Activity Guide

Prepared By:
Arizona Ecumenical Council
Earth Care Commission
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“Opening the Book of Nature” is based on the work of Joseph Cornell, one of the world’s leading nature educators. Much of Cornell’s work is aimed at helping people achieve deep spirituality through connections with the natural world.

**Four stages.** Cornell’s basic program model—which he calls “Flow Learning”—has four stages:

I. Awakening Enthusiasm
II. Focusing Attention
III. Directly Experiencing
IV. Sharing Inspiration.*

The activities in this guide follow this Flow Learning model. Thus, for an Opening the Book of Nature outing, we suggest you choose one or more activities from each of the four categories of activity presented.

**Quotations.** At the beginning of each activity we have offered some quotations from scripture, theologians, and literature. These quotations are intended to provoke thought, inspire insights, establish connections with previous generations of kindred spirits, and provide beautiful language that might enrich your experience of nature. Activity leaders may read these quotes for your own edification and meditation. You can also share these reflections with participants as appropriate.

**Printing.** In order to preserve resources, we recommend you print this document double-sided or read through it on the computer and print only the activities you plan to use. Feel free to email the document to other leaders on your team.

**Additional Information.** For additional information on the Arizona Ecumenical Council, please visit www.aecunity.net. For additional information on the Earth Care Commission, please email Pastor Doug Bland at doug.bland@tempeccc.com.


* For more information about Cornell’s Flow Learning model, see Cornell, *Sharing Nature with Children II* at 29-43.
I. AWAKENING ENTHUSIASM

Activity Option #1 - Nature Bingo

Players: This exercise is for three or more players, ages eight years and up, or three or more parent/child teams.

Time: 20 to 30 minutes

Supplies: One bingo board per player or team (Appendix A), information cards (Appendix B), five small natural objects per player or team, and six prizes.

Applicable Scripture:
“Hearken unto this, O Job: Stand still and consider the wondrous works of God.” (Job 37:14)

“For of him and through him, and to him, are all things: to whom be glory forever.” (Romans 11:36)

Applicable Theology:
“Creation is a Bible whose letters and syllables are the aspects of creatures…Conversely, Scripture is like a cosmos constitutes of heaven and earth and things in between.” (St. Maximos the Confessor)

Applicable Literature:
“Earth’s crammed with heaven,
And every common bush afire with God;
But only he who sees, takes off his shoes,
The rest sit around and pluck blackberries…” (Elizabeth Barrett Browning)

Instructions:
Play this game in a place where participants can sit with bingo game boards in front of them while listening to a single game leader. Using bingo game boards and information cards provided, distribute game boards among participants. Direct each participant to collect five natural objects (leaves, large pebbles, seed pods) to be used to cover/mark squares on game boards (or distribute natural objects to cover squares).

To play, select a card and call out the category heading on the card. Read aloud some of the information on the card. Allow players a few moments to think and encourage them to call out the answer when they figure it out. If no one comes up with the answer, give a little more information as provided on the card, eventually announcing the answer if none of the participants figures it out.

Make sure to have prizes (silly or inspiring) to award the winner of each round.
Activity Option #2 - Animal Clue

Players: This exercise is for six or more players, ages eight years and up.

Time: 20 to 30 minutes

Supplies: Animal cards (Appendix C), animal clue key (Appendix D) index cards, pencils, and 60-foot rope for marking boundary.

Applicable Scripture:
“But ask now the beasts, and they shall teach thee: and the fowls of the air, and they shall tell thee: Or speak to the earth, and it shall teach thee: and the fishes of the sea shall declare unto thee. Who knoweth not in all these that the hand of the Lord hath wrought this?” (Job 37:14)

“Out of the ground the Lord formed every beast and fowl of the air: and brought them unto Adam to see what he would call them: and whatsoever Adam called every creature, that was the name thereof.” (Genesis 2:19)

“The wild animals honor me, the jackals and the owls, because I provide water in the desert and streams in the wasteland, to give drink to my people, my chosen.” (Isaiah 43:20, 21)

Applicable Theology:
“Apprehend God in all things, for God is in all things.
Every creature is full of God and is a book about God.
Every creature is a word of God.
If I spent enough time with the tiniest creature---even a caterpillar---
I would never have to prepare a sermon,
so full of God is every creature.” (Meister Eckhart (1226-1327))

Instructions:
Use animal clue cards and paper or index cards and pencils. Have players form a wide circle, each about eighteen feet from the center and at least an arm’s length apart from one another. Mark the boundary of the circle with a rope or some other way. Divide the players into teams of three and give each team a blank index card or paper and a pencil. Place animal clue cards face-up in the center of the circle. Instruct players that the deck contains six clue cards about each of five animals; some clues are very general and might seem to apply to more than one animal and some are highly specific. A team does not have to find all six cards for each animal, but should find enough clues to be sure of the animal’s identity. Be sure to let players know that none of the six animals is closely related, so it should not be difficult to distinguish them. Explain the scoring process to the players (see below).

To play, the players stand outside of the circle. Each team sends one runner into the circle to fetch a clue card. Runners may not look at the card until they are outside the circle. The team members read each fetched card together and can try to guess the animal’s identity. Another team member returns the card to the center and fetches a new one. (A team cannot hold more than one card at a time.) This process continues, with each team rotating runners through the circle to return and fetch cards, until the team thinks it has guessed all five animals. Teams are permitted to take notes and should keep a list of its answers. Once a team believes it has guessed all five animals, team members show their answers to the leader. The leader will use the key to determine if the answers are correct.

Scoring:
One point awarded for each correct guess. Two points deducted for each incorrect guess. Nine points for each animal guess made, up to five guesses. Three points for first team to finish; two points for second team to finish; one point for each team that finishes. (For example, a team that finishes second and guesses four out of five animals correctly receives 47 points.) The highest possible score would be 53; lowest possible would be 36.
Activity Option #3 - Natural Processes

Players: This exercise is for 12 to 18 players, ages 7 and up, or a large group divided into 10 to 12 teams of two or three people per team.

Time: 20 to 30 minutes

Supplies: Natural processes cards (Appendix E).

Applicable Scripture:
“The heavens declare the glory of God; and the firmament shows God’s handiwork.” (Psalm 19:1)

“If you walk in my statutes, and keep my commandments… then I will give you rain in due season, and the land shall yield her increase, and the trees shall yield their fruit…and I will give peace in the land… And I will make you fruitful…and establish my covenant with you.” (Leviticus 26:3-9)

Applicable Literature:
“And this our life, exempt from public haunt, Find tongues in trees, Books in the running brooks. Sermons in tones, And good in every thing.”
(William Shakespeare, As You Like It, Act II. Sc. 1)

Instructions:
This is a version of charades. Using the natural processes cards provided in the appendix, distribute a single natural process card to each player or team. Give the players a few minutes to come up with their charade. Each player or team acts out its process while the rest of the group tries to guess the process that’s being acted out. At the end of each player’s or team’s turn, encourage discussion that allows the performer(s) to explain more about the process.

II. FOCUS ATTENTION

Activity Option #1 - Colors

Players: This exercise is for one to 30 participants; ages three years and older.

Time: Five to 15 minutes

Supplies: Daylight

Applicable Scripture:
“He makes me lie down in green pastures.” (Psalm 23:2)

“I have set my bow in the clouds, and it shall be a sign of the covenant between me and the earth.” (Genesis 9:13)

Applicable Theology:
“Throughout creation, the wisdom of God shines forth, as a mirror containing the beauty of all forms and lights and as a book in which all things were written according to the deep secrets of God.” (St. Bonaventure, 1217-1274)

Applicable Literature:
“Come forth into the light of things.
Let nature be your teacher.” (William Wordsworth)

Instructions:
Choose a natural setting with something interesting to look at. Have participants sit or stand still quietly. Ask them to close their eyes for a few seconds and, without making noise, open them and look straight forward and count all the different colors they see without moving and tell them you will say when it is time to stop looking. Ask what surprised them. Give them a couple of minutes to take in the colors in front of them—take a little longer than feels absolutely comfortable. When enough people show signs of restlessness that it is appropriate to stop, gently call out. Discuss what they saw. Were there more colors than they expected? Did they notice any colors they hadn’t expected? Did they see more as a result of concentrating on one vista for an extended time?
**Activity Option #2 – Sounds**

**Players:** This exercise is for one to 30 participants; ages three years and older.

**Time:** Five to 15 minutes

**Supplies:** Daylight

**Applicable Scripture:**
“I tell you, if these should hold their peace, the stones would immediately cry out.” (Luke 19:40)

“Listen, O heavens, and I will speak. Hear, O earth, the words of my mouth. Let my teaching fall like rain and my words descend like dew, like showers on new grass, like abundant rain on tender plants.” (Deuteronomy 32:1-2)

“The mountains and hills will burst into song before you, and all the trees of the field will clap their hands.” (Isaiah 55:12)

**Applicable Literature:**
“How do I talk to a little flower?
Through it I talk to the Infinite.
And what is the infinite?
It is that silent, small force. It isn’t the outer physical contact. No, it isn’t that. The Infinite is not confined in the visible world. It is that still small voice that calls up the fairies.” (George Washington Carver (1864-1943)

“The beauty of the trees,
The softness of the air,
The fragrance of the grass,
Speaks to me.
The summit of the mountain,
The thunder of the sky,
The rhythm of the sea,
Speaks to me.
The faintness of the stars,
The freshness of the morning,
The dewdrop on the flower,
Speaks to me.
The strength of fire,
The taste of salmon,
The trail of the sun,
And the life that never goes away,
They speak to me.
And my heart soars.”
(Chief Dan George and Helmet Hirnschall in My Heart Soars)

**Instructions:**
Choose a pretty spot that is relatively free from urban and other human caused noise. A good choice would be a place with lots of natural sounds around (birds, bees, leaves rustling, water babbling). Tell participants to sit quietly without making any noise. Ask them to put their hands in fists at chest height. Explain that on your signal, they will close their eyes and try to listen for all the nature sounds they can. Ask them to hold up a finger for each new sound they hear. Tell them that you will let them know when it is time to open their eyes. Give them a little more time than is comfortable. When enough participants show signs of restlessness or have all ten fingers up, call time and discuss what they heard. Ask if they were surprised by how many sounds they heard. What sounds surprised them? What did they not hear that they expected to hear? Ask if they noticed the silence between sounds. How many sounds did they hear? Some groups will want to repeat this activity right away. Go for it!
Activity Option #3 - Unnature Trails

Players: This exercise is for one to 30 participants; ages 5 and older.

Time: 15 to 20 minutes

Supplies: 20 to 30 small, noticeable man-made objects.

Applicable Scripture:
“So you shall not pollute the land wherein you are…” (Numbers 35:34)

Applicable Literature:
“Whenever a person breaks a stick in the forest let him consider what it would feel like if it were himself that was thus broken.” (Nigerian Proverb)

Instructions:
Prepare the unnature trail by choose a length of trail about 30 to 100 yards long and wide enough for two people to pass each other. Place man-made objects, “Easter Bunny” style, along the trail. Some objects should be obvious and some should be a little hard to spot. Be clever about the objects’ placement (in a tree, nestled in a bush, amid flowers, among rocks). Keep a count of the number of objects planted.

Tell the participants that they will be walking a strange trail, where they will see a number of objects that “don’t belong.” Let them know that the object of this activity is to spot all of the odd objects and you will let them know at the end of the walk how many there are. Ask them to stay on the trail and to do the activity without speaking or pointing. Tell them they can walk very slowly or back and forth as they like, but remind them this is an individual activity. Walk the length of the trail section and wait at the other end. When they are finished, each participant can whisper or write down how many objects he or she spotted.

Give participants plenty of time to complete this activity. When they are finished, tell the group how many objects in total were hidden. Ask if they felt they did a good job. What helped them spot objects? Were there any items they didn’t see at first—if so, what caused them to spot the object(s) at some point? What was the best way of going down the trail to see things? Were there any surprises—something they took for something else at first?
Activity Option #4 - Scavenger Hunt

Players: This exercise is for three or more participants; ages 5 and older.

Time: Varies depending on list and place

Supplies: Laminated copies of scavenger list (Appendix F or Appendix G) and wax pencils.

Applicable Scripture:
“Consider the lilies of the field, how they grow; they toil not, neither do they spin: And yet I say to you that Solomon in all his glory was not arrayed like one of these.” (Matthew 6:28-29)

Applicable Theology:
“God has ordained the world to be like a theater upon which to behold his goodness.” (John Calvin, 1509-1564)

Applicable Literature:
“And nature, the old nurse, took
The child upon her knee.
Saying, “Here is a story book
My father hath writ for thee.
Come, wander with me” she said,
“In regions yet untrod,
And read what is still unread,
In the manuscripts of God.” (Henry W. Longfellow)

Instructions:
This activity proceeds along the lines of a traditional scavenger hunt except that participants are asked not to collect the objects found. (It’s generally not a good idea to encourage collecting items found in nature; in some cases, collecting violates state and federal law.) Find a trail or safe area where the scavenger hunt can take place. If needed, divide participants up into groups of two or three. Tell them that they will be doing a non-collecting scavenger hunt leaving the lightest possible footprints. Advise them that they should mark the list with the wax pencil when an item is spotted. Let them know the boundaries of the scavenger hunt—e.g., that they should stay within view or earshot or on the trail and must return when the signal is given. Distribute the lists and pencils and send them off. When they return, discuss what they found. What was surprising? What was hard to find? What did they see a lot of? What was the most beautiful thing? And so on.

For an added dimension, have a couple of digital cameras on hand and let participants borrow them to take photos of themselves with some of their favorite finds. Then pass the cameras around to view the photos during the debriefing.
III. Direct Experience

Activity Option #1 - Camera Game

Players: This exercise is for two or more players; ages 3 and up.

Time: 30 minutes

Supplies: Colored pencils and index cards.

Applicable Scripture:
“O Lord, how manifold are thy works! In wisdom has thou made them all: the whole earth is full of thy riches.” (Psalm 104:24)

Applicable Literature:
“A good photograph is knowing where to stand.” (Ansel Adams)

“A true photograph need not be explained, nor can it be contained in words.” (Ansel Adams)

”Not everybody trusts paintings but people believe photographs.” (Ansel Adams)

“Sometimes I do get to places just when God's ready to have somebody click the shutter.” (Ansel Adams)

“Love all of God’s creation, the whole of it and every grain of sand. Love every leaf, every ray of God’s light! Love the animals, love the plants, love everything. If you love everything, you will soon perceive the divine mystery in things. Once you perceive it, you will begin to comprehend it better every day. And you will come at last to love the whole world with an all-embracing love.” (Fyodor Dostoyevsky, 1821-1881)

Instructions:
It is important to carefully demonstrate this activity to participants. Participants form pairs. One of the pair will be the photographer, and the other will be the camera. The camera closes his or her eyes and the photographer guides the camera (by holding the camera’s hand and pulling gently on his or her arm) to beautiful and interesting pictures. The photographer sets up each picture, adjusting the camera’s head and position to framing the “photograph.” To “take” the photo, the photographer taps the camera on the shoulder and the camera opens his or her eyes. After three to five seconds, the photographer taps the camera’s shoulder to signal that camera to close his or her eyes.

It's important that the camera keep his eyes closed between pictures, so that the three- to five-second "exposure" will have the impact of surprise. Instruct the photographers that they will have about ten minutes to take around six to ten shots.

Give some examples of what makes a good photograph, and encourage the photographers to be creative: taking shots from unusual angles and perspectives. (For example, by positioning the camera under a tree, looking upward close to a tree's bark or a flower or panning the horizon.

You can advise the photographers that they can prepare their cameras for each photograph by telling the camera which lens to use (close-up, wide angle, telephoto). The photographers can also instruct their cameras to take a panoramic photograph by slowly moving their gaze from left to right or right to left.

Tell the photographers they'll have about 10 minutes to take pictures, and then they'll trade roles. It works well to tell the photographers to take a certain number of pictures (six to ten is fine), and then trade places with their partners. With these rules, everyone will finish at about the same time.
After everyone has played both roles, give each player a 3 x 5 index card and tell them, "Remember one of the pictures you took when you played camera. Develop it by drawing it, and give it to the photographer." If some players are self-conscious about their lack of artistic talent, tell them they can blame the quality of their pictures on the photographer!

Note:
People who do the Camera game typically find it memorable and greatly enjoyable. But some people are uncomfortable with the idea of closing their eyes and allowing someone to guide them on uncertain terrain and touch them on the head, so you might consider offering an alternative activity for folks who feel this way. One alternative is a modified Camera Game in which the camera is on a fixed “tri-pod” (that is, sitting in one spot) and the photographer brings objects to the camera or instructs the camera how to position himself or herself to frame the photograph. Another option is to offer Expanding Circles as an alternative for people who don’t want to take part in the Camera Game.
Activity Option #2 - Expanding Circles

Players: This exercise is for one or more participants; ages adolescent and older.

Time: 10 to 30 minutes, depending on how amenable participants are to meditative activity.

Supplies: Ideally done where there is a panoramic view.

Applicable Scripture: “For in him we live and move and have our being…” (Acts 17:28)

Applicable Theology: “Some people, in order to discover God, read books. But there is a great book; the very appearance of created things. Look above you? Look below you! Note it. Read it. God, whom you want to discover, never wrote that book with ink. Instead He set before your eyes the things that he had made. Can you ask for a louder voice than that? Why heaven and earth shout to you: ‘God made me!’” (St. Augustine (354-430)

“Instead of stopping short at the outward appearance which visible things present to the sense, if you seek to contemplate their inner essences, seeing them as images of spiritual realities or as inward principles of sensible objects, you will be taught…” (St. Maximus the Confessor, 580-662)

Applicable Literature: “He drew a circle to shut me out, Heretic, rebel, a think to flout But love and I had the wit to win. We drew a circle that took him in.” (Edward Markham)

“Everything the Power of the World does is done in a circle. The sky is round, and I have heard that the earth is round like a ball, and so are all the stars. The wind, in its greatest power, whirls. Birds make their nests in circles, for theirs is the same religion as ours. The sun comes forth and goes down again in a circle. The moon does the same, and both are round. Even the seasons form a great circle in their changing, and always come back again to where the were. The life of a man is a circle from childhood to childhood, and so it is in everything where power moves. Our teepees were round like the nests of birds, and these were always set in a circle, the nation's hoop, a nest of many nests, where the Great Spirit meant for us to hatch our children.” (Black Elk Speaks, John G. Neihardt, University of Nebraska Press, Lincoln and London, 1932, 1961, 1979.)

Instructions: This is a highly meditative activity that promotes clarity of focus. You can do this by instructing the participants in the entire activity before they start or by gently guiding them through the activity.

The participants situate themselves in a spot where they have a panoramic view and an interesting foreground. They should not be sitting so closely together as to distract each other. They should begin by sitting and relaxing—perhaps taking a few deep breaths. Then they concentrate on thinking of themselves each in the middle of a small circle, being aware of their bodies—their feet, their legs, their spinal column, their heads, their arms, their hands. After a minute or two, they expand the circle, extending their awareness to include the objects a few feet away and feeling themselves among those objects, moving and becoming alive in the objects. They should try to focus on being with what’s in the circle, and if their minds wander they should try to come back to the circle and all that is in it. After a couple of minutes, participants should expand their circles, ten or twenty feet, feeling themselves connected with all within. They should continue expanding the circle every minute or two (by increasing large distances—fifty yards, a quarter mile) until the circle encompasses the entire vista. Tell the participants that as their circles expand, they should try to stay aware of everything within their view—their own bodies, the ground they are sitting upon, the shrubs and rocks close by as well as the distant mountains and clouds—feeling that they are connected with everything they see.
Activity Option #3 - Path of Knowledge

Players: This exercise is for one or more participants; ages 10 and up.

Time: Will vary depending on circumstances

Supplies: A trail at least a quarter mile long in a natural area.

Applicable Scripture:
“For since the creation of the world, God’s invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that human beings are without excuse.” (Romans 1:20)

Applicable Theology:
“Any error about creation also leads to an error about God.” (St. Thomas Aquinas, 1225-1274)

Applicable Literature:
“And the world cannot be discovered by a journey of miles, no matter how long, but only by a spiritual journey, a journey of one inch, very arduous and humbling and joyful, by which we arrive at the ground at our feet, and learn to be at home.” (Wendell Berry)

Instructions:
Instruct the participants to stay silent and observant during this activity and that their mission is to discover an object that is particularly beautiful to them. Tell them that when they settle on their object to think of a word or phrase that describes it. When everyone has walked the path of knowledge, participants gather together and share their descriptions. Participants walk along a path spread out and single-file. They should take their time so that they have sufficient opportunity to observe. If the group is very large, post someone at the end of the path and send participants down the path a few at a time while the rest of the group does another activity.
Activity Option #4 – Mesquite Tree Imagery

Players: This exercise is for two or more participants; ages 5 and up.

Time: 20 – 30 minutes

Supplies: A picture of a mesquite tree (Appendix H) and, if available, a mesquite pod to pass around.

Applicable Scripture:
“Happy are those whose…delight is the law of the Lord… They are like trees planted by streams of water, which yield their fruit in its season, and their leaves do not wither. In all that they do, they prosper.”

“On either side of the river was the tree of life, bearing twelve kinds of fruit, yielding its fruit every month; and the leaves of the tree were for the healing of the nations.” (Revelation 22:2)

“Hurt not the earth, neither the sea nor the trees.” (Revelation 7:3)

“They are like trees planted by streams of water, which yield their fruit in its season, and their leaves do not wither. In all that they do, they prosper.”

Applicable Theology:
“If I believe in God’s Son…all creatures will appear a hundred times more beautiful to me than before. Then I will properly appreciate the sun, the moon, the stars, trees, apples, pears, as I reflect that he is Lord over and the center of all things.” (Martin Luther, 1483-1546)

Applicable Literature:
In Alice Walker’s The Color Purple, Shug is explaining to Celie how she got rid of God as “the old white man” and found the Spirit and new life in so doing: “[Shug] say, My first step from the old white man was trees. Then air. Then birds. Then other people. But one day when I was sitting quiet and feeling like a motherless child, which I was, it come to me, that feeling of being part of everything, not separate at all. I know that if I cut a tree, my arm would bleed. And I laughed and I cried and I run all around the house. I knew just what it was.”

Instructions:
Have participants gather in a clearing or open area. Ask them to stand spread out, a little more than arm’s length apart and near enough to hear you. Tell them they are about to experience a year in the life of a crucial, life-sustaining being of the Sonoran Desert, a mesquite tree. Show them the picture of the mesquite tree. Be sure to point out the bipinnate compound leaves.

Advise participants that while you tell the story of a year in the life of a mesquite tree, they should keep their eyes closed but they can move their arms and heads and backs along with the story, acting it out (but keeping heir feet rooted, because they are, after all, trees), or they can simply stand still and see the story in their minds’ eyes.

Ask them to close their eyes and tell story: Trees are an immensely important part of the cycle of life on Earth. Trees make half the Earth’s oxygen. They hold down the soil. They give homes and food to animals. They give warmth in winter and coolness in summer. They are sturdy. They are silent. They beckon us. They are noble.

It is early morning. You are alone, walking along a path in the Sonoran Desert. You stop for a moment to take in the glow of sunlight reflecting pink and orange off the rock formations. As you stand there, taking in the beauty of the morning, you feel yourself becoming a tree. Your toes grow, curling out of your shoes and turn into roots as they go into the ground. They’re beautiful trees with small feathery leaves that seem to glow green in the early morning in spring.
IV. Shared Inspiration

Activity Option #1 - Unfolding Poem

Players: This exercise is for three or more participants; ages 10 and up.

Time: 20 – 30 minutes

Supplies: Paper and pens/pencils

Applicable Scripture:
“Then I heard every creature in heaven and on earth and under the earth and on the sea, and all that is in them, singing, “To him who sits on the throne and to the Lamb, be praise and honor and glory and power for ever and ever.” (Revelation 5:13)

Applicable Theology:
“God writes the Gospel, not in the bible alone, but also on trees, and in the flowers and clouds and stars” (Martin Luther, 1483-1546)

Instructions:
This is a poetry writing activity, focusing on a theme selected by the leader. The first step for the leader is to select a theme—it might be based on something experienced during the outing or on one of the quotations offered below. Divide participants into teams of three and instruct them that they will be working together to write a poem on the theme you have selected. Demonstrate how the poem is written by explaining and showing this:

To write the poem, the first team member writes a single first line of the poem and passes it to another team member, who writes a responding second line and a third line and then folds back the paper between the second and third lines of writing so that only the third line is visible to the next team member, who writes a fourth line, responding to the third line, and a fifth line. The third team member then folds the paper between the fourth and fifth lines of the poem so that only the fifth line is now visible and gives the paper back to the first team member, who writes the last line of poetry.

Once the above is explained, give each team a paper and pencil. Allow ten to fifteen minutes for the teams to write their poems. When everyone is finished, invite teams to share their poems by reading them aloud to the group.
Activity Option #2 - Lectio Divina (Praying the Scriptures)

Players: This exercise is appropriate for participants amenable to meditative activity.

Time: 20 – 30 minutes

Supplies: Copies of scripture passages (Appendix I), one passage per player.

Applicable Scripture:
“All things were created by him and for him. He is before all things and in him all things hold together.” (Colossians 1:16, 17)

Applicable Theology:
“Believe one who knows:
You will find something greater in woods than in books.
Trees and stones will teach you
that which you can never learn from masters.”
(St. Bernard of Clairvaux, 1090-1153)

“My book…is the nature of created things, and any time I wish to read the words of God, the book is before me.”
(Anthony of the Desert)

“The whole earth is a living icon of the face of God.”
(St. John of Damascus, 675-749)

Applicable Literature:
“My profession is always to be alert, to find God in nature, to know god’s lurking places, to attend all the oratorios and the operas in nature.” (Henry David Thoreau)

“I wish you could come here [to Yosemite] and rest a year in the simple unmingled love-fountains of God. You would return with fresh truth gathered and absorbed from pines and waterfalls and deep-singing winds, and you would find that they all sang of fount love just as did Jesus Christ and all of pure God in whatever form…” (John Muir, Letter to His Mother, 1867)

“I don’t think it is enough appreciate how much an outdoor book the Bible is. …It is best read and understood outdoors, and the farther outdoors the better. …Passages that within walls seem improbable or incredible outdoors seem merely natural. This is because outdoors we are confronted everywhere with wonders; we see that the miraculous is not extraordinary but the common mode of existence. It is our daily bread. Whoever really has considered the lilies of the field or the birds of the air and …will hardly balk at the turning of water into wine—-which was, after all, a very small miracle. We forget the greater and still continuing miracle by which water (with soil and sunlight) is turned into grapes.” (Wendell Berry in Sex, Economy, Freedom & Community)

Instructions
Lectio divina is an ancient spiritual practice of “praying the scriptures”; i.e. taking a scripture passage and really listening to it and allowing the scripture passage to speak to you at a deeper level, beyond the ear, beneath the mind, all the way to the soul. Below are passages of scripture. Give participants a scripture verse and invite him or her to take the scripture with them to a quiet place to contemplate it—to say the scripture to them, identifying a word or phrase that especially speaks to them. You can instruct participants: “Find a word or phrase that especially speaks to you, and then repeat that word or phrase over and over on your breath, as a way to center yourself in the presence of God.” End with a prayer of thanksgiving.
Activity Option #3 - Birds of the Air

Players: This exercise is appropriate for all ages and numbers of players.

Time: Depends on the number of songs and stories you choose.

Supplies: Musical instruments or a CD player, as desired. Copies of lyrics or stories, as desired. Props for story telling, as desired.

Applicable Scripture:
“Behold the fowls of the air: for they sow not, neither do they reap; yet your Heavenly Father feeds them.” (Matthew 6:26-27)

Applicable Theology:
“Every visible or invisible creature is a theophany or appearance of God. The Christian is the one who, wherever he looks, sees God everywhere and rejoice in Him.” (John Scotus Eriugena, 810-877)

Instructions: Have participants join together in inspirational song, story, and prayer. Feel free to use some of the suggestions below, or find ideas from your own faith community. Your church’s music director will probably have some wonderful ideas for songs. Additional prayers and stories may be found online or in a library.

Suggestions:
Please see Appendix J for additional suggestions of songs and stories.
Appendices

Appendix A – Bingo Card
This is for Nature Bingo, which is Awaken Enthusiasm activity option #1. You need to print one card per player or team. Fill in the squares with answers to the information cards, but try to make every bingo card different with the answers placed in different squares.

Appendix B – Information Cards
These are for Nature Bingo, which is Awaken Enthusiasm activity option #1. You need to print one copy of each card and cut out the cards. Shuffle them before beginning the activity.

Appendix C – Animal Clue Cards
These are for Animal Clue, which is Awaken Enthusiasm activity option #2. You need to print one copy of each card and cut out the cards. Shuffle them before beginning the activity.

Appendix D – Animal Clue Key
This is the answer key for the Animal Clue game, which is Awaken Enthusiasm activity option #2. You need to print one copy of the key for the leader to read.

Appendix E – Natural Processes Cards
These are for Natural Processes, which is Awaken Enthusiasm activity option #3. You need to print one copy of each card and cut out the cards. Shuffle them before beginning the activity.

Appendix F – Scavenger Hunt List
This is for the Scavenger Hunt, which is Focus Attention activity option #4. Print this template and write in your own items to be discovered. If you would like ideas, see Appendix G for a pre-written list. Make copies of your completed list, one copy per player or team. If possible, laminate the lists so they may be used again for future groups.

Appendix G – Scavenger Hunt List
This is for the Scavenger Hunt, which is Focus Attention activity option #4. This is a pre-written list you may use, or you may write your own list (see Appendix F). Print one copy per player or team. If possible, laminate the lists so they may be used again for future groups.

Appendix H – Mesquite Tree
This is for the Mesquite Tree exercise, which is Direct Experience activity option #4. Print at least one copy of the tree, in color if possible. Feel free to use other images of mesquite trees if you prefer.

Appendix I – Scripture Passages for Lectio Divina
These are for the Lectio Divina exercise, which is Shared Inspiration activity option #2. Each player should receive his or her own scripture passage. If you have a lot of players then you may need to print more than one copy of each passage. Cut them out on the lines.

Appendix J – Bibliography for Nature Stories and Songs
These are ideas and suggestions for the Birds of the Air exercise, which is Shared Inspiration activity option #3. Your place of worship might have some other favorite songs, prayers, and stories that you might like to incorporate.

Appendix K – Promotional Flyer
Post this flyer around your place of worship to promote your Opening the Book of Nature event!
Appendix B

(When you read the questions, try to get the group to guess the answers before you give the answers. The answers are the words that need to be written on the bingo boards before the activity begins. You should pick questions that are appropriate for your group. Ask the questions in a random order. You might want to choose questions that are appropriate for your group’s level of education and experience.)

- Most streets in Phoenix run either north-south or east-west. One well-traveled Avenue is an exception, however. This road, built before Phoenix was established as a city, was built as a direct line for railroad and roadway to transport food and supplies from what is now central Phoenix to the hungry miners at the early and successful Vulture Mine. Name this well traveled Avenue. (Answer: Grand)

- If you grew up watching old western “B” movies then you’ve seen lots of these. According to Hollywood westerns they were a popular mode of transportation in the west for decades, but, in fact, they traveled through the central Arizona for only twelve years. No Hollywood western was complete without runaway ________ or a ___________ robbery. (Answer: Stagecoach)

- The route across the Sonoran Desert from Casa Grande to the Gila River was one of the longest and thirstiest journeys in the west. Midway through this route, travelers found a place to rest and replenish themselves. Stagecoaches and other travelers stopped here to drink from a hand dug well and find food for horses and humans. Name this critical halfway point between Casa Grande and the present day Gila Bend. (Answer: Maricopa Station)

- As you travel across the Sonoran Desert, you will occasionally find cylindrical shaped holes in the bedrock. These holes were used for grinding Mesquite pods into flour and preparing other foods for eating. They work like mortar and pestle. Matates are similar, in using a ‘river rock’ on a flat surface to process food. What is the name given to this cylindrically shaped hole used for preparing food? (Answer: Mono)

- Petroglyphs, pictoglyphs and geoglyphs are forms of what kind of art? (Answer: Rock Art) Fun Note: Some of the most prominent and interesting ancient human creations in the Sonoran Desert are fashioned in the medium of rock. Weathered basalt becomes covered with a dark patina. By carefully chipping off the outer layer of basalt the lighter color is exposed and this effect allows designs to be created. Many have lasted over 1,000 years. In some places you can find hundreds of petroglyphs (chipped rock art). Other techniques include painting dyes onto rock (pictoglyphs) and aligning rocks in shapes or lines, some over 1,000 feet long (geoglyphs).

- One of the most famous gold mines in Arizona was discovered by a miner from Austria whose first name was “Henry.” He called it the “Vulture Mine” because he said a vulture helped him in locating the gold. This mine rapidly became the most productive gold mine in Arizona and had over 5,000 employees. The mining town five miles from the Vulture Mine was named after Henry. What was Henry’s last name? (Answer: Wickenburg)

- This river is found on the old King Woolsey Ranch. In a letter dated 1921 the stream was named because of the temperature of the water. It’s Spanish for cold water. (Answer: Agua Fria) Fun Note: King Woolsey was a notable Arizona Pioneer. His other ranch was along the Gila River - west of present day Gila Bend. He became a Legislator for Territory of Arizona. Other landmarks named after him include Woolsey Peak and the Woolsey wilderness. What a name, huh?

- Annual rainfall varies from 3 inches in Phoenix ________ to more than 30 inches in the mountains of the eastern part of the state. (Answer: Deserts)

- Ancient people, who we call the ____________, established a civilization that lasted for seventeen hundred years. (Answer: Hohokam)

- What city in Arizona was named after the mythical Egyptian bird that was believed to rise to new life from its own ashes? (Answer: Phoenix)
Arizona has the world’s largest forest of what kind of pine tree? (Answer: Ponderosa)

Nearly 27% of Arizona’s 114,000 square miles is occupied by the sixteen native ________. (Answer: Tribes)

Only 18% of Arizona’s land is ________. The other 82% is state, federal and Indian land. (Answer: Private).

The Arizona state flower is the __________. (Answer: Saguaro)

The Arizona state tree is the _____  _____. (Answer: Palo Verde)

The Arizona state bird is the _____  _____. (Answer: Cactus Wren)

What is a course-grained and light colored igneous rock formed deep in the crust? (Answer: Granite)

The Sonoran Desert of Arizona is in a geologic province characterized by northwest-trending mountain ranges separated by sedimentary basins? What is this province called? (Answer: Basin and Range Province)

What is a dark lava rock common in the Sonoran Desert? (Answer: Basalt)

What is the calcite hardpan that forms in the Sonoran Desert? (Answer: Caliche)

What is the large canyon that runs though northern Arizona? (Answer: The Grand Canyon)

Past mining of what metal gives the Dreamy Draw its name? (Answer: Mercury (from mercury poisoning))

How old are the youngest volcanoes at Sunset Crater? (Answer: 600 years)

What is the large canyon that cuts through east central Arizona? (Answer: The Salt River Canyon)

What is the deep-blue copper mineral that was mined in Bisbee, Arizona? (Answer: Azurite)

What geologic feature is represented by the San Francisco Peaks? (Answer: Stratovolcano)
### Appendix C

<table>
<thead>
<tr>
<th>One of my kind is the world’s smallest warm-blooded animal—only 2.5” long and weighing about 2 grams. I use lots of energy. If humans expended as much energy per unit of weight as I do, they would have to eat 370 pounds of potatoes or 130 pounds of bread every day.</th>
<th>I weave leaves and sticks and plant fibers, and sometimes yarn, thread or hair into my nest to camouflage it. I use spider webbing to bind and tie my nest together.</th>
<th>I guard and protect “my” patch of flowers or garden. I may eat 50-60 meals there in a single day.</th>
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<tbody>
<tr>
<td>1-4</td>
<td>1-9</td>
<td>1-12</td>
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<table>
<thead>
<tr>
<th>I have the fastest wing beat of any bird. My wings move so fast they hum—up to 80 beats per second.</th>
<th>I am well known for my ability to fly up, down, sideways, and backwards and to hover for long periods of time.</th>
<th>All of my kind who live in the Sonoran Desert have long, pointed beaks for probing flowers for nectar and saber-like wings for hovering in front of flowers.</th>
</tr>
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<tbody>
<tr>
<td>1-27</td>
<td>1-33</td>
<td>1-29</td>
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<table>
<thead>
<tr>
<th>I am one of the Earth’s first terrestrial arthropods, having climbed from the primal seas 350-400 MYA.</th>
<th>During our elaborate mating dance we clasp each other with our pincers.</th>
<th>I am an arachnid who hibernates in the winter.</th>
</tr>
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<td>1-3</td>
<td>1-8</td>
<td>1-14</td>
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<thead>
<tr>
<th>Many people are terrified of me, but of 30 species found in AZ, only one of my kind has a sting that is poisonous to humans.</th>
<th>My body is slender, and I have long, delicate pincers and a segmented tail that curves into a stinger at the tip.</th>
<th>I am nocturnal, foraging for insects at night. My body glows under UV light, so if you want to see me in action, take a black light out to the desert on a warm, moonless night.</th>
</tr>
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<tbody>
<tr>
<td>1-16</td>
<td>1-19</td>
<td>1-28</td>
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<thead>
<tr>
<th>My lineage goes back 50 million years, where my reptilian ancestors lived in tropical forests long before the Sonoran Desert existed.</th>
<th>In the Sonoran Desert I usually live alone on rocky, boulder-strewn hillsides.</th>
<th>I dig shallow burrows and make use of existing crevices or depressions to protect me from the hot desert sun.</th>
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</thead>
<tbody>
<tr>
<td>1-5</td>
<td>1-13</td>
<td>1-18</td>
</tr>
<tr>
<td>I get much of my water from the grasses, globemallow and other plants I eat, but when they are available I drink from temporary rain pools. I can store over 40% of my weight in water and urinary wastes.</td>
<td>I can live 35-50 years and spend my life within a few miles of where I hatch.</td>
<td>I am toothless; my large tongue helps me push food into my mouth.</td>
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<td>1-22</td>
<td>1-26</td>
<td>1-34</td>
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<tr>
<th>I am more common in the Sonoran Desert than my relative, the mountain lion.</th>
<th>I am small—a little larger than a large housecat, but my long legs make me appear larger than I am.</th>
<th>I live a solitary life, avoiding others of my kind; I only come together to mate in early spring.</th>
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<td>1-10</td>
<td>1-1</td>
<td>1-15</td>
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<thead>
<tr>
<th>I am a good climber, and can retreat to trees for safety, but prefer to hunt on the ground.</th>
<th>I am secretive and shy, usually keeping to the more thickly vegetated areas; therefore people seldom see me.</th>
<th>I mainly eat jackrabbits, cottontails, birds, snakes and rodents, but can take down a deer if I want to.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-21</td>
<td>1-24</td>
<td>1-30</td>
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<table>
<thead>
<tr>
<th>I have smooth skin. The color of my skin is greenish, yellowish or olive with irregular blotches or spots of black, brown or dark green. My belly is white.</th>
<th>My name comes from the dark sickle-shaped “spade” on my hind foot, which I use to quickly bury myself in loose, sandy soil.</th>
<th>Although I must start my life in water, as an adult, I live well in dry conditions in areas with sandy, well-drained soils. I like to live by creosote bushes and mesquite trees.</th>
</tr>
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<td>1-2</td>
<td>1-7</td>
<td>1-20</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>I come out during the summer monsoons, and you can often see me along the road during summer thunderstorms.</th>
<th>I am a frog, but people often call me a toad.</th>
<th>I lay my eggs in shallow pools; they hatch in 15 hours and my babies change from tadpoles to froglets in 9-14 days—before the ponds dry up.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-23</td>
<td>1-31</td>
<td>1-35</td>
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<tr>
<td>2-1</td>
<td>2-8</td>
<td>2-15</td>
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<tr>
<td>-----</td>
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</tr>
<tr>
<td>I move quickly now, but not so in my youth.</td>
<td>I usually hunt near water.</td>
<td>I eat flying insects in the air.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-19</th>
<th>2-26</th>
<th>2-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sometimes I’m very colorful.</td>
<td>I’m cold-blooded and I wear my skeleton on the outside instead of the inside.</td>
<td>With my 4 wings I look like a helicopter flying.</td>
</tr>
</tbody>
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<tr>
<th>2-3</th>
<th>2-10</th>
<th>2-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are several different kinds of me, but the most well known is the diamondback.</td>
<td>I am a predator who keeps the desert healthy by eating mice and rats.</td>
<td>I can move my rattles back and forth 60 times per second.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-21</th>
<th>2-29</th>
<th>2-34</th>
</tr>
</thead>
<tbody>
<tr>
<td>My heat vision allows me to hunt at night and tell if an animal is food or if I am in danger.</td>
<td>I am a pit viper. My pits give me “heat vision,” which allows me to get images from the heat given off by an animal.</td>
<td>People think I am aggressive, but I avoid contact with humans; I only bite if I can’t get away from you.</td>
</tr>
</tbody>
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<thead>
<tr>
<th>2-2</th>
<th>2-9</th>
<th>2-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am the largest frog in North America.</td>
<td>My call is a loud, guttural bellow that carries a long distance, giving the impression that I am much larger than I actually am, which is an advantage in keeping predators away.</td>
<td>I eat animals such as insects, fish, snakes and occasionally other frogs. My hunting style is &quot;sit and wait&quot;; I sit and wait for my prey to pass by, and then in a flash, I grab it with my tongue and eat it.</td>
</tr>
<tr>
<td>I have been introduced to many localities throughout the world where I compete with, and often drive out, native species.</td>
<td>My legs are about 7-10” long, which allow me to leap 3 to 6 feet.</td>
<td>Two of my kind were launched into orbit in 1970 on the Orbiting Frog Otolith spacecraft.</td>
</tr>
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<td>---</td>
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</tr>
<tr>
<td>2-18</td>
<td>2-27</td>
<td>2-33</td>
</tr>
<tr>
<td>I’m a carnivore and eat mostly insects, and the smaller of my kind.</td>
<td>I am a fast, strong swimmer.</td>
<td>I need cold, well-oxygenated water to live in.</td>
</tr>
<tr>
<td>2-5</td>
<td>2-13</td>
<td>2-17</td>
</tr>
<tr>
<td>I spawn my eggs during the spring, in small clear streams.</td>
<td>I’m slim and sleek.</td>
<td>I’m as pretty as a rainbow.</td>
</tr>
<tr>
<td>2-22</td>
<td>2-25</td>
<td>2-31</td>
</tr>
<tr>
<td>I am active and inquisitive, snooping about and peering into shadows.</td>
<td>While most wrens are known for their musical voices, mine is rough and scratchy.</td>
<td>I am bold and am often seen clambering and scrambling about in the open.</td>
</tr>
<tr>
<td>2-6</td>
<td>2-20</td>
<td>2-11</td>
</tr>
<tr>
<td>I am a native Arizonan who nests in saguaro, cholla, and yucca, trees.</td>
<td>I forage on the ground and in low trees, often in pairs or family groups.</td>
<td>I like to eat insects, like other wrens, but I also eat fruit pulp and seeds.</td>
</tr>
<tr>
<td>2-24</td>
<td>2-28</td>
<td>2-32</td>
</tr>
<tr>
<td>I live in herds on steep canyon walls and rugged terrain.</td>
<td>I defend myself by retreating to hard-to-reach places where predators cannot follow.</td>
<td>I can live several months without drinking free water, getting my water from dew and plants.</td>
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<tr>
<td>2-4</td>
<td>2-7</td>
<td>2-12</td>
</tr>
<tr>
<td>I am named for the huge horns I grow.</td>
<td>Males butt heads to establish dominance and the cracking sound of their butting heads can be heard a mile away.</td>
<td>I can drink up to 20% of my body weight in just a few minutes at a waterhole.</td>
</tr>
<tr>
<td>2-23</td>
<td>2-35</td>
<td>2-36</td>
</tr>
<tr>
<td>I am very small, only about 2.25” long.</td>
<td>At one time I was among the most common fish in the low desert of the U.S.; I am rarely now in AZ.</td>
<td>I feed upon vegetation and crustaceans as well as aquatic insect larvae.</td>
</tr>
<tr>
<td>1-6</td>
<td>1-11</td>
<td>1-17</td>
</tr>
<tr>
<td>I am the only native fish in AZ to bear live young.</td>
<td>The main reason for my disappearance is the mosquitofish, which was introduced to control mosquitoes. They eat my young and compete with me for critical resources.</td>
<td>I prefer shallow, warm, slow-moving waters of creeks and small or medium rivers.</td>
</tr>
<tr>
<td>1-25</td>
<td>1-32</td>
<td>1-36</td>
</tr>
</tbody>
</table>
Appendix D

**Scorpion** (Clue Key: 1-3, 1-8, 1-14, 1-16, 1-19, 1-28)
1. I am one of the Earth’s first terrestrial arthropods, having climbed from the primal seas 350-400 MYA.
2. During our elaborate mating dance we clasp each other with our pincers.
3. I am an arachnid who hibernates in the winter.
4. I am nocturnal, foraging for insects at night. My body glows under UV light, so if you want to see me in action, take a black light out to the desert on a warm, moonless night.
5. Many people are terrified of me, but of 30 species found in AZ, only one of my kind has a sting that is poisonous to humans.
6. My body is slender, and I have long, delicate pincers and a segmented tail that curves into a stinger at the tip.

**Desert Tortoise** (Clue Key: 1-5, 1-13, 1-18, 1-22, 1-26, 1-34)
1. My lineage goes back 50 million years, where my reptilian ancestors lived in tropical forests long before the Sonoran Desert existed.
2. In the Sonoran Desert I usually live alone on rocky, boulder-strewn hillsides.
3. I dig shallow burrows and make use of existing crevices or depressions to protect me from the hot desert sun.
4. I get much of my water from the grasses, globemallow and other plants I eat, but when they are available I drink from temporary rain pools. I can store over 40% of my weight in water and urinary wastes.
5. I can live 35-50 years and spend my life within a few miles of where I hatch.
6. I am toothless; my large tongue helps me push food into my mouth.

**Bobcat** (Clue Key: 1-1, 1-10, 1-15, 1-21, 1-24, 1-30)
1. I am more common in the Sonoran Desert than my relative, the mountain lion.
2. I am small—a little larger than a large housecat, but my long legs make me appear larger than I am.
3. I live a solitary life, avoiding others of my kind; I only come together to mate in early spring.
4. I am a good climber, and can retreat to trees for safety, but prefer to hunt on the ground.
5. I am secretive and shy, usually keeping to the more thickly vegetated areas; therefore people seldom see me.
6. I mainly eat jackrabbits, cottontails, birds, snakes and rodents, but can take down a deer if I want to.

**Spadefoot** (Clue Key: 1-2, 1-7, 1-20, 1-23, 1-31, 1-35)
1. I have smooth skin. The color of my skin is greenish, yellowish or olive with irregular blotches or spots of black, brown or dark green. My belly is white.
2. My name comes from the dark sickle-shaped “spade” on my hind foot, which I use to quickly bury myself in loose, sandy soil.
3. Although I must start my life in water, as an adult, I live well in dry conditions in areas with sandy, well-drained soils. I like to live by creosote bushes and mesquite trees.
4. I come out during the summer monsoons, and you can often see me along the road during summer thunderstorms.
5. I am a frog, but people often call me a toad.
6. I lay my eggs in shallow pools; they hatch in 15 hours and my babies change from tadpoles to froglets in 9-14 days—before the ponds dry up.

**Gila Topminnow** (Clue Key: 1-6, 1-11, 1-17, 1-25, 1-32, 1-36)
1. I am very small, only about 2.25” long.
2. At one time I was among the most common fish in the low desert of the US; I am rarely now in AZ.
3. I feed upon vegetation and crustaceans as well as aquatic insect larvae.
4. I am the only native fish in AZ to bear live young.
5. The main reason for my disappearance is the mosquitofish, which was introduced to control mosquitoes. They eat my young and compete with me for critical resources.
6. I prefer shallow, warm, slow-moving waters of creeks and small or medium rivers.
Hummingbird (Clue Key: 1-4, 1-9, 1-12, 1-27, 1-29, 1-33)
1. One of my kind is the world’s smallest warm-blooded animal, only about 2.5-5” in length and 2-10gm in weight. I use up lots of energy. If humans expended as much energy per unit of weight as I do, they would have to eat 370 pounds of potatoes or 130 pounds of bread every day.
2. I weave leaves and sticks and plant fibers, and sometimes yarn, thread or hair into my nest to camouflage it. I use spider webbing to bind and tie my nest together.
3. I guard and protect “my” patch of flowers or garden. I eat 50-60 meals there in a single day.
4. I have the fastest wing beat of any bird. My wings move so fast they hum—up to 80 beats per second.
5. I am well known for my ability to fly up, down, sideways, and backwards and to hover for long periods of time.
6. All of my kind who live in the Sonoran Desert have long, pointed beaks for probing flowers for nectar and saber-like wings for hovering in front of flowers.

Dragonfly (Clue Key: 2-1, 2-8, 2-15, 2-19, 2-26, 2-30)
1. I move quickly now, but not so in my youth.
2. I usually hunt near water.
3. I eat flying insects.
4. Sometimes I’m very colorful.
5. I’m cold-blooded and I wear my skeleton on the outside instead of the inside.
6. With my 4 wings I look like a helicopter flying in the air.

Rattlesnake (Clue Key: 2-3, 2-10, 2-14, 2-21, 2-29, 2-34)
1. I am a predator who keeps the desert healthy by eating mice and rats.
2. People think I am aggressive, but I avoid contact with humans; I only bite if I can’t get away from you.
3. I am a pit viper. My pits give me “heat vision,” which allows me to get images from the heat given off by an animal.
4. My heat vision allows me to hunt at night and tell if an animal is food or if I am in danger.
5. I can move my rattles back and forth 60 times per second.
6. There are several different kinds of me, but the most well known is the diamondback.

Bullfrog (Clue Key: 2-2, 2-9, 2-16, 2-18, 2-27, 2-33)
1. I am the largest frog in North America.
2. My call is a loud, guttural bellow that carries a long distance, giving the impression that I am much larger than I actually am, which is an advantage in keeping predators away.
3. I eat animals such as, insects, fish, snakes and occasionally other frogs. My hunting style is "sit and wait"; I sit and wait for my prey to pass by, and then in a flash, I grab it with my tongue and eat it.
4. I have been introduced to many localities throughout the world where I compete with, and often drive out, native species.
5. My legs are about 7-10” long, which allow me to leap 3 to 6 feet.
6. Two of my kind were launched into orbit in 1970 on the Orbiting Frog Otolith spacecraft.

Trout (Clue Key: 2-5, 2-13, 2-17, 2-22, 2-25, 2-31)
1. I’m a carnivore and eat mostly insects, and the smaller of my kind.
2. I am a fast, strong swimmer.
3. I need cold, well-oxygenated water to live in.
4. I spawn my eggs during the spring, in small clear streams.
5. I’m slim and sleek.
6. I’m as pretty as a rainbow.

Cactus Wren (Clue Key: 2-6, 2-11, 2-20, 2-24, 2-28, 2-32)
1. I am active and inquisitive, snooping about and peering into shadows.
2. While most wrens are known for their musical voices, mine is rough and scratchy.
3. I am bold and am often seen clambering and scrambling about in the open.
4. I am a native Arizonan who nests in saguaro, cholla, and yucca, trees.
5. I like to eat insects, like other wrens, but I also eat fruit pulp and seeds.
6. I forage on the ground and in low trees, often in pairs or family groups.
Bighorn Sheep (Clue Key: 2-4, 2-7, 2-12, 2-23, 2-35, 2-36)
1. I live in herds on steep canyon walls and rugged terrain.
2. I defend myself by retreating to hard-to-reach places where predators cannot follow.
3. I can live several months without drinking free water, getting my water from dew and plants.
4. I can drink up to 20% of my body weight in just a few minutes at a waterhole.
5. Males butt heads to establish dominance and the cracking sound of their butting heads can be heard a mile away.
6. I am named for the huge horns I grow.
### Appendix E

| Bimodal Rain  
(Two Rainy Spells) | Rain Shadows |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Rain comes to the Sonoran Desert in two spells: in sometimes-dramatic thunderstorms of the summer monsoon season and in larger, gentler winter storms. This bimodal rain pattern brings out two completely different suites of wildflowers and insects. This is one of the reasons the Sonoran Desert has the greatest diversity of plant forms of any desert in the world.</td>
<td>The Sonoran Desert is ringed by mountains. As moist air moves east from the Pacific Ocean toward the Sonoran Desert, it is forced upward over the Cascades and Sierra Nevada range. This air cools as it rises, which causes it to precipitate (cool air cannot retain as much moisture as warm air), draining the moisture from the air, so that when it flows eastward over the Sonoran Desert, it is dry. This phenomenon is called the “rain shadow effect.”</td>
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**Natural Process 1**

<table>
<thead>
<tr>
<th>Gila Monster’s Tail</th>
<th>Saguaro Fruit</th>
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<tbody>
<tr>
<td>The Gila monster is a stout-bodied beaded lizard. The slow-moving Gila monster spends most of the year in underground burrows. However, during the spring months, the Gila monster has a short period of activity, feeding on nestling birds and mammals, the eggs of birds and reptiles, lizards and carrion. It stores fat from the food it eats in its plump, expandable tail. Four or five meals may be enough to sustain the lizard for an entire year. A Gila monster’s total surface activity may add up to just three weeks per year.</td>
<td>Just before the summer rainy season, at the hottest and driest time of the Sonoran Desert year, Saguaro cactus fruits ripen bright red. The only moist food available then, the fruits are a staple for many mammals, insects and birds. White-winged doves, Gila woodpeckers and house finches digest the pulp of the fruit and pass the seeds while perching in trees that will become nurse plants to the ones that successfully germinate in the summer rains. A saguaro seed will germinate in about five days. Nearly all saguaros that survive to maturity grow under a nurse plant that shelters them from weather and herbivorous animals.</td>
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</table>

**Natural Process 2**
### Succulents and Water

Cactuses are succulents, adapted to quickly store large amounts of water in their fleshy leaves, stems or roots. The roots of a succulent absorb water through passive diffusion (no active pumping or sucking), which can happen only if the soil is wetter than the succulent’s moist interior. In the Sonoran Desert, where rains typically wet only the top few inches of soil for a short time, most succulents have extensive shallow root systems for taking up water. In the rainy season, cactuses swell with water. Most succulents have a waxy outer surface and small, nonexistent or cylindrical leaves, adaptations that allow the plant to avoid losing moisture in the hot, dry air. Most succulents are spiny, bitter or toxic (or all three), protecting them from being eaten by thirsty animals.

### Riparian (Riverene) Areas

More than eighty-five percent of Sonoran animals depend on rivers or streams for some phase of their life cycles. Streams and rivers in the Sonoran Desert are sustained by water that falls in the mountains and foothills and migrates into the aquifer (ground water) and alluvial valleys. Lined with cottonwood-willow forests or mesquite bosques, desert streams and rivers are long green oases. The San Pedro River in southeastern Arizona sustains some 400 bird species, 83 mammal species and 47 reptile and amphibian species. Now that’s biodiversity!

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<table>
<thead>
<tr>
<th>Natural Process 5</th>
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<tbody>
<tr>
<td><strong>Seed Banking</strong></td>
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<tr>
<td>In a wet year in the Sonoran Desert, there may be 200,000 seeds per square meter of soil. The arid climate of the Sonoran allows seeds to escape decomposing, ensuring that several thousand seeds per square meter remain even after several drought years. This “seed bank” is a crucial source of food for animals (seed eaters include harvester ants, kangaroo rats and sparrows) and sustains the desert food chain. The seed bank also helps ensure that plant species will survive through a long dry spell.</td>
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<tr>
<th>Natural Process 6</th>
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<tbody>
<tr>
<td><strong>Desert Spadefoot</strong></td>
</tr>
<tr>
<td>Couch’s Spadefoot has an interesting way of coping with the heat and aridity of the Sonoran Desert. About three-inches long, the spadefoot is a blotchy greenish-brown toad with a white belly. On the bottom of each hind foot, the spadefoot has a sharp nail-like ridge, which the toad uses for digging burrows in dry soil. The spadefoot spends up to eleven months per year in its underground burrow. During the summer monsoon season, vibrations from thunder or rainfall prompt spadefoots to emerge from their burrows, and males call to attract females. The females lay eggs in the shallow rain puddles, and the eggs hatch in as little as fifteen hours! The tadpoles change into froglets within two weeks! Thereafter, the young spadefoot must eat enough to survive in its burrow for a year, which it can do in a single meal.</td>
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| Natural Process 8 |
Appendix F

Activity Rules:

1. Do not collect objects you find in nature. Be careful to leave the lightest footprints possible. Remember the old saying: “Leave no trace!”

2. Stay within the boundaries designated by the activity leader.

3. Look for items on the list below. When you find something, cross it off the list.

Scavenger Hunt

1. __________________________  11. __________________________
2. __________________________  12. __________________________
3. __________________________  13. __________________________
4. __________________________  14. __________________________
5. __________________________  15. __________________________
6. __________________________  16. __________________________
7. __________________________  17. __________________________
8. __________________________  18. __________________________
9. __________________________  19. __________________________
10. __________________________ 20. __________________________
Appendix G

Activity Rules:

1. Do not collect objects you find in nature. Be careful to leave the lightest footprints possible. Remember the old saying: “Leave no trace!”

2. Stay within the boundaries designated by the activity leader.

3. Look for items on the list below. When you find something, cross it off the list.

Scavenger Hunt

(This list is adapted from the one used at the Glen Helen Outdoor Education Center in Yellow Springs, OH, with a few changes to make it applicable to the Sonoran Desert.)

1. A feather
2. One seed dispersed by the wind
3. Exactly 100 of something
4. A mesquite bean
5. A thorn
6. Three different kinds of seeds
7. One camouflaged animal or insect
8. Something round
9. Something fuzzy
10. Something sharp
11. Something colorful
12. Something that flies
13. Something that is decaying
14. Five pieces of human-made litter
15. Something perfectly straight
16. Something beautiful
17. A chewed leaf (not by you!)
18. Something that makes a noise
19. Something white
20. Something important in nature*
21. Something that reminds you of yourself
22. Something soft
Appendix H
Appendix I

For in him we live and move and have our being… Acts 17: 28

For since the creation of the world, God’s invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that men are without excuse. Romans 1: 20

For of him and through him, and to him, are all things: to whom be glory forever. Romans 11: 36

Out of the ground the Lord formed every beast and fowl of the air; and brought them unto Adam to see what he would call them: and whatsoever Adam called every creature that was the name thereof. Genesis 2: 19

But ask now the beasts, and they shall teach thee; and the fowls of the air, and they shall tell thee. Or speak to the earth, and it shall teach thee: and the fishes of the sea shall declare unto thee. Who knoweth not in all these that the hand of the Lord hath wrought this? Job 12: 7-9

Hearken unto this, O Job: Stand still and consider the wondrous works of God. Job 37: 14

The heaven declare the glory of God; and the firmament showeth His handiwork. Psalm 19: 1

O Lord, how manifold are they works! In wisdom has thou made them all: the whole earth is full of thy riches. Psalm 104: 24

Behold the fowls of the air: for they sow not, neither do they reap; yet your Heavenly Father feedeth them. Matthew 6: 26-27
Consider the lilies of the field, how they grow; they toil not, neither do they spin: And yet I say to you that Solomon in all his glory was not arrayed like one of these. *Matthew 6: 28-29*

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Through him all things were made: without him nothing was made that has been made. *John 1: 3*

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All things were created by him and for him. He is before all things and in him all things hold together. *Colossians 1: 16*

---

The Lord reigns… Let the heaven rejoice, let the earth be glad, let the seas resound and all that is in it; let the fields be jubilant and everything in them. Then all the trees of the forest will sing for joy, they will sing before the Lord for he comes, he comes to judge the earth. *Psalm 96: 10-13*

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The wild animals honor me, the jackals and the owls, because I provide water in the desert and streams in the wasteland, to give drink to my people, my chosen. *Isaiah 43: 20, 21*

---

Listen, Oh heavens, and I will speak, hear, Oh earth, the words of my mouth. Let my teaching fall like rain and my words descend like dew, like showers on new grass, like abundant rain on tender plants. *Deuteronomy 32: 1-2*

---

The mountains and hills will burst into song before you, and all the trees of the field will clap their hands. All this will be a memorial for the Lord, a sign that for all time will not be cut off. *Isaiah 55: 12,13*

---

When I consider your heavens, the work of your fingers, the moon and the stars, which you have set in place, what is man that you are mindful of him, the son of man. *Psalm 8: 3-8*

---

Then I heard every creature in heaven and on earth and under the earth and on the sea, and all that is in them, singing “To him who sits on the throne and to the Lamb, be praise and honor and glory and power for ever and ever.” *Revelations 5: 13*
Appendix J

Bibliography of Earth, Desert and Native American Stories and Songs

Collections

Children’s Books
- Buchanan, Ken. This House is Made of Mud. Northland Publishing.
- ----, Everybody Needs a Rock. 1974. NY: Scribner. (Also Audio)
- ----, Hawk I’m Your Brother. 1986. NY: Aladdin. (Also in Spanish)
- ----, I’m in Charge of Celebrations. 1986. NY: Scribner. (Also Audio)
- ----, The Desert is Theirs. 1975. NY: Atheneum. (Also Audio)
- Dr. Seuss. The Lorax. NY: Random House
- Hoose, Phillip and Hannah. Hey Little Ant. NY: Scholastic Inc. (Also in Spanish)

Stories
- Oglesby, Sandy. What’s That Coming? Original Stories. 2005. Sandy@Sandytells.com

Story: There is a wonderful Chasidic story about the child of a rabbi who sued to wander in the woods. At first his father let him wander, but over time he became concerned. The woods could be a dangerous place. He decided to discuss the matter with his child. One day he took him aside and said, “you know, I have noticed that each day you walk into the woods. I wonder why do you go there?” The boy said to his father, “I go there to find God.” “That is a very good thing,” the father replied gently. “I am glad you are searching for God. But, my child, don’t you know that God is the same everywhere?” “Yes,” the boy answered, “but I’m not.” (David J. Wolpe in Teaching Your Children About God.)

Songs
- “The animals are waiting to sing a song of peace.” (with sign language)
- “Canticle of the Sun” by St. Francis
- Raffi has several songs about the Earth on all of his CDs: Roots and Shoots, Animal Songs, Let’s Play, Baby Beluga, Raffi in Concert, One Light One Sun
- *Penguin Parade* by Banana Slug String Band has the following songs: Animals are Dancin’, Ants, Fishes, What Do Animals Need?, Croak-a-Ribbit, Go Into the Night, Safe at Home

- *Duck in New York City* by Connie Kaldor has the following songs: Duck in NYC, If You Love a Hippopotamus, Alligator Waltz, Seed in the Ground, Slug Opera, Honey Honey Honey, I Love Tomatoes, Nose Song, Quack Quack Quack, I Want to be a Cloud

- Tom Chapin has many songs about the Earth on several CDs:
  - *Family Tree*: Someone’s Gonna Use It, Family Tree, This Pretty Planet
  - *Mother Earth*: Song of One, Two Seagulls, Wheel of the Water, Good Garbage, Mother Earth’s Routine
  - *In My Hometown*: Gertie’s Birdseed Diner, Our Next Door Neighbor the Moon

  
  "The birds of the air are my brothers; all flowers my sisters; the trees are my friends. All living creatures, mountains and streams I take unto my care. For this green earth is our mother, hidden in the sky is the spirit above. I share one life with all who are here; to everyone I give my love, to everyone I give my love."

- The following songs are found in Wendolyn Bird’s *Tales from Earth to Sky* listed above: Clouds are Puffy, Poofy, Goofy; Standing Like a Tree; Deer is So Gentle; Spider, Spider, Look at You. She also has a new version of “If You’re Happy and You Know It”
  
  If you’re happy and you know it, do a face dance.
  If you’re happy and you know it, do a face dance.
  If you’re happy and you know it, then your face will surely show it
  If you’re happy and you know it, do a face dance.
  Additional verses: do a bunny hop, walk like a coyote

**Prayer - “Chinook Blessing Litany”**

We call upon the earth, our planet home, with its beautiful depths and soaring heights, its vitality and abundance of life, and together we ask that it: *Teach us, and show us the way.*

We call upon the mountains, the Cascades and the Olympics, the high green valleys and meadows filled with wild flowers, the snows that never melt, the summits of intense silence, and we ask that they: *Teach us, and show us the way.*

We call upon the waters that rim the ear, horizon to horizon, that flow in our rivers and streams, that fall upon our gardens and fields, and we ask that they: *Teach us, and show us the way.*

We call upon the land that grows our food, the nurturing soil, the fertile fields, the abundant gardens and orchards, and we ask that they: *Teach us, and show us the way.*

We call upon the forests, the great trees reaching strongly to the sky with the earth in their roots and the heavens in their branches, the fir and the pine and the cedar, and we ask them to: *Teach us, and show us the way.*

We call upon the creatures of the fields and forests and the seas, our brothers and sisters the wolves and deer, the eagle and dove, the great whales and the dolphin, the beautiful Ora and salmon who share our Northwest home, and we ask them to: *Teach us, and show us the way.*

We call upon the moon and the stars and the sun, which govern the rhythms and seasons of our lives and remind us that we are part of a great and wondrous universe, and we ask them to: *Teach us, and show us the way.*

We call upon all those who have lived on this earth, our ancestors and our friends, who dreamed the best for future generation, and upon whose lives our lives are built, and with thanksgiving, we call upon them to: *Teach us, and show us the way.*

And lastly, we call upon all that we hold most sacred, the presence and power of the Great Spirit of love and truth which flows through all the universe ... to be with us to: *Teach us, and show us the way.*
Opening the Book of Nature

Join us for fun nature activities designed to awaken and deepen your spirituality. Adults and children welcome.

DATE:
TIME:
LOCATION:
CARPOOL INFO:
RSVP: PHONE:
BRING: Hats, closed-toed shoes, sun block, water, and snacks as needed.