - Have the students rub the balloon with the felt, wool, or on their hair
    - Tell them to stick the balloon to the wall (if it is "charged" it should stick to the wall)
    - Let students try to stick their balloons to other things
      - If it doesn't work, tell them they may need to charge their balloon again
    - Ask students how the balloon is sticking to the wall
      - Tell them to review what they did prior to the balloon sticking
        - Be sure to review "friction" in this discussion

        - Result of experiment: Friction creates energy that makes balloons stick to walls (or shirts, etc.)
    - Science experiment: Water bending combs
        - Take a comb and rub it with wool or felt (with the students watching)
        - Have students gather around a sink that can have a small but consistent stream of water
        - Hold the comb near the water- the water should "bend"
        - Move the comb closer to or further from the water
            - Ask students what happens to the "bend" in the water
        - Discuss:
            - Ask students what was done to the comb (be sure they are using the word "friction" in their explanation)
            - Ask students what happened to the water when the comb came near the water
            - Relating the comb experiment to the balloon experiment, talk about how the balloon was "attracted" to the wall, but the comb "repelled" the water (next week you will discuss charges, protons, neutrons, electrons, etc., so it is okay to just speak in generalities this week)
            - Talk about how some energy can be seen (light) and some energy cannot be seen- only the effects can be observed

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## Week 5

**Topics:**

- Energy

**Words to Remember:**

- Energy
- Friction
- Attract
- Repel
- Atom
- Nucleus
- Proton
- Neutron
- Electron
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Definition of energy: ORIGIN mid 16th cent. (denoting force or vigor of expression): from French énergie, or via late Latin from Greek energeia, from en- ‘in, within’ + ergon ‘work.’
- (Teacher resource) Definition of friction: ORIGIN mid 16th cent. (denoting chafing or rubbing of the body or limbs, formerly much used in medical treatment): via French from Latin frictio(n-), from fricare ‘to rub.’
- (Teacher resource) Definition of attract: ORIGIN late Middle English : from Latin attract- ‘drawn near,’ from the verb attrahere, from ad- ‘to’ + trahere ‘draw.’
- (Teacher resource) Definition of repel: ORIGIN late Middle English : from Latin repellere, from re- ‘back’ + pellere ‘to drive.’
- (Teacher resource) Definition of atom: the basic unit of a chemical element. ORIGIN late 15th cent.: from Old French atome, via Latin from Greek atomos ‘indivisible,’ based on a- ‘not’ + temnein ‘to cut.’
- (Teacher resource) Definition of nucleus: the positively charged central core of an atom, containing most of its mass. ORIGIN early 18th cent.: from Latin, literally ‘kernel, inner part,’ diminutive of nux, nuc- ‘nut.’
- (Teacher resource) Definition of proton: a stable subatomic particle occurring in all atomic nuclei, with a positive electric charge equal in magnitude to that of an electron, but of opposite sign. ORIGIN 1920s: from Greek, neuter of prōtos ‘first.’
- (Teacher resource) Definition of neutron: a subatomic particle of about the same mass as a proton but without an electric charge, present in all atomic nuclei except those of ordinary hydrogen. ORIGIN early 20th cent.: from neutral + -on .
- (Teacher resource) Definition of electron: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids. ORIGIN late 19th cent.: from electric + -on .
    - Electric: ORIGIN mid 17th cent.: from modern Latin electricus, from Latin electrum ‘amber,’ from Greek ēlektron (because rubbing amber causes electrostatic phenomena).
    - -On: denoting subatomic particles or quantaORIGIN originally in electron, from ion
        - Ion: ORIGIN mid 19th cent.: from Greek, neuter present participle of ienai ‘go.’
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible

- Black board, white board, or something upon which to make lists with students
- Atom diagram
- Scissors
- Crayons

**Suggested Daily Schedule:**

- Day 1:
  - Read/say Genesis 1:1-5
  - Review (write words on board, have students say the words, recall what the words mean):
    - energy
    - friction
    - attract
    - repel
  - Discuss:
    - Write all the words on the board and have the students say the words
    - Talk through the meanings of the words.  Don't forget to use the Greek and Latin origins of the words!
      - Atom
      - Nucleus
      - Proton
      - Neutron
      - Electron
  - Science activity:
    - Give students Atom diagram and atom parts sheet, crayons, and scissors (feel free to give the students more than one copy of page one of the atom diagram so that they have more protons, neutrons, and electrons with which to work- next week you will discuss the makeup of different kinds of atoms)
    - Instruct them to color the large circles in the first row red and draw a plus sign on each circle
    - Instruct them to color the large circles in the second row blue
    - Instruct them to color the small circles in the third row green and draw a minus sign on each circle
    - Have students cut out their colored circles
  - Discuss:
    - With circles and atom diagram in front of them, discuss with the students where the parts go:
      - Protons and neutrons go in the center (nucleus)
      - Electrons go on the orbiting path outside the nucleus
      - Neutrons impact the weight and radioactivity of an atom- the more neutrons, the heavier the atom and the more radioactive it is
    - There always has to be an equal number of protons and electrons (so the charge of the atom is neutral) (There is a bonus math lesson in here!)
- Day 2:
  - Read/say Genesis 1:1-5
  - Review:
    - Atom
    - Nucleus
    - Proton
    - Neutron
    - Electron
    - energy
    - friction
    - attract
    - repel

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## Week 6

**Topics:**

- Energy

**Words to Remember:**

- Energy
- Friction
- Attract
- Repel
- Atom
- Nucleus

- Proton
- Neutron
- Electron
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Definition of energy: ORIGIN mid 16th cent. (denoting force or vigor of expression): from French énergie, or via late Latin from Greek energeia, from en- ‘in, within’ + ergon ‘work.’
- (Teacher resource) Definition of friction: ORIGIN mid 16th cent. (denoting chafing or rubbing of the body or limbs, formerly much used in medical treatment): via French from Latin frictio(n-), from fricare ‘to rub.’
- (Teacher resource) Definition of attract: ORIGIN late Middle English : from Latin attract- ‘drawn near,’ from the verb attrahere, from ad- ‘to’ + trahere ‘draw.’
- (Teacher resource) Definition of repel: ORIGIN late Middle English : from Latin repellere, from re- ‘back’ + pellere ‘to drive.’
- (Teacher resource) Definition of atom: the basic unit of a chemical element. ORIGIN late 15th cent.: from Old French atome, via Latin from Greek atomos ‘indivisible,’ based on a- ‘not’ + temnein ‘to cut.’
- (Teacher resource) Definition of nucleus: the positively charged central core of an atom, containing most of its mass. ORIGIN early 18th cent.: from Latin, literally ‘kernel, inner part,’ diminutive of nux, nuc- ‘nut.’
- (Teacher resource) Definition of proton: a stable subatomic particle occurring in all atomic nuclei, with a positive electric charge equal in magnitude to that of an electron, but of opposite sign. ORIGIN 1920s: from Greek, neuter of prōtos ‘first.’
- (Teacher resource) Definition of neutron: a subatomic particle of about the same mass as a proton but without an electric charge, present in all atomic nuclei except those of ordinary hydrogen. ORIGIN early 20th cent.: from neutral + -on .
- (Teacher resource) Definition of electron: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids. ORIGIN late 19th cent.: from electric + -on .
  - Electric: ORIGIN mid 17th cent.: from modern Latin electricus, from Latin electrum ‘amber,’ from Greek ēlektron (because rubbing amber causes electrostatic phenomena).
  - -On: denoting subatomic particles or quantaORIGIN originally in electron, from ion
    - Ion: ORIGIN mid 19th cent.: from Greek, neuter present participle of ienai ‘go.’
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Charging a balloon with your hair
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Atom diagram
- Scissors
- Crayons
- Balloons
- Tape

**Suggested Daily Schedule:**

- Day 1:
  - Read/say Genesis 1:1-5
  - Review (write words on board, have students say the words, recall what the words mean):
    - energy
    - friction
    - attract
    - repel
    - Atom
    - Nucleus
    - Proton
    - Neutron
    - Electron
  - Science Experiment: Opposites attract (and same repels)!
    - Give each student a balloon
    - As in the past, have them, using friction (rubbing it on their hair, sweater, carpet, etc.), create a static charge on the ballon so that it can stick to the wall, their shirt, a plastic chair, etc.
    - Have students keep track of what will or won't allow the balloon to stick to it
      - Note: if the balloon does not stick, encourage students to recharge the balloon (rub on hair or sweater) before ruling out the object

        - After getting the balloons to stick to multiple objects (try different rooms as well!) make a list on the board with two columns: Objects to which the balloon stuck and Objects to which the balloon didn't stick
    - Discuss:
        - When the charge of an atom is neutral, how many protons and electrons does it have? (The same number)
        - When you rub the balloon on your hair or sweater, the balloon, because of friction, steals electrons from your head or sweater.  This means the charge of the balloon is no longer neutral!
            - In fact, your hair is now positively charged (because it lost electrons) and the balloon is now negatively charged (because it gained electrons)
        - Ask: what is an opposite? (you have discussed this before)
            - After receiving answers from the students, ask if they know the opposite of positive (this is difficult- feel free to help them with the correct answer of negative)
        - Ask: what is the opposite of attract? (repel)
        - Ask: If opposites attract, what does positive attract? (negative)
        - Ask: If things that are the same repel, what does negative repel? (negative)
        - Ask: If the balloon is negatively charged and it is attracted to the wall, what is the charge of the wall when the balloon touches it? (Positive)
    - Note: in the next session, you will demonstrate this in slow motion using the Atom Diagram they created
- Day 2: Opposites attract in slow motion
    - Read/say Genesis 1:1-5
    - Review:
        - Atom
        - Nucleus
        - Proton
        - Neutron
        - Electron
        - energy
        - friction
        - attract
        - repel
    - Recall the experiment from the day before
        - Why was your hair positively charged? (It lost electrons)
        - Why was your balloon negatively charged? (it gained electrons)
        - Why did the balloon stick to the wall? (the negative charge of the balloon was attracted to the positive charge of the wall and repelled the negative charge of the wall)
    - Science activity:
        - Explain to the children that they are now going to demonstrate the attraction and repulsion of the charges of electrons and protons.
        - Prepare:
            - Have a student lay or tape a proton and electron to/in his hair
            - Tape a proton and electron to the balloon
            - Tape a proton and electron to the wall
        - As you do the taping, have the students verbalize that because there are an equal number of protons and electrons, the charge is neutral.
        - Have student pretend the balloon is being rubbed on the student's hair.
            - Ask: What happens? (The balloon steals electrons from the hair)
                - Steal the electron from the hair and tape it to the balloon
                - Ask: Are there more protons or electrons on the balloon? (Electrons)
                - Ask: Are there more positive charges or negative charges? (negative)
                - Tell: So, since there are more negative charges, the balloon is negatively charged)
        - Have student take the balloon to the wall
            - Ask: Which will the balloon attract? (positive/proton)
            - Ask: Which will the balloon repel? (negative/electron)
    - Science Activity (Part 2)
        - Sitting again with their atom diagrams, ask the following and have the students demonstrate
            - How do you make your atom negatively charged? (Add a negative (electron) so there are more negatives (electrons) than positives (protons)
            - How do you make your atom positively charged? (Take away a negative (electron) so there are more positives (protons) than negatives (electrons)
    - Conclude by answering any questions

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## Week 7

**Topics:**

- Heat

**Words to Remember:**

- Energy
- Conduction
- Convection
- Radiation
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Definition of heat: a form of energy arising from the random motion of the molecules of bodies, which may be transferred by conduction, convection, or radiation
- (Teacher resource) Definition of conduction: the process by which heat or electricity is directly transmitted through a substance when there is a difference of temperature or of electrical potential between adjoining regions, without movement of the material. ORIGIN mid 16th cent. (in the senses [provision for safe passage] and [leadership] ): from Latin conductio(n-), from the verb conducere (see conduct ).
- (Teacher resource) Definition of convection: the movement caused within a fluid by the tendency of hotter and therefore less dense material to rise, and colder, denser material to sink under the influence of gravity, which consequently results in transfer of heat. ORIGIN mid 19th cent.: from late Latin convectio(n-), from Latin convehere, from con- 'together' + vehere 'carry.'
- (Teacher resource) Definition of radiation: the emission of energy as electromagnetic waves or as moving subatomic particles.  ORIGIN late Middle English (denoting the action of sending out rays of light): from Latin radiatio(n-), from radiare 'emit rays'
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Bowl of hot water
- Bowl of cold water
- Red food coloring
- Blue food coloring
- Atom diagram

**Suggested Daily Schedule:**

- Day 1: Finding heat
  - Read/say Genesis 1:1-5
  - Review (write words on board, have students say the words, recall what the words mean):
    - energy
    - friction
    - attract
    - repel
    - Atom
    - Nucleus
    - Proton
    - Neutron
    - Electron
  - Discuss:
    - What is heat?
      - Have students list things that are hot.
    - How do you know something is hot without touching it?
  - Science Activity: Finding heat (this is an especially good experiment on a cold day)
    - Walk around inside:
      - Do you see anything that is hot?  How do you know it is hot?
    - Walk around outside:
      - Do you see anything that is hot?  How do you know it is hot?
    - Discuss:
      - How do you know something is hot? (have students try to articulate their observations)

        - What does heat look like? (depending on what the students were able to observe, they might talk about wavy lines (above a hot road) or the like
- Day 2: Creating and Observing heat
    - Read/say Genesis 1:1-5
    - Review:
        - Atom
        - Nucleus
        - Proton
        - Neutron
        - Electron
        - energy
        - friction
        - attract
        - repel
    - Science experiment: Creating heat (this can be done inside or outside, but on a cold day, it might work better outside)
        - Have students briefly touch their cheeks with their hands.  Are their hands hot or cold?
        - Have the students rub their hands together vigorously.
        - Have the students now touch their cheeks.
        - Is there any change in how warm their hands feel?
    - Discuss:
        - What were you causing when you rubbed your hands together? (you may have to help students recall last week's discussion of friction as friction is the correct answer, but students might first give answers like heat, to which you can ask, but what was going on to create the heat?)
    - Science activity: Observing heat
        - Fill a bowl with hot water (as hot as you can get it as it might cool slightly)
        - Fill a bowl with cold water and place it next to the bowl of hot water
        - Have students look carefully at both bowls for the next step
        - Put a drop of red food coloring in the bowl of hot water
        - Then, put a drop of blue food coloring in the bowl of cold water
    - Discuss:
        - Which drop spread out faster when it hit the water? (If necessary, redo the experiment so studens may observe again) (the cl
        - When you caused heat with your hands, what did you have to do with your hands? (you are aiming for something like "your hands had to move fast.")
        - Ask: if moving your hands quickly caused heat, why might the drop move more quickly in this bowl (point to the bowl of hot water) than this bowl (point to the bowl of cold water)? (you are looking for something along the lines of "because the water in that bowl is hot.")
    - Next week students will discuss conduction, convection, and radiation as they relate to heat.  Part of this discussion will involve discussion of molecules, so if students still have their atom diagrams, that could be helpful.

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## Week 8

**Topics:**

- Conduction

**Words to Remember:**

- Energy
- Conduction
- Equilibrium
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Definition of heat: a form of energy arising from the random motion of the molecules of bodies, which may be transferred by conduction, convection, or radiation
- (Teacher resource) Definition of conduction: the process by which heat or electricity is directly transmitted through a substance when there is a difference of temperature or of electrical potential between adjoining regions, without movement of the material. ORIGIN mid 16th cent. (in the senses [provision for safe passage] and [leadership] ): from Latin conductio(n-), from the verb conducere (see conduct ).
- (Teacher resource) Definition of equilibrium: a state of rest or balance due to the equal action of opposing forces. ORIGIN 1608.: from Latin aequilibrium, from aequus "equal" + libra "a balance, scale, plummet"

- (Teacher resource) Definition of radiation: the emission of energy as electromagnetic waves or as moving subatomic particles.  ORIGIN late Middle English (denoting the action of sending out rays of light): from Latin radiatio(n-), from radiare 'emit rays'
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Ice cubes
- Glass or bowl of hot water
- Pan
- Stove
- Metal spoon
- Plastic spoon
- Wooden spoon
- 3 Tablespoons of butter (from a stick of butter, divided into 1 Tablespoon squares)
- Atom diagram

**Suggested Daily Schedule:**

- Day 1: Conduction
  - Read/say Genesis 1:1-5
  - Review (write words on board, have students say the words, recall what the words mean):
    - conduction
  - New word:
    - equilibrium
  - Discuss:
    - Molecules are always seeking equilibrium or balance.  How do we know when a molecule (which we can't see) has achieved equilibrium?
  - Science experiment: Equilibrium
    - Fill a glass or bowl with hot water.
    - Have students feel the water
    - Have students feel the ice cube
    - Put an ice cube in the bowl or glass
    - Once the ice cube has melted, have students feel the water
  - Discuss:
    - What did the water feel like before the ice cube was placed in it?
    - What did the ice cube feel like before it was put in the water?
    - What happened to the ice cube?
    - How did the water feel after the ice cube melted?
    - Conclusion: to achieve equilibrium or balance, the temperature of the water and the ice needed to change.  The water got cooler and the ice got warmer.
- Day 2: Observing conduction
  - Read/say Genesis 1:1-5
  - Review:
    - Conduction
    - Equilibrium
  - Recall: Have students recall experiment and discussion from yesterday
  - Science experiment: Observing conduction
    - Place a pan full of water on the stove.
    - Have the students touch each spoon.
    - Place the spoons in the pan with the HANDLES in the water (the spoon part should be sticking out)
    - Place 1 Tablespoon square of butter on each spoon
    - Bring the water to a boil, having students carefully watch what happens to the butter
  - Discuss:
    - What happened to the butter on each spoon?
    - How did the butter melt? (The spoons got hot)
    - Were the spoons hot before they were placed in the water?
    - How did they get hot? (conduction)
    - Which spoon got hot faster? (metal, then wood, then plastic)
      - Metal is a good conductor (it transfers heat well)

- Wood is a semi-good conductor
- Plastic is not a good conductor

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## Week 9

**Topics:**

- Convection

**Words to Remember:**

- Energy
- Convection: the movement caused within a fluid by the tendency of hotter and therefore less dense material to rise, and colder, denser material to sink under the influence of gravity, which consequently results in transfer of heat. ORIGIN mid 19th cent.: from late Latin convectio(n-), from Latin convehere, from con- ‘together’ + vehere ‘carry.’
- Density: degree of consistency measured by the quantity of mass per unit volume.  ORIGIN early 17th cent.: from French densité or Latin densitas, from densus ‘dense.’
- Expand: become or make larger or more extensive ORIGIN late Middle English : from Latin expandere ‘to spread out,’ from ex- ‘out’ + pandere ‘to spread.’
- Contract:  decrease in size, number, or range  ORIGIN Middle English : via Old French from Latin contractus, from contract- ‘drawn together, tightened,’ from the verb contrahere, from con- ‘together’ + trahere ‘draw.’
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Definition of heat: a form of energy arising from the random motion of the molecules of bodies, which may be transferred by conduction, convection, or radiation
- (Teacher resource) Definition of convection: the movement caused within a fluid by the tendency of hotter and therefore less dense material to rise, and colder, denser material to sink under the influence of gravity, which consequently results in transfer of heat. ORIGIN mid 19th cent.: from late Latin convectio(n-), from Latin convehere, from con- ‘together’ + vehere ‘carry.’
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- (Teacher resource) Definition of radiation: the emission of energy as electromagnetic waves or as moving subatomic particles.  ORIGIN late Middle English (denoting the action of sending out rays of light): from Latin radiatio(n-), from radiare ‘emit rays’
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- 4 identical glass bottles or jars (such as Starbucks iced coffee or canning jars- mouth should be at least 1.5 inches in diameter)
- blue food coloring
- red food coloring
- index card or old playing card or tag board (must be larger than mouth of glass bottleor jar)
- hot water
- cold water
- empty bottle (water bottle or plastic soda bottle)
- balloon
- pan of hot water
- tongs (for holding bottle)
- balloon
- string or something to measure the size of the balloon
-
-

**Suggested Daily Schedule:**

- Day 1: Convection
  - Read/say Genesis 1:1-5
    Review (write words on board, have students say the words, recall what the words mean):

        - convection

      Discuss:

        - Hot rises and cold falls

    - Science experiment: Convection observed (from http://www.hometrainingtools.com/water-convection-science-project/a/1445/)
      - Take your materials to the place that is okay to get wet.
      - Fill two of the jars to the rim with cold tap water. Place a couple of drops of blue food coloring in each jar (enough to make the water noticeably blue). Add a few more drops of cold water so that a bulge of water forms over the rim.
      - Fill the other two jars to the rim with hot water from the tap. Place a couple of drops of red food coloring in each jar (enough to make the water noticeably red). Add a few more drops of hot water so that a bulge of water forms over the rim.
      - Take one of the red jars and place the tag board on top, letting the water seal the tag board to the jar. Using one hand to keep the tag board on the mouth of the jar, quickly turn the jar over. The water seal will keep the tag board stuck to the rim and will prevent water from leaking out.
      - Place the upside-down jar on top of a blue jar. Align the two mouths of the jars together and then, holding both jars steady, have someone else carefully remove the tag board, keeping the mouths of the jars together as much as possible.
      - You should now have the red jar sitting upside down on top of the blue jar, both filled with their respective water. What do you notice about the water?
      - Now, take a new piece of tag board and place it on the second blue jar. Using the same method as before, place the second blue jar on top of the second red jar, making sure the mouths are aligned.
      - Remove the tag board and watch the water in the two jars. What happens to the water?
    - Discuss:
      - When the red jar was placed on top of the blue jar, the distinction between red water and blue water stayed fairly clear. But when the blue jar was placed on top of the red jar, there was a very rapid mixing of colors. Why is this?

        Well, simply put, cold water is "heavier" than hot water. When the hot water is heated, the water molecules start moving around pretty fast and move apart from each other. The water molecules in the cold water, on the other hand, are packed closer together. So, in two equal size jars, more cold water molecules can fit in their jar than hot water molecules can fit in their jar. In scientific terms, the cold water is more dense than the hot water. So when hot water is placed beneath cold water, it will rise up while the cold water sinks down. This causes the mixing of the water you saw earlier. However, when the hot water is placed on top of the cold water, nothing moves because the hot water is already where it wants to be - at the top. (next session we will explore why this happens)

- Day 2: Density (understanding why heat rises and cold falls)
  - Read/say Genesis 1:1-5
  - Review:
    - Recall: Have students recall experiment and discussion from last session
    - Convection
    - Density
  - Science experiment 1: Observing density
    - Blow up a balloon
    - Measure the size of the balloon
    - Put the balloon in a snowbank or set it in the snow with snow packed around it so it doesn't go anywhere. (if snow if not available, put the balloon in the freezer)
    - Go on to Science experiment 2
  - Science experiment 2: Observing density
    - Stretch the balloon over the mouth of the empty bottle.
    - Put the bottle in the pot of hot water, let it stand (or hold it in the water with the tongs) for a few minutes and watch what happens.
  - Discuss:
    - What happens to the balloon? (It should expand as the air heats up because the molecules begin to move faster due to the heat)
    - Note to students that you did not add any air to make the balloon expand, it expanded simply because of the movement of the molecules due to the heat.
    - Define expand
    - Have students recall the balloon you put outside.  Ask the students if heat made the balloon expand, what might cold make the balloon do?
    - Take answers from the students
    - Go check the balloon in the snow or freezer
    - Measure the balloon
    - Define contract
  - Discuss:
    - Recall the previous session's experiment with the water and jars.

    - Help students make connections between the two experiments (the hot water was expanded and "full," so it did not have room for the cold water)

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## Week 10

**Topics:**

- Radiation

**Words to Remember:**

- Energy
- Radiation
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Definition of heat: a form of energy arising from the random motion of the molecules of bodies, which may be transferred by conduction, convection, or radiation
- (Teacher resource) Definition of radiation: the emission of energy as electromagnetic waves or as moving subatomic particles.  ORIGIN late Middle English (denoting the action of sending out rays of light): from Latin radiatio(n-), from radiare ‘emit rays’
- (Teacher resource) Definition of equilibrium: a state of rest or balance due to the equal action of opposing forces. ORIGIN 1608.: from Latin aequilibrium, from aequus "equal" + libra "a balance, scale, plummet"
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Candle (a candle in a jar (Yankee type) will work best as you can set it on a table)
- Infrared terrier
- Infrared dog
- Infrared parrot
- Infrared house
- Infrared hand
- Sheet of black paper
- Sheet of white paper
- 2 Sheets of aluminum foil

**Suggested Daily Schedule:**

- Day 1: Radiation
    - Read/say Genesis 1:1-5
    - Review (write words on board, have students say the words, recall what the words mean):
        - conduction (key to remember for coming discussion: heat travels through a solid)
        - convection (key to remember for coming discussion: heat travels through something that flows- a liquid or gas)
        - equilibrium
    - Discuss:
        - What is the difference between conduction and convection? (In terms of how heat is transferred, but let students report any observations they remember from the science experiments you have done.  You may need to help the students organize their observations into conduction and convection categories, which is a good exercise in and of itself)
    - New word:
        - radiation
    - Science experiment: Observing radiation
        - Light a candle
        - Have students carefully hold their hands above the flame.
            - Ask what they feel
        - Have students carefully look around the flame to see the waves radiating off the candle
            - Ask what they see (this one might be difficult as it is hard to focus around the candle when a fascinating flame is there, too!)
        - Take the candle outside if it is cold (this is ideal) or open a freezer or refrigerator and stand beside it with the candle
        - Once again, have students look around the candle to see the waves

        - Have students see how far away from the candle their hands can be and still feel the heat
    - Discuss:
        - You can still feel the heat of the flame in the cold because of radiation.
- Day 2: Observing radiation
    - Read/say Genesis 1:1-5
    - Recall: Have students recall experiment and discussion from yesterday
    - Discuss: All objects give off energy as thermal radiation.  We can feel radiation, but we can't see it unless we have a special camera.  House inspectors, plumbing and heating repairmen, and hunters are a few examples of people who might use infrared cameras.
        - Show students pictures taken with an infrared camera
        - Where do animals, humans, and objects give off heat most easily?
        - Thinking of the hand example, why is it a good idea to wear mittens or gloves in the winter?
    - Science activity: Observing radiation
        - Make a list of things that give off heat
        - Go on a scavenger hunt to find these things (or some of these things depending on the list the students made)
        - When you find something that gives off heat, put your hand near it (but don't touch!) and then move further away.
        - Keep track of how far away you could be and still feel the heat.
        - Discuss:
            - Why do some objects give off more heat than others?
            - What are some of the characteristics of hotter objects (think color, material, etc.)
    - Science experiment:
        - On a sunny day, lay a piece of black paper, a piece of black paper, a sheet of aluminum foil with the shiny side up, and a piece of aluminum foil with the dull (matte) side up (you may need something to anchor them down if there is a breeze)
        - Leave the sheets out for 15 minutes (at least)
        - Using their hands, have the students test the difference in heat given off by each sheet
        - Discuss:
            - Which sheet was giving off the most heat?
            - Why was this? (color, material, etc.)

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## Week 11

**Topics:**

- Sound
- Pitch
- Volume

**Words to Remember:**

- Energy
- Sound: vibrations that travel through the air or another medium and can be heard when they reach a person's or animal's ear ORIGIN Middle English soun, from Anglo-Norman French soun (noun), suner (verb), from Latin sonus. The form with -d was established in the 16th cent.
- Vibration: an oscillation of the parts of a fluid or an elastic solid whose equilibrium has been disturbed, or of an electromagnetic wave. ORIGIN mid 17th cent.: from Latin vibratio(n-), from the verb vibrare
- Wave: a periodic disturbance of the particles of a substance that may be propagated without net movement of the particles, such as in the passage of undulating motion, heat, or sound. ORIGIN Old English wafian (verb), from the Germanic base of waver ; the noun by alteration (influenced by the verb) of Middle English wawe [(sea) wave.]
- Pitch: the quality of a sound governed by the rate of vibrations producing it; the degree of highness or lowness of a tone.
- Volume: quantity or power of sound; degree of loudness
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Rubber bands
- Unsharpened pencils

- Glass glasses (preferably all from the same set)
- Water
- Spoons
- Bowl
- Tuning fork (if available)
- Piano

**Suggested Daily Schedule:**

- Day 1: What is sound?
  - Read/say Genesis 1:1-5
  - Discuss:
    - Define sound
    - Define vibration
    - Define wave
    - Define pitch
    - Define volume
  - Science experiment: Observing sound
    - Each student:
      - Stretch a rubber band between the pinky and thumb and "strum" the rubber band
      - What do you feel on your hands? (you are moving in the direction of understanding sound waves/vibration)
      - What happens to the sound when you put your fingers closer together or further apart?
    - Three students (or teacher and one student):
      - Have two students carefully stretch a rubber band between them.  Have the third student "strum" the rubber band
      - What happens to the sound when the students get closer or further apart? (you are moving in the direction of understanding pitch)
      - What happens to the sound when you "strum" more vigorously or less vigorously? (you are moving in the direction of understanding volume)
  - Science experiment: What makes things have different pitches? (this is an experiment to help students observe that sound waves travel differently through different objects and that the medium/material impacts the sound
    - Give each student an unsharpened pencil
    - Have students walk around and tap different objects (some will be better choices than others, but observing bad examples is sometimes part of being a scientist)
    - Discuss and make two lists:
      - What objects make high sounds and what objects make low sounds?
      - Look at the lists
      - What do the objects that make high sounds have in common?
      - What do the objects that make low sounds have in common?
      - Note: if there are not enough objects on the lists to answer the last two questions, have the students go tap more objects
- Day 2: Observing pitch
  - Read/say Genesis 1:1-5
  - Recall: Have students recall experiments and discussion from yesterday
  - Review:
    - Sound
    - Vibration
    - Wave
    - Pitch
    - Volume
  - Discuss: Sound waves travel through objects differently (as you discussed yesterday)
    - Today we are going to do an experiment where we influence the pitch rather than just observe the pitch
  - Science experiment: Observing pitch
    - Have students fill glasses of water with various amounts of water
    - Gently tap the edge of the glass with a spoon
    - Have students work to put the glasses of water in order just by observing sound (though, they may start to catch on to the amount of water)
  - Discuss:
    - Which glasses make high sounds?
    - Which glasses make low sounds?
    - What is the difference between the glasses? (the amount of water)
    - Does more or less water make the higher pitch?
  - Further exploration:
    - See if the students can figure out how to play a song with the glasses (Jesus Loves Me or something simple like that)
    - They may need to put more water in a glass or take some water out of the glass to get the right pitch

    - Further exploration:
        - Open a piano so that students can see the strings
        - Play a high note
        - Play a low note
        - What is the difference between the strings that make high sounds and the strings that make low sounds?
    - Optional science experiment if a tuning fork is available: Observing sound waves
        - Strike a tuning fork
        - Let it touch the water in a bowl
        - Observe the ripples

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## Week 12

**Topics:**

- Sound
- Pitch
- Volume

**Words to Remember:**

- Energy
- Sound: vibrations that travel through the air or another medium and can be heard when they reach a person's or animal's ear ORIGIN Middle English soun, from Anglo-Norman French soun (noun), suner (verb), from Latin sonus. The form with -d was established in the 16th cent.
- Vibration: an oscillation of the parts of a fluid or an elastic solid whose equilibrium has been disturbed, or of an electromagnetic wave. ORIGIN mid 17th cent.: from Latin vibratio(n-), from the verb vibrare
- Wave: a periodic disturbance of the particles of a substance that may be propagated without net movement of the particles, such as in the passage of undulating motion, heat, or sound. ORIGIN Old English wafian (verb), from the Germanic base of waver ; the noun by alteration (influenced by the verb) of Middle English wawe [(sea) wave.]
- Pitch: the quality of a sound governed by the rate of vibrations producing it; the degree of highness or lowness of a tone.
- Volume: quantity or power of sound; degree of loudness
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Balloons
- Hula hoop
- Pieces of paper (any size, but probably 8.5x11 would work best) with the word SOUND written on them
- Bucket (ice cream bucket, for example)
- Water
- Small object (like a pebble or a penny)
- Computer (or some other way to watch a YouTube video)

**Suggested Daily Schedule:**

- Day 1: How does sound travel?
    - Read/say Genesis 1:1-5
    - Review:
        - Sound
        - Vibration
        - Wave
        - Pitch
        - Volume
    - New word:
        - Density: degree of consistency measured by the quantity of mass per unit volume. ORIGIN early 17th cent.: from French densité or Latin densitas, from densus ‘dense.’
    - Demonstrate density:

        - Place a hula hoop on the floor
        - Tell the students that they are molecules
        - Have one student stand inside the hula hoop.  Keep adding students to the hula hoop until it is full (or you run out of students).  Explain to the students that the more molecules you put in a space, the more dense it is. (you will return to this concept later)
    - Science experiment: Balloon whispering
        - Have students stand across the room from one another (in partners) and whisper a sentence to one another
        - Discuss:
            - Could you hear what your classmate said?
            - Through what was the sound traveling? (air)
        - Give each pair of students a balloon
        - Have one student put the balloon up to his ear and the other whisper the same sentence into the balloon (have the students try to whisper at the same volume they whispered before)
        - Discuss:
            - Was it easier or harder to hear what your classmate said? (Hopefully the answer is yes)
            - Through what was the sound traveling? (compressed air)
        - Discuss:
            - Ask students to recall (or review with them) molecules (everything is made up of molecules (protons, electrons, neutrons), including air)
            - Sound travels through air
            - The air in the balloon is compressed, meaning it has more density (there are more molecules in the space).
            - If molecules carry sound, would more molecules make the sound softer or louder?
                - Visualize density and sound:
                    - Give one student/molecule a piece of paper with the word sound on it
                    - Have the student snap the paper back and forth (in an accordion fashion) to make noise
                    - Ask: Is that sound loud? (Students will probably say no, unless the student/molecule is extremely vigorous)
                    - Give another student/molecule a piece of paper with the word sound on it and have him walk around with the other student
                    - Continue adding molecules (density) and the noise should increase
            - Ask students to recall how the volume changed with the density change
            - Ask students for any conjectures as to why that might be the case (there are more molecules to carry the sound)
- Day 2: Observing sound
    - Read/say Genesis 1:1-5
    - Recall: Have students recall experiments and discussion from yesterday
    - Review:
        - Sound
        - Vibration
        - Wave
        - Pitch
        - Volume
        - Density
    - Discuss: Density (the amount of molecules in a space) impacts how sound travels (as you discussed yesterday)
        - Today we are going to think about how this works
    - Science experiment: How sound works
        - Fill a bucket with water
        - Drop a small object in the water
        - Have students observe the ripples/waves
    - Discuss:
        - If you could see sound, you would see waves, much like the ripples of water
        - In this example, what does the pebble/penny/object represent? (The sound occurring)
        - In this example, what do the waves represent (how the sound moving would look if we could see it)
    - Further exploration:
        - Watch:

- Discuss:
  - What did you observe? (different pitches made the flames different shapes and sizes)
    - Note: you may need to watch the video again after the discussion so students can put the two concepts together

## Week 13

**Topics:**

- How voices make sounds
- How ears hear sounds

**Words to Remember:**

- Energy
- Sound: vibrations that travel through the air or another medium and can be heard when they reach a person's or animal's ear ORIGIN Middle English soun, from Anglo-Norman French soun (noun), suner (verb), from Latin sonus. The form with -d was established in the 16th cent.
- Vibration: an oscillation of the parts of a fluid or an elastic solid whose equilibrium has been disturbed, or of an electromagnetic wave. ORIGIN mid 17th cent.: from Latin vibratio(n-), from the verb vibrare
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- Pitch: the quality of a sound governed by the rate of vibrations producing it; the degree of highness or lowness of a tone.
- Volume: quantity or power of sound; degree of loudness
- Genesis 1:1-5

**Textbook reference and written work:**

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- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource) Read The Hearing Ear
- (Teacher/student resource) Watch Anatomy of the Ear
- (Student resource) Ear diagram- blank
- (Teacher resource) Ear diagram- labeled

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Crayons, pencils, or something with which to write
- Rubber bands
- Plastic wrap
- Bowl or pot with wide opening
- Uncooked rice
- Scissors
- Tape
- Computer (or some other way to watch a YouTube video)

**Suggested Daily Schedule:**

- Day 1: How does the voice work?

- Read/say Genesis 1:1-5
- Review:
  - Sound
  - Vibration
  - Wave
  - Pitch
  - Volume
- Discuss:
  - Think back to all the experiments we have done lately.  What has to happen for sound to occur? (something has to vibrate)'
  - If this is the case, how do you think the voice works? (something has to vibrate)
- Discuss:
  - Tell students: in your throat, you have what are called vocal cords
- Demonstrate:
  - Have the students hold their hands parallel to one another
  - Ask, are your hands making any sound? (No)
  - Have the students clap
  - Ask, did your hands make a sound? (Yes)
- Discuss:
  - That is how your vocal cords work- there is no sound until the vocal cords 'hit'
  - Ask, why do the vocal cords have to be apart? (so we can breathe, so we can swallow, etc.)
  - If you want, you can go more in depth with the different parts of the voice, how the mouth, nose, lungs, etc. all play a part in making sound, but the goal is for students to make a connection between things vibrating and sound happening.
- Demonstrate: Vocal vibrations
  - Give students a rubber band (this works best if they have a partner)
  - Pretend the rubber band is your vocal cords
  - The speed of the vibration of the vocal cords produces different pitches of sound
  - Can you get the rubber band to produce different pitches?
- Discuss:
  - Why can some people sing high and some people sing low?  (And similar questions)

- Day 2: How does the ear work?
  - Read/say Genesis 1:1-5
  - Recall: Have students recall discussion from yesterday
  - Review:
    - Sound
    - Vibration
    - Wave
    - Pitch
    - Volume
  - View: Anatomy of the Ear
    - The video uses technical words.  Teachers may decide if this would be distracting for students.  If so, watch the video on mute and explain to the students how the sound waves come in the outer ear, hit the ear drum, and cause the bones in the ear to vibrate.  Teachers may explain things further (how the vibrations translate to messages to the brain, etc.), but mainly, the point is to help students understand that just as vibrations make sound, so also is that how we hear.
  - Discuss:
    - Give students an  Ear diagram- blank handout
    - Have students draw arrows to show sound going in the ear
    - Have students circle or otherwise note which parts of the ear vibrate (tympanic membrane, malleus, incus, stapes)
  - Science experiment: How the ear works
    - Stretch plastic wrap over the bowls or pot
    - Use tape to firmly secure the plastic wrap (it has to be very tight)
    - Place a teaspoon of uncooked rice on the plastic wrap
    - Clap near the plastic wrap
    - Make other sounds (bang things together, etc.) and observe differences in what happens to the rice
  - Discuss:
    - The plastic wrap represents what? (The outer ear)
    - The rice represents what? (The bones inside the ear)
    - What makes the bones (rice) act differently? (Differences in volume of sound)

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## Week 14

**Topics:**

- Electricity

**Words to Remember:**

- Energy
- Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
- Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
- Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
- Electric current: The movement of electrons which creates the flow of electricity.
- Insulator:  a substance or device that does not readily conduct electricity
- Negative charge: of, containing, producing, or denoting the kind of electric charge carried by electrons. ORIGIN late Middle English: from late Latin negativus, from negare ‘deny’
- Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’
- Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
- Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
- Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
- Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper, cut into even strips (to make a paper chain)
- Tape
- Computer (or some other way to watch a YouTube video)

**Suggested Daily Schedule:**

- Day 1: Electric vocabulary
  - Read/say Genesis 1:1-5
  - Discuss:
    - Energy
    - Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
    - Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
    - Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
    - Electric current: The movement of electrons which creates the flow of electricity.
    - Insulator:  a substance or device that does not readily conduct electricity
    - Negative charge: of, containing, producing, or denoting the kind of electric charge carried by electrons. ORIGIN late Middle English: from late Latin negativus, from negare ‘deny’
    - Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’
    - Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
    - Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
    - Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’

    - Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
- Day 2: Making an electric circuit
  - Read/say Genesis 1:1-5
  - Review: Have students recall words learned in previous session
  - Science activity:
    - Using strips of paper and tape, have students make a paper chain.
    - Tape is important because you will sometimes need to take apart and repair the chain in the coming weeks.
    - Make the chain a significant length as it will be used for demonstration purposes (you can even use it to review this week's Words to Remember!)

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## Week 15

**Topics:**

- Electricity

**Words to Remember:**

- Energy
- Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
- Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
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- Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
- Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
- Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource) Series circuit and parallel circuit illustration

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)

**Suggested Daily Schedule:**

- Day 1: Electric vocabulary and series circuits
  - Read/say Genesis 1:1-5
  - Review:
    - Energy
    - Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’

        - Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
        - Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
        - Electric current: The movement of electrons which creates the flow of electricity.
        - Insulator:  a substance or device that does not readily conduct electricity
        - Negative charge: of, containing, producing, or denoting the kind of electric charge carried by electrons. ORIGIN late Middle English: from late Latin negativus, from negare ‘deny’
        - Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’
        - Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
        - Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
        - Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
        - Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
    - Science activity: Series circuit
        - With your paper chain, have one student hold one end of the chain and another student hold the other end
        - Ask students if this is a circuit (no, because a circuit is a complete and closed path)
        - With help, have the students bring the two ends together- the student holding the two ends will be called the power source (perhaps a battery)
        - Ask why this is now a circuit (because it is now a complete and closed path)
        - What if we wanted to put a light bulb in our circuit?  (Have a student pretend to be a light bulb or put a piece of yellow paper in the chain to act as a light bulb and talk through why it is still a circuit- the path is still closed and complete
        - What if we put another light bulb in our circuit?
        - What about a switch? (Have a student pretend to be a switch in the circuit- a switch breaks the circuit and stops the flow of electricity- how is this still a circuit? The path is still closed and complete, just sometimes interrupted)
        - Point out to students that a switch in a series circuit will cut the electricity to all the bulbs in the circuit
- Day 2: Circuits
    - Read/say Genesis 1:1-5
    - Review: Have students recall words learned in previous session
    - Review: Have students recall the series circuit activity  (Note: if students are struggling to visualize electricity running through the chain, have them imagine that electricity is like water- it flows until it hits interference (like a switch)
    - Science experiment: Parallel circuit
        - Sometimes we want one light to be on, but another light to be off.  To accomplish this, we need a parallel circuit.
        - Have students start off in a series circuit.  How can we get to a circuit where electricity has more than one option to travel? (Allow students to brainstorm.  It may help them to visualize trying to get electricity to two different light bulbs, so put two "light bulbs" in the room and have them then brainstorm getting electricity to the bulbs)
        - As students work to a solution, help them recall frequently that the electrons need choices
        - If students are still stuck, allow them to view the illustration found in the teacher resources
        - Once they have built their parallel circuit with the paper chain, help them talk through where the electrons have a choice as to which way they travel.
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## Week 16

**Topics:**

- Electricity
- Conduction

**Words to Remember:**

- Energy
- Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
- Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
- Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
- Electric current: The movement of electrons which creates the flow of electricity.

- Insulator:  a substance or device that does not readily conduct electricity
- Negative charge: of, containing, producing, or denoting the kind of electric charge carried by electrons. ORIGIN late Middle English: from late Latin negativus, from negare ‘deny’
- Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’
- Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
- Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
- Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
- Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource) Series circuit and parallel circuit illustration

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Balloons (or stocking feet)

**Suggested Daily Schedule:**

- Day 1: Electric vocabulary and exploring conduction
  - Read/say Genesis 1:

    Review:
    - Energy
    - Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
    - Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
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    - Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’
    - Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
    - Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
    - Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
    - Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.

    Science activity: What conducts?
    - Give each student a balloon or have them take off their shoes if there is carpet and instruct them to build up electricity by running their stocking feet on the carpet or rubbing the balloon on their hair (stocking feet work best)
    - Have students walk around and try to "shock" different items (chair, desk, light switch, etc.)
    - When they find something that sparks or shocks, put that on a class list (students may have to recharge themselves occasionally and definitely after they find something that shocks)
    - Have students also report things that do not shock
    - When students have accumulated good lists, have them discuss the materials that each item is made of on each list.
    - Ask students what conducts electricity (the materials from the shocking list)

- Day 2: Insulation
  - Read/say Genesis 1:1-5
  - Review: Have students recall words learned in previous session
  - Review: Have students recall the conduction activity  (Note: if students are struggling to visualize electricity running through the chain, have them imagine that electricity is like water- it flows until it hits interference (like a switch)
  - Insulation activity:
    - On the board, make a list of things that conduct electricity
    - On the board, make a list of things that did not conduct electricity
    - Take a tour of your surroundings and find things that use electricity (fan, computer, pencil sharpener, light, etc.)
      - On your tour, make note of the materials these things are made of- especially noting that different parts of the items are made of different materials.
    - Discuss:
      - Which materials conduct electricity?
      - What part of the object contains conducting materials?
      - Which materials insulate (or stop) electricity?
      - What part of the object contains insulating materials?
      - Why is it important to have insulating materials on an object that uses electricity?
    - Further discussion:
      - Think of jobs people do that use electricity.  How do they make sure they are not conductors? (wear rubber boots, etc.)
      - Feel free to extend this discussion to other topics such as recreation (golfing, playing baseball with metal bats, metal cleats on football/baseball cleats, etc.) and why they call or delay these things when there is lightning.

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## Week 17

**Topics:**

- Electric Scientists

**Words to Remember:**

- Energy
- Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
- Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
- Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
- Electric current: The movement of electrons which creates the flow of electricity.
- Insulator:  a substance or device that does not readily conduct electricity
- Negative charge: of, containing, producing, or denoting the kind of electric charge carried by electrons. ORIGIN late Middle English: from late Latin negativus, from negare ‘deny’
- Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’
- Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
- Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
- Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
- Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students

- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Michael Faraday- God's Power and Electric Power
- 1/2 teaspoon salt
- 1/2 teaspoon pepper
- plastic spoon
- woolen cloth or yarn
- plate

**Suggested Daily Schedule:**

- Day 1: Electric vocabulary and exploring insulation
  - Read/say Genesis 1:

    Review:
    - Energy
    - Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
    - Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
    - Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
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    - Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
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    - Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.

    Read:
    - Read:
      - Michael Faraday- God's Power and Electric Power (as this may be beyond the reading level of the students, feel free to read it to them)
    - Discuss:
      - What was school like for Michael Faraday?
      - How did he overcome his lack of schooling? (By reading)
      - About what was he curious? (science, electricity, magnetism, etc.)
      - What did Michael Faraday invent?
      - Etc.
      -
- Day 2: Thinking like Faraday
  - Read/say Genesis 1:1-5
  - Review: Have students recall things they learned about Michael Faraday
  - Science experiment:
    - Stir the salt and pepper together on a plate
    - Ask students how they could possibly get the salt and pepper separated
    - Rub the spoon with the wool
    - Hold the spoon over the salt and pepper mixture
    - What happens?
    - Hold the spoon closer to the mixture.  Now what happens?
  - Discuss: The spoon becomes electrically charged when it is rubbed.  Ask students to recall learning about electrons and how electrons move.  How does this relate to the pepper moving?

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## Week 18

**Topics:**

- Charges

**Words to Remember:**

- Energy
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- Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
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- Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- A battery (any size)
- A 9-volt battery
- Tape
- Copper wire
- A potato

**Suggested Daily Schedule:**

- Day 1: Charge it!
  - Read/say Genesis 1:
    Review: (Note especially positive charge and negative charge)

  - Energy
  - Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
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  - Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’

        - Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
        - Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
        - Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
        - Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.

      Discuss:
        - Make a list of opposites (ex. salt and pepper)
        - Look at the list and discuss ways the pairs of words go together.
        - Put Positive Charge and Negative Charge on the board
        - Discuss how they are opposites, but they go together
    - For next session, have each student bring a battery to class
- Day 2: Testing polarity
    - Read/say Genesis 1:1-5
    - Observe:
        - Look at your battery.  Do you see a plus sign and a minus sign?  There is a positive side and a negative side.  They are opposites, but they are both necessary for the battery to work.
    - Discuss:
        - Batteries have a positive side and a negative side.  Have you ever watched a car being jumped?  The cables have to go a certain way on the car batteries, otherwise the circuit will not work correctly and the vehicles will sustain damage.  What happens if the battery is so old and corroded that you can't tell which node is positive and which is negative?  All you need is a potato and some wire!
    - Science experiment:
        - Strip insulation from both ends of each piece of wire.
        - Connect and tape the wires to the two battery poles.
        - Cut the potato into halves. Stick the free ends of the wire into a cut surface of the potato fairly close to each other but not touching each other.
        - Observe the area where the wires are stuck in the potato.
        - Around one wire there will appear some white frothing.
        - The area about the other wire will turn green.
        - The wire at which green color appears is the positive.
        - Potato juice is electrolyzed and green copper salt (copper chloride ) is formed.
        - Frothing is due to the formation of hydrogen at the negative.
    -

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## Week 19

**Topics:**

- Voltage

**Words to Remember:**

- Energy
- Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
- Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
- Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
- Electric current: The movement of electrons which creates the flow of electricity.
- Insulator:  a substance or device that does not readily conduct electricity
- Negative charge: of, containing, producing, or denoting the kind of electric charge carried by electrons. ORIGIN late Middle English: from late Latin negativus, from negare ‘deny’
- Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’
- Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
- Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
- Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’

- Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- A large iron nail (about 3 inches)
- About 3 feet of THIN COATED copper wire
- A fresh D size battery
- Tape
- Some paper clips or other small magnetic objects

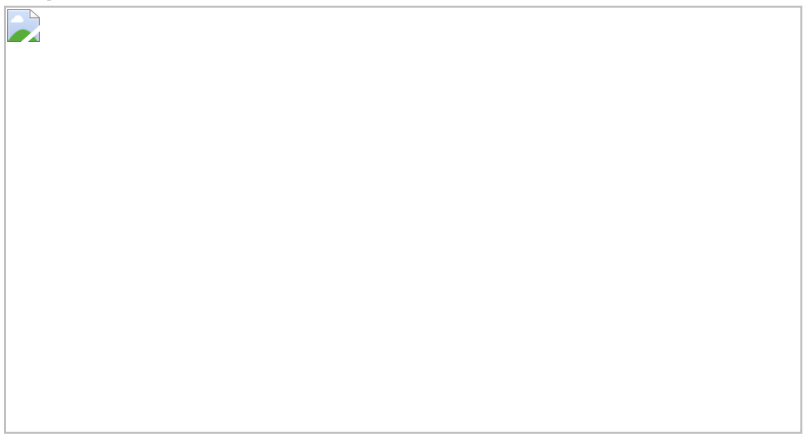
**Suggested Daily Schedule:**

- Day 1: Electron review
  - Read/say Genesis 1:
    Review: (Note especially electron)

    - Energy
    - Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
    - Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
    - Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
    - Electric current: The movement of electrons which creates the flow of electricity.
    - Insulator:  a substance or device that does not readily conduct electricity
    - Negative charge: of, containing, producing, or denoting the kind of electric charge carried by electrons. ORIGIN late Middle English: from late Latin negativus, from negare ‘deny’
    - Parallel circuit: one in which electric current travels along more than one path, because there is more than one path for the electrons to follow. ORIGIN (of parallel) mid 16th cent.: from French parallèle, via Latin from Greek parallēlos, from para- ‘alongside’ + allēlos ‘one another.’
    - Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
    - Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
    - Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
    - Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.

    Science activity:
    - With your paper chain circuit, have students stand in a circle
    - Have students take turns being the electrons and travel around the circuit
    - If more than one student is available, have another student act as an insulator (the student can choose what kind of insulator they are) (the electron can no longer move)
    - Have students take turns being electrons and insulators
  - Discuss:
    - What makes the electron move? (we need a power supply)
- Day 2: Moving electrons (making an electromagnet)
  - Read/say Genesis 1:1-5
  - Science Acticity:
    - 1. Leave about 8 inches of wire loose at one end and wrap most of the rest of the wire around the nail. Try not to overlap the wires.
    - 2. Cut the wire (if needed) so that there is about another 8 inches loose at the other end too.

- 3. Now remove about an inch of the plastic coating from both ends of the wire and attach the one wire to one end of a battery and the other wire to the other end of the battery. See picture below. (It is best to tape the wires to the battery - be careful though, **the wire could get very hot!**)



- 4. Now you have an ELECTROMAGNET! Put the point of the nail near a few paper clips and it should pick them up!
- **NOTE:** Making an electromagnet uses up the battery somewhat quickly which is why the battery may get warm, so disconnect the wires when you are done exploring.

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## Week 20

**Topics:**

- James Joule

**Words to Remember:**

- Energy
- Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
- Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
- Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
- Electric current: The movement of electrons which creates the flow of electricity.
- Insulator:  a substance or device that does not readily conduct electricity
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- Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
- Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
- Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
- Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- James Joule article
- Stopwatch
- Staircase
- Meter stick

- What's a Joule activity sheet

**Suggested Daily Schedule:**

- Day 1: Who was James Joule?
  - Read/say Genesis 1:
  - Review: (Note especially electron)
    - Energy
    - Circuit: a complete and closed path around which a circulating electric current can flow. ORIGIN late Middle English: via Old French from Latin circuitus, from circuire, variant of circumire ‘go around,’ from circum ‘around’ + ire ‘go.’
    - Conductor: a material or device that conducts or transmits heat, electricity, or sound ORIGIN late Middle English (denoting a military leader): via Old French from Latin conductor, from conducere ‘bring together’
    - Electrons: a stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.
    - Electric current: The movement of electrons which creates the flow of electricity.
    - Insulator:  a substance or device that does not readily conduct electricity
    - Negative charge: of, containing, producing, or denoting the kind of electric charge carried by electrons. ORIGIN late Middle English: from late Latin negativus, from negare ‘deny’
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    - Positive charge: of, containing, producing, or denoting an electric charge opposite to that carried by electrons.
    - Power supply: "pushes" electrons through a circuit. This power supply can come in many different forms (for example, a battery is a power supply).
    - Series circuit: (of a set of batteries or electrical components) arranged so that the current passes through each successively. ORIGIN early 17th cent.: from Latin, literally ‘row, chain,’ from serere ‘join, connect.’
    - Voltage: can be thought of as electrical pressure which pushes the electrons through the circuit. Electric pressure is measured in volts.
  - Read: James Joule article
  - Discuss:
    - What did James Joule do?
    - How did being a Christian contribute to him being a great scientists?

Day 2: What is a Joule?

- Read/say Genesis 1:1-5
- Science activity:
  - Hand out What's a Joule activity sheet
  - Go through the steps on the activity sheet
  - Once the students have figured out how much horsepower they used, have them do some research to determine how their horsepower compares to the horsepower of other things (a car, a lawnmower, a snowblower, a tractor, etc.)
  - If time allows, let students try to increase their horsepower
    - Discuss: what needs to change to increase the horsepower? (speed? height of staircase?)  Let them be scientists and try different options.

## Week 21

**Topics:**

- Magnetism

**Words to Remember:**

- Attract
- Repel
- Pole
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Magnets
- Water
- A Magnet
- A Paper-Clip
- A Clear Glass
- A Piece of thin cardboard (with a maze drawn on it)
- A Plastic or Wooden Ruler

**Suggested Daily Schedule:**

- Day 1: What is a magnet?
  - Read/say Genesis 1:1-5
  - Define:
    - Attract: exert a force on (an object) that is directed toward the source of the force ORIGIN late Middle English: from Latin attract- 'drawn near,' from the verb attrahere, from ad- 'to' + trahere 'draw.'
    - Repel: force away from itself ORIGIN late Middle English: from Latin repellere, from re- 'back' + pellere 'to drive.'
    - Pole: each of the two points or regions of an artificial or natural magnet to and from which the lines of magnetic force are directed. ORIGIN late Middle English: from Latin polus 'end of an axis,' from Greek polos 'pivot, axis, sky.'
  - Explore:
    - Give students magnets and have the explore the attracting and repelling properties of magnets
    - Walk around and find things to which the magnets are attracted.
    - Can those same things repel the magnet? (try flipping the magnet around)
    - Make a list of things to which the magnets attract
  - Discuss:
    - Of what are those things on your list made?
    - Were any of these things also conductors of electricity?

Day 2: Testing magnets

- Read/say Genesis 1:1-5
- Review:
  - Attract
  - Repel
  - Pole
- Science activities: Testing Magnet strength
  - A-mazing magnets
    - Guide a paper-clip through the maze with your hand
    - Now place the paperclip on the top of your cardboard with the maze facing up.
    - Place the magnet under your cardboard where the paperclip is resting on top.
    - Now move your magnet around and see what happens.
  - Magnets to the rescue
    - Fill your glass with water and drop the paper-clip inside the glass. Take the magnet and place it on the outside of the glass close to the magnet and see if you can pull the paper-clip to the side of the glass and up to the top (without getting wet).
  - Mountain climbing magnets
    - Hold your ruler so that one end is resting on a flat surface and hold the other end up at a angle. Place the magnet on the under side of the ruler (the end that it resting on the flat surface) and then place the paperclip on the top of the ruler (again, the end of the ruler that is resting on the flat surface).
    - Move the magnet to go up to the top end of the ruler, pulling the paperclip along.
  - Discuss:
    - What does the magnet pull on?
    - What does the magnet pull through?
    - How does this relate to conductors and insulators? (Water is the one that throws the pattern off)
    - Magnets pull **on** magnetic materials, such as iron, nickel, cobalt and steel, but pull **through** non-magnetic things, like cardboard, glass, plastic and wood. Magnets can even travel through water.

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## Week 22

**Topics:**

- Magnetism

**Words to Remember:**

- Attract
- Repel
- Pole
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Magnets
- Sewing needles
- Straight pins
- Water
- A Bowl
- Two Needle-Magnets
- Small Pieces of Paper
- Water
- A Bowl
- A Compass (used for navigation)
- Two Small Pieces of Paper
- Two Needle-Magnets

**Suggested Daily Schedule:**

- Day 1:
  - Read/say Genesis 1:1-5
  - Review:
    - Attract: exert a force on (an object) that is directed toward the source of the force ORIGIN late Middle English: from Latin attract- 'drawn near,' from the verb attrahere, from ad- 'to' + trahere 'draw.'
    - Repel: force away from itself ORIGIN late Middle English: from Latin repellere, from re- 'back' + pellere 'to drive.'
    - Pole: each of the two points or regions of an artificial or natural magnet to and from which the lines of magnetic force are directed. ORIGIN late Middle English: from Latin polus 'end of an axis,' from Greek polos 'pivot, axis, sky.'
  - Science activity: Making magnets
    - Hold a needle by the eye and stroke it gently 30 times with your magnet, in the same direction.
    - Do the same with the second needle, making sure that you use the same end of the magnet.
    - Repeat for all students (if students are not making the needle magnets themselves
    - Test your needle-magnets on some pins before you use them for other experiments.
  - Science Activity
    - Place each needle on a pieces of paper and float them side by side (with one point and one eye next to each other)
    - What happens?
    - Next, place the needles so that both eyes are side by side.  What happened this time?
    - Feel free to repeat either step multiple times, placing the needles at different distances apart, etc.
  - Discuss:
    - Have you ever heard the phrase "opposites attract"?
    - Magnets have two ends (or poles).
    - If you put the poles of two magnets together, they will either pull together or push apart.
    - Magnets will pull (attract) each other if the poles are different.
    - This invisible pull is called a magnetic force.  Magnets will push (repel) each other if the poles are the same.

Day 2: North Pole!

- Read/say Genesis 1:1-5
- Review:
  - Attract
  - Repel

    - Pole
- Science activities: Finding the North Pole
    - Float a small piece of paper in a bowl of water and rest a needle-magnet on it.  When the needle is still mark which way it points.
    - Now do the same with the second needle-magnet.  Both needles should point the same direction, which is along a north-south line.
    - To find out which end of your needle-magnet points north, you can either use a compass or you can use your shadow.
        - Go outside at midday on a sunny day.
        - If you are north of the equator, your shadow will point north.
    - Rotate the bowl- what happens to the magnet?

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## Week 23

**Topics:**

- Electromagnetic radiation overview

**Words to Remember:**

- Radio waves
- Microwaves
- Infrared
- Light waves (visible)
- Ultraviolet waves
- X-rays
- Gamma rays
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Electromagnetic Spectrum infographic
- Ruler
- Paper
- Jump rope
- Electromagnetic Spectrum template
- Something with which to write

**Suggested Daily Schedule:**

- Day 1: More waves than a parade
    - Read/say Genesis 1:1-5
    - View:
        - Electromagnetic Spectrum infographic
    - Read:
        - Words to Remember
    - Discuss (Review):
        - You have been learning about different kinds of energy
        - We discussed infrared rays when we talked about heat (or, pose this as a question- how do you "see" heat?).  Help students recall the pictures taken by infrared cameras, looking at the heat waves rising off a candle, etc.
        - Before we look at any other kind of energy, we are going to see how all the forms of energy fit together
    - Science activity: Understanding waves
        - Have two students stand holding opposite ends of a jump roap
        - Have one student hold his end tight and the other student move his end up and down to form "waves" (this may take a bit of doing as you want to see a series of waves, not just one "wave" like when you are actually jumping rope- see

illustration)
    - Have students experiment and observe:
        - if they want many waves (or short waves) in the jump rope, do they move it fast or slow? (it should be fast for many waves and slow for few waves)
        - if they want few waves (or long waves) in the jump rope, do they move it fast or slow?
    - An illustration showing a jump rope with each end being held by a person. As the people move the jump rope up and down very fast – adding MORE energy – the more wave crests appear, thus shorter wavelengths. When the people move the jump rope up and down slower, there are fewer wave crests within the same distance, thus longer wavelengths.

Day 2: Visualizing the Electromagnetic spectrum

- Read/say Genesis 1:1-5
- Review:
    - Radio waves
    - Microwaves
    - Infrared
    - Light waves (visible)
    - Ultraviolet waves
    - X-rays
    - Gamma rays
    - Science activities: Draw the electromagnetic spectrum
        - Give students a ruler or meter stick so as you discuss the following sizes of wavelengths students have a reference point
        - Read and discuss the following statements about the different parts of the the electromagnetic spectrum (from *www.sciencelearn.org.nz*):
            - Radio waves have the longest wavelengths – they range from 1 millimetre to 30 000 metres. Radio waves are used for radios, cellphones, televisions, Police radars and in industry to melt materials such as plastics.
            - Microwaves have wavelengths ranging from 1 millimetre to 1 metre. They are used for heat treatment therapy, alarm systems and heating food.
            - Infrared radiation wavelengths range from 750 nanometres to 1 millimetre. (A nanometre is 1 billionth of a metre.) Infrared radiation is usually described as heat. The most important source of infrared radiation is the Sun, although most heating appliances in your home will emit infrared radiation too. Remote controls have an infrared source, and your TV has a detector.
            - Visible light has wavelengths ranging from 400 to 770 nanometres. The most common form of visible light also comes from the Sun. Other sources are light bulbs and lasers. Lasers have lots of uses, for example, in CD players, pointers and laser eye surgery.
            - Ultraviolet light has wavelengths ranging from 300 to 400 nanometres. The main source of UV radiation is the Sun, but it is also generated in industry. It's used in sunbeds, dentistry, detecting forged banknotes and treatment of skin conditions.
            - X-rays have wavelengths between 0.01 and 10 nanometres. They are used in medicine and airport security. Doctors use them to look at bones, and dentists use them to look at teeth.
            - Gamma rays have the shortest wavelength at less than 0.01 nanometres. They are used in medicine as a diagnostic tool and to sterilise equipment. They can be used in industry for food irradiation, searching for oil, measurement of water and soil densities, and level detectors, for example, making sure cans of food are filled to the correct level.
        - Give students an Electromagnetic Spectrum template and writing utensil.
            - Talk through each of the seven types of waves on the spectrum and have students draw each part of the spectrum on their template.  The goal here is not perfect accuracy, but for the students to see how the waves get smaller as they go along.  In each box, have students draw an example or representation of that kind of wave.

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## Week 24

**Topics:**

- Radio waves

**Words to Remember:**

- Radio waves
- Microwaves
- Infrared
- Light waves (visible)
- Ultraviolet waves
- X-rays

- Gamma rays
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Radio (with antenna)
- 9-volt battery
- coin
- Morse code alphabet

**Suggested Daily Schedule:**

- Day 1: Radio waves
  - Read/say Genesis 1:1-5
  - View: Radio Waves movie
    - Radio Waves
  - Discuss:
    - What things use radio waves?
    - What impacts the direction of radio waves? (type of antenna, etc.)
    - What impacts the strength of radio waves? (distance, weather, buildings, etc.)
- Day 2:
  - Read/say Genesis 1:1-5
  - Review:
    - Radio waves
    - Facts about radio waves from last session
  - Science activity:
    - Take a fresh 9-volt battery and a coin.
    - Find an AM radio and tune it to an area of the dial where you hear static.
    - Now hold the battery near the antenna and quickly tap the two terminals of the battery with the coin (so that you connect them together for an instant).
    - You will hear a crackle in the radio that is caused by the connection and disconnection of the coin.
    - Your battery/coin combination is a radio transmitter! It's not transmitting anything useful (just static), and it will not transmit very far (just a few inches, because it's not optimized for distance). But if you use the static to tap out Morse code, you can actually communicate over several inches with this crude device!
  - Science activity extension: Morse code
    - Use your radio to tap out Morse code messages
    - Here is a Morse code alphabet

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## Week 25

**Topics:**

- Visible light waves

**Words to Remember:**

- Roy G. Biv: visible light spectrum in order of wavelength- Red, Orange, Yellow, Green, Blue, Indigo, Violet
- Radio waves
- Microwaves
- Infrared
- Light waves (visible)
- Ultraviolet waves
- X-rays
- Gamma rays

- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Glass of water- three-quarters full
- White paper
- Sun
- (Optional) candle and matches
- Color waves/Temperature of Stars handout
-

**Suggested Daily Schedule:**

- Day 1: Seeing light
  - Read/say Genesis 1:1-5
  - Discuss:
    - Has anyone ever seen a rainbow in the sky?  What were the circumstances surrounding the event? (It had just rained, it was really cold (if they are talking about sun dogs), etc.)
    - Although we don't always see them, light is made up of different colors- Roy G. Biv (memorize)
  - Science activity:
    - Take the glass of water and paper to a part of the room with sunlight (near a window is good).
    - Hold the glass of water (being careful not to spill it) above the paper and watch as sunlight passes through the glass of water, refracts (bends) and forms a rainbow of colors on your sheet of paper.
    - Try holding the glass of water at different heights and angles to see if it has a different effect.
  - Discuss:
    - What colors did you see?
    - Are there any other variables you can change? (going outside vs. sun through the window, etc.)
    - If you changed a variable, did you notice any differences?
- Day 2: How fast is Roy G. Biv?
  - Read/say Genesis 1:1-5
  - Review:
    - Roy G. Biv
  - Discuss:
    - When you think about light, you should automatically think of all the colors.  When speaking of light, white contains all of the colors.  When speaking of art or painting, white is the absence of color (and black contains all of the colors)
    - Think back to our experiments with candles.  What color was the hottest? (Blue)  What color was the coolest part of the flame? (orange/yellow)
      - Optional- light and candle and let students see the flame to review
  - Science activity:
    - Review: when molecules heat up, do they move faster or slower? (faster)
    - Take a look at this picture of light waves (available for handout here):
       illustration of each wavelength in the spectrum
    - Which light waves do you think are faster? (Blue, indigo, violet)
    - Conclusion: Things that are extremely hot look blue because the molecules are moving the fastest.  Note, just because something is not blue does not mean it is not hot.  Example:
      -  An image of the surface of the Sun appearing warm yellow. A temperature gauge on the left side shows the hotter star Rigel as blue and the cooler star Betelgeuse as red.
      -

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**Topics:**

- Visible light waves

**Words to Remember:**

- Roy G. Biv: visible light spectrum in order of wavelength- Red, Orange, Yellow, Green, Blue, Indigo, Violet
- Reflection: the throwing back by a body or surface of light, heat, or sound without absorbing it. ORIGIN late Middle English: from Old French reflexion or late Latin reflexio(n-), from Latin reflex- 'bent back,' from the verb reflectere .
- Absorption: the process or action by which one thing absorbs or is absorbed by another ORIGIN late 16th cent. (in the sense 'the swallowing up of something'): from Latin absorptio(n-), from absorbere 'swallow up'
- Diffraction: the process by which a beam of light or other system of waves is spread out as a result of passing through a narrow aperture or across an edge,
- Scatter: the process in which electromagnetic radiation or particles are deflected or diffused
- Refraction: the fact or phenomenon of light, radio waves, etc., being deflected in passing obliquely through the interface between one medium and another or through a medium of varying density. ORIGIN mid 17th cent.: from late Latin refractio(n-), from refringere 'break up'
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource) Epsom Salt Suncatcher

**Materials:**

  - Bible
  - Black board, white board, or something upon which to make lists with students
  - Construction paper circuit
  - Computer (or some other way to watch a YouTube video)
  - Wave behaviors
  - Epsom Salt
  - Clear Recycled Plastic Lids- use the clearest you can find
  - Water
  - Empty Jar
  - Bowl or glass measuring cup
  - Fork
  - Microwave (optional)
  - Tray
  - String, thread, or fishing line
  - Exacto/Pin

**Suggested Daily Schedule:**

- Day 1: What do waves do? (Properties of light waves)
  - Read/say Genesis 1:1-5
  - Read:
    - Wave behaviors
  - Discuss:
    - Words to remember
    - Have students come up with examples of light doing each of these things (some may be more difficult)
      - Reflection (mirror, water, etc.)
      - Absorption (clothes, etc.- help them to understand that most light is absorbed)
      - Diffraction (this is what is happening when you see a rainbow)
      - Scatter (this is why the sky looks blue- "Light at shorter wavelengths—blue and violet—is scattered by nitrogen and oxygen as it passes through the atmosphere.")
      - Refraction (like looking at something through a glass of water- the light waves change direction)
    - Once students have discussed examples, have them try to find examples of each property of light waves.
- Day 2: Catching Roy G. Biv
  - Read/say Genesis 1:1-5
  - Review:
    - Roy G. Biv
    - Words to Remember
  - Science activity:

- Follow the instructions in Epsom Salt Sun catcher to make a sun catcher.

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## Week 27

**Topics:**

- Visible light waves

**Words to Remember:**

- Transparent:  allowing light to pass through so that objects behind can be distinctly seen ORIGIN late Middle English: from Old French, from medieval Latin transparent- 'shining through,' from Latin transparere, from trans- 'through' + parere 'appear.'
- Translucent: allowing light, but not detailed images, to pass through ORIGIN late 16th cent. (in the Latin sense): from Latin translucent- 'shining through,' from the verb translucere, from trans- 'through' + lucere 'to shine.'
- Opaque: not able to be seen through ORIGIN late Middle English opake, from Latin opacus 'darkened.' The current spelling (rare before the 19th cent.) has been influenced by the French form.
- Roy G. Biv: visible light spectrum in order of wavelength- Red, Orange, Yellow, Green, Blue, Indigo, Violet
- Reflection: the throwing back by a body or surface of light, heat, or sound without absorbing it. ORIGIN late Middle English: from Old French reflexion or late Latin reflexio(n-), from Latin reflex- 'bent back,' from the verb reflectere .
- Absorption: the process or action by which one thing absorbs or is absorbed by another  ORIGIN late 16th cent. (in the sense 'the swallowing up of something'): from Latin absorptio(n-), from absorbere 'swallow up'
- Diffraction: the process by which a beam of light or other system of waves is spread out as a result of passing through a narrow aperture or across an edge,
- Scatter: the process in which electromagnetic radiation or particles are deflected or diffused
- Refraction: the fact or phenomenon of light, radio waves, etc., being deflected in passing obliquely through the interface between one medium and another or through a medium of varying density.  ORIGIN mid 17th cent.: from late Latin refractio(n-), from refringere 'break up'
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Stained glass windows
- Red, Blue, and Yellow Tempera paint
- paper plates (or something on which to mix paint
- Paint brushes
-

**Suggested Daily Schedule:**

Day 1: Light and materials

- Read/say Genesis 1:1-5
- Discuss:
  - Transparent:  allowing light to pass through so that objects behind can be distinctly seen ORIGIN late Middle English: from Old French, from medieval Latin transparent- 'shining through,' from Latin transparere, from trans- 'through' + parere 'appear.'
  - Translucent: allowing light, but not detailed images, to pass through ORIGIN late 16th cent. (in the Latin sense): from Latin translucent- 'shining through,' from the verb translucere, from trans- 'through' + lucere 'to shine.'
  - Opaque: not able to be seen through ORIGIN late Middle English opake, from Latin opacus 'darkened.' The current spelling (rare before the 19th cent.) has been influenced by the French form.
- Science activity
  - Take the students to a church with stained glass windows (remind them that even though church is not going on, they should still be reverent)
  - Have them observe the stained glass windows:

        - Which part is transparent? (some stained glass windows do not have transparent glass even though they may have clear glass- this is a good opportunity to reinforce that in order for something to be transparent, one has to be able to clearly see an image on the other side, not just that light can go through)
        - Which part is translucent?
        - Which part is opaque? (this is usually the mortar or metal between the pieces of glass)

Day 2: Light colors and paint colors

- Read/say Genesis 1:1-5
  Review:
  - Words to remember

  Discuss:
  - You know from previous observations and discussions that light is made up of different colors.
  - White light contains all of the colors (remember Roy G. Biv) and black is absent of color
  - However, in paint, black contains all of the colors and white is absent of color (opposite of light)
- Science activity:
  - Put separate dabs of red, blue, and yellow paint on a paper plate. (You may need to use multiple paper plates by the time things are said and done)
  - Mix a bit of red and blue.  What do you get?
  - Mix a bit of blue and yellow.  What do you get?
  - Mix a bit of red and yellow.  What do you get?
  - Mix a bit of all of the colors (original and mixed).  What do you get?
    - Note: Sometimes you can't quite get to black depending on how evenly things were mixed, but students should see that in order to get to black, they have to add all of the colors together, which is the same way they got to white when working with light.

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## Week 28

**Topics:**

- Visible light waves

**Words to Remember:**

- Transparent:  allowing light to pass through so that objects behind can be distinctly seen ORIGIN late Middle English: from Old French, from medieval Latin transparent- ‘shining through,’ from Latin transparere, from trans- ‘through’ + parere ‘appear.’
- Translucent: allowing light, but not detailed images, to pass through ORIGIN late 16th cent. (in the Latin sense): from Latin translucent- ‘shining through,’ from the verb translucere, from trans- ‘through’ + lucere ‘to shine.’
- Opaque: not able to be seen through ORIGIN late Middle English opake, from Latin opacus ‘darkened.’ The current spelling (rare before the 19th cent.) has been influenced by the French form.
- Roy G. Biv: visible light spectrum in order of wavelength- Red, Orange, Yellow, Green, Blue, Indigo, Violet
- Reflection: the throwing back by a body or surface of light, heat, or sound without absorbing it. ORIGIN late Middle English: from Old French reflexion or late Latin reflexio(n-), from Latin reflex- ‘bent back,’ from the verb reflectere .
- Absorption: the process or action by which one thing absorbs or is absorbed by another  ORIGIN late 16th cent. (in the sense ‘the swallowing up of something’): from Latin absorptio(n-), from absorbere ‘swallow up’
- Diffraction: the process by which a beam of light or other system of waves is spread out as a result of passing through a narrow aperture or across an edge,
- Scatter: the process in which electromagnetic radiation or particles are deflected or diffused
- Refraction: the fact or phenomenon of light, radio waves, etc., being deflected in passing obliquely through the interface between one medium and another or through a medium of varying density.  ORIGIN mid 17th cent.: from late Latin refractio(n-), from refringere ‘break up’
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit

- Computer (or some other way to watch a YouTube video)
- Muffin pan
- 12 muffin papers (optional)
- 12 objects that students think might/could melt in the sun
- Paper
- Writing utensil
- Timer
- Sun
- Will it melt? chart
-

**Suggested Daily Schedule:**

Day 1: Heat energy

- Read/say Genesis 1:1-5
- Discuss:
  - Review Words to Remember
- Science activity:
  - Have the student(s) choose 12 objects/food that might/could melt in the sun
  - Place one object in each muffin cup of the muffin pan (for easier cleanup, use muffin papers and set the items in muffin paper-lined muffin tins.
  - Record the name of each object/food on the Will it melt? chart
  - Set the muffin pan out in direct sunlight and set the timer for 10 minutes.
  - After 10 minutes, observe the objects and record your findings.  Be sure to note how much the item melted, if it melted at all.
  - Set the timer for 20 more minutes, observe, and record.
  - Set the timer for 30 more minutes, observe, and record.
- Discuss:
  - What did you observe?
  - Were there any surprises?
  - Were there any differences in the way items melted?

Day 2: Heat energy

Read/say Genesis 1:1-5
Review:
- Words to remember

- Science activity:
  - Repeat the activity from Day 1 using the same objects (but new objects if the previous iteration melted), except put the muffin pan in the sun inside.
- Discuss:
  - Did the same objects melt?
  - Did they melt at the same rate?
  - What factors may have changed the melting rate? (the window, air conditioning, etc.)

## Week 29

**Topics:**

- Visible light waves

**Words to Remember:**

- Transparent:  allowing light to pass through so that objects behind can be distinctly seen ORIGIN late Middle English: from Old French, from medieval Latin transparent- ‘shining through,’ from Latin transparere, from trans- ‘through’ + parere ‘appear.’
- Translucent: allowing light, but not detailed images, to pass through ORIGIN late 16th cent. (in the Latin sense): from Latin translucent- ‘shining through,’ from the verb translucere, from trans- ‘through’ + lucere ‘to shine.’
- Opaque: not able to be seen through ORIGIN late Middle English opake, from Latin opacus ‘darkened.’ The current spelling (rare before the 19th cent.) has been influenced by the French form.
- Roy G. Biv: visible light spectrum in order of wavelength- Red, Orange, Yellow, Green, Blue, Indigo, Violet
- Reflection: the throwing back by a body or surface of light, heat, or sound without absorbing it. ORIGIN late Middle English: from Old French reflexion or late Latin reflexio(n-), from Latin reflex- ‘bent back,’ from the verb reflectere .
- Absorption: the process or action by which one thing absorbs or is absorbed by another  ORIGIN late 16th cent. (in the sense ‘the swallowing up of something’): from Latin absorptio(n-), from absorbere ‘swallow up’

- Diffraction: the process by which a beam of light or other system of waves is spread out as a result of passing through a narrow aperture or across an edge,
- Scatter: the process in which electromagnetic radiation or particles are deflected or diffused
- Refraction: the fact or phenomenon of light, radio waves, etc., being deflected in passing obliquely through the interface between one medium and another or through a medium of varying density.  ORIGIN mid 17th cent.: from late Latin refractio(n-), from refringere ‘break up’
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Straight pins
- Cork board (sheets can be purchased online or at craft stores like Hobby Lobby)
- Scissors
-

**Suggested Daily Schedule:**

Day 1: Light and plants

- Read/say Genesis 1:1-5
- Discuss:
  - If a board or a plank is laid on the grass for several days, so that the sunlight cannot reach it, the grass will be light yellow, and even white, when the board is first removed. In a few days,however, the grass will regain its usual green color. What caused the change? Potatoes and onions which sprout in the dark have very light green or light yellow stalks and leaves. If these are brought into the sunlight they become green. Although plants may grow in the dim light they need the sunlight in order to grow well and to bear fruit.
- Science activity:
  - Cut a thin slice of cork and trim it into some shape, such as a heart, or a cross, and pin it upon a growing leaf which must be left upon the tree. The best way to fasten the piece upon the leaf is to push two pins through it, through the leaf, and into another piece of cork, which is held on the under side of the leaf. Do not touch it for one week. At the end of a week remove the pieces of cork and report how the leaf appears. Let the leaf remain upon the tree and examine it at the end of another week.  What has happened?

Day 2: Light and plants

Read/say Genesis 1:1-5

Review:

- Words to remember

- Science activity:
  - Repeat the activity from Day 1, but try other designs and remove the leaves from the trees when the cork covers are removed. See who can make the best design.
  -

Activity from *Elementary General Science with Experiments* by Percy Rowell (1914)

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## Week 30

**Topics:**

- Visible light waves

**Words to Remember:**

- Transparent:  allowing light to pass through so that objects behind can be distinctly seen ORIGIN late Middle English: from Old French, from medieval Latin transparent- ‘shining through,’ from Latin transparere, from trans- ‘through’ + parere ‘appear.’

- Translucent: allowing light, but not detailed images, to pass through ORIGIN late 16th cent. (in the Latin sense): from Latin translucent- ‘shining through,’ from the verb translucere, from trans- ‘through’ + lucere ‘to shine.’
- Opaque: not able to be seen through ORIGIN late Middle English opake, from Latin opacus ‘darkened.’ The current spelling (rare before the 19th cent.) has been influenced by the French form.
- Roy G. Biv: visible light spectrum in order of wavelength- Red, Orange, Yellow, Green, Blue, Indigo, Violet
- Reflection: the throwing back by a body or surface of light, heat, or sound without absorbing it. ORIGIN late Middle English: from Old French reflexion or late Latin reflexio(n-), from Latin reflex- ‘bent back,’ from the verb reflectere .
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- Diffraction: the process by which a beam of light or other system of waves is spread out as a result of passing through a narrow aperture or across an edge,
- Scatter: the process in which electromagnetic radiation or particles are deflected or diffused
- Refraction: the fact or phenomenon of light, radio waves, etc., being deflected in passing obliquely through the interface between one medium and another or through a medium of varying density.  ORIGIN mid 17th cent.: from late Latin refractio(n-), from refringere ‘break up’
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Brightly colored cotton cloth
- Unbleached white cloth
- Scissors
- Water
-

**Suggested Daily Schedule:**

Day 1: Light effects

- Read/say Genesis 1:1-5
- Discuss:
  - In the winter, especially for those who live in colder climates, the color of one's skin lightens in the winter.  Conversely, in the summer, especially if time is spent outside, one's skin tends to darken.  This phenomena is due partially to the melanin in our skin, but also due partially to the effects of the sun.
- Science activity:
  - Take the pieces of cotton cloth you have collected and cut each piece in half
  - Make a list of the colors on each swatch of cloth
  - Keep one half of each piece in the dark so that the color will not change
  - Wet the other halves with water and expose them to the bright sunlight until there is a change in color.
  - Each day check the cloth exposed to the sun
  - Document any changes you see
  - The pieces should be kept wet and it may take a few days before there is much change. You may have to wet the cloth multiple times per day.
  - After a week, compare the sun-exposed cloth to the "control" pieces of cloth.  What differences do you notice?
  - Feel free to continue the activity longer so as to note additional changes.
- Explore more
  - If the technology is available, take a picture of the sun-exposed cloth each day at the same time and from the same angle, etc.
  - After a week (or two, or three), compare all of the pictures and note whether they correspond with the observations you made each day.

Day 2: Light effects

Read/say Genesis 1:1-5
Review:

    - Words to remember
- Science activity:
    - Repeat the activity from Day 1, but use unbleached white cloth instead of brightly colored cloth.
- Discuss:
    - What impact can the sun have on cloth?

Activity from *Elementary General Science with Experiments* by Percy Rowell (1914)

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## Week 31

**Topics:**

- Using energy
- Mechanics

**Words to Remember:**

- Simple machines: any of the basic mechanical devices for applying a force, such as an inclined plane, wedge, or lever
- Lever: a rigid bar resting on a pivot, used to help move a heavy or firmly fixed load with one end when pressure is applied to the other.  ORIGIN Middle English: from Old French levier, leveor, from lever ‘to lift.’
- Wheel and axle: a simple lifting machine consisting of a rope that unwinds from a wheel onto a cylindrical drum or shaft joined to the wheel to provide mechanical advantage.
- Pulley: a wheel with a grooved rim around which a cord passes. It acts to change the direction of a force applied to the cord and is chiefly used (typically in combination) to raise heavy weights.  ORIGIN Middle English: from Old French polie, probably from a medieval Greek diminutive of polos ‘pivot, axis.’
- Inclined plane: a plane inclined at an angle to the horizontal
- Wedge: a piece of wood, metal, or some other material having one thick end and tapering to a thin edge, that is driven between two objects or parts of an object to secure or separate them.
- Screw: a short, slender, sharp-pointed metal pin with a raised helical thread running around it and a slotted head, used to join things together by being rotated so that it pierces wood or other material and is held tightly in place.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Mechanics
- Just Add Energy
- Table of Mechaniks
- Simple Machines Resource chart
- Simple Machines Scavenger hunt
-

**Suggested Daily Schedule:**

Day 1: Simple machines

- Read/say Genesis 1:1-5
- Discuss:
    - This year we have been discussing energy.  God created energy and it comes in various forms.
    - In the coming years, we will learn how energy is used by plants, animals, and people to grow and do things.
    - For humans, we have been given energy and the use of energy to serve our neighbor.  The doctrine of vocation teaches us that we are called by God to love and serve our neighbor.
    - In the article Just Add Energy..., Professor McIntosh says, "What is a machine? A machine is a device for using energy to do work of some kind. Energy without machines just dissipates (the sun’s energy would be typical). But a machine harnesses energy to advantage:  a solar cell turns the suns rays into electricity; a Rolls Royce Trent gas turbine turns chemical energy

into thrust to power aircraft; the chlorophyll reaction in a plant leaf uses sunlight to enable the plant to grow and absorb carbon dioxide while emitting oxygen; the adenosine triphosphate (ATP) motor in living organisms transfers energy from food and respiration into usable energy to drive the cell machinery of DNA, ribosomes, amino acids and protein building, etc."
    - Machines allow us to use energy to love and serve our neighbor.
- Define:
    - Words to Remember
- Explore:
    - Look at the Table of Mechaniks.
    - Look for the different examples of simple machines throughout the picture.

Day 2: Simple machines

- Read/say Genesis 1:1-5
- Review:
    - Words to remember
- Discuss:
    - Think or look back to the Table of Mechaniks.  You saw various examples of simple machines.
    - Using the Table of Mechaniks as a reference, make a list of simple machines with which you are familiar.
- Explore:
    - Using the Simple Machines Scavenger hunt sheet, go on a scavenger hunt to find simple machines.

## Week 32

**Topics:**

- Using energy
- Mechanics

**Words to Remember:**

- Simple machines: any of the basic mechanical devices for applying a force, such as an inclined plane, wedge, or lever
- Lever: a rigid bar resting on a pivot (fulcrum), used to help move a heavy or firmly fixed load with one end when pressure is applied to the other.  ORIGIN Middle English: from Old French levier, leveor, from lever ‘to lift.’
- Wheel and axle: a simple lifting machine consisting of a rope that unwinds from a wheel onto a cylindrical drum or shaft joined to the wheel to provide mechanical advantage.
- Pulley: a wheel with a grooved rim around which a cord passes. It acts to change the direction of a force applied to the cord and is chiefly used (typically in combination) to raise heavy weights.  ORIGIN Middle English: from Old French polie, probably from a medieval Greek diminutive of polos ‘pivot, axis.’
- Inclined plane: a plane inclined at an angle to the horizontal
- Wedge: a piece of wood, metal, or some other material having one thick end and tapering to a thin edge, that is driven between two objects or parts of an object to secure or separate them.
- Screw: a short, slender, sharp-pointed metal pin with a raised helical thread running around it and a slotted head, used to join things together by being rotated so that it pierces wood or other material and is held tightly in place.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Mechanics
- Just Add Energy
- Table of Mechaniks
- piece of paper
- piece of cellophane tape
- ruler

- pencil
- highlighter
- scissors
- 12 inch ruler
- 10 pennies
- Pencil
- Level desk or table top
-

**Suggested Daily Schedule:**

Day 1: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to Remember
- Explore:
  - There are many similarities between an inclined plane and a screw.  In fact, some define a screw as an inclined plane wrapped around a pole.  After doing the following project, explain why it is correct to define a screw as an inclined plane wrapped around a pole.
  - Mark a piece of paper diagonally and color a wide stripe along the diagonal.
  - Cut the paper along the diagonal as shown in Figure 1.
  -

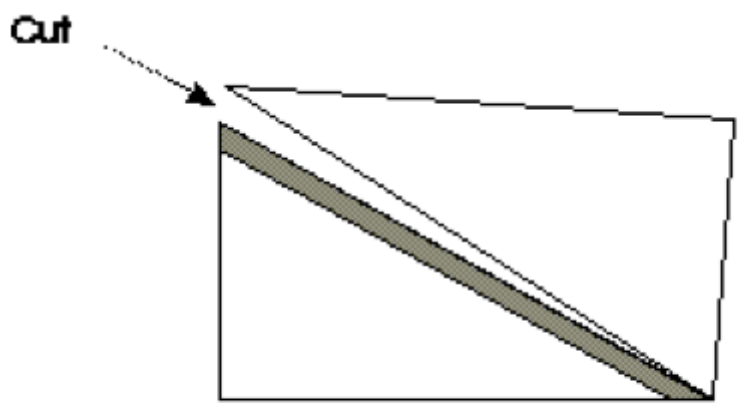


Figure 1

  - Tape the paper to the pencil as shown in Figure 2.
  -

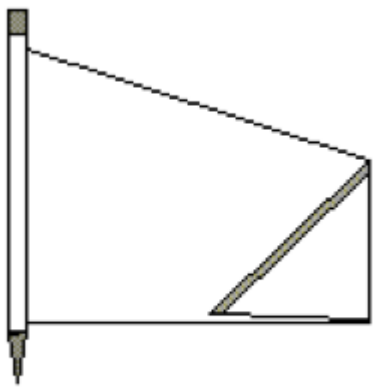

Figure 2

  - Wrap the paper around the pencil.

Day 2: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to remember
- Explore:
  - A lever, like all of the simple machines, is very useful.  Unlike some of the other simple machines, a lever is relatively simple to construct.
  - Lay down the pencil flat on the desk.
  - Lay the ruler across the pencil so that the two ends of the ruler teeter back and forth like a see saw.
  - Adjust the ruler on the pencil so that the two ends balance perfectly. The balance point should be at about the 6 inch mark.
  - Stack 5 pennies at the very edge of the ruler on the 1 in. side and the other 5 pennies on the very edge of the 12 inch side. Since the two piles of pennies are about equal in weight, the two ends of the ruler should remain balanced.
  - Take three pennies off of the 12 inch side and place them on the stack at the 1 inch side. You should now have 8 pennies on one side and 2 on the other. The ruler should be tilted down toward the 1 inch side. You've just constructed a lever!
  - What did you have to do in order to lift the pennies on the one side?
  - Could you apply this on a larger scale?  In other words, what if you wanted to lift a rock with a lever?  What would you need on the other side of the lever in order to lift the rock?

# Week 33

**Topics:**

- Using energy
- Mechanics

**Words to Remember:**

- Simple machines: any of the basic mechanical devices for applying a force, such as an inclined plane, wedge, or lever
- Lever: a rigid bar resting on a pivot (fulcrum), used to help move a heavy or firmly fixed load with one end when pressure is applied to the other.  ORIGIN Middle English: from Old French levier, leveor, from lever ‘to lift.’
- Wheel and axle: a simple lifting machine consisting of a rope that unwinds from a wheel onto a cylindrical drum or shaft joined to the wheel to provide mechanical advantage.
- Pulley: a wheel with a grooved rim around which a cord passes. It acts to change the direction of a force applied to the cord and is chiefly used (typically in combination) to raise heavy weights.  ORIGIN Middle English: from Old French polie, probably from a medieval Greek diminutive of polos ‘pivot, axis.’
- Inclined plane: a plane inclined at an angle to the horizontal
- Wedge: a piece of wood, metal, or some other material having one thick end and tapering to a thin edge, that is driven between two objects or parts of an object to secure or separate them.
- Screw: a short, slender, sharp-pointed metal pin with a raised helical thread running around it and a slotted head, used to join things together by being rotated so that it pierces wood or other material and is held tightly in place.
- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Mechanics
- Just Add Energy
- Table of Mechaniks
- Lego Pulleys instructions
-

**Suggested Daily Schedule:**

Day 1: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to Remember
- Discuss:
  - Pulleys are used by people to love and serve their neighbors in a wide variety of ways.
  - It possible, take a look under the hood of a vehicle or the lid of a mower while neither are running.  Do you see any pulleys?
- Explore:
  - View:

- Explore more:
  - Using some basic Legos, you can build a pulley of your own!
  - Lego Pulleys instructions

Day 2: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to remember
- Explore:
  - Bolts and screws have threads on them.  In the following video, notice especially the die used to create the threads on the bolt.  Recalling that a screw is an inclined plane around a pole, like what does the die used to create the threads look? (an inclined plane).


## Week 34

**Topics:**

- Using energy
- Mechanics

**Words to Remember:**

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- Genesis 1:1-5

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- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Mechanics
- Just Add Energy
- Table of Mechaniks
- Piece of wood
- Screw
- Screw driver
-

**Suggested Daily Schedule:**

Day 1: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to Remember
- Discuss:
  - Simple machines are everywhere.
  - Watch the video and look for simple machines in the big machines.
- Explore:
  - View:
    -

- Explore more:
  -

Day 2: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to remember
- Discuss:
  - Simple machines are everywhere.
  - Watch the video and look for simple machines in the big machines.
- View

- Explore:
  - Using the screwdriver, screw the screw into the piece of wood.
  - Watch the inclined plane/screw go into the wood.
  - What do you observe when you look closely, especially at the very point where the screw is entering the wood?

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## Week 35

**Topics:**

- Using energy
- Mechanics

**Words to Remember:**

- Simple machines: any of the basic mechanical devices for applying a force, such as an inclined plane, wedge, or lever
- Lever: a rigid bar resting on a pivot (fulcrum), used to help move a heavy or firmly fixed load with one end when pressure is applied to the other.  ORIGIN Middle English: from Old French levier, leveor, from lever ‘to lift.’
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- Genesis 1:1-5

**Textbook reference and written work:**

- Read Genesis 1, then reread Genesis 1:1-5 (verses 1-5 are the theme verses for 1st Grade)
- (Teacher resource) Read Genesis 1:1
- (Teacher resource) Read Energy (From In the Beginning was Information by Dr. Werner Gitt)
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Mechanics
- Just Add Energy
- Table of Mechaniks
- Paper football
- Wooden Ruler
- Various sizes of rocks
- 2x4 piece of wood (or small plank of some kind)
- Block, brick, or other material to serve as fulcrum for 2x4
-

**Suggested Daily Schedule:**

Day 1: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to Remember
- Discuss:
  - Simple machines help us use energy to love and serve our neighbor.  Sometimes we love and serve our neighbor by solving problems or helping them solve problems.
- Explore:
  - Make a paper football (it is like folding a flag, if you are not familiar with paper footballs)
  - You need to get the paper to fly from the ground to at least one foot off the ground, but you are not allowed to touch the football.
  - Build a simple machine using at least a ruler to get the football a foot off the ground. (Most likely, a lever will be built, but allow students to explore different possibilities.)

Day 2: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to remember
- Explore:
  - Using a 2x4 (or similar), build a lever and use it to lift varying sizes of rocks using the following method:
    - balance the 2x4 on the fulcrum
    - place a rock (or rocks) on one side of the lever- it should tip to that side
    - find a rock or rocks to put on the other side of the lever to once again balance the lever
    - experiment with various combinations of rocks, hypothesizing and predicting how many rocks need to be on each side of the lever for it to balance
- Explore more:
  - If there is a park with a see saw/teeter totter, cover the same concepts as the above exploration, but use people instead of rocks.  Since you cannot multiply people, work with your student to scoot forward or backward on the see saw to achieve balance.

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## Week 36

**Topics:**

- Using energy
- Mechanics

**Words to Remember:**

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- Lever: a rigid bar resting on a pivot (fulcrum), used to help move a heavy or firmly fixed load with one end when pressure is applied to the other.  ORIGIN Middle English: from Old French levier, leveor, from lever ‘to lift.’
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- Genesis 1:1-5

**Textbook reference and written work:**

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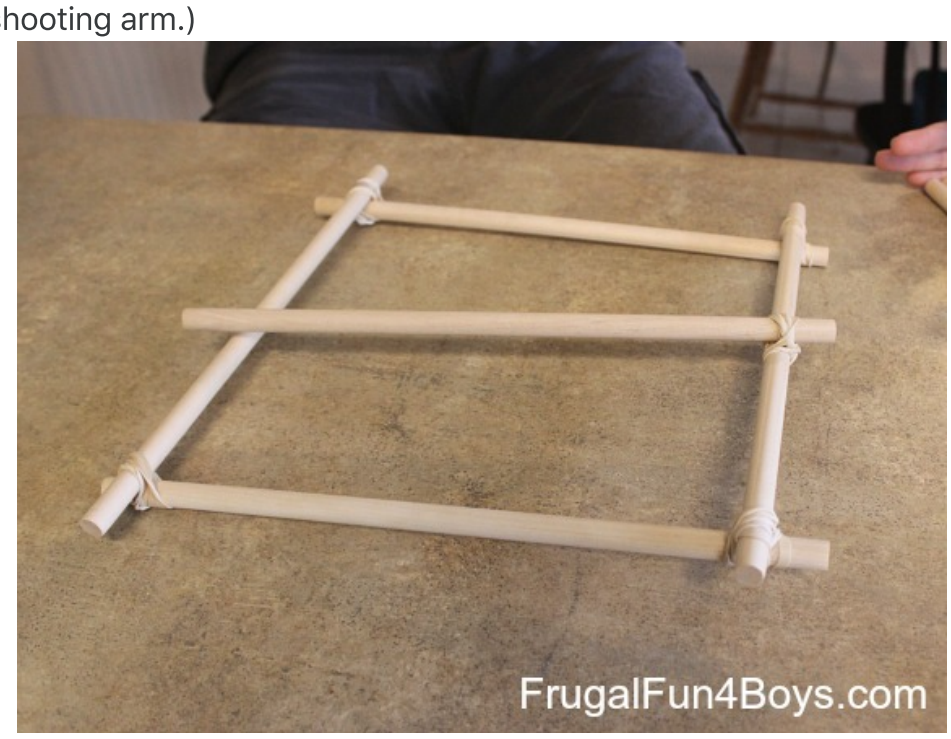
- (Teacher resource) Read On the first day
- (Teacher resource) Read Genesis 1:3 study notes from ICR
- (Teacher resource)

**Materials:**

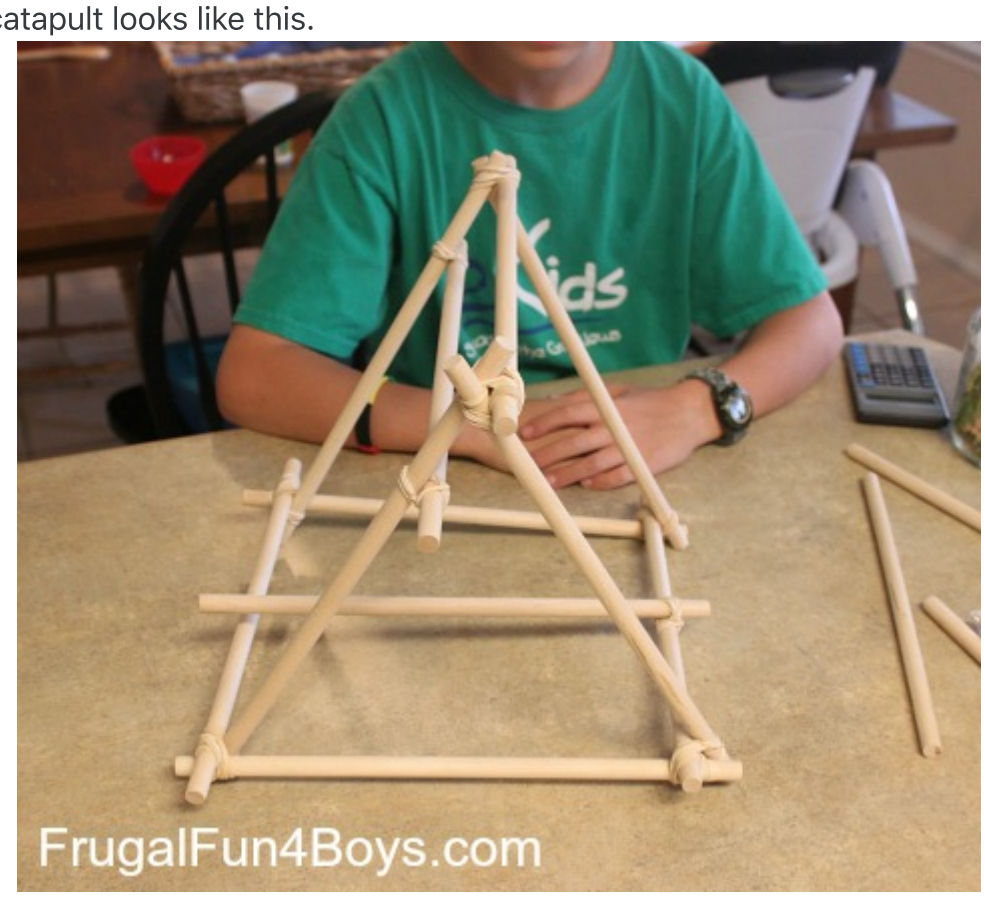
- Bible
- Black board, white board, or something upon which to make lists with students
- Construction paper circuit
- Computer (or some other way to watch a YouTube video)
- Mechanics
- Just Add Energy
- Table of Mechaniks
- 12 dowel rods – I used pre-cut 12″ and 3/8″ diameter dowel rods that I found at Hobby Lobby.
- Rubber bands
- A juice bottle lid or similar object to use as an ammunition basket
- Low temp glue gun
- Something to launch – ping pong balls or water splash bombs.  We also had good success with homemade sponge water bombs
-

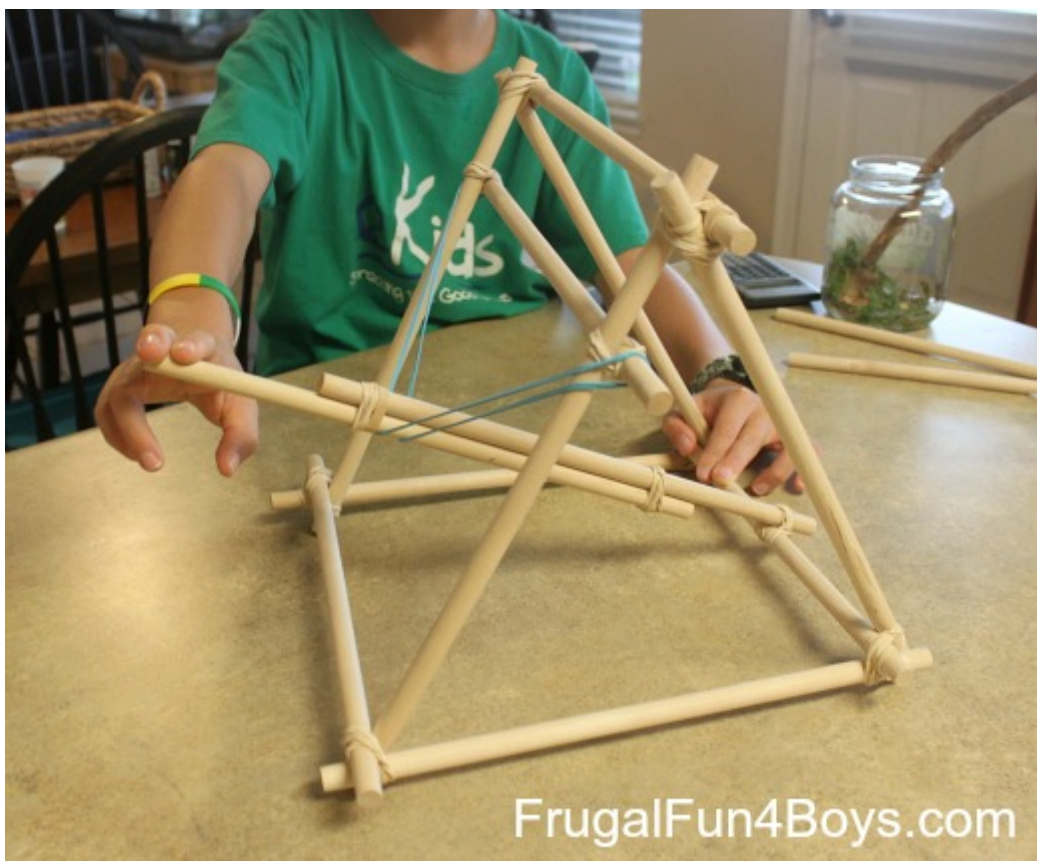
**Suggested Daily Schedule:**

Day 1: Simple machines

- Read/say Genesis 1:1-5
- Review:
  - Words to Remember
- Discuss:
  - Simple machines help us use energy to love and serve our neighbor.
  - What are some of the ways simple machines can help us love and serve our neighbors?
- Explore:
  - A catapult includes, most prominently, a lever. (Directions and pictures from http://frugalfun4boys.com)
    - Step 1: Use rubber bands to make a "T" shape with two dowel rods.  Then add three more rods to make the square base of the catapult, like this.  (If you make the base first, you'll end up having to take it apart to add the vertical piece for the shooting arm.)
    - 

    - Step 2: Add 1 vertical rod to each corner.  Add a horizontal rod at the top on the side where the shooting arm is.
    - 

- Step 3: Add a horizontal rod to the other side, where you should currently have two loose vertical rods.  Put this horizontal rod a couple of inches down from the top.  Then, connect all of the vertical rods at the top, so that your catapult looks like this.
  - 

- Step 4: In order to make the shooting arm long enough, we added a second dowel rod.  If you're not buying them pre-cut, you could just make that piece longer.  However, I figured it was easier and cheaper to buy the pre-cut ones.
  We used a long blue rubber band to give tension to the shooting arm.
  - 

- Step 5: Glue on your ammunition basket, and you're ready to fire!
  - 


Day 2: Simple machines

- Read/say Genesis 1:1-5
- Review:

    - Words to remember
- Explore:
    - Using your catapult, explore the following:
        - Add additional or tighter rubber bands.  Does additional torque affect the catapult’s power?
        - Try changing the angle of the rubber bands.
        - What objects shoot the farthest?  Try ping pong balls, marshmallows, pom pom balls, etc.
        - Which travels farther – a dry splash bomb or a wet splash bomb?