Quick Start Guide

Science Instructor's Guide: Levels K–6

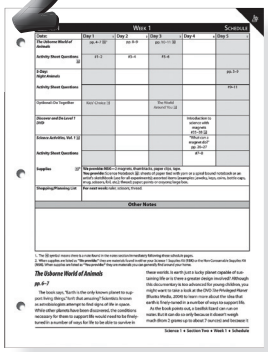
1 Get to Know Your Instructor's Guide

Your Instructor's Guide (IG) gives you the structure and flexibility to teach your children with confidence.

In your Science IG, you'll find detailed Notes that explain how to conduct experiments and discuss the concepts they address. The supply lists on the Schedule pages help you plan ahead for experiments. We also include a handy chart that shows which subjects you'll study and when, so you can plan field trips or other extracurricular opportunities.

Before you dive into your new Sonlight materials, familiarize yourself with your IG. Remember that you are in control of your homeschool; the wealth of information in your IG is here to help you. Only you can decide the right pace for your family. Your IG is a tool to make your life easier as you shape your children's education.

2 Plan Your Schedule

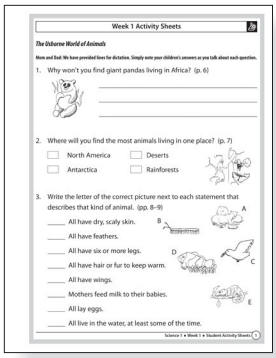


The weekly schedules help you plan. You can follow them closely, reorganize them, or merely use them as a springboard for your own plans. Please know you DO NOT have to do everything scheduled in your IG. Find a rhythm that works for you.

Find activity ideas and thought-provoking Notes for scheduled assignments directly behind your Schedule pages. Use these Notes to spark discussions with your children.

3 Organize Your Activity Sheets

In addition to the hands-on experiments scheduled throughout your program, your children can use the included Activity Sheets to interact with the science concepts they're learning. Find a complete answer key for these Activity Sheets after each week's schedule. Some parents choose to place the Activity Sheets in a separate binder so children may work on them independently when assigned. If you think you might reuse your Science IG in a few years with a younger child, we recommend you purchase an extra set of Activity Sheets when you buy the IG. That way, you'll still have matching Activity Sheets even after we update the IG you're using.



4 Start Your Science Journey

Ready? Set? Go! Your Science IG lets you to teach well from the very first day. As you progress, adapt the curriculum to meet your needs. Need to go faster or slower? Need to use more/less than what we offer? Sonlight puts you in control of your homeschool journey and enables you to customize your children's educational experience. Our goal is to make your job easier, help you overcome obstacles, and protect your family's interests. Please contact us if we can help. Visit us at www.sonlight.com/help or call (303) 730-6292.

Subjects in Science Levels K–6

Sonlight's unique and innovative science program will capture your children's imagination and encourage them to discover the wonders of God's world. Intriguing, full-color books and stories will bring science to life. Over the years, Sonlight children will focus on several primary fields of study:

- **Biology/Nature:** Children explore God's living world through biology, botany, animals and anatomy.
- **Technology:** Children develop an understanding of machines, inventions and modern technology.
- **Physical Sciences:** Children conduct experiments and discover truths as they study chemistry and physics.
- **Earth and Space:** Children chart new territory in oceanography, meteorology, archaeology and astronomy.
- **Health and Medicine:** Children delve into the world of anatomy, physiology, nutrition and medicine.

Science K—Weekly Subject List

5-Day

Week	Subject
1	earth/day and night/seasons/tadpoles and frogs
2	weather/storms and floods/water cycle/clouds/ice/tadpoles and frogs
3	weather/storms/hail/tornadoes/wind/tadpoles and frogs
4	rocks and fossils/earthquakes/volcanoes/plants and soil
5	rivers/mountains/deserts/plants and water/ tadpoles and frogs
6	grasslands/rainforests/seas and oceans/plants
7	waves/currents and tides/polar regions/freezing and melting/tadpoles and frogs
8	coasts/caves and caverns/natural resources/plants/eggs and chicks
9	conservation/climate change/eggs and chicks
10	life/cells/animals/eggs and chicks
11	mammals/birds/eggs and chicks
12	birds/reptiles/eggs and chicks
13	seashore life/underwater life/coral reefs/sharks/ eggs and chicks
14	seashore life/underwater life/coral reefs/sharks/eggs and chicks
15	whales/dolphins/deep sea/caterpillars and butterflies
16	plants/plant growth/flowers/caterpillars and butterflies
17	plants/flowers/caterpillars and butterflies
18	plants/flowers/caterpillars and butterflies
19	trees/leaves/fungi/flowers/caterpillars and butterflies
20	human body/bones and muscles/digestion/caterpillars and butterflies
21	brain/senses/babies/health and nutrition/ caterpillars and butterflies
22	medicine/science/scientists/caterpillars and butterflies
23	atoms/molecules/solids/liquids/gases/under the sea
24	energy/forces/hot and cold/wet and dry/under the sea
25	gravity/floating/friction/under the sea
26	magnets/light and color/electricity/cameras/under the sea
27	sound/science words/clocks/springs/gears/levers/under the sea
28	telephones/refrigerators/microwaves/cars/motorcycles/under the sea
29	diggers/tractors/trains/planes/under the sea
30	plumbing/ships and boats/submarines
31	space/space travel/movie technology
32	living in space/satellites/probes/solar system/television
33	Moon/Sun/Mercury/Venus/sound systems
34	Mars/Jupiter/Saturn/Uranus/Neptune/Pluto/computers
35	space objects/galaxies/moon phases/constellations/Internet
36	Isaac Newton/physics/laws of motion

Science K—Weekly Subject List

4-Day

Week	Subject
1	earth/day and night/seasons
2	weather/storms and floods/water cycle/clouds/ice
3	weather/storms/hail/tornadoes/wind
4	rocks and fossils/earthquakes/volcanoes/plants and soil
5	rivers/mountains/deserts/plants and water
6	grasslands/rainforests/seas and oceans/plants
7	waves/currents and tides/polar regions/freezing and melting
8	coasts/caves and caverns/natural resources/plants
9	conservation/climate change
10	life/cells/animals
11	mammals/birds
12	birds/reptiles
13	amphibians/creepy crawlies/butterflies/pollination
14	seashore life/underwater life/coral reefs/sharks
15	whales/dolphins/deep sea
16	plants/plant growth/flowers
17	plants/flowers
18	plants/flowers
19	trees/leaves/fungi/flowers
20	human body/bones and muscles/digestion
21	brain/senses/babies/health and nutrition
22	medicine/science/scientists
23	atoms/molecules/solids/liquids/gases
24	energy/forces/hot and cold/wet and dry
25	gravity/floating/friction
26	magnets/light and color/electricity/cameras
27	sound/science words/clocks/springs/gears levers
28	telephones/refrigerators/microwaves/cars/motorcycles
29	diggers/tractors/trains/planes
30	plumbing/ships and boats/submarines
31	space/space travel
32	living in space/satellites/probes/solar system
33	Moon/Sun/Mercury/Venus
34	Mars/Jupiter/Saturn/Uranus/Neptune/Pluto
35	space objects/galaxies/moon phases/constellations
36	Isaac Newton/physics/laws of motion

SCIENCE K	WEEK 1				SCHEDULE
Date:	**Day 1** 1	**Day 2** 2	**Day 3** 3	**Day 4** 4	**Day 5** 5
Children's Encyclopedia	pp. 8–9 N[1]	pp. 10–11 N	pp. 12–13 N		
Activity Sheet Questions N	#1–2	#3–4	#5–7		
5-Day: ***Tadpoles and Frogs***					pp. 3–7 N
Discover & Do DVD N				"Before You Begin" #1–3	
Optional: Do Together	Planetary Comparison N		The Seasons at Your House N		
Science Activities, Vol. 2				"Air All Around" pp. 2–3 N	
Supplies N	**You provide:** sheets of paper, 8"x10" cardboard for each player, crayons, thread or string or yarn, bottle, bowl, water.				
Shopping/Planning List	**For next week:** feather from any bird, plate, 10"x10" paper, pencil, scissors, crayons, needle, thread or string or yarn.				
Other Notes					

1. The N symbol means there is a note immediately following the schedule.

Children's Encyclopedia

p. 8

Let your children know how amazing it is that so many things have to work just right in order for our world to support life. For example, if we were too close to the sun, our world would be too hot to support life. If we were too far, it would be too cold. Isn't amazing what God has done in His creation? He's made things just right to support life on Earth.

The book mentions continents, but doesn't list them. The seven continents are North America, South America, Europe, Asia, Africa, Australia, and Antarctica. Find a map at the back of the book and show your children the continents.

How do we know what Earth looks like? Up until the time of rockets, spaceships, and satellites, we didn't know, but we could guess. Nowadays we have photographs of Earth taken from space, so we know what it looks like. Doesn't it look wonderful? If you look at images of other planets in our solar system, they are each interesting in their own way, but they're nothing like Earth. Our world is made for life. It has air, water, land, lots of kinds of plants, animals, and people. Did this all happen by itself or did God make it this way on purpose?

p. 9

Notice the "Internet links" box at the top of the page. It is not necessary to visit all these links as part of your reading, but if you'd like to just follow the link listed in the book for supplemental online material.

The book mentions what the earth is made of, but doesn't properly label the layers. The outer layer is called the crust, next there is the mantle, then in the center is the core. One idea to help your children visualize the layers

of the earth is to compare the earth to an egg. The shell is the crust, the white part is the mantle, and the yolk is the core. For a hands-on visual, hard-boil an egg and talk about each part. To see the "mantle" and the "core," you'll need to peel away the "crust" first, but then cut the egg in half lengthwise for a nice cross-section of the "earth"! Of course, the earth is not shaped exactly like an egg, but neither is it perfectly round (there are flatter parts on the top and bottom).

p. 10

Do you own a globe? If not, you can also use a ball such as a basketball or soccer ball to demonstrate the concept of day and night. All you need is a globe or ball and a flashlight. The flashlight, naturally, represents the sun. Shine the flashlight on one side of the globe or ball. The part of the world facing the light is experiencing day, while the other areas are experiencing night. But the world rotates, so as it turns day turns to night on one part of the globe, while night turns to day in other areas.

p. 13

The book refers to the northern and southern hemispheres, but does not explain the concepts of western and eastern hemispheres. You might want to show your children a world map, noting the northern and southern hemispheres, as divided by the equator, while also pointing out the western hemisphere and the eastern hemisphere. This is also a good opportunity to review continents and continent names.

Activity Sheet Questions

Find each week's Activity Sheets immediately after the notes and answer the questions assigned on the schedule page. Each Activity Sheet has a corresponding Answer Key page at the end of each week's notes.

You do not have to do every question on the Activity Sheets. Feel free to adjust and/or omit activities to meet the needs of your children. We cover the same concepts repeatedly throughout the year (and years to come!) to enable students to learn "naturally" through repetition and practice over time.

Please don't expect your children to write the answers until they gain considerable proficiency at handwriting. We have provided a variety of activities to interest and challenge your children. Feel free to let your children do those activities they enjoy and simply talk through others.

We have provided space for you to fill in answers as your children respond verbally, or simply check off the items that you discuss.

Remember: this program is designed for you to use to meet your children's needs. It is not meant to use you!

Suggestion: your Activity Sheets might work more easily in a small binder for your children to keep and use as assigned. If you have more than one child using this program, extra Activity Sheets can be purchased for each child (Item # KTS1).

Occasionally we assign a "cut-out" activity. Please find these separate sheets immediately after week 36. If you like, color the sheets first, then cut them out and attach them to the worksheet.

Tadpoles and Frogs (5–day only)

pp. 3–7

On Fridays, we will read interesting living science books that stand on their own. Simply read and enjoy them with your children. Toward the end of the year, we will do additional pages from the *The Usborne Internet-Linked Children's Encyclopedia* that don't line up easily with our science experiments. Enjoy!

Discover & Do Level K DVD

We produced this fun and educational video so you and your children could watch "Professor Ike" perform each of the assigned experiments from *Science The Usborne Book of Science Activities, Vol. 2*. We recommend you gather your supplies, watch the DVD to see what to do, and then try each of these simple experiments yourself.

Or, if you prefer, you can do the experiment(s) on your own and then watch the DVD to see how it turned out on screen. You may want to mix and match to find out what works best. We hope this video makes your science experiments more enjoyable and more educational.

Note to Mom or Dad: Please navigate your *Discover & Do DVD* by using the DVD menu on your screen.

Optional: Do Together

Day 1: Planetary Comparison

Using an encyclopedia or the Internet, help your children look up how long it takes other planets to rotate once on their axes and to travel once around the Sun. How long is a day on Jupiter? How long is a year on Mercury? Let your children pick the planets they want to compare to Earth. Help them make a chart if they want to see how all the planets compare to Earth. As you work on this activity, reinforce what your children have learned about how the earth rotates on its axis and travels around the Sun.

Day 3: The Seasons at Your House

Using a large piece of poster board, draw a line down the middle in each direction so as to divide it into four equal parts. Label the upper left corner "Spring," the upper right corner "Summer," the lower left corner "Fall," and the lower right corner "Winter." Now ask your children to use crayons, markers, paint, colored pencils, etc. to draw a picture of what each of the seasons looks like where you live. As they draw, discuss the seasons and what's different about each one. Ask them to think about how a stranger who just flew in from halfway around the world would be able to tell what season it is at any particular time. What clues would he find? Have fun with this activity, as your children learn more about how the seasons change in your particular area. When they're done, proudly display their work of art on the refrigerator or a wall where everyone can see it.

Science Activities, Vol. 2

pp. 2–3

If you remember school science experiments as boring demonstrations without making much of a point, it's time for you and your children to try *The Usborne Book of Science Activities, Vol. 2*. Packed with simple activities and experiments, this book will be your guide to the practical application of science throughout all 36 weeks of this curriculum.

Take some time to look through this book and you'll notice it covers three main kinds of science experiments: science with air, science in the kitchen, and science with plants. What your children will really learn about are principles of physics, botany, and even some chemistry. But you won't need an advanced science degree to work through these activities. In fact, our accompanying *Discover & Do DVD*, described previously, will show you exactly what to do to make these experiments fun and easy.

Note, too, that we've scheduled all experiments for one day during the week. That way you'll have time to prepare and take your time as you work through these fun activities.

Supplies

When supplies are listed as "**We provide:**", they are materials found in either your course-specific (**KSK**) Supplies Kit or the Non-Consumable (**NSK**) Supplies Kit. When supplies are listed as "**You provide:**", they are materials you can generally find around your home. ■

Children's Encyclopedia

Mom or Dad: Write your child's answer as you talk about each question.

1. How many continents does the earth have? Count them. (p. 8)

(7)

On which continent do you live? *(Answers will vary.)*

2. Why is a day 24 hours long?
(Put an X next to the correct answer.) (p. 8)

[X] because that's how long it takes for the earth to spin once on its axis

[ ] because that's how long it takes for the earth to travel around the sun

3. **Discuss with Mom or Dad:** Why is it daytime on only one side of the earth at a time? (p. 10)

(As the earth turns, only one side faces the sun; one side of the earth is light while the other side is in shadow.)

4. **Challenge:** Make the statement true. (Please find Cut-Out #1.) (p. 10)

The sun rises in the East and sets in the West.

5. Can you name the four seasons? (p. 12)

1) *(Spring)* 2) *(Summer)*

3) *(Fall)* 4) *(Winter)*

6. Use the map to help you answer. (Please find Cut-Out #2) (p. 13)

When it is summer in:

…it is winter in:

7. During which two seasons does the earth tilt toward or away from the sun? Circle them. (p. 13)


winter


spring


summer


fall

Children's Encyclopedia

Mom or Dad: Write your child's answer as you talk about each question.

1. How many continents does the earth have? Count them. (p. 8)

_____

On which continent do you live? _____

2. Why is a day 24 hours long?
(Put an X next to the correct answer.) (p. 8)

☐ because that's how long it takes for the earth to spin once on its axis

☐ because that's how long it takes for the earth to travel around the sun

3. **Discuss with Mom or Dad:** Why is it daytime on only one side of the earth at a time? (p. 10)

_____

_____

4. **Challenge:** Make the statement true. (Please find Cut-Out #1.) (p. 10)

   The sun rises in the _____ and sets in the _____.

5. Can you name the four seasons? (p. 12)

   1) _____ 2) _____

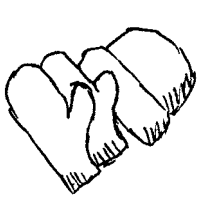
   3) _____ 4) _____

6. Use the map to help you answer. (Please find Cut-Out #2) (p. 13)

When it is summer in: _____

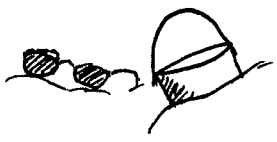
…it is winter in: _____

7. During which two seasons does the earth tilt toward or away from the sun? Circle them. (p. 13)

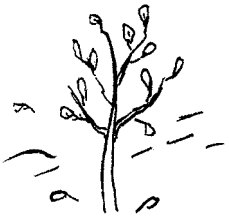


winter

spring



summer



fall

SCIENCE K	WEEK 2				SCHEDULE
Date:	**Day 1** 6	**Day 2** 7	**Day 3** 8	**Day 4** 9	**Day 5** 10
Children's Encyclopedia	pp. 14–15 N	pp. 16–17 N			
Activity Sheet Questions	#1–3	#4–5			
Weather			pp. 3–7 N	pp. 8–11 N	
Activity Sheet Questions			#6–7	#8–11	
5-Day: ***Tadpoles and Frogs***					pp. 8–11
Discover & Do Level K DVD				#11	
Optional: Do Together	Climate Map N	After the Flood: Make Your Own Rainbow N			
Science Activities, Vol. 2				"Rising Air" pp. 8–9	
Supplies	**We provide: KSK** — 1"x 8" strip tissue paper. **You provide:** feather from any bird, plate, 10"x10" paper, pencil, scissors, crayons, needle, thread or string or yarn.				
Shopping/Planning List	**For next week:** 10"x10" cardboard, two pieces of cardboard — 3"x6" and 2"x2", scissors, glue, pen, paper, stones.				
Other Notes					

Children's Encyclopedia

p. 15

Occasionally, you'll notice short experiment suggestions such as "Make a rainbow" on this page. Please consider these activities as optional.

p. 16

The photograph at the bottom of this page shows a hurricane. Earth is not the only planet to have storms. Jupiter, for example, has many huge storms, such as the Great Red Spot. If you look at images of Jupiter, the spot looks like part of the planet, but is actually an enormous storm that has been occurring for many years.

p. 17

Hmm, what part of the Bible might this discussion of floods relate to? How about the great flood and Noah's ark? After reading about floods, consider reading and discussing the story of the biblical flood to your children (Genesis 6–8).

Weather

p. 3

It's an exaggeration to state, as the book does, that "Every kind of weather is happening somewhere in the world right now." In a broad sense this is true in that there is sun, rain, wind, and snow, but in a more specific sense

this is not true, as, for example, hurricanes aren't always occurring. Just make sure your children get the bigger picture — different kinds of weather happen regularly in the world. Even though it may be a sunny day where you and your children live, across the world someone else may be experiencing very different weather.

p. 5

How do we know what Earth looks like? Up until the time of rockets, spaceships, and satellites, we didn't know, but we could guess. Nowadays we have photographs of Earth taken from space, so we know what it looks like. Doesn't it look wonderful? If you look at images of other planets in our solar system, they are each interesting in their own way, but they're nothing like Earth. Our world is made for life. It has air, water, land, lots of kinds of plants, animals, and people. It's just where it needs to be so that we can have enough sun, too. Did this all happen by itself or did God make it this way on purpose?

p. 7

The book assumes our world is at least "millions of years" old. See our note on "Evolution and the Age of the Earth" in the Introduction about how to address issues regarding the age of the earth.

pp. 8–9

In addition to the four types of clouds listed on these pages, *Weather* also mentions a lenticular cloud (p. 26).

Optional: Do Together

Day 1: Climate Map

Why is it colder in Canada and hotter in Florida? Use an encyclopedia or the Internet to look up climate data for different places around the world. What is the average temperature in Finland? What about in Belize? What areas are the hottest in the world? In your country? On your continent? More importantly, why is this so? Point out how the warmer areas are closer to the equator. Discuss the equator with your children and point out how the earth bulges out at the equator, therefore areas closer to the equator are that much closer to the sun and that much warmer.

Day 2: After the Flood: Make Your Own Rainbow

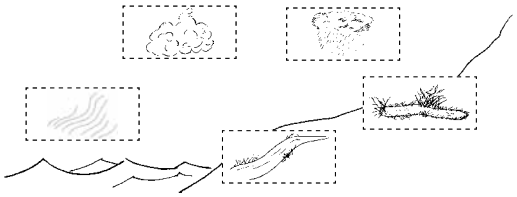
Issues of faith and science intersect often. For example, in your children's reading this week, they learned about the scientific aspects of rainbows. But do they know the biblical explanation behind rainbows? To remind them, discuss Noah and the flood and then read Genesis 9:8–17. According to the Bible, what should we remember when we see a rainbow? After discussing the biblical aspects of rainbows with your children, help them make their own. You'll need a glass of water, a table, a white sheet of paper, and the sun. Fill the glass all the way to the top with water. Put the glass of water on a table so that it is half on the table and half off of the table. Be careful that the glass doesn't fall. Then, make sure that the sun can shine through the glass of water. After you do that, place the white sheet of paper on the floor.

Adjust the piece of white paper and the glass of water until a rainbow forms on the paper.

Explain to your children that light is made up of a lot of colors. Specifically, the colors are red, orange, yellow, green, blue, indigo, and violet. When light passes through the water, it is broken up into the colors seen in a rainbow. ■

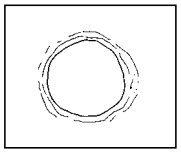
Children's Encyclopedia

1. Describe the water cycle. (Please find Cut-Out #3.)
   Then add arrows to show which way the water moves. (p. 14)



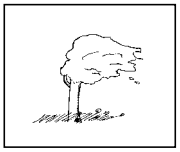
2. Draw a picture to record the weather each day this week. (pp. 14–15)

Day 1

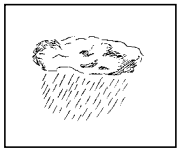


Day 2

(Possible Answers)

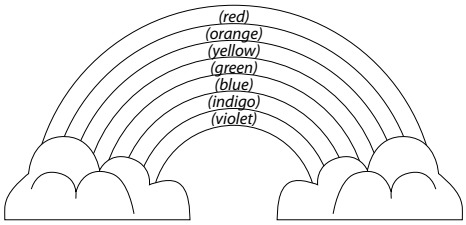


Day 3



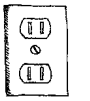
Day 4

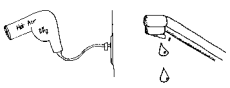
3. Label and color the correct colors on the rainbow. (p. 15)



red yellow violet blue
orange indigo green

4. Draw lines to match each storm feature to the picture that shows what each is like. (p. 16)





spark — wind and rain — sucks things up

hurricane — lightning — tornado

5. Why do floods happen? (p. 17)

(too much rain falls in a short time)

(undersea volcanoes or earthquakes send huge waves to shore)

(ice and snow melt when the ground is too frozen to absorb it)

(monsoon winds bring heavy rain from the ocean)

Weather

6. What three things cause weather? Circle them. (p. 4)

heat

clouds

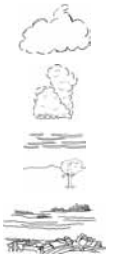
air

water

7. Why isn't there any new water on the earth? (pp. 6–7)

(because water is always cycling around the earth between air, sea, and the land.)

8. Look at the cloud pictures below to predict the weather. Draw a line to show your answer. (pp. 8–9)



thunderstorm

good weather

rain or snow later

fog or drizzle

9. Fog is like _____ that is close to the ground. Circle one. (p. 9)

a tree **a breeze** **rain** **cloud**

10. How many points do snowflakes have?

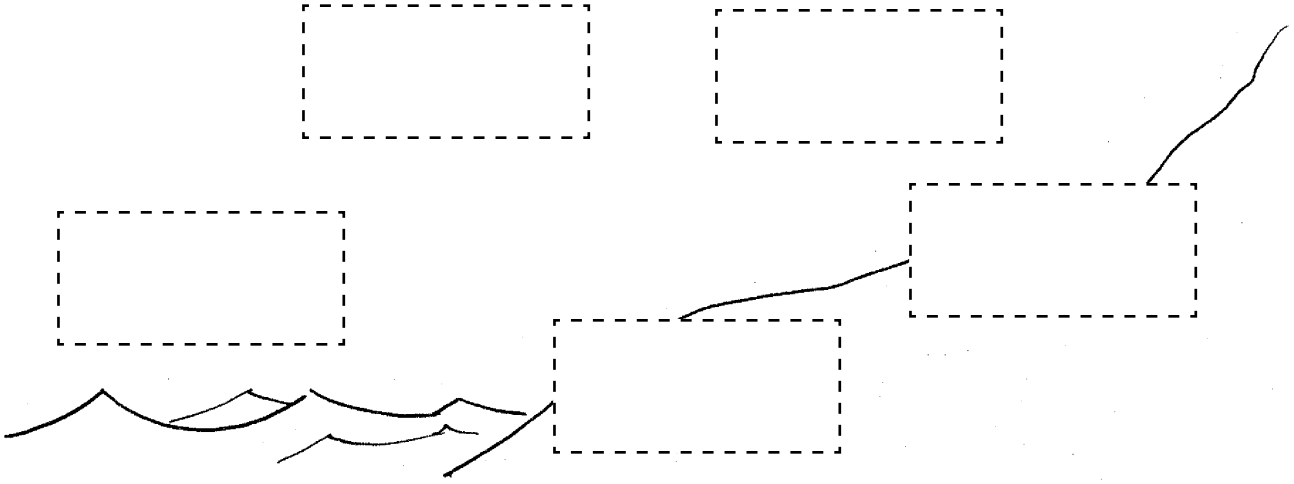
Count them. (p. 10) *(6)*

11. Finish the sentence. (Please find Cut-Out #4.) (p. 11)

Icicles form when snow on a roof melts in the warm sunshine and freezes when it drips into the cool shade underneath.

Children's Encyclopedia

1. Describe the water cycle. (Please find Cut-Out #3.)
   Then add arrows to show which way the water moves. (p. 14)



2. Draw a picture to record the weather each day this week. (pp. 14–15)

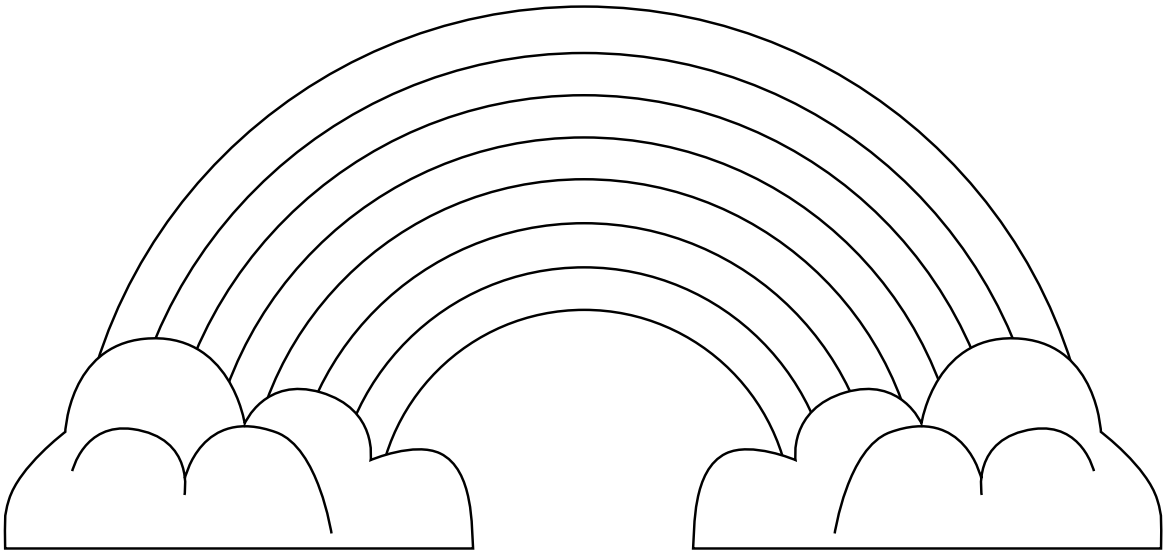
Day 1

Day 2

Day 3

Day 4

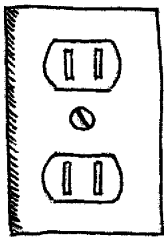
3. Label and color the correct colors on the rainbow. (p. 15)



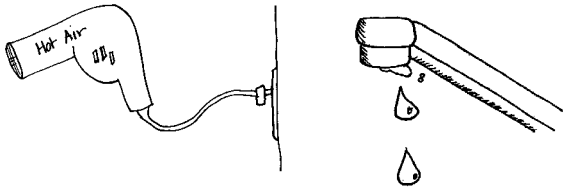
red yellow violet blue

orange indigo green

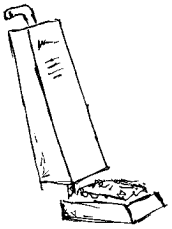
4. Draw lines to match each storm feature to the picture that shows what each is like. (p. 16)



spark



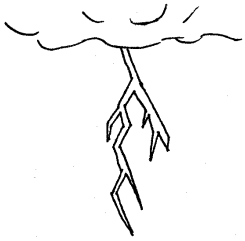
wind and rain



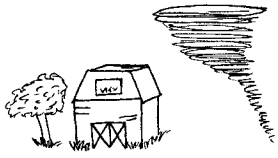
sucks things up

hurricane

lightning



tornado



5. Why do floods happen? (p. 17)

_____

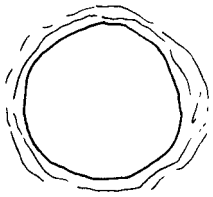
_____

_____

_____

Weather

6. What three things cause weather? Circle them. (p. 4)



heat

clouds

air

water

7. Why isn't there any new water on the earth? (pp. 6–7)

_____

_____

8. Look at the cloud pictures below to predict the weather. Draw a line to show your answer. (pp. 8–9)

- • thunderstorm
- • good weather
- • rain or snow later
- • fog or drizzle

9. Fog is like _____ that is close to the ground. Circle one. (p. 9)

a tree **a breeze** **rain** **cloud**

10. How many points do snowflakes have?

Count them. (p. 10) _____

11. Finish the sentence. (Please find Cut-Out #4.) (p. 11)

Icicles form when snow on a roof melts in the _____ sunshine and freezes when it drips into the _____ shade underneath.

Date:	Day 1 11	Day 2 12	Day 3 13	Day 4 14	Day 5 15
Weather	pp. 12–15 N	pp. 16–19 N	pp. 20–23 N	pp. 24–30 N	
Activity Sheet Questions	#1–3	#4–5	#6–8	#9–11	
5-Day: ***Tadpoles and Frogs***					pp. 12–15
Discover & Do Level K DVD				#12–13	
Optional: Do Together		Tornado in a Bottle N	Disaster Relief N	Make a Windsock N	
Science Activities, Vol. 2				"Wind" pp. 10–11	
Supplies	**We provide: NSK** — dowel, spool, tape, clay. **You provide:** 10"x10" cardboard, two pieces of cardboard — 3"x6" and 2"x2", scissors, glue, pen, paper, stones.				
Shopping/Planning List	**For next week:** dirt, medium jar with lid, disposable cup (yogurt) to scoop dirt, water, leaf litter (dead and rotting leaves), baggie, sheet paper, gloves — gardening or rubber (optional), small paint brush or stick to pick up a bug.				

Other Notes

Weather

pp. 14–15

Let your children know that hail is sometimes dangerous. If hailstones are big enough they can cause damage to cars, homes, and other things. If you live in an area where you might get hail, make sure your children know to be careful around it.

According to *National Geographic News* (August 4, 2003), the largest hailstone on record in the U.S., as noted briefly in the book, was seven inches in diameter with an 18.75 inch circumference, or, "almost as large as a soccer ball."[1] That's a big piece of ice! The hailstone is frozen and is kept at the National Center for Atmospheric Research in Boulder, Colorado, which isn't too far from Sonlight Curriculum's offices in Littleton.

1. http://news.nationalgeographic.com/news/2003/08/0804_030804_largesthailstone.html. Accessed June 2008.

p. 17

The book notes, "Ancient Greeks believed that the wind was the breath of the Gods." In Greek mythology, several gods are associated with wind including Aeolus, Boreas (or Aquilo), Eurus, Favonius (or Zephyrus), and Notus (or Auster). Do gods really control the wind? The God of the Bible does. Genesis 8:1 tells us that God "sent a wind over the earth." This wind helped the flood waters recede so Noah's ark could reach dry ground. Other passages also speak about God's control of the wind (see, for instance, Numbers 11:31, Amos 4:13, and Jonah 4:8). In Acts 17:24, the Apostle Paul describes God as, "The God who made the world and everything in it is the Lord of heaven and earth …"

p. 23

See our note about pp. 52–53 of *The Usborne Children's Encyclopedia* for more on the concept of migration.

Weather doesn't use the term, but make sure your children know that the comment about birds flying away from cold weather is about migration.

p. 26

This is a good place to remind your children of the 4 kinds of clouds discussed earlier in the book: cumulus, stratus, cirrus, and cumulonimbus. Review pages 8 and 9 for more information about these clouds.

p. 27

The story about a hailstone with a turtle inside is amusing, but we're not sure it's true. There are several stories about the incident, but they all have different dates ranging from 1887, 1894, 1930, and 1984. All the stories agree that the turtle supposedly was in a hailstone than fell near Vicksburg, Mississippi, possibly in Bovina. Some accounts add that it was a 6 inch by 8 inch gopher turtle. Whether the story is true or not, we're pretty sure you and your children don't have to worry about turtles encased in hailstones falling out of the sky. But you never know!

p. 28

Is it getting hot around here? The book introduces the subject of global warming, but does so carefully, noting, "Many scientists think that the Earth's atmosphere is slowly getting warmer." There are scientists on both sides of this issue, so we'll leave it to you to present this material as you see fit. Your children should at least be familiar with the terms *global warming* and *greenhouse effect*.

p. 30

Yes, it's a glossary! There are lots of things you can do with the glossary. You could just read through it with your children. Or maybe you think they could use a spelling test based on the glossary terms. How about asking them if they can define any of the terms *before* you read the glossary together? If you're feeling particularly creative you could mix up the letters for each glossary term, write them on a sheet of paper, and have your children unscramble the words.

Optional: Do Together

Day 2: Tornado in a Bottle

Discuss tornadoes with your children and then help them make their very own water-based tornado in a bottle. You'll need:

- two 2-liter clear plastic bottles (empty and clean)
- water
- 1-inch metal washer
- duct tape
- optional: food coloring and/or glitter

Fill one of the bottles two-thirds full of water. Place a metal washer over the opening of the bottle and then turn the second bottle upside down and place it on the washer. Use duct tape to fasten the two containers and the metal washer together. Tape it tightly to make sure no water will leak out when you turn the bottle over. To create the tornado, flip your creation over so that the bottle with the water is on top. Swirl it in a circular motion, and a tornado will form in the top bottle as the water rushes into the bottom bottle. If you want to get creative, use food coloring to give the tornado color and/or glitter to represent debris. Explain to your children that when you swirl the bottle, a vortex forms that creates the tornado!

Day 3: Disaster Relief

Discuss the various weather-related disasters that have occurred in your area in recent memory. Have there been tornadoes? Hurricanes? Floods? Drought? Talk with your children about how people are affected by these disasters. Also discuss what ways — if any — are available to avoid or lessen the effects of such disasters. Finally, brainstorm ideas of how your family might be able to help people affected by recent weather-related disasters (or ones yet to come). Could you donate money or supplies needed by families affected by disasters? Could you raise funds from family or church members? If your family was the victim of a weather-related disaster, how would you cope? What would you do? What kind of assistance would you hope to receive from others? Through this discussion, reinforce what your children have learned about weather-related disasters and their effects. Then make it real by discussing recent events. Find articles and pictures in local papers or on the Internet to help your children understand the sometimes furious nature of weather.

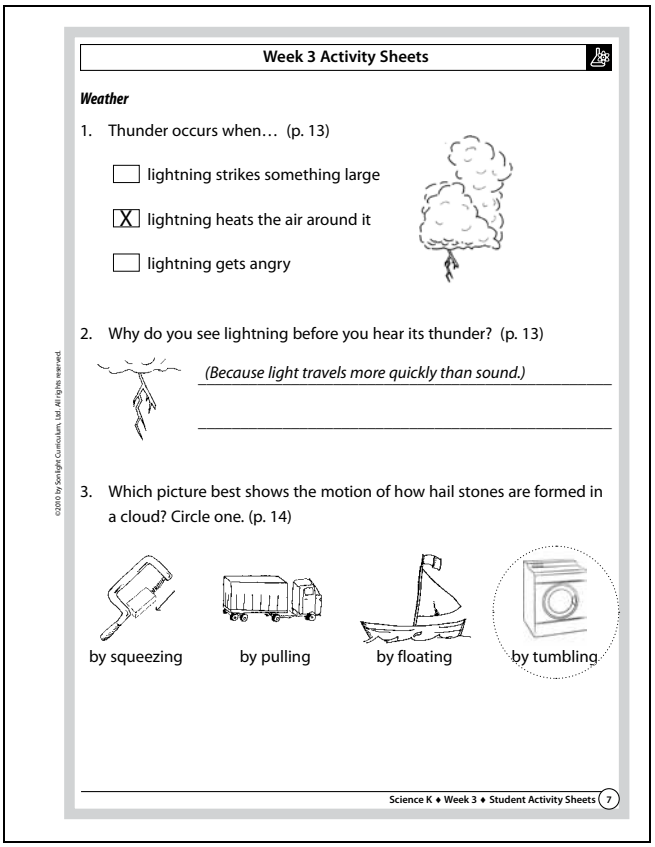
Day 4: Make a Windsock

To help your children better understand wind and the air around them, help them make their very own windsock. You'll need the following supplies:

- A cylindrical cardboard oatmeal box
- Construction paper
- Crepe paper or more construction paper for streamers

- Glue
- String
- Scissors
- Hole punch

Cut the bottom off a cylindrical cardboard oatmeal box. Cover the box with construction paper and then let your children decorate it however they want. Cut some crepe paper (or construction paper) streamers and glue or staple them to one end of the windsock. Punch four holes along the top of the windsock. Cut two pieces of string about a foot long. Tie the strings to the windsock (tie the opposite ends of a string to holes on opposite sides of the cylinder). Tie a longer piece of string to the smaller pieces — you'll hang the windsock from this piece of string. Hang your windsock from your window or porch. As it blows in the wind, reinforce what your children have learned this week about air and the atmosphere! ■



Week 3 Activity Sheets

Weather

1. Thunder occurs when… (p. 13)

☐ lightning strikes something large

☒ lightning heats the air around it

☐ lightning gets angry

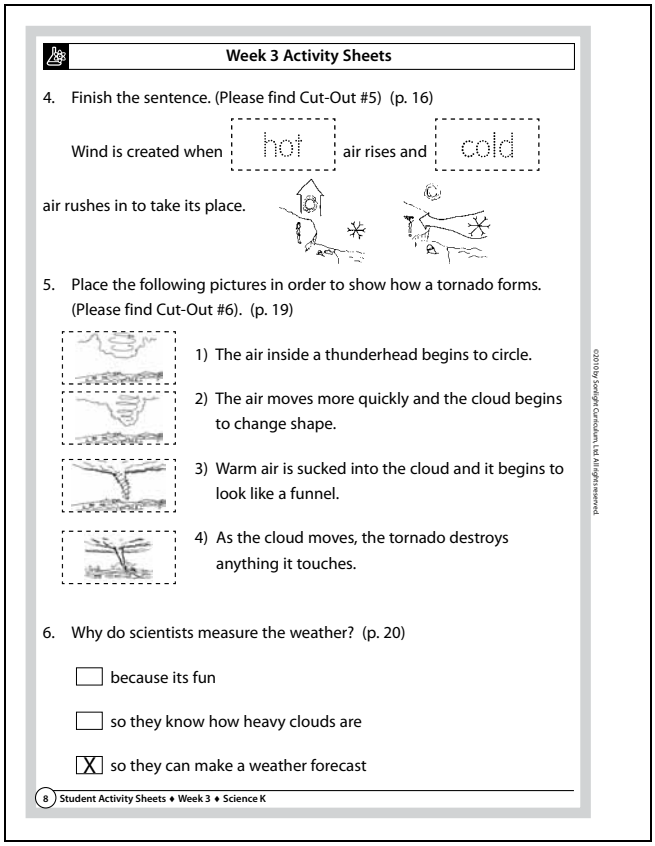
2. Why do you see lightning before you hear its thunder? (p. 13)

(Because light travels more quickly than sound.)

3. Which picture best shows the motion of how hail stones are formed in a cloud? Circle one. (p. 14)

by squeezing | by pulling | by floating | by tumbling

Science K ♦ Week 3 ♦ Student Activity Sheets 7



Week 3 Activity Sheets

4. Finish the sentence. (Please find Cut-Out #5) (p. 16)

Wind is created when hot air rises and cold air rushes in to take its place.

5. Place the following pictures in order to show how a tornado forms. (Please find Cut-Out #6). (p. 19)

1) The air inside a thunderhead begins to circle.

2) The air moves more quickly and the cloud begins to change shape.

3) Warm air is sucked into the cloud and it begins to look like a funnel.

4) As the cloud moves, the tornado destroys anything it touches.

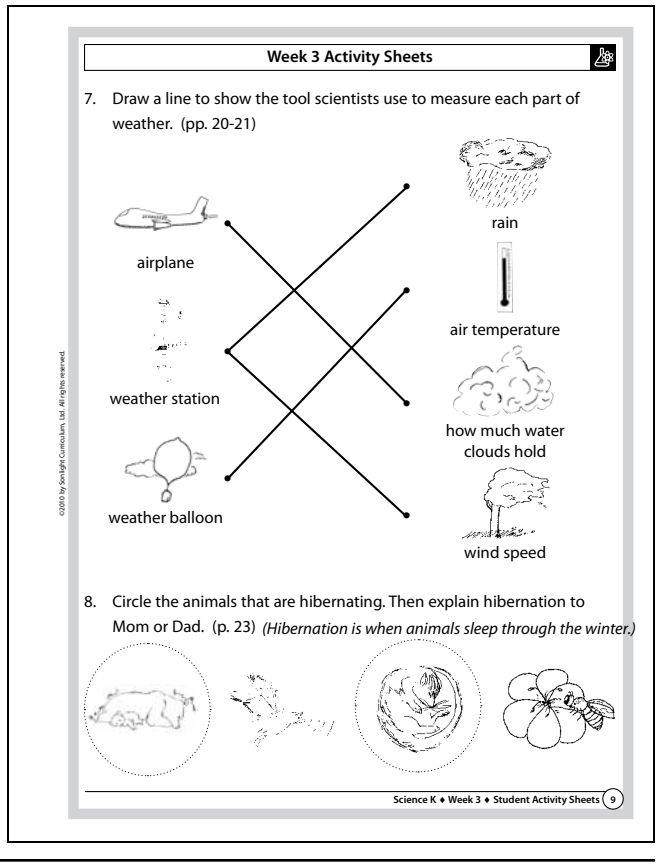
6. Why do scientists measure the weather? (p. 20)

☐ because its fun

☐ so they know how heavy clouds are

☒ so they can make a weather forecast

8 Student Activity Sheets ♦ Week 3 ♦ Science K



Week 3 Activity Sheets

7. Draw a line to show the tool scientists use to measure each part of weather. (pp. 20-21)

airplane
weather station
weather balloon
rain
air temperature
how much water clouds hold
wind speed

8. Circle the animals that are hibernating. Then explain hibernation to Mom or Dad. (p. 23) *(Hibernation is when animals sleep through the winter.)*

Science K ♦ Week 3 ♦ Student Activity Sheets 9

Week 3 Activity Sheets

9. Use the words in the box to finish the sentence. (p. 28)

penguins	desert	camels	Antarctica

(Camels) live in the *(desert)* because they can survive a long time without water. *(Penguins)* live in *(Antarctica)* because they huddle together to keep each other warm.

10. What can make raindrops red? (p. 27)

- ☐ When paint falls out of an airplane and gets stuck in a cloud.
- ☐ Nothing.
- ☒ If wind picks up sand which mixes with droplets of water to become rain.

11. What two things cause Earth's atmosphere to trap heat? (pp. 28-29)

(gases released by burning fuel)

(animal gases)

Why is this a problem? *(ice and snow would melt and could cause floods)*

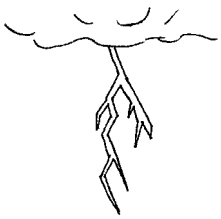
10 Student Activity Sheets ♦ Week 3 ♦ Science K

Weather

1. Thunder occurs when… (p. 13)

- ☐ lightning strikes something large
- ☐ lightning heats the air around it
- ☐ lightning gets angry

2. Why do you see lightning before you hear its thunder? (p. 13)



_____

_____

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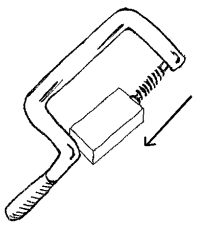
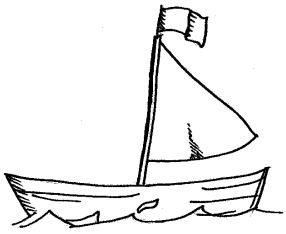


by squeezing

by pulling



by floating

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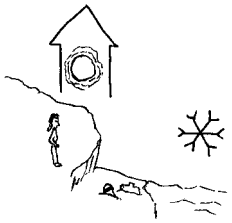

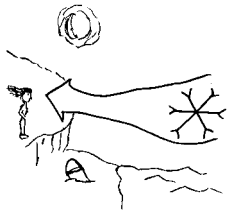

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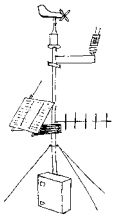
airplane



weather station

weather balloon

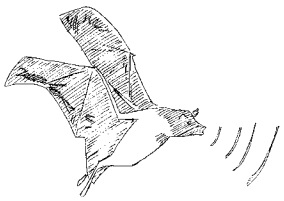
rain

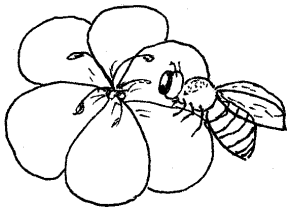
air temperature

how much water clouds hold

wind speed

8. Circle the animals that are hibernating. Then explain hibernation to Mom or Dad. (p. 23)





9. Use the words in the box to finish the sentence. (p. 28)

penguins	desert	camels	Antarctica

_____ live in the _____ because they can survive a long time without water. _____ live in _____ because they huddle together to keep each other warm.

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- ☐ When paint falls out of an airplane and gets stuck in a cloud.
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11. What two things cause Earth's atmosphere to trap heat? (pp. 28-29)

_____

_____

Why is this a problem? _____

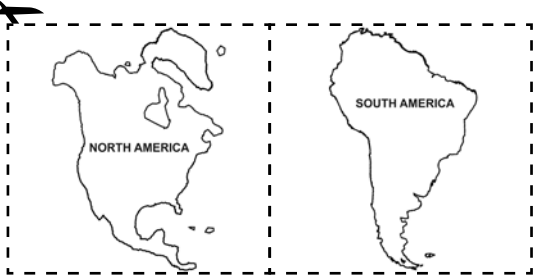
_____

Cut-Out Sheets

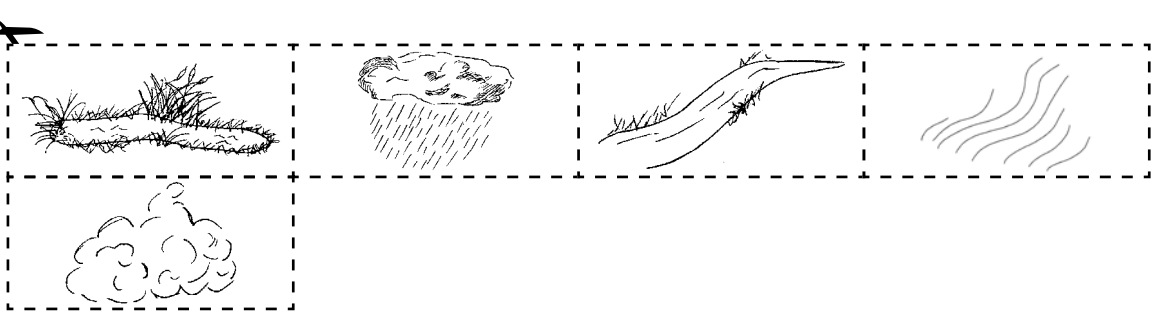
Cut-Out #1

East | West

Cut-Out #2



Cut-Out #3



Cut-Out #4

cool | warm

Cut-Out #5

cold | hot

Cut-Out #6