Summer in Space

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Return to Summer Learning Adventures.

WEEK 4: SUMMER IN SPACE

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FUN THINGS WE'RE DOING

- ☐ Make a Bedroom Planetarium!
- ☐ Create a CD Spaceship
- ☐ Set Up a Solar System of Kids
- ☐ Layers of the Earth Project
- ☐ Build a Rocket Ship
- ☐ Crayon Resist Painting
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- ☐ Make a Galaxy Mobile
- ☐ DIY Jetpack
- ☐ Backyard Astronomy

EXTRA CREDIT ADVENTURES

- ☐ Take a special nighttime trip up to the top of a nearby hill, and stargaze without the glare from city lights
- ☐ Read about Hercules, a character from Greek mythology, then find his constellation in the night sky
- ☐ Visit a local planetarium or science center, and see a star show or look through a powerful telescope

THINGS WE NEED

- ☐ Aluminum foil
- ☐ Blanket
- ☐ Constellation book
- ☐ Cream of tartar
- ☐ Empty oatmeal container
- ☐ Empty paper towel roll
- ☐ Extra supplies: Tape, crayons, push pin, utility knife, ruler, duct tape, paintbrushes, markers, pencil, glue stick, scissors, stapler, scotch tape, painters tape, hot glue gun, string
- ☐ Felt
- ☐ Flashlight
- ☐ Flour
- ☐ Food coloring
- ☐ Glitter
- ☐ Large cardboard box
- ☐ Old CD
- ☐ Paper: Black construction paper, cardboard, watercolor paper, white paper, tissue paper (orange, red, or yellow)
- ☐ Playing cards
- ☐ Salt
- ☐ Star stickers
- ☐ Tempera paint
- ☐ Tennis ball
- ☐ Toothpicks
- ☐ Two empty 2-liter bottles
- ☐ Vegetable oil

Make a Bedroom Planetarium!

If you're lucky enough to live near a museum or a university with a planetarium, you'll definitely want to take your child for a visit to explore outer space with him. But you don't need to pay the price of admission for this delightful constellation craft…you'll just need an old round oatmeal container, a flashlight, and a few other common materials. Help your first grader learn to recognize constellations with this fun and easy activity. Then, on the next clear night, take a walk and see if he can find them in the sky!

What You Need:

- Round cardboard oatmeal container with plastic lid, clean and dry.
- Plain flashlight
- Black paper
- Tape
- White crayon
- Constellation book
- Push Pin
- Pencil
- Construction paper, gold stars, and clear contact paper

What You Do:

1. Start by decorating your Starfinder: Have your child glue or tape sheets of construction paper around the outside of the container, and decorate it with as many of gold stars as he would like (you might even encourage him to mark out a few constellations right on the container).
2. When he's finished, help him to cover the whole design with clear contact paper (later, you'll be pulling tape on and off, and the contact paper will protect the design).
3. Now help your child cut a hole in the plastic lid with scissors or an X-acto knife, so that the flashlight can fit through.
4. Tape the lid around the edge so that the flashlight is secure.
5. Cut the round cardboard bottom out of the oatmeal can. Now use it to mark several circles on your black paper. Your circles should be larger than the original circle being used as a template. Trace a circle that is about ½" wider (all the way around) than the original circle cut from the oatmeal container.
6. Look up some key constellations in a science book (constellations like the Big Dipper, Little Dipper, Draco, Andromeda, and Orion or you can surf the internet to find pictures of constellations. You can make copies or print these templates out and then have your child trace them onto white paper. Cut around them to fit the inner circle of your Starfinder, and glue them onto one of the black circles you and your child cut out. Then take a thumbtack and lightly poke a hole where every star in that constellation appears. Help your child do this several times on several different circles.
7. Now put your whole starfinder together. Tape one black constellation circles to the end of your starfinder, and then pop the plastic lid onto the top, with the flashlight inside, facing toward the constellation end of the Starfinder. Each time your child wants to look at a new constellation, you can replace the constellation circle on the Starfinder with a different one.
8. Turn all the lights off in your child's room, turn on the flashlight in the starfinder, and see what you can see! Be prepared for oohs and aahs. With this activity, you and your child can bring the giant night sky into your very own home and do some star gazing from the comfort of your beds!

Create a CD Spaceship

The universe is a vast expanse filled with planets, stars, moons, and maybe even an alien or two! The possibility of another life form visiting Earth is something most every child has pondered, or at least seen on TV. Your child will delight in creating her very own flying saucer from an old CD, rubber ball, tin foil, and toothpicks. There is no telling where her imagination will go when given the opportunity to conceive of extraterrestrials in space! Furthermore, this entertaining activity will promote greener attitudes in your child as she sees how toys can be created out of recycled goods.

What You Need:

- CD (use an old or scratched one)
- Toothpicks
- Tennis ball or rubber racquetball
- Hot glue gun
- Tin foil (save used pieces)
- Permanent markers or paint

What You Do:

1. Ask you child to wrap tin foil around the outside of the CD. Help her glue down any parts that are loose.
2. Cut the rubber ball or tennis ball in half. Once the ball is cut, have your child wrap the outside of the ball in tin foil. Again, help her glue down any portions of the foil that are loose.
3. Remind your child that the spaceship probably has a central hub on the top of it. This can be created by gluing the cut ball half to the center of the top of the CD.
4. Ask your child how she thinks the spaceship would probably land. Let her come to her own conclusion, but suggest the possibility that there could be a few landing legs for the ship to touch down upon. This can be created by gluing three or four toothpicks to the bottom of the craft.
5. After the structure has been created, ask your child what else she envisions on an alien's spaceship. She can add lights with yellow paint or markers, or perhaps the ship will have blue, red, or purple lights. Your child can even draw in a few alien pilots on the central hub, as they might be visible from a window! Let your child decide what additions will make her craft complete.

This is a great way to integrate science as well. Your child may pose thoughts as to what exists beyond our very own planet, which you can respond to with basic lessons about the solar system. Your child's imagination will thrive as she plays with her new alien spaceship!

Set Up a Solar System of Kids

Abstract science concepts, such as vast distances, are often difficult for children to grasp. Use this kinesthetic learning activity to help your fourth grader envision the solar system and its immense size by creating a small scale map of the solar system—using human planets! Your child—and seven of his closest friends–will be one step ahead of the game when they are expected to understand the solar system in school.

What You Need:

- Field or large open space
- 8 children

What You Do:

1. Stand at one side of the field (home base will work well if it is a softball field). Explain to the children that you are going to make a map of the solar system. You will represent the Sun and each of them will represent a planet. The scale you will be using is one step = 36 million miles.
2. Pick a child to mark the place of Neptune. Neptune is 2.8 billion miles away from the sun, or 78 steps. Have this child walk 78 steps in a straight line away from the Sun.
3. The next child represents Uranus, 1.8 billion miles, or 50 steps, from the Sun. This child should follow the same path as Neptune.
4. Next comes Saturn, 885 million miles, or 25 steps from the Sun.
5. Jupiter should stop 483 million miles, or 13 steps from the Sun.
6. Mars is only 142 million miles, or four steps, from the sun.
7. Earth is 93 million miles, or three steps, from the sun.
8. The child representing Venus only needs to take two steps to reach 67 million miles away from the sun.
9. Closest in is Mercury, at only 36 million miles (one step) from the sun.

When they are done with the activity, call the kids back in for a discussion. Given these distances, how long would it take to travel between planets? It took Mariner 4 about 6 months to reach our closest neighbor—Mars. Ulysses reached Jupiter in about 14 months. Voyager II took 12 years to reach Neptune. What will be necessary before space travel, even just within our own solar system, is possible?

Layers of the Earth Project

Is your fourth grader a hands-on learner? If so, just reading about the layers of the Earth may not be enough to inspire or even interest him. Turn the abstract lesson into a practical craft with the fun and colorful creation of dough earth layers!

What You Need:

- 2 cups flour
- 1 cup coarse sea salt
- 4 teaspoons cream of tartar
- 2 tablespoons vegetable oil
- 2 cups water
- Cooking pot
- Spoon
- Cutting board
- Food coloring

What You Do:

1. Have your child put the flour, salt, cream of tartar, vegetable oil and water into the pot.
2. Heat on low, stirring constantly. The dough will start to come together and become very thick.
3. When the dough pulls away from the sides of the pot, remove it from pot and knead for 1-2 minutes. You will notice that there are still crystals of salt. Remind your young learner that the earth is made up of a wide variety of minerals. These salt crystals are a visual reminder of that fact.
4. Help your child separate the dough into 6 balls of increasing size, starting with a ball about 1 inch in diameter.
5. Your child should now use the food coloring to dye the balls one at a time, starting with the smallest ball. This one is red. Add 6 drops of food coloring. Fold into the dough with a spoon until the coloring has blended in partially and then use your hands.
6. The next largest ball is going to be orange. Add 4 drops of yellow food coloring and 2 drops of red. Repeat the mixing process. The proportions of food coloring for the other balls of dough, smallest to largest, are as follows: yellow/7 drops yellow coloring; green/7 drops green coloring; grayish green/7 drops of red food coloring, 2 of green, 3 of blue, and 3 of yellow coloring; blue/7 drops of blue. Add and mix as directed in step 5.
7. Now your child will form a cut away model of the Earth. First, he will make the inner core. Working with the red ball of dough, he should press it onto the cutting board, until it is flattened on one side.
8. Next he will add the outer core, the orange dough. He should flatten this dough into a pancake and drape it over the red dough, pressing it close without smashing the half ball flat.
9. Next comes the mantle, the yellow dough. Again, he should made a pancake and add this to the outside of the half ball.
10. Repeat this process with the crust (the grayish green dough) and the water (the blue dough).
11. Last but not least, he should use the green clay to form land masses and press them onto the half globe.
12. Viewed from the top, he can see the Earth – land and water. But if he carefully picks up his model and turns it over, he will see a cutaway model of the Earth – red inner core, orange outer core, yellow mantle, greyish crust, blue water and green land.

Build a Rocket Ship

Plan a trip to the moon or through the rings of Saturn while you show your child how to make a rocket ship. Fortunately, you don't need a NASA budget to make this rocket a reality. This activity requires time and patience, but it's a great way to teach kids about construction and measurement. Your kid will put her creativity to use as she paints, decorates, and designs. This project requires a lot of cutting with a sharp utility knife. Make sure you do these steps yourself, but encourage your child to help with measuring and assembling whenever she can.

What You Need:

- A large cardboard box (such as a cabinet box or a dishwasher box)
- Additional corrugated cardboard
- Utility knife (and an adult to use it)
- Straight edge
- Pencil
- Packaging or duct tape
- Tempera or other craft paint
- Paintbrush
- Optional decorations including glow-in-the-dark stickers

What You Do:

1. The large box is the base of the rocket. Start by cutting a door so that little astronauts can enter and leave their rocket ship. You can cut three sides of the door and fold it back so that it is "hinged" or simply cut it out entirely to leave an opening. For an especially big rocket, cut port hole windows as needed to light the interior.
2. Nothing is worse than an unstable rocket. Cut several triangles from the extra pieces of cardboard and help your young astronaut tape these tail fins to the base of each corner.
3. Now it's time to make the nose of your rocket. This will require four corrugated cardboard triangles. Pick one side of the box and attach the triangle to it. The base of the triangle should be the same as the side of the box. Use the straight edge to add the remaining two sides of the triangle; make them equal in length and note this length for the remaining triangles. Repeat this step to make three more identical triangles.
4. Tape the triangles together to form a pyramid. Then tape the pyramid to the top of your rocket.
5. Help your astronauts decorate their rocket ship. They can use paint, glow-in-the-dark stickers or markers.
6. Once the rocket ship is all decorated, use it in some imaginary game play! For extra fun, make some mini marshmallow poppers. They're the perfect alien defense system!

Make Summer Screen Time Matter

Help your child keep learning this summerâ€”and prevent the summer slideâ€”with Brainzy, our fun math and reading program for young learners. Brainzy helps kids practice key skills with imaginative characters, catchy songs, and original stories. Try it free.

Return to Summer Learning Adventures.

Crayon Resist Painting

This outer space art project is out of this world! It's filled with colorful planets, rockets, astronauts, satellites, aliens and anything else your young explorer can imagine. This project is a fantastic way to follow up a visit to a science museum or planetarium. It's also a great way to extend knowledge of our solar system while encouraging your child's imagination.

What You Need:

- Watercolor paper, 8.5" x 11"
- Crayons (take out the dark colors)
- Black tempera paint
- Water
- Paint palette
- Flat paint brush

What You Do:

1. Share photographs of outer space with your child. You can look up images on the Internet of the solar system, satellites, astronauts, space stations, spaceships and galaxies. Also, take a look at artist renderings of aliens or outer space fantasy worlds to jump start her imagination. One very fun website to visit is the Nasa Kid's Club.
2. On white paper have your child color her version of outer space using crayons. She should use vivid colors and press down hard with the crayons—solid shapes without any paper showing through will give the best results.
3. Scoop out some black paint onto a paint palette and check its consistency. If it's thick, add a little bit of water. The paint should be similar to the consistency of hot chocolate.
4. Mom or dad should help with brushing the black paint over the entire picture in even strokes going in the same direction. If the paint is too thick, it won't be resisted by the crayon and will turn the entire picture black. If the paint is too thin, it may go on as gray and require two coats of paint. It's best to test a small section before covering the entire picture.
5. Allow the space exploration picture to dry.

Your child can make a whole collection of these space scenes to string up for an out of orbit effect!

Tour the Planets

Learn the planets while working on math! This learning mash-up is a great way to get your child interested in science and math while competing with his friends. Players will navigate the game through addition, subtraction and multiplication while exploring the solar system. Whoever colors in the most planets wins!

What You Need:

- White paper
- Markers
- Deck of cards with the face cards (jacks, queens, and kings removed)
- Pencil

What You Do:

Create The Scoresheet:

- Each player makes their own coloring sheet on a vertical piece of white paper. In the center of the page, draw the outline of a sun with a black marker.

- Draw 9 concentric rings around the sun, one ring per planet or moon in our solar system. Make a black outline drawing of each planet or moon on it's orbital line. They can be drawn as creatively as you like!

- Next to each drawing, write the corresponding initial. The initials in order around the sun should be: M, V, E, M, J, S, U, N, P.

-Have your child shuffle the deck and place it face down.

Play The Game:

1. Ask your child to shuffle the deck and place it face down. For this game aces= 1.
2. Each player takes 2 cards at a time. They can choose to use any math system including addition, subtraction, or multiplication to combine the two cards they choose, trying to end up with any number between 1 and 9.
3. If the answer is between 1 and 9, the player gets to color in the corresponding planet in order of their distance from the sun. For example, if a player's number is 5, they would color in Jupiter, because it's the 5th planet from the sun.
4. Players can only color in the planets if their math is correct, they can name the planet, and the planet has not been colored in yet by another player.
5. When all the planets have been named, each player should count the number of planets they have colored and whoever has colored the most planets is the winner!

Make a Galaxy Mobile

This is a perfect follow up project for a visit to the planetarium or studying outer space. Make a stellar galaxy mobile using cardboard, black construction paper, paint and glitter. Hang your galaxy mobile in your room for a dazzling show of outer space!

What You Need:

- Cardboard, 1 sheet 11” x 17”
- Black construction paper
- Tempera paint
- Paintbrushes
- Glitter
- Paper tape
- Glue stick
- String
- Pencil
- Scissors

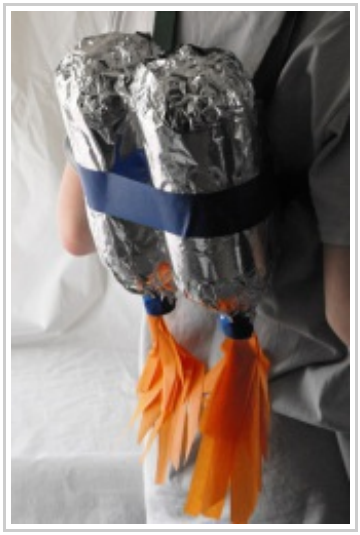
What You Do:

1. Cut a circle disc from the cardboard that all of the galaxies will hang from. Puncture three small holes in the shape of a triangle on the edges of the disc. Set it aside.
2. Draw images of galaxies onto the black construction paper. They should be at least the size of the palm of your hand. Cut them out with scissors.
3. Tape a piece of string on to the back of the galaxies. The strings can all be different lengths.
4. Paint all of the galaxy shapes with different colors of tempera paint on both sides and allow them to dry. Make sure to paint over the tape.
5. Rub glue onto the painted galaxies with a glue stick, then sprinkle glitter on top of the paint. Allow to dry.
6. Attach each string to the top of the disc using tape. Make sure each string is a different length and they are evenly spaced apart from one another.
7. Paint black over the tape and on both sides of the disc. Allow to dry.
8. Cut three pieces of string 10” long each. Tie a knot on one side of each string, and then thread each string through the holes in the disc. Tie them together in a knot at the length you want to hang your galaxy mobile.

Helpful Tip:

You can find images of galaxies on Wikipedia at this link:
http://en.wikipedia.org/wiki/File:Hubble_sequence_photo.png

DIY Jetpack



Help your child rocket off for some high-flying fun with a jetpack you make from recycled materials and a few odds and ends. Unlike many other jetpack craft tutorials, this one does not require spray paint which can make the craft difficult to complete if you're an apartment dweller. Your child can also do much more of this spray paint-free project himself for a greater sense of accomplishment.

What You Need:

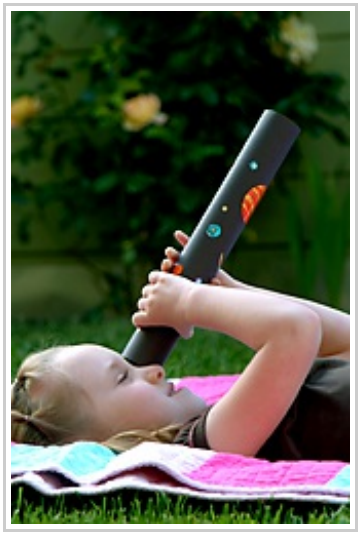
- Two 2-liter soda bottles with lids
- Corrugated cardboard
- Felt or polar fleece
- Scissors
- Stapler
- Orange, red or yellow tissue paper
- Aluminum foil
- Scotch tape
- Painters tape

What You Do:

1. The first three steps are for the adult to do: Cut a square piece of corrugated cardboard approximately 8 inches by 8 inches. This is the base onto which you will staple the shoulder straps and tape the jets. It should be small enough not to be seen behind two soda bottles lying side by side.
2. Cut two strips of felt, long enough to be shoulder straps so that your child can comfortably wear his jetpack. Make each strap approximately 1 inch wide.
3. Staple these straps onto the top and bottom of the corrugated cardboard square.
4. Now it's time to get your child involved. Have him cut strips of tissue paper to be the flames. They don't have to be over an inch wide and can vary in length. They can also be jagged on the bottom so that they look a bit more flame-like.
5. Help him make two stacks out of these strips, fanning them out slightly. Staple each stack.
6. Tear off two large pieces of aluminum foil and use one to cover each of the soda bottles, carefully fitting the foil to each bottle. Tape the long seam of the foil with small pieces of scotch tape.
7. Use one long piece of painters tape to tape the soda bottle jets to the cardboard base.
8. With smaller pieces of tape, fix the flames to the bottle lids.
9. Now turn your child loose for some high-flying fun!

Host an outer space themed birthday party with jetpack building as a craft activity. Then your astronauts can stage races of various kinds to see which jetpack is the fastest.

Backyard Astronomy



You've probably heard the rhyme, "Twinkle, twinkle, little star, how I wonder what you are." Answering this question in terms that a five-year-old can grasp may not be as hard as you think. In a nutshell, everything in the sky is either making light or reflecting light. Stars make light, while the moon and planets reflect light. Your child will likely be fascinated to know that our own sun is a star. And come nighttime, you and your child can enjoy gazing up at the night sky together without any special equipment needed. Backyard astronomy is the perfect activity to enjoy with your child (and the whole family!) on those warm, clear Spring and Summer nights.

What You Need:

- Empty paper towel roll
- Stickers of stars and planets
- Paint
- Internet or local newspaper
- Blanket

What You Do:

Make a Telescope

While you won't be able to see any far out planets with an empty paper towel roll, it will help your child focus on what she's looking at. To make this homemade "telescope", have your child paint her paper towel roll and decorate it with stickers of the stars and planets. Getting your child involved in the process will build anticipation for the evening.

Research the Night Sky

Some constellations are easier to see than others. Ursa Major, "The Great Bear", is the most popular constellation because it is visible in the Northern Hemisphere year round. The Big Dipper is actually not a constellation at all, but part of The Great Bear. And the North Star, Polaris, is not the brightest star in the sky, but a very important one. Because of where it sits in the sky it appears not to move, making it the marker to find north from anywhere on Earth! Orion, "The Great Hunter", is another favorite of junior astronomers and easily visible from January through April. Teaching your child the legends behind the constellations may also helps her remember what to look for and get excited about it along the way. For example, Orion is the great hunter of the night sky traveling with his two loyal dogs - the constellations Canis Major and Canis Minor. The three stars which make up Orion's belt that hold his sword are easy to spot. And from there you can locate an array of other constellations.

Not sure what to look for? Using the Internet is a quick and easy way to find out which stars are currently in your area. Check out googolplex.cuna.org and www.astronomical.org. You can also often find this information in your local newspaper.

Let the Gazing Begin

You will probably have to let your child stay up a little later than usual, but lying in the backyard with mom and dad looking at the night sky will be an experience well worth it! It will take your eyes 30-40 minutes to adjust to the darkness, so be patient. As your child looks up at the stars with her handmade telescope, ask your child, *"What do you see in the sky?"* Explain that the stars make pictures called constellations, and that constellations are used to help people remember which stars are which. Check out the brightest

star in the sky, Sirius, part of the Big Dog constellation.

On a clear, dark night, you can see between 1,000 and 1,500 stars with the bare eye. Point out a few constellations but also encourage your child to find her own pictures in the sky. If she were an astronomer, what would she name them?

This is a fun way to introduce the beginning concepts of astronomy and get your child excited about something science-related. It's also a great way to spend a summer night with the whole family involved.