***Standards listed in bold font are Utah Core Science Standards. Those that are not in bold are supplemental.**
****Words that are in bold font in the lesson are vocabulary words that your child should know by the end of the lesson.**
****The general supplemental science standards (1, 1.1, 1.1.a, 1.1.b, 1.1.c, 1.1.d, 1.1.e, 1.2, 1.2.a, 1.2.b, 1.2.c, 1.2.d, 1.3, 1.3.a, 1.3.b 1.3.c, and 1.3.d) are included naturally in the lessons and will not always be listed in the Standards Taught for each lesson**

Title of Lesson 1: The Earth

Standards Taught: Lesson this month are in preparation for the standards that will be taught next month		
Materials: Globe Blue balloon Continents Cutouts (here) Scissors Sharpie Optional: Paper mache mix (see here for recipes), newspaper scraps torn into 1 in strips, paint brush, blue paint	**Preparation:** Blow up the blue balloon, leaving it slightly smaller than fully inflated. Tie the balloon and squish it into a more spherical shape. Visit the link for the continents cutouts and print one of the worksheets that shows each continent. Adjust the sizing to match your balloon	**Implementing the Lesson:** First, ask your child what a planet is. Explain that a planet is a spherical object (like a ball) that orbits (or travels around) a star. Tell your child that there are several planets that scientists know about, and probably even more that they haven't found yet. Planets are very big and very far apart. Point out that our sun is a huge star and we live on one of the planets moving around it: the earth. Show your child the globe, explaining that this globe shows us what our planet looks like, though earth is much bigger. This is a model of the earth. A model shows us something very big in a smaller form. Ask your child to name the colors they see on the globe. Explain that earth is mostly covered with water (the blue parts) and also has some land (the green or other colored parts). Point out the equator, explaining that this imaginary line goes all the way around the middle of the earth, like a belt. It helps us to navigate (or tell where we are). Point out the north and south poles, explaining that these points are the top and bottom of the earth. Then, point out that they are a little bit skewed from straight up and down. Explain that earth is tilted just a little bit. Have your child lean to one side to illustrate the point. Next, give your child the balloon and explain that today we are going to make our own model of the earth. If you are going to do paper mache, help your child cover the entire balloon by dipping each newspaper scrap into your mixture and placing it (as flat as possible) over the balloon. Be sure to overlap. Let dry completely. Then, ask your child to paint their balloon blue and let it dry. Then, give your child the scissors and continents cutouts. Explain that the blue on our balloon represents the water on the earth. These papers represent the land. Help your child match the continents on their model to the ones on the globe. Then, allow your child to glue or paper mache them to their balloon in roughly the right area. Finally, ask your child to use the sharpie to mark the equator, north pole, and south pole on their balloon. Keep this project for the next few lessons.

Title of Lesson 2: The Sun

Standards Taught: Lesson this month are in preparation for the standards that will be taught next month		
Materials: Flashlight Earth balloon from previous lesson A sunny day	**Preparation:**	**Implementing the Lesson:** Review the previous lesson with your child. Remind them of what a planet is, which planet we live on, and what it is made up of (water and land). Explain that the planets in our solar system are all orbiting (or traveling around) the sun. Ask your child to tell you what they know about the sun. Explain that the sun is a big star, very far away. It is a sphere and its surface is on fire. That fire provides light and warmth to the earth, and to the other planets around it. Take your child outside and ask them to stand in the sunshine. Then, ask them to travel to a shady spot. Is it warmer in the sunshine or the shadow? Why do you think that is? Is it brighter in the sun or the shade? Why? Point out that the sun provides light and warmth. The shade is simply something blocking the sunshine from a certain place. Point to your child's shadow, explaining that this is a shady place because their body blocks the sun's rays from reaching the ground. Next, take your child inside and ask them to hold their model earth up. Stand in the center of a large space with the flashlight, explaining that we are going to pretend that the flashlight is the sun. Ask your child to move their earth model around the sun, roughly in a circle. Shine the flashlight at the earth wherever your child walks. Ask your child to make the following observations: Where is the sunshine the brightest on your model? Is there any shade? What do you think happens when part of the earth is in the sun? What about when part of it is in the shade? Do you think the same parts of the earth are in the shade all the time? What about the parts that are in the sun? Place the flashlight down on a flat surface. Ask your child to place their earth model next to it, so the light is shining on it. Point out that there are areas of sun and shade on their model. Explain that the sunny side is the part of the earth that is experiencing day, like we are right now. The shady part is experiencing night. Explain that, right now, the people on the other side of the world are asleep in bed because it is nighttime there. Next, ask your child if it is colder during the day or at night. Point out that, at night, the sun and earth create a shadow over the land and water, making it dark and cold, just like the shady spot outside. During the day, the sun shines brightly and warms up the area it is shining on. This makes days hotter than nights most of the time. Finally, tell your child that the earth moves in another way, too. It orbits around the sun, but it also spins around on its axis (or line between the north and south poles). Demonstrate this movement for your child using their earth model. Ask

		your child to find the North American continent on their model (help as needed) and put their finger on it. Point out that, as the earth spins, this continent goes through day, then night, then day again. This is why the sun comes up in the morning and why it goes down in the evening. The sun is not actually moving, the earth is. Allow your child to experiment with this movement, shadows, and day and night as needed until they understand the concept.

Title of Lesson 3: The Moon

Standards Taught: Lesson this month are in preparation for the standards that will be taught next month		
Materials: Flashlight from previous lesson Earth model from previous lessons Mirror Cardstock Scissors Glow in the dark paint Paintbrush	**Preparation:**	**Implementing the Lesson:** Review the previous lesson with your child. Ask them what they remember about the earth and the sun. Then, ask your child to name something else they see in the sky sometimes….usually at night. Explain that we are going to learn about the moon today, and about stars in the next lesson. Ask your child to hold their earth model in their hands again, reminding them of the rotation and orbit and what creates day and night. Remind your child that the sun shines its light on the earth. Explain that it also shines it light on the moon. Tell your child that, though the moon glows, it doesn't have light of its own. It simply reflects the light that the sun shines on it back to the earth. Illustrate this concept by asking your child to hold their earth model near a mirror. Shine the flashlight on the mirror, careful that the reflection does not come back into anyone's eyes. Try to aim the reflected light onto your child's earth model. Point out that the light from the sun is still bright on one side of the earth, but it is also shining on the moon, represented by the mirror. The moon then reflects, or turn that light back, towards the earth. This is why the moon seems so bright, especially at night when the sun is not shining on our side of the earth. Switch places with your child, allowing them to experiment with the reflection of light in the mirror. Remind them not to shine the light or the reflection into anyone's eyes. Finally, give your child the cardstock and ask them to cut it into a moon shape. This may be a circle (full moon) or a crescent shape. Then, ask your child to cover one side of the cardstock with glow in the dark paint. Ask your child if this paper has its own light, point out that it is not yet shining, and place the cardstock in the sun somewhere safe. Later tonight, allow your child to check their cardstock to see it glowing. Explain that this light came from the sun, just like the real moon.

Title of Lesson 4: The Stars

Standards Taught: Lesson this month are in preparation for the standards that will be taught next month		
Materials: Black construction paper Aluminum foil Glue A clear night sky	**Preparation:**	**Implementing the Lesson:** Briefly review the previous 3 lessons with your child, asking them to share what they learned. Add and correct as needed. Then, tell your child that today we are going to learn about something else in the night sky: stars. Explain that the sun is a very large star. Like the sun, other stars are spheres of heat and light. Stars are very far away from the earth and some stars are further than others. They are different sizes and in different parts of our solar system. There are even stars that are so far away, they are not in our galaxy. Stars may appear to be different colors and shapes from where we stand on earth and can change colors as they age. The rotation and orbit of the earth allows us to see different stars in different parts of the sky (they don't move, the earth does) during different times and seasons. Stars have helped sailors, explorers, and airplanes to navigate at night for a very long time. Give your child the black construction paper and ask them to tear or cut the aluminum foil into stars (they do not have to be star shaped). Then, allow your child to glue the stars across their paper any way they wish. Finally, go star gazing with your child after dark. Point out different stars you see and remind your child of what they learned in their lesson.

Title of Lesson 5: The Daytime Sky

Standards Taught: S.1.1, S.1.1.1, S.2.2, S.2.2.a, S.2.2.b		
Materials: A sunny or partly-cloudy day (not overcast) Crayons/Markers Blank papers Sidewalk Chalk	**Preparation:**	**Implementing the Lesson:** Review lessons 1 and 2 with your child, reminding them that the Earth spins on its axis, creating day and night. This makes it appear as if the sun is moving across the sky throughout the day. Give your child the sidewalk chalk early in the morning (as near sunrise as you can). Ask them to go outside and draw an arrow on the ground that points to the sun. Explain that the sun rises in the east, so their arrow is pointing east. Next, give your child one of the blank papers and the crayons/markers. Ask them to draw an image of the sky as they can see it now. Ask them to add the colors of the sunrise, the brightness of the sun behind the horizon, and anything else they see in the sky. This may include clouds, stars that are still shining, or even the moon. Remind your child not to look directly at the sun, as it is harmful to their eyes. Label this image with the time it was drawn. Around 9 am, take your child outside again. Ask them to observe the sky, reminding them not to look directly at the sun. Do they notice any changes? Can they still see the stars? The moon? Is the sun in the same place? Point out that the bright sun makes it difficult to see the stars during the day. Explain that the stars are still in the sky, but they are not bright enough to shine through the light of the sun. Explain that, because the Earth is rotating, the moon may have moved or even seem to have disappeared. That's because it is now nighttime on the other side of the world and the moon is shining there. The sun appears to have moved for the same reason. Ask your child to draw a new observation image of the sky, noting the changes they've observed. Label their picture with the time it was drawn. Repeat this process at noon, 3pm, 6 pm, and sunset. At sunset, ask your child to draw another chalk arrow beside their first. Point out that the sun sets in the west, the direct opposite of where it rose. Finally, ask your child to lay their observation sketches out in chronological order. Point out the movement of the sun over time. Praise your child for their hard work in tracking the movement all day long. Ask them to teach you or another family member what they learned.

Title of Lesson 6: Animal Shadows

Standards Taught: S.1.1, S.1.1.1, S.1.1.3, S.2.2.a		
Materials: Observation Sheet 6 Sidewalk chalk	**Preparation:**	**Implementing the Lesson:** Remind your child of the previous lesson and of what they learned about shadows in lesson 2. Shadows occur when the light from the sun is blocked by something. Explain that today we are going to use shadows to observe the movement of the sun across the sky. Ask your child to choose a small toy animal (the plastic ones, at least 3 inches tall work best). Have your child fill out box one of Observation Sheet 6. Next, ask your child to take their animal to a safe, sunny place outside. This will need to be a place where it can sit in direct sunlight all day without being disturbed. Ask your child to draw the animal and its shadow after it is placed in the proper area. Ask your child to add the location of the sun onto their image by drawing its direction in relation to the animal (head, back, tail, etc). Finally, ask your child to trace the animal's shadow with sidewalk chalk. Help your child check and observe the shadow produced by the animal throughout the day. Note the movement of the sun each time you observe. Ask your child to fill in the appropriate box for the time on the observation sheet, drawing the animal, the shadow, and the position of the sun. Have your child trace the shadow with sidewalk chalk each time. Note the movement in the placement of the shadow as well as its relative size. Repeat this process until all the boxes on the observation sheet are filled in. At the end of the day, bring your animal back in. Ask your child to explain their drawings and tell you why the shadow moved throughout the day. Remind them of the movement of the Earth, making it appear that the sun is moving across the sky. Watch this video with your child and point out the movement of the sun and shadows, just like what they observed in their experiment. Then, point out the moonrise explaining that we will be learning that the moon seems to move across the sky, just like the sun, because of the Earth's movements.

Observation Sheet 6

1. Draw and color in your toy animal	2. Draw and color in your animal with its shadow when you first put it outside	3. Draw and color in your animal with its shadow at 10 am
4. Draw and color in your animal with its shadow at noon	5. Draw and color in your animal with its shadow at 3 pm	6. Draw and color in your animal with its shadow at sunset

Title of Lesson 7: Nighttime Sky

Standards Taught: S.1.1, S.1.1.1, S.2.2, S.2.2.b

Materials:	**Preparation:**	**Implementing the Lesson:**
Blank paper Crayons/Markers		Remind your child of the video from the previous lesson, watching it again if needed. Ask your child to remind you about what they learned from their experiments with observing the sun (the sun seems to move across the sky because the Earth is rotating) and explain that the moon does this, too. You can see the moon seemingly moving across the sky in the video. Next, ask your child to review their pictures from lesson 5, reminding them that they drew the movement of the sun across the sky as it happened. One on blank paper, ask your child to draw a night sky showing the movement of the moon, which mirrors the movement of the sun. Discuss the following as your child works: Why does the moon seem to move across the sky? (because the Earth rotates) Why don't you see the moon through the entire day? (because, like the sun, the moon is sometimes on the other side of the Earth) Why do you sometimes see the moon during the day? (because at times the moon is on our side and not in the shadow of the Earth, making it bright enough to observe while the sun is out). When they are finished with their drawing, praise them for their work, pointing out their accurate predictions in the movement of the moon. Explain that, because we sleep at night, it is more difficult to observe the moon. Next, ask your child what else can be seen in the night sky. Explain that, at night, the light of the sun shines on the other side of the Earth. This means our side is in the shadow and it is dark enough for the stars to be seen. The stars are always in the sky, even when the bright sun makes it impossible for us to see them. However, like the moon and the sun, the stars seem to move across the sky because of the movement of the Earth. Watch this video with your child. Then, ask them to add some starts to their drawing. Explore a question your child has about the night sky. Some common questions are: What are shooting stars? Why are the stars we see in different places during different seasons? Why does the moon change shape (phases)? Help your child research and find answers to questions they may have about the night sky.

Title of Lesson 8-9: Space Exploration

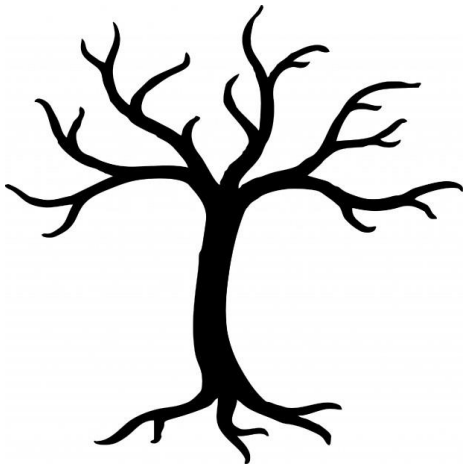
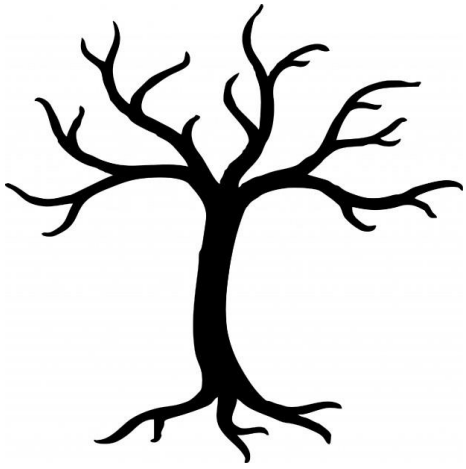
Standards Taught: These lessons are a review of previous standards dealing with space		
Materials: Varies depending on what your child would like to learn about	**Preparation:**	**Implementing the Lesson:** Review what your child has learned about the Sun, Earth, moon, and stars so far. Ask them to tell you how the plants and animals on Earth get the light and warmth they need, how the Earth and moon move, and what the different between the day and night sky is. Then, ask your child to choose something about space they would like to learn more about. This may be the Sun, Earth, moon, stars, planets, asteroids, meteors, comets, or space shuttles. Take time to research this aspect together. Look for books and webpages with information (this website is a great one for a variety of topics). Watch videos together. Then, perform a related experiment or create a craft reflecting the subject. Continue this subject or choose a new one for Lesson 9.

Title of Lesson 10: Seasons of the Year

Standards Taught: S.1.1.2, S.2.3.a

Materials:	**Preparation:**	**Implementing the Lesson:**
Observation Sheet 10 Paint in the following colors: green, white, red, orange, yellow, pink Paint brush White or silver glitter		Review with your child the revolution and orbit of the Earth. Discuss how the revolution creates day and night and explain that the orbit of the Earth around the sun creates seasons. Using a globe and flashlight, model this orbit for your child. Point out that one orbit around the Sun creates a year on Earth. This means that we experience all the seasons in the time that the Earth goes around Sun. The seasons change as the Earth moves. Ask your child to name the four seasons. Ask your child to show you the North and South Poles on the globe. Point out that, if we drew a line between these poles, the line would be a little bit sideways. This is because the Earth is tilted. This tilt means that different parts of the Earth are closer or further away from the Sun at different times as it travels in its orbit. Demonstrate this for your child by moving the globe around the flashlight with your finger on your state. Point out that when your part of the Earth is pointed towards the Sun, you experiences summer. During the summer, your part of the Earth has long days and is very warm. Ask your child to tell you some of their favorite things to do during the summer. Then, move your globe so it is positioned opposite of summer. Point out that now your part of the Earth is further away from the Sun, meaning it gets colder and the days get shorter (it is dark outside for longer). This creates winter in your part of the world. Ask your child to tell you what they like about the winter. Finally, position the Earth between summer and winter on either side of the Sun. Point out that these seasons are in between hot and cold, creating autumn/fall and spring. Ask your child to describe the differences and fun activities of these seasons. Watch this video with our child. Ask them to review why there are different seasons on Earth and how those seasons affect the amount of sunlight and length of day on Earth. Perform the globe experiment above again, this time pointing out that when your part of the Earth is experiencing one season, the opposite hemisphere is experiencing the opposite seasons because of the Earth's tilt. This means that, in Australia Christmas is warm and sunny while in the U.S. it is cold and snowy. Finally, ask your child to use the paint, paintbrush, and glitter to add details appropriate to each season on Observation Sheet 10. As they work, discuss the changing leaf colors of autumn, the snow and ice of winter (add glitter for a sparkling effect), the blossoms of spring, and the green leaves and fruit of summer. Ask your child to describe the weather in each season and how that weather helps the tree. Save the Observation Sheet for lesson 12.

Observation Sheet 10

Autumn/Fall 	**Winter** 
Spring 	**Summer** 

Title of Lesson 11: Seasons: Weather

Standards Taught: S.2.3, S.2.3.a, S.2.3.b, S.2.3.c		
Materials: Observation Sheet 10 Cardstock Markers/Crayons Laminating Machine Your weather chart	**Preparation:**	**Implementing the Lesson:** Review the previous lesson with your child, asking them to remind you of why Earth has different seasons. Remind your child that seasons can differ depending on where on Earth you are at different times. Ask your child to review each season and what it is like (position relative to the Sun, temperature, activities, etc). Next, review the different types of weather that come in each season. In the summer, weather is warm and sunny. During autumn, Earth starts to cool down and leaves begin to change. In the winter, it is cold and it may rain or snow. In the spring, Earth begins to warm up. The snow melts and it may get very rainy. This helps the flowers and plants begin to grow again. Ask your child to tell you about a time they experienced each type of weather. Then, discuss the following types of weather with your child, asking your child to define each word as you go and helping them when needed: sunny, windy, foggy, cloudy, partly cloudy, snowy, rainy, stormy. Show your child your weather station. Discuss times they may have experienced each type of weather and what they liked or didn't like about it. Talk about what the temperature felt like, what they wore or did to protect themselves, and what activities could or couldn't be done in each type of weather. If your child experiences fear in any type of weather, research why it happens together. Discuss safety tips and how this type of weather helps the Earth and the living things on it. Finally, point out that your weather chart may be missing some of these types of weather. Ask your child to use the cardstock and markers to create pieces they can add to your weather chart to include these new vocabulary words. When they are finished, laminate each piece and add them to your daily weather checks.

Title of Lesson 12: Seasons: Day and Night

Standards Taught: S.2.3, S.2.3.a, S.2.3.b, S.2.3.c

Materials:	**Preparation:**	**Implementing the Lesson:**
Observation Sheet 10 Crayons/Markers		Review the seasons and their relative weather with your child. Ask them to remind you how the Earth experiences different seasons. Point out that when your part of the Earth is further away from the Sun it experiences cooler temperatures (winter) and when it is nearer to the Sun your part of the Earth is warmer (summer). In between those times are times when the weather begins to change from cold to hot (spring) or hot to cold (autumn). Explain that each part of the Earth's distance from the sun changing temperature. However, so does the time that part of the Earth has sun shining on it. During different seasons, the day (when the Sun shines on your part of the Earth) is longer or shorter. This means that when you wake up in the summer, the Sun is already up in the sky and it is likely still up when you go to bed. In the winter, however, the Sun comes up much later and you may start school when it is still dark outside. It also goes down earlier, meaning it may be dark outside before dinner. Point out examples of this in your child's life. Explain that the times didn't change much on the clock (you may experience Daylight Savings, for example), but the amount of sunlight your part of the Earth gets does. This means that Earth has more time in the sun to warm up during the summer and less during the winter. This helps the seasons keep their cooler or warmer temperatures during different seasons. During spring and autumn, day and night are almost equal in time. Watch this video with your child, pointing out that one was taken during the winter while the other was taken in the summer. Point out the differences in daylight in each season. Finally, give your child the crayons/markers and ask them to draw a sun on the top left corner of each season and a moon on the top right corner of each. Ask them to draw a vertical line down the middle of spring and autumn and color as desired to show that day and night are almost equal during these seasons. Then, ask them how they would divide the day during winter. Point out that night is longer than day and encourage your child to find a way to divide their winter square accordingly. Repeat the process for summer, pointing out that during the summer the days are longer. Allow your child to decorate and color their page as desired.

Title of Lesson 13: Rocks and Soil

Standards Taught: S.2, S.2.1, S.2.1.a

Materials:	**Preparation:**	**Implementing the Lesson:**
An example of the three types of rocks: sedimentary, metamorphic, and igneous 3 different types of soil (e.g. potting soil, sand, clay, silt) 3 plates or cups, one for each type of soil Magnifying Glass Observation Sheet #13	Study the information here to learn more about the different types of rocks	Give your child the three rock examples and the magnifying glass. Explain that these are three different types of rocks. Ask them which rock is their favorite. Discuss what they like about it, the size, the texture, the color, and any noticeable traits. Allow your child to lead the conversation and compare and contrast the rock with the others. Then, tell your child what type of rock it is (sedimentary, metamorphic, or igneous) and how it formed. Point out that its method of formation gave it some of the characteristics they noted before. Repeat this process for each of the three rocks, allowing your child time to observe each rock. Next, place the three different types of soil on each of the plates or cups. Allow your child time to observe each type of soil with the magnifying glass on their own. Encourage them to look at, feel, and pick up each type of soil, reminding them that scientists use more than one sense to observe. Ask them to describe what they see for each soil. Explain that, over time, other materials break down and create soil. Like rocks, soils can be different from each other depending on what they are made of. Ask your child to compare and contrast the soils they've observed. Next, ask your child to complete Observation Sheet #13, using the observations they've made. Focus on type (sandy, clay, silt, etc.), color (brown, black, tan, beige, red, etc.), texture (sticky, rough, smooth, soft), and particle size (clumpy, large, small, medium). Allow your child to note any other observations they've made and ask them to draw an image (with crayons or markers) of each soil type. Explain that the characteristics of each soil type make them useful in different ways to humans and other animals. Briefly discuss what each soil may be used for (e.g. potting soil has nutrients to help plants to grow, etc).

Observation Sheet #13

Type of Soil:			
Color:			
Texture:			
Particle Size:			
Other Observations:			
Drawing:			

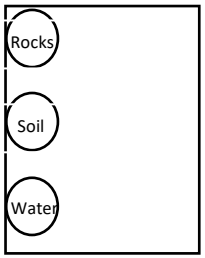
Title of Lesson 14: Water: Streams, Rivers, Lakes, Ponds, Oceans

Standards Taught: S.2, S.2.1, S.2.1.b

Materials:	**Preparation:**	**Implementing the Lesson:**
This image Water bottle Playdoh, Clay, or Sand Water and containers to carry it in (e.g. buckets, bowls, etc) Large area that can get wet (e.g. bathtub, kitchen floor, outside area)		Show your child the water bottle and ask them how you got that water. Where did it come from? How did it get into the bottle? If your child points out that it came from the store, ask them where the store got it. Where did the company who put the water into the bottle get the water? Where did the pipes get the water? Help your child follow the water back to a likely natural source (e.g. river, stream, lake, snow top mountain, etc). Show your child the image of the water cycle. Use the image to point out different parts of the water cycle as you explain them. Explain that water from the ocean is warmed by the sun in a process called evaporation. As the water is warmed, it turns into vapor (like steam) and rises to form clouds in the sky. The clouds then are blown all around the world and, when they are ready, the water vapor cools and condenses back into water and creates rain, snow, or hail. This falls back to the earth, usually over land. The snow and hail eventually melt and all the water that fell flows into streams or rivers, which move the water around. Some of these streams and rivers are above the ground, while others flow beneath it. The water may end up in a small pond, a bigger lake, or even back in the huge ocean. Here, the water cycle begins again. Point out that during this process, water is moved around to where humans can use it. Water is pulled from the rivers, streams, lakes, and ponds so that it can be cleaned and put into our pipes, which bring it into our homes and businesses. Some companies place water into bottles, like the one you have now. When we use water, it travels back through another set of pipes, sending it back to be cleaned again for future use. Ask your child to briefly review the water cycle with you, using the image as needed. Then, give your child the playdoh, clay, or sand. Ask them to build a model of the water cycle, including a large body of water (pond, lake, or ocean), and a river or stream that leads back to it. Allow your child to experiment and play with the water containers. Encourage them to gently pour the water into their river and/or stream and help it reach their ocean/lake/pond. As they work, ask open-ended questions that encourage experimentation such as: What would happen if we created more than one river? What happens if the river overflows? What happens if there is no rain for a long time? What would happen to the plants, animals, and people who don't like near the ocean/pond, lake? Does all of the water return to the ocean/pond/lake? Why or why not?

Title of Lesson 15: Rocks, Soil, and Water: Uses

Standards Taught: S.2, S.2.1, S.2.1.c

Materials:	**Preparation:**	**Implementing the Lesson:**
Large paper or poster board, with three large circles drawn on it and labeled like this:  Markers/Crayons		Review the previous two lessons with your child, asking them to remind you of what they've learned about rocks, soil, and water. Show your child the poster board/paper that you've prepared. Explain that today we are going to list ways humans use each of these things. Remind your child of the lesson about soil and how different types of soil may be used for different things. Then, give your child the paper/poster board. Ask them to think of at least three ways humans can use rocks (e.g. decoration, weed control, building a house, jewelry, building roads, bridges, castles, etc.). As they think ok ideas, ask your child to draw a horizontal line from the *Rocks* circle, draw and label the first use, draw a second horizontal line, draw and label the second use, and so on. Repeat this process for soils (e.g. gardening, sandbox, playground, filling holes, leveling a yard, making bricks, sandcastles, etc.) and water (e.g. drinking, cooking, watering plants, watering animals, play/swimming, etc).

Title of Lesson 16: Plant Needs

Standards Taught: S.1.2.1, S.4.2.b

Materials:	**Preparation:**	**Implementing the Lesson:**
3 Plastic Cups Potting Soil 6 Seeds Water Permanent Marker Observation Sheet 16		Briefly discuss the difference between living and non-living things with your child. Point out that living things need to eat, drink, and breathe to survive, or stay alive. They can also grow and reproduce, either by having children, like animals, or through seeds, like plants. Ask your child to name a few non-living things, pointing out that each of these things cannot die and has no need of food, water, or breathing. Then, ask your child to name some living things, asking them what they eat, drink, and breathe. Explain that most animals breathe oxygen while plants breathe carbon dioxide. Next, ask your child to tell you what else plants need to survive. Explain that they get water and some nutrients from the soil and carbon dioxide from the air people breathe out. However, plants get most of their energy (or food) from the sun. When the sun shines on a plant it goes through a process known as photosynthesis. This process allows the plant to change sunlight into energy. Ask your child to review the things a plant needs to survive. Finally, tell your child that they are going to do an experiment to see how a plant grows if it does not have everything it needs. Help your child label each of the plastic cups as follows: Cup One: Water and Sunlight, Cup Two: No Water, Cup Three: No Sunlight. Then, help your child fill each cup with potting soil and plant two seeds in each. Finally, place cup one in a sunny area and help your child give it an appropriate amount of water. Next, place cup two beside cup one, but do not water it. Finally, water cup three and place it in an area with no sun. Over the next two-three weeks, help your child continue to water cup one and three. Ask your child to observe and draw each cup on Observation Sheet 16 daily. At the end of the experiment, discuss the difference in plant growth and health. Why did some plants grow better than others? What did that plant have that the others did not? What needs do plants have that were not being met?

Observation Sheet 16 (2 pages)

Draw a picture of each plant daily

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Cup 1							
Cup 2							
Cup 3							

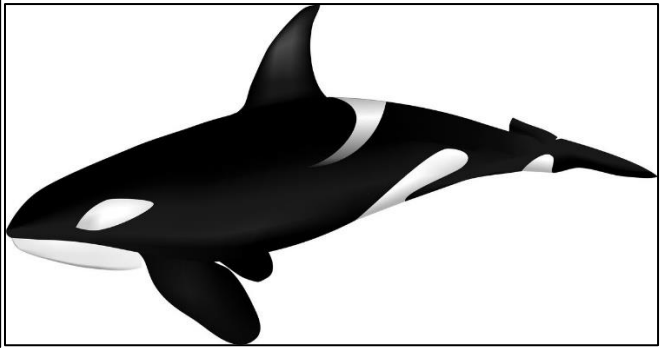
	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Cup 1							
Cup 2							
Cup 3							
Which plant grew the best? Why do you think it grew better than the others?							

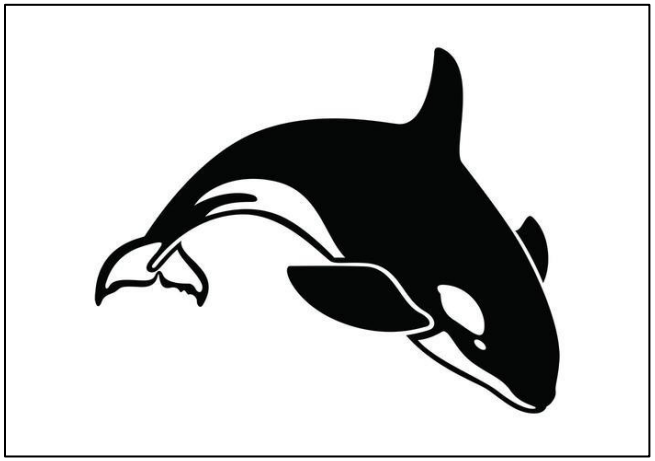
Title of Lesson 17: Parents and Offspring

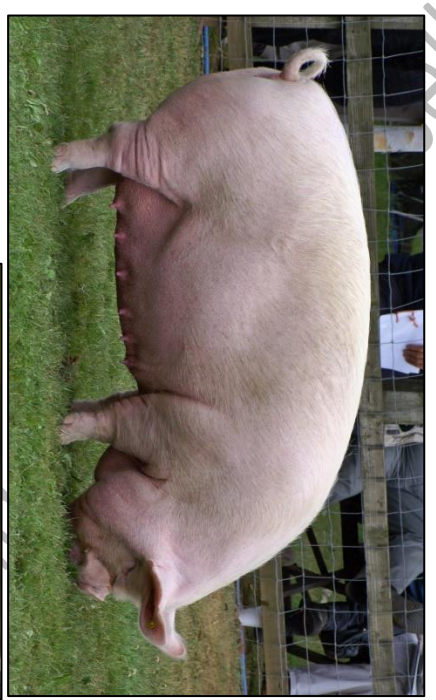
Standards Taught: S.1.2.3, S.4.1, S.4.1.a, S.4.1.b, S.4.2.c

Materials:	**Preparation:**	**Implementing the Lesson:**
Parent and Baby Cutouts My Family Characteristics Chart Bible Life Cycle Chart	Print and cut the Parent and Baby Cutouts on cardstock	Briefly review the characteristics and needs of a living thing with your child. Discuss what living things do (eat, drink, grow, move, and reproduce) that non-living things do not. Ask your child to remind you what reproduce means. If needed, remind them that means that animals have babies and plants create seeds. Read Genesis 1:11-12, 21-24, and 26-28 and discuss the phrase *be fruitful and multiply*. Point out that it was Heavenly Father's plan for living things to reproduce and provide all that humans needed to live on earth. Explain that reproduction allows for a species (or type of plant or animal) to continue on, even after the parents die. Then, ask your child to name a baby animal they've seen recently. Discuss what that baby looked like. Was it furry or feathered or scaled? What colors was it? Was it small or large? How many legs and arms did it have? Who did the baby look most like? Point out that baby animals often look like their parents in some ways. A baby snake would not look like a baby elephant. Next, discuss a baby plant your child has seen. Point out that plants, too, have similarities to the adult plant the seeds fell from. Often, an entire population of plants look alike, though they may have some variations. Take your child to an area that has several plants of the same type (e.g. an orchard, forest, garden, nursery, etc.) and take the time to point out similarities and differences within a species. Show your child the Parent and Baby Cutouts you've prepared. Then, mix them up and place them face down in rows. Play the memory game with your child, working to find matches of parents and babies. Each time a match is found, discuss a similarity and a difference between the baby and its parent. Point out that humans, too, look like their parents. Ask your child to describe ways they look like mom and dad and ways they differ. Point out that their siblings, too, have characteristics that are shared with both parents. However, not all of the children in your family look exactly like each other of exactly like their parents. Using photos or visual contact (e.g. video call), help your child fill in the My Family Characteristics Chart and note similarities and differences between parents and offspring. Finally, explain that some baby animals do not look like their parents when they are born/hatched, but later grow up to look like them. Show your child the Life Cycle Chart, pointing out each stage of the animals' growth and ask your child to point out similarities and differences between the baby and adult stages.

Parent and Baby Cutouts (3 pages)



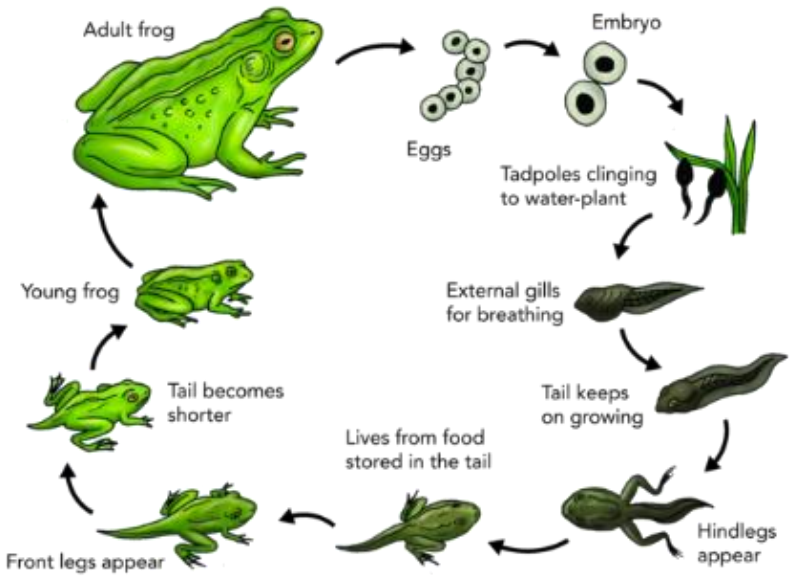


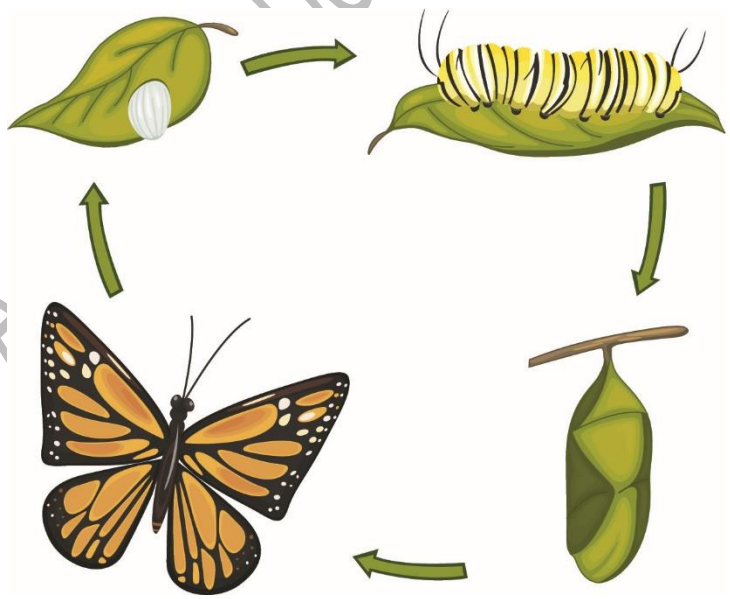


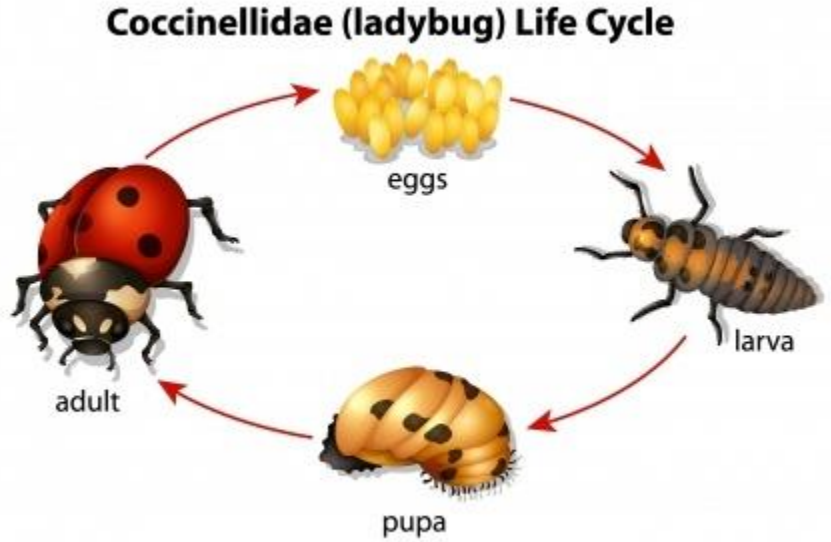
My Family Characteristics Chart

Name	Eye Color	Hair Color	Skin Color	Height	Other
Me					
Mom					
Dad					
Sibling 1					
Sibling 2					
Sibling 3					
Grandmother 1					
Grandfather 1					
Grandmother 2					
Grandmother 3					
Aunt					
Uncle					
Cousin					

Life Cycles







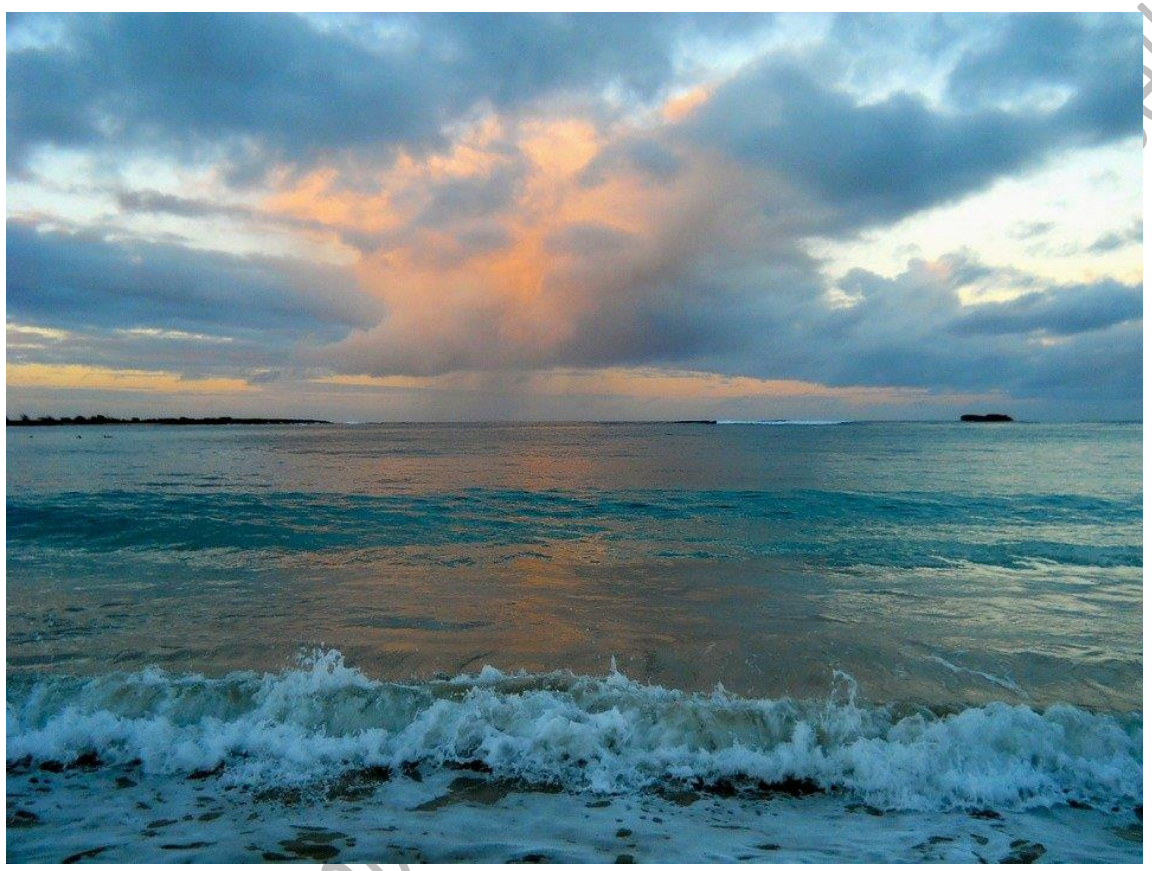
Title of Lesson 18: Environment and Physical Adaptations

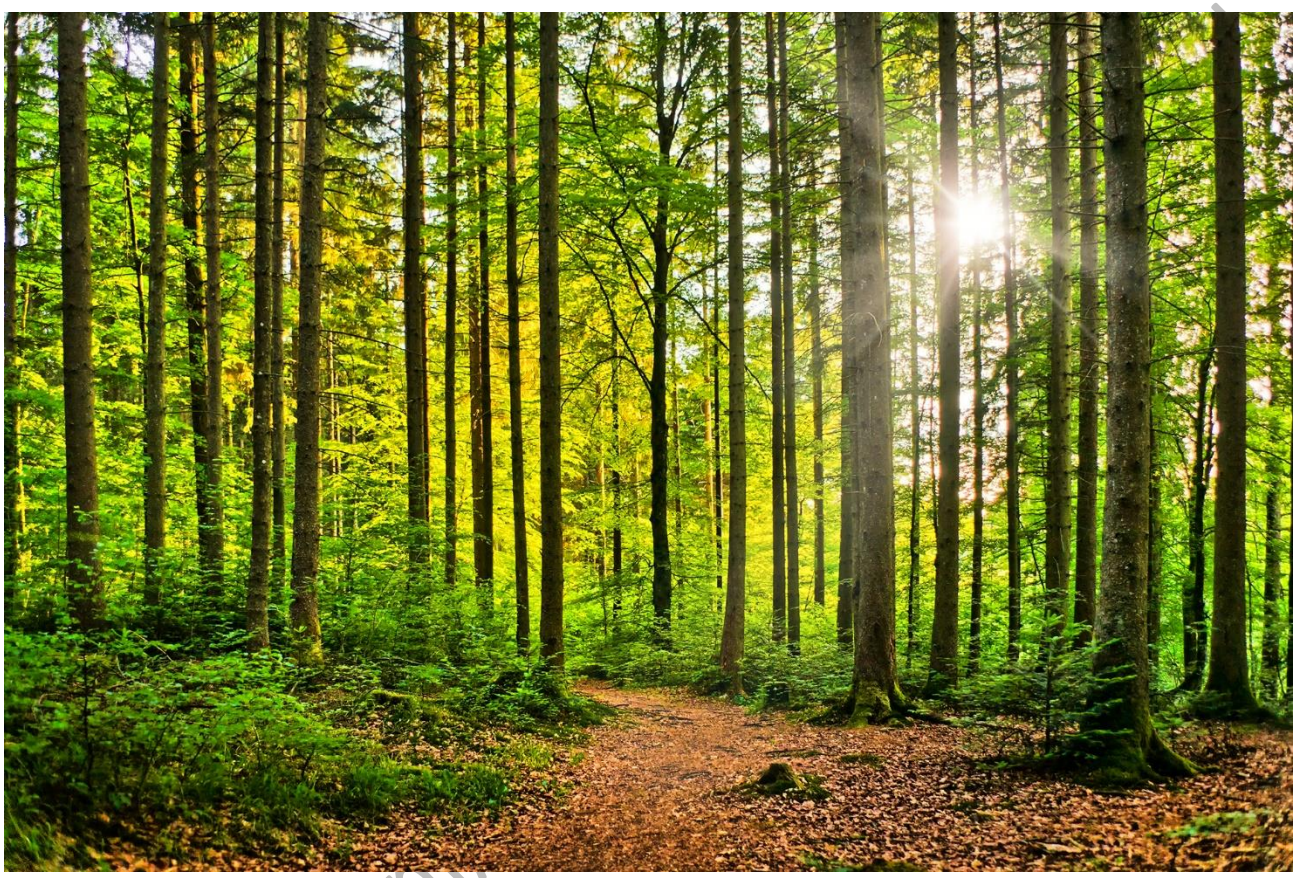
Standards Taught: S.1.2.2, S.4.2, S.4.2.a, S.4.2.b

Materials:	**Preparation:**	**Implementing the Lesson:**
Environment Sheets Parent and Baby Cutouts from previous lesson Plant Cutouts		Briefly review the previous two lessons with your child, discussing living and non-living things, the characteristics and needs of living things, and similarities and differences between parents and their offspring. Ask your child to match parents and babies using the cutouts from the previous lesson. Then, ask your child where each of these animals lives. Give your child the Environment Sheets and ask them to match each animal pair to the correct environment. Then, discuss the characteristics of each environment: Savannah: warm, dry with a rainy season, lots of tall grass, few trees, water collects only in certain places (watering holes), Ocean: covered in salt water, large, temperature varies by location, Forest: lots of trees and other plants, warm in the summer and very cold in the winter, frequent rain which creates lakes and ponds, Rainforest: lots of trees and other plants, very warm, lots of rain- everything is wet much of the time, Farm: cared for by humans, animals are given shelter from the weather and fed through pastures or daily by humans, adequate water. Point out that the animals that live in each environment face challenges. The animals in the savannah, for example, face very dry winters and open land that provides little protection from predators. However, the animals' physical traits (e.g. color of their fur, toughness of their skin, ability to store water within their bodies) help them adapt (or change) in their challenging environment. Discuss the challenges of each environment and the adaptations that each animal has that helps them to survive. For example: ocean animals are able to swim because of tails and flippers, and have special eyelids that help them see in the water, forest animals are camouflaged to blend in and hide from predators and have great hearing so they can run if there is trouble, rainforest animals, like the monkey, also are colored to blend in with their surroundings and can swing from tree to tree with their long arms, farm animals may have feathers to keep them warm or strong snouts to help them search in the ground for food. Next, point out that plants also have different adaptations based on where they survive best. Where it is dry and plants don't get much water, plants have thin, pointy leaves which are covered in a wax to help hold water in. Where it is very wet, the leaves are wide and curved to allow for the water to run off before the plant becomes too heavy and breaks. Ask your child to cut out the plants on the Plant Cutout page, discuss the adaptations of each, and ask your child to add them to the correct environment.

Savannah

Ocean



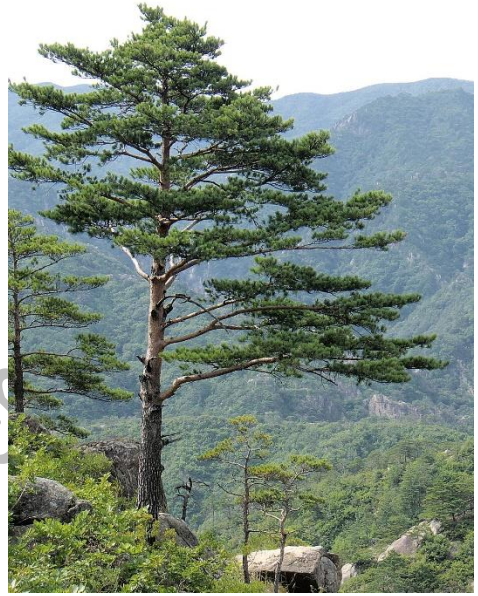
Forest 

Farm 

Rainforest 

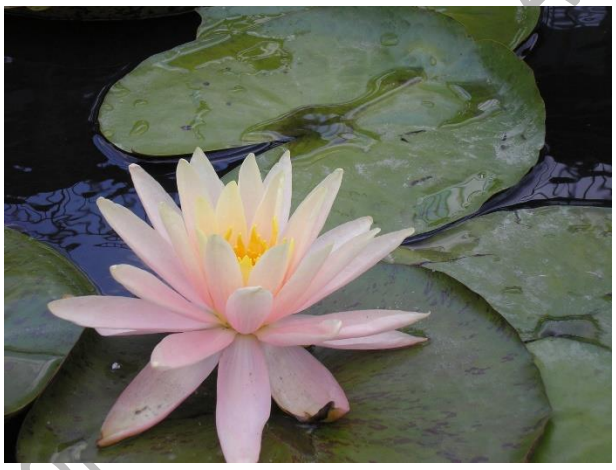
Plant Cutouts

Savannah Grass



Pine Tree

Seaweed



Water Lily

Cornstalk

Title of Lesson 19: Behavioral Adaptations

Standards Taught: S.1.2.4		
Materials: Parent and Baby Cutouts from Previous Lessons Environment Sheets from Previous Lesson	**Preparation:**	**Implementing the Lesson:** Ask your child to match the parent and baby animal cutouts again. Then, ask them to place each one in the correct environment and review some of the physical characteristics that help each animal survive in their environment. Point out that these characteristics help in their own environment, but if an animal was moved to another environment, they probably wouldn't do as well. For example, if a whale was placed in a forest it wouldn't survive long because it needs water. Similarly, if a farm chicken was placed in a rainforest it wouldn't be protected from predators very well. Point out that many of the animals wouldn't know how to act in a new environment, either. The whale wouldn't be able to move around because it has always moved by swimming. Likewise, the chicken, who had a farmer bring food to it, wouldn't understand how to find its own food and water. However, in their own environments, these actions are easy for the animals. These actions, or things animals do to survive in their environment, are called behavioral adaptations. Some other examples of behavioral adaptations are: desert animals coming out at night rather than in the heat of the day, babies crying to tell their mother they are hungry, puppies yipping when they are hurt, or rabbits freezing when a predator is near. Work with your child to discuss behavioral adaptations of each of the animal pairs from the cutouts. Some examples are: whales migrating to find better food sources, pigs play in the mud to cool their bodies when they are too hot, elephants live in herds and protect each other from predators, chickens roost and sleep in high trees so predators don't harm them at night, baby sea turtles run to sea after they hatch and don't come out of the water often because they can move better in the water, lions communicate through sounds to better hunt as a team, monkeys wrap their tails around trees to swing from place to place, and mother deer licking their babies often to remove scents that may bring a predator near. Finally, discuss some behavioral adaptations that your child has. For example, what do they do when they are cold? Do they grab a blanket, put on a jacket, or light a fire in the fireplace (with help)? What about when it is sunny outside? Do they wear sunscreen or sunglasses?

Title of Lesson 20: How Do Non-Living Things Move

Standards Taught: S.3.1, S.3.1.a, S.3.1.b, S.3.1.c

Materials:	**Preparation:**	**Implementing the Lesson:**
Ball Blank Papers Pen/Pencil Crayon/Markers Aluminum Foil Water Two buckets or large containers to hold water Large area to work in	Fill one of the buckets with water	Ask your child to review the difference between living and non-living things. Remind them that living things breathe, eat, drink, reproduce, grow, and move. Ask your child to act out how the following living things move: human, horse, dog, cat. Point out that these things move on their own. Next, ask your child if a non-living thing can move on its own. Point out that non-living things only move if a force (a push or a pull) is put on them. When a ball is thrown, for example, the person throwing it pushes it forward with their hand. When a pencil falls off a table the force of gravity pulls it to the ground. When a paper blows away outside, the force of the wind is pushing it. Ask your child if they can give you another example of a non-living object moving and discuss the force behind this movement. Give your child the ball and ask them if they can get this non-living object to move in the following patterns: straight, zigzag, circular, curved, back-and-forth, fast, and slow. Discuss the fact that forces such as gravity and their hands pushing or pulling the ball are affecting its direction. Finally, show your child the bucket of water. Ask them if water is a living or non-living thing. Point out that water does not eat, breathe, grow, or reproduce. However, it can move when acted on by a force. Point out that the water in streams moves because of gravity pulling it down. Tell your child that in today's experiment, we are going to see if we can get water to move in the all the same ways as we did the ball. Use the aluminum foil to help your child build a long trench with high sides. This should be supported (use tables, chairs, wooden boards, etc.) and connected sufficiently enough to hold water. The beginning of the trench should be higher up than the end, allowing for gravity to move it downwards. Place the empty bucket at the bottom of the trench so that it can catch the water. Ask your child to think about how they will make the water move in these ways: straight, zigzag, circular, curved, back-and-forth, fast, and slow. Allow your child to carefully pour the water into the beginning of their river and observe how it moves. Give your child the blank paper and ask them to draw their observations. Help them label this paper with the direction and/or speed they have achieved (most likely straight movement). Then, help your child add different items to their river, move the trench, or adjust the amount of water used until they have moved the water in each required direction. Allow them to experiment, observe, and record each successful attempt. Help your child label each drawing with the direction and/or speed they have achieved. Drawing should include the changes made to get the water to move in the correct direction/speed. For example, a zig-zag movement may be achieved by adding large rocks or blocks of wood opposite each other along the trench, a curved or circular movement may require restructuring the trench, and a slow movement may require decreasing the tilt from the beginning to the end or pour the water more slowly at the start.

Title of Lesson 21: Push and Pull

Standards Taught: S.3.1.c		
Materials: Rope Gloves that fit your child (optional) Large item, heavy enough that it will be difficult for your child to lift but light enough for your child to push and pull (e.g. tote filled with books)	**Preparation:**	**Implementing the Lesson:** Ask your child to share with you what they learned in the previous lesson. Discuss living vs. non-living things and the affect that forces have on the movement of non-living things. Then point out that they can exert forces on non-living things and change their direction, just as they did with the ball. Next, show your child the large item. Ask them to try to pick it up by exerting an upwards force. Point out that this item is very heavy and they may not be able to lift it. Discuss the fact that the force of gravity is holding the item down, pulling it towards the earth. Then, point out that there are two other ways this item can be moved: pushed and pulled. Tie the rope securely around the object and ask your child to practice pushing and pulling it in different directions. Point out that when your child pulls/pushes harder, the object moves further. Finally, ask your child if they can push and/or pull the object to make its movement follow these patterns: straight, zigzag, circular, curved, back-and-forth, fast, and slow. Discuss some real-live examples of items being pushed or pulled. For example: a paper blowing in the wind, a child on a swing, a train car behind an engine, a jump rope being spun, or a soda can rolling across a countertop. Ask your child to point out whether the force used is a push or pull and where the force is coming from.

Title of Lesson 22: Classification

Standards Taught: S.3.2, S.3.2.a

Materials:	**Preparation:**	**Implementing the Lesson:**
A handful of rocks or pebbles, various colors and sizes A variety of small craft supplies with different textures and shapes (e.g. pom poms, feathers, buttons, string, sequins, brads, fabric, paper, paint brushes, glue bottle, tape) Several items from around the home in different shapes and textures (e.g. pillows, boxes, canned goods, pencils, phone, pots and pans, soap) Observation Sheet 22		Ask your child what a scientist is and what he/she does. Discuss different types of scientists, explaining that each type learns about different parts of the world. A paleontologist, for example, learns about dinosaur bones. A biologist learns about plants. A seismologist studies earthquakes. A meteorologist, the weather. However, all scientists have one goal: to learn more about the world around them. Explain that one of the first things any scientist does is classify, or sort, the things they are learning about. A paleontologist, for example, classifies the bones he digs up by what type of dinosaur they belong to. Was this dinosaur a meat-eater or did it like plants? Was it large or small? Did it fly, crawl, or walk? Where and when did it live? A biologist may classify different plants by color, size, location, or species (type). This classification helps scientists take something very big and break it into smaller pieces. This helps them focus on one thing at a time and it helps them find ways the things they are studying may be connected. Tell your child that today they are going to be scientists working on classification. First, give your child the rocks or pebbles, explaining that a scientist that studies rocks is a geologist. Ask them to sort the rocks by size. Encourage them to have at least five piles of rock sizes, pointing out that there can be more size classifications than small, medium, and large. Finally, ask your child to observe their piles. What do they notice about the smallest rocks? Are they all the same type of rock? Do they have anything in common? What about the next piles? Point out that it would be difficult to see these similarities if they had not sorted the rocks by size. Ask your child to draw each pile in the corresponding box and record their observations on Observation Sheet 22. Next, point out that these rocks/pebbles can be classified in another way, too: by color. Ask your child to sort the rocks again, this time by color. After the rocks are sorted, ask your child to point out similarities and differences between the rocks in each pile. Point out that the rocks that match in color may be made of the same materials and share traits such as size, texture, or shape. Help your child record the colors of each pile and the observations they have made on the observation sheet and put the rocks away. Next, tell your child that they are going to be a different kind of scientist: an archeologist. Explain that an archeologist studies different items, called artifacts, which people used long ago. These items help them to better understand our ancestors and how they lived. Give your child the craft supplies and household items. First, ask your child to sort these items by shape and ask your child to point out similarities between each pile. Are these items used for the same type of task? For example, do most of the squares and cubes hold things? Do they belong in the same room? Help your child record their observations on the observation sheet. Finally, ask your child to sort the items by texture, reminding them that texture is the way something feels: soft, smooth, rough, scratchy, bumpy, etc. Help your child record their chosen textures on the observation sheet. Then, discuss similarities between the items such as use or location. For example, are the soft things often used against the skin? Do the smooth things belong in the kitchen? Briefly discuss how these classifications could help an archeologist learn more about how humans lived long ago.

Observation Sheet 22

Geologist Size Classification			Geologist Color Classification		
Small Rocks	**Small-medium Rocks**	**Medium Rocks**			
Medium-large Rocks	**Large Rocks**	**Observations**			**Observations**
Archeologist Shape Classifications			**Archeologist Texture Classifications**		
Square/Cube	**Circle/Sphere**	**Triangle/Pyramid**			
Oval	**Cylinder**	**Observations**			**Observations**

Title of Lesson 23: Predicting Classifications

Standards Taught: S.3.2.b, S.3.2.c

Materials:	**Preparation:**	**Implementing the Lesson:**
Ice cubes Crayon with the wrapper removed Chocolate bar Large marshmallow Lollipop Microwaveable cup/mug Bar of Ivory Soap Food scale Paper plates Observation Sheet 23		Review the term *classification* with your child, asking them to explain how it helps scientists better understand the world around them. Ask your child to discuss with you the different classifications, or traits, they sorted their items into in the previous lesson: size, shape, texture, and color. Point out that this allowed them to see connections between the objects and study one part of the group at a time. Explain that today we are going to practice classification again. This time, however, we are going to classify using different traits: weight, temperature, buoyancy (sink or float), and reactions to heat, cold, and water. Show your child Observation Sheet 23 and point out that all of these classifications are listed. Point to the items at the top of the table and explain that these are the objects they will be working with. Give your child the objects (ice cube, crayon, chocolate bar, marshmallow, lollipop, cup, and soap) and ask them to first classify them by weight. Ask your child to line the items up based on how much they think they weight. Help your child use the scale to confirm the correct order of the items by weight. Then, ask your child to record their observations by writing the weight of each item on their observation sheet. Next, ask your child to feel each item and record their relative temperature on the observation sheet. Are the items warm, cold, or lukewarm (in between). Then, fill your sink or a container with water. Ask your child to choose one item and predict whether it will float or sink. Ask them to explain why they believe this will be the case. Allow your child to drop the item into the water, noting whether it sinks or floats on their observation sheet and whether or not their predictions were correct. Help them note the effect of water being added to the item as well (e.g. did it melt, lose color, get bigger, get smaller, change texture, etc.). Place the item on a towel and continue testing each item individually, recording observations as you go. Next, ask your child to place each item on a paper plate and put them in the freezer for 15-30 minutes. Help your child note the changes the items went through in the cold on their Observation Sheet. Did the item change color, shape, or size? Did the temperature change? Did it become more brittle? Then, place one item at a time in the microwave (soap last) for 1-2 minutes. Ensure an adult handles the items and uses proper safety equipment. Help your child note the changes the items went through when heat was added on the observation sheet. Finally, ask your child to review their recorded observations. Do they see any similarities between the items? What do those items have in common? What was surprising about their results?

Observation Sheet 23

	Ice Cube	Crayon	Chocolate Bar	Marshmallow	Lollipop	Cup	Soap
Weight							
Temperature							
Buoyancy							
Heated							
Cooled							
Water Added							

Title of Lesson 24: Vibrating Air

Standards Taught: S.1.3.1		
Materials: This Video 6 glasses or tumblers, roughly the same size Water Pencil/pen	**Preparation:**	**Implementing the Lesson:** Ask your child to make a few different sounds such as saying a word, barking like a puppy, meowing like a cat, or whistling like a bird. Then, ask your child if they can explain how sound gets from their mouth to your ear so that you can hear it. Ask your child to make one of the sounds again, this time with their hand on their vocal cords (throat). Point out that they can feel something in their throat moving. Explain that this is their vocal cords. When they speak, they breathe air out of our lungs. The vocal cords shake, making the air move. This movement, along with the shape of our mouth, produces sound. The air, still vibrating, comes in contact with the air around them, making it vibrate, too. The vibrations move across the room to where you are, and into your ear, making it vibrate, too. Your brain then translates these vibrations into sound. We can't see the vibrations in the air, because air is transparent. Explain that there is a way to see movement making sound, though. Show your child the video, pointing out that the sounds of the guitar are made from the vibrations of the strings. If the strings don't move, there is no sound. The movement of the strings creates movement in the air around them. Those movements eventually make their way to your ear and your hear music. Explain that there is another way to see the vibrations that create sound. Give your child the six glasses and help them fill each glass to different levels with the water. Line the glasses up from least to most full. Allow your child to gently tap the side of each glass, noting the different sounds they hear when they do. Explain that the different levels of water make the glass vibrate differently when it is struck. Different vibrations create different sounds. Next, ask your child to observe what happens to the water in the glass when it is struck. Point out that the water ripples, showing the vibrations that cause the sound. Allow your child to continue to experiment with the glasses and sounds until they are satisfied.

Title of Lesson 25: Light and Dark

Standards Taught: S.1.3.2. S.1.3.3		
Materials: Flashlight Dark room Glow Stick Reflective material (e.g. bicycle reflector, aluminum foil, mirror) Three stuffed animals or action figures, different colors	**Preparation:** Place each of the stuffed animals throughout the dark room	**Implementing the Lesson:** Briefly review what your child learned about sound and vibrations in the previous lesson. Then, explain that today we are going to learn about another thing that travels across distances: light. Ask your child to describe sources of light they are familiar with (e.g. fire, electric lights, flashlights, the sun, glow sticks). Ask your child to discuss ways light helps us, including how it helps us see better, helps us grow, and helps our food grow. Point out that when it is very dark it's difficult to do certain tasks like reading, cooking, walking through a room, or building a tower of blocks. Point out that when there is light, the darkness goes away. Next, take your child to the dark room. Sit in the dark and ask your child to discuss what they can see without light. Point out that it is difficult to see anything because our eyes need light to see. Turn on the flashlight and point it in one corner of the room. Ask your child to describe what they can see now. Can they see the entire room? Why or why not? Point out that some areas may be brighter than others, allowing them to see better on one side of the room than the other. Move the flashlight around, asking your child to tell you what they see. Using the toys, point out that different colors are easier to see in the dim light of the flashlight than others (e.g. white is easier to see than purple or blue). Next, allow light into the room by turning on an electric lightbulb or opening the door to natural light. Ask your child if they can see more objects at a time with this brighter light. Point out that colors stand out more, objects are not hidden in the dark, and their eyes can process much more of the room than with the dim light of the flashlight. Finally, explain that sometimes we can see items better in the dark because they make their own light or they reflect the light coming from somewhere else. Show your child the reflective material and ask them to place it in the dark room. Turn off the lightbulb or close the door again. Allow your child to point the flashlight at the reflective material and observe what happens. Explain that this item is not making its own light, it is simply shining the light from the flashlight back at other objects. Turn off the flashlight and give your child the glow stick. Point out that the glow stick is not getting light from another source, but it is making its own light. This makes it easy to see, even when it is dark.

Title of Lesson 26: Light Shining Through

Standards Taught: S.1.3.3		
Materials: Flashlight Piece of clear plastic/clear plastic container Piece of colored plastic Piece of wood Fabric Wax paper Cardboard Clear glass of water	**Preparation:** Close the windows and doors and turn off the lights in the room you will be using	**Implementing the Lesson:** Ask your child to review what they learned about light and how it helps us see in the previous lesson. Then, ask them to tell you what happened when the light was shone on the reflective material. Point out that different objects react differently to light. Some, like the toys, are simply seen in the light. Others, like the reflective material, shine the light to another area. Other items, like the glow stick, create their own light. Show your child the items you've gathered and discuss each one. Point out that each of these items will react differently to light being shone on it. However, today we will be observing the light that gets stopped or goes past these items and shines on the wall. Hold the flashlight up with the clear plastic in front of it. Point out that the light shows us the plastic, but some of it also shines onto the wall behind it. This is because the plastic material allows some light to travel through. Ask your child to repeat the experiment with each of the items, noting the amount, color, and pattern of the light shines through. Point out that some items, like the wood, do not allow any light to pass through and create a shadow on the wall. Others change the color of the light, the shape of the light, or the brightness of the light. Allow your child to experiment with other items around the house, noting how it blocks or allows light to travel through. This is a great time to do shadow puppets, too, noting that your hands block the light from getting to the wall and making pictures from the darkness.

Title of Lesson 27: Communicating Across Distances

Standards Taught: S.1.3.4		
Materials: Varies, depending on your child's chosen communication method	**Preparation:**	**Implementing the Lesson:** Ask your child to briefly review what they've learned about sound and light in the previous lessons. Point out that sound and light can both travel across rooms to affect what we see and hear. Explain that humans have created tools and methods to use both light and sound to communicate over large distances, too. In fact, sound has been used to carry messages across entire fields and sound can carry them across many miles. Share the following examples with your child: During the Revolutionary War, soldiers needed a way to hear the commands from their leaders on the battlefield. Since the fighting was so loud, it was difficult to talk or even scream loud enough for others across the field to hear. So, special soldiers were trained to play drums, which could be heard above the noises of battle. Different drumbeats stood for different instructions. Drums used sound to communicate across a distance. Long ago, people in China were afraid that they would be invaded. They built a wall to protect themselves, but phones, televisions, and computers did not exist yet. How would the people on the wall warn others if the invaders were coming? They used light. Huge piles of wood were placed at different parts of the wall. When the invaders came, the solider who saw them would light the wood on fire, making a bright light. When the soldier at the next pile of wood saw the light, he would light his pile. This went on for miles, making sure all the people in China were warned to be ready long before the invaders could get very far. Ask your child to design, build, test, improve, and use a system of long-distance communication that uses sound or light. Some ideas include: a loudspeaker, a code using musical instruments, a code using a flashlight, or a paper-cup telephone.

Title of Lessons 28-29: Explore

Standards Taught: Review		
Materials: Varies	**Preparation:**	**Implementing the Lesson:** Part of science is being willing to ask questions and work to find answers. Ask your child to tell you what they would like to learn about or build in science during these two weeks. Maybe they've seen an experiment someone else did. Perhaps they've been wondering how something works. Or maybe they have a new book full of engineering ideas. Allow your child to choose two science experiments based on their own interests. Collect supplies, prepare, and carry out these experiments with your child. Spend time researching the science behind them and teach your child what you learn. Chart, graph, record, and collect and present data from your experiments. Encourage your child to share what they learn with family, friends, or others. *This is a great time for a co-op science fair