

Space Is the Place

WE'RE SO GLAD YOU DECIDED TO JOIN US!

At UM Pre-College Programs, we believe that kids need to learn actively – through play, creativity, movement, and interaction. You'll see some videos linked here, but we've chosen to emphasize activities children can do away from screens.

We will be releasing these guides throughout the summer to help fuel your summer explorations. Enjoy!

HOW TO USE THIS PACKET

Each day has four elements to balance children's daily experience. We've divided each element into things kids can do (mostly) by themselves (depending on their age), and things they'll need more adult help with. Some of the "on your own" activities may require adult help because they involve reading, using scissors, etc.



INVESTIGATE is all about absorbing information and testing that information out. You'll find instructional content and hands-on activities here.



CREATE is all about making things – art, design, building, doing. These activities offer reflection space complementing the investigation material.



MOVE is all about physical activity. We want to encourage children to pull away from the screens and the books and move in ways that help them physically respond to the weekly theme.



JUST FOR FUN Playing is important, even if sometimes it's not directly related to the academic learning children are doing. Growing brains need down time to process information, and also — it's summer!

Supply List at a Glance

EVERYDAY ITEMS

- Pencils
- Paper (construction and plain copy)
- Index Cards
- Crayons, markers, or colored pencils
- Scissors
- White glue or glue stick
- Stapler
- Tape (packing, masking, duct, and transparent)
- Acrylic paint and brushes
- Ruler, yard stick, tape measure
- String and/or yarn
- Balloons (variety of colors)
- Aluminum foil, cling wrap, and wax paper
- Glitter
- Cereal boxes or thick cardstock
- Paper plates
- Straws
- Toothpicks

DAY 1

Eat the Solar System: watermelon, large grapefruit, small apple, lime, grapes, blueberry, raisin

Build a Moon Habitat: 148 sheets of newspaper (15x20" or larger)
(Optional: Bed sheet, tissue paper)

DAY 2

Make a Vacuum Experiment:

- Candle and jar or glass that can fit over
- Food coloring
- Plate

Starshade: stylus or empty ballpoint

Nighttime Planet Toss

- Frisbee
- Glow-in-the-dark acrylic paint

Space Slime

- Borax
- Red and blue food coloring
- Two bowls
- 1/2 and 1 cup measuring cups

DAY 3

Planetary Scavenger Hunt: Rocks

Driveway Galaxy: Sidewalk chalk

Pushlight Planets: Tap lights

Build Your Own Spacecraft

- Edible: (you can use some or all of these!)
Some of your favorite snacks — rice crispy treats, graham crackers, pretzels, gummy candy, licorice twists, frosting
- Non-edible: small boxes, plastic cups and bowls, popsicle sticks, nuts, bolts, paperclips, CDs, shiny paper, rubber bands, sponges, velcro

DAY 4

Build a Planetary Habitat: Blocks, LEGO®, or cardboard boxes

Catch the Alien: hula hoop (optional)

Pop Rocket Launcher

- 2-liter plastic soft drink bottle, empty and rinsed
- 2 1/2" PVC tee connectors
- 1 1/2" PVC connector
- 2 1/2" PVC caps
- 5' length of 1/2" PVC pipe
- Eye protection

Moonwalker Relay Race

- Coffee cans (2 for each moonwalker)
- Twine or thin ropes

DAY 5

Constellation Show

- Flashlight
- Thumb tack or push pin

Low-Tech Spaceship

- Big box
- Empty paper towel rolls
- Streamers

Indoor Astronaut Training Course: crepe paper

Space Is the Place

Day One: What Is Space, Exactly?

TODAY IS ALL ABOUT

We look up at the sky at night and see darkness with points of light. But what is – and isn't – space made of? What else is out there? This week we will focus on learning the names of some of the features of space we observe in our solar system and beyond. We will also explore our relationship to the planets – how they capture our imaginations.



INVESTIGATE

On Your Own WATCH

Early Elementary

"Planets of Our Solar System" <https://youtu.be/d8y8kc317EE>

Late Elementary

"Space Compilation Crash Course" https://youtu.be/Td_A9H69eE8

With an Adult TALK ABOUT IT

You just saw a video about space, but what are some of the things you still don't know about space? If you were studying space, what are the most important questions you'd want to answer?



MOVE

On Your Own MOVE TO THE MUSIC

Dance or move to the music as you listen to **Gustav Holst's *The Planets***.

<https://www.youtube.com/watch?v=Isic2Z2e2xs>

What is the mood of each planet? Can you think of stories that might go with each one?

With an Adult BUILD A MOON HABITAT

<https://spaceplace.nasa.gov/moon-habitat/en/>



Snap a pic and share your creation! Tag us on Instagram @umprecollege



JUST FOR FUN

On Your Own MAKE A "BOREDOM BOX"

Cut colorful paper into squares. On each square, write down an activity that you'd like to do. Put them all in a small box, or make your own box with the template on page 2. Decorate the box with colorful paper, markers, glitter, etc.

Next time you're bored, draw a paper from the box and do that activity!

ACTIVITY IDEAS:

Invent a new game, Play balloon tennis, Draw a sidewalk chalk town with roads for your toy cars to drive around, Create a stuffed-animal safari



On Your Own DESIGN A SPACE MAZE

CREATE

<https://www.fun-stuff-to-do.com/how-to-make-a-maze.html>

Supplies: paper, pencil, markers and/or colored pencils

1. Draw a picture of a rocket in the upper left-hand corner of your paper.
2. Draw a planet – make it a really interesting one – in the lower right-hand corner of your paper.
3. Draw a maze connecting the rocket and the planet! See if someone in your family can find their way through the maze you've made.

With An Adult EAT THE SOLAR SYSTEM

Supplies:

- 1 watermelon
- 1 large grapefruit
- 1 small apple (like a Granny Smith)
- 1 lime
- 2 grapes
- 1 blueberry
- 1 small raisin

(You can substitute any of these for fruit/vegetables of a similar size.)

Using information from the internet, try to match each piece of fruit with a planet. (Hint: which is the largest planet? Which two planets are almost identical in size?)

Find an answer key here:

<https://www.open.edu/open-learn/ocw/mod/oucontent/view.php?id=66947§ion=2.1>

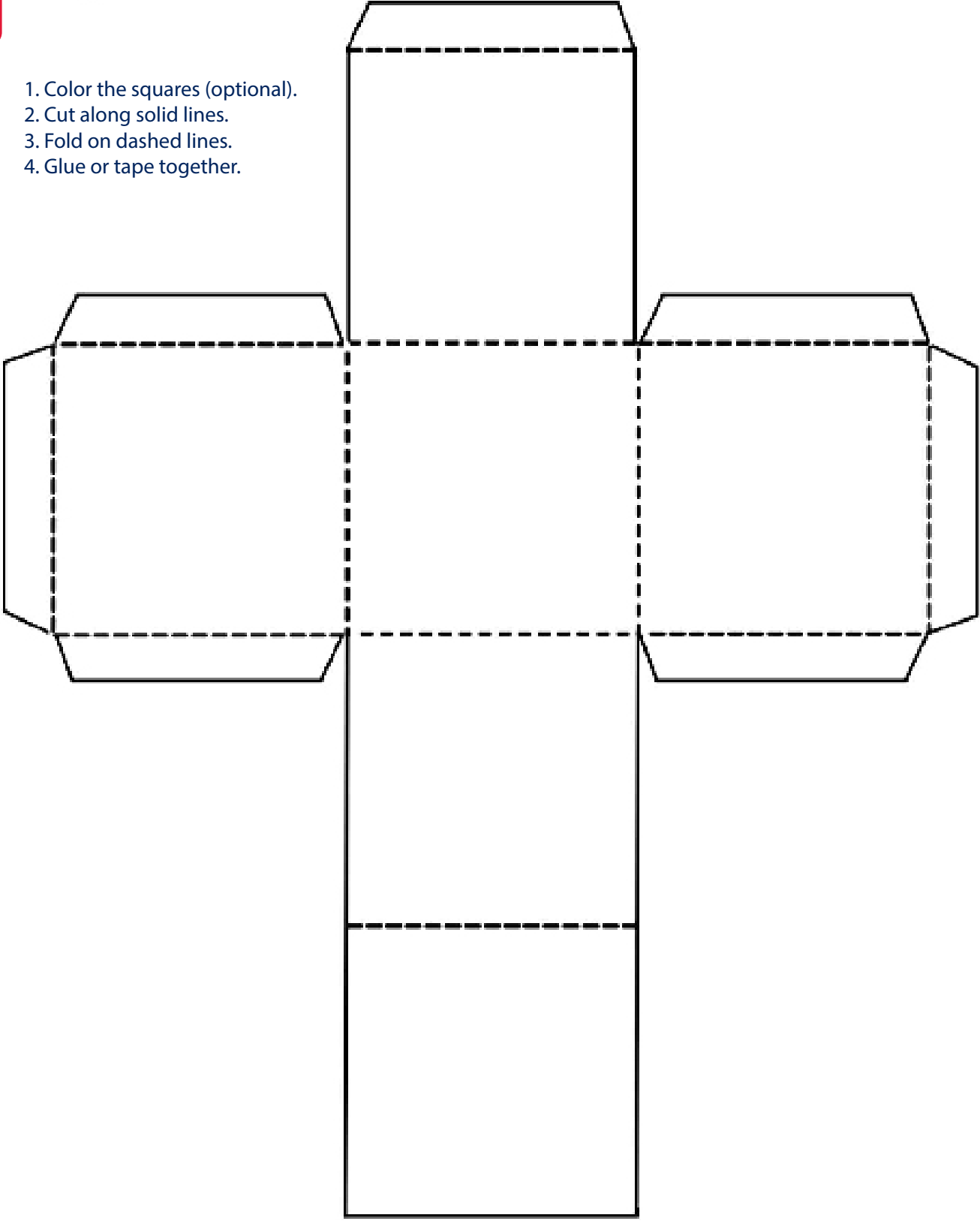
Day One: What Is Space, Exactly?



On Your Own "BOREDOM BOX" TEMPLATE

JUST FOR
FUN

1. Color the squares (optional).
2. Cut along solid lines.
3. Fold on dashed lines.
4. Glue or tape together.



Space Is the Place

Day Two: Space Is Weird – Really Weird.

TODAY IS ALL ABOUT

We know that in space, some of the things we think are normal just aren't normal anymore. You drop an egg, and it doesn't fall and splatter. It just floats off. So this week we're going to learn about how - and why - things work differently in space. How can you tell time? What would happen if you got near a Black Hole? We'll answer these questions and imagine what it would be like to experience the weirdness of space.



INVESTIGATE

On Your Own WATCH AND RESEARCH

Early Elementary

"What Is a Black Hole?" https://youtu.be/OfMExgr_vzY

Guide to Black Hole Safety: <https://svs.gsfc.nasa.gov/13322>

Late Elementary "9 Space Facts That Will Blow Your Mind"

<https://youtu.be/JipLCxRBHaQ>

Astronaut Chris Hadfield Debunks Space Myths

<https://youtu.be/t6rHHnABoT8>

What Time Is It in Space?

<https://nasaclips.arc.nasa.gov/video/realworld/real-world-what-time-is-it-in-space>

With an Adult VACUUM EXPERIMENT

SPACE IS A VACUUM https://youtu.be/iSe_R87kF6U

"Make a Vacuum" Experiment <https://youtu.be/-K2ti9S6aUI>

In this experiment, you will create a vacuum inside a glass cup or jar using a candle, so you'll need the help of an adult. What do you think will happen to the water as the candle burns in the jar?

Supplies: plate, water, food coloring, candle and a jar or glass large enough to fit over the candle.



On Your Own POSTCARDS FROM SPACE

CREATE

Supplies: index cards (or sheets of paper cut to 4x6"), markers and/or colored pencils

Make a series of "vacation-in-space" postcards. Make them weird and beautiful, and you can even add fun vacation catch-phrases like: "Greetings from a Black Hole: Wish you were here ...and I wasn't!" Write a note to family and friends on the other side!

With An Adult

MAKE A STARSHADE

We can learn a lot about exoplanets with existing technology like spectroscopy, but taking a picture could tell us so much more. Engineers could build a Starshade the size of a baseball diamond that could shield a telescope's camera from the light of a distant star. Flying tens of thousands of kilometers in front of a space telescope, Starshade's precise design would block light from a star so the telescope might be able to capture an image of the planets around the star. Scientists could then study these exoplanets to learn more about them and even search for signs of life. Build your own small model with this activity. Visit the site below to find out how, including a printable template! You will also need scissors and a stylus or empty ballpoint pen.

<https://www.jpl.nasa.gov/edu/learn/project/space-origami-make-your-own-starshade/>



JUST FOR FUN

With an Adult MAKE SPACE SLIME

Did you know that our universe is stretching out in all directions? It's true! Ever since the universe began, it's been stretching out and expanding. Even today, as we use telescopes to see galaxies far away, we see they are moving away from us.

In this activity, you'll make your own stretchy universe slime!

Supplies: Clear school glue, 1 teaspoon of borax, water, red and blue food coloring, Two bowls, Measuring cups: 1/2 cup and 1 cup, Glitter, Wax paper

Complete instructions:

<https://spaceplace.nasa.gov/universe-slime/en/>



MOVE

On Your Own NIGHTTIME PLANET TOSS

Paint a Frisbee with glow-in-the-dark paint (along with some regular colors) in wild, planetary swirls. Make sure you get plenty of glow in the dark paint on there. When it's dry, head out into the yard at night and play planetary toss at night!



Snap a pic and share your creation!
Tag us on Instagram @umprecollege

Day Three: Planetary Voyages

TODAY IS ALL ABOUT

Sure you know the names of the planets, but do you know what the planets are actually like? How much do you actually know about the hidden corners of our home, the Solar System? Learn about moons you've never heard of and get inspired by the beauty of our planetary neighbors.



On Your Own PLANETARY SCAVENGER HUNT

CREATE Collect rocks and paint each of them like a different planet. Then, hide them around your house or yard for someone else to find! Even better: leave them on nature trails or around your neighborhood as a surprise for strangers.

With An Adult PUSH LIGHT PLANETS

Bring the solar system inside with this art project. And at night as you go to sleep, you can watch your planets glow! Supplies: Tap lights, extra batteries, acrylic or glass paint, brushes, Mod Podge

<http://www.playathomemomllc.com/2012/05/push-light-planets/>



On Your Own DRIVEWAY GALAXY

JUST FOR FUN Pull out the sidewalk chalk and create a marvelous galaxy all your own. You can put in old constellations and new ones you've just invented. Make sure to include some space stations for astronauts!



Snap a pic and share your creation! Tag us on Instagram @umprecollege



INVESTIGATE

On Your Own WATCH AND RESEARCH

Early Elementary: How did the Solar System Form?

<https://spaceplace.nasa.gov/solar-system-formation/en/>

Moons in Our Solar System: <https://nasaclips.arc.nasa.gov/video/ourworld/our-world-moons-in-our-solar-system>

Late Elementary: NASA's Interactive Solar System

<https://solarsystem.nasa.gov/>

With an Adult TALK ABOUT IT

What are some facts you learned from the above websites that surprised you? CREATE A MATH PROBLEM BASED ON PLANET FACTS.

Make it simple enough that the adult can solve it! Then, ask them to solve it and explain what question the math problem solves.

For example: how much farther from the sun is Jupiter compared to Earth?

484,000,000	Jupiter's Distance
- 94,297,000	- Earth's Distance
389,703,000 miles	How much farther Jupiter is from the sun

Was this fun? Now make an entire worksheet of planetary math problems for an adult in your life that you know needs a little more entertainment.



MOVE

On Your Own SOLAR SYSTEM RACE

At your favorite park or in your backyard, assign a planet to different landmarks or objects — trees, rocks, even patio chairs. Make sure they're far from one another. Each item represents a planet: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune. Mark a spot to be the Sun. Start at the Sun and race from planet to planet, BUT each time you get to a new planet, you have to change how you're moving! You can do this alone and time yourself or play with friends.

Examples:

Sun to Mercury: RUN	Mars to Jupiter: WALK BACKWARD
Mercury to Venus: HOP	Jupiter to Saturn: SKIP
Venus to Earth: CRAB WALK	Saturn to Uranus: CARTWHEELS
Earth to Mars: CRAWL	Uranus to Neptune: SOMERSAULTS

With an Adult BUILD A SPACE CRAFT: Edible and non-edible versions

Now that you know what's out there, imagine a spacecraft that could explore our solar system! What would you want it to be able to do? Where would it go, and what features would it need to get the job done?

<https://spaceplace.nasa.gov/build-a-spacecraft/en/>

BUILD AN EARTH, MOON, MARS SCALE MODEL WITH BALLOONS

In summer, it feels like the sun is REALLY close to us in Mississippi. This scale model will put it all in perspective for you.

https://www.nasa.gov/audience/foreducators/k-4/features/A_Earth_Moon_Mars_Balloons.html



Snap a pic and share your creation! Tag us on Instagram @umprecollege

Day Four: Aliens and Astronauts

TODAY IS ALL ABOUT

On Earth, humans belong - we are perfectly adapted to live on our beautiful blue planet. But when we go into space, we're the ones who don't belong, we're the aliens. Today is all about how we launch ourselves into space - and how we survive once we get there. We'll also answer important questions like how to brush your teeth in space, and we'll get creative thinking about what life on alien planets might look like.



On Your Own WATCH

Early Elementary: If I Were an Astronaut: <https://www.youtube.com/watch?v=9wV8yw7iV8w>
How to Brush Your Teeth in Space: <https://www.youtube.com/watch?v=3bCoGC532p8>

INVESTIGATE

Late Elementary: The International Space Station: <https://www.nasa.gov/audience/for-students/5-8/features/nasa-knows/what-is-the-iss-58.html>

Rocket Science in 60 Seconds: <https://www.youtube.com/watch?v=MLgYJh6OF-bY&list=PLBEXDPatoWBmBVBjCSHID7H66slRoBYnCc&index=15>

With an Adult TALK ABOUT IT

Talk to an Adult: If you were an astronaut, what parts of the job would you like most? What parts of it wouldn't you like? If you could bring just one special thing into space, what would it be and why?



MOVE

On Your Own CATCH THE ALIEN

First, make an alien mask. You can use a paper plate, draw on it, cut holes in it for your mouth and eyes. Then use a hole punch to punch one hole on each side of the plate. Attach yarn or string to each of the hole-punched holes. Now you have an alien mask! Next, grab a hula hoop and step outside with a friend or sibling. One of you is the alien, the other is the alien catcher! Try to throw the hula hoop over the alien. If it touches the alien, the alien has to freeze for a count of 5. If the catcher catches the alien with the hoop, then you switch roles. Don't have a hula hoop? Play alien tag instead!



On Your Own ASTRONAUTS VS. ALIENS

A board game that's a race between players. You can design it to use dice rolls or you can have players draw cards to advance. Let your imagination go!

Things to think about:

- What's the goal of the game? How will you know who wins?
- How do players get to move toward the goal?
- What should the art look like?
- What will the player pieces be? Pennies work well.
- What rules do you need to have so the game is fair for everyone?

JUST FOR FUN

With An Adult ALIEN SQUEEZE BALL

All you need is a balloon, some flour, some water, and some permanent markers to make an alien head out of your squeeze ball. <https://laughingkidslearn.com/squeezy-ball/>



Snap a pic and share your creation! Tag us on Instagram @umprecollege



CREATE

On Your Own

ALIEN NATURE GUIDEBOOK

Imagine a new planet in space and decide what it's like. Does it have strong gravity? Does it have ground or is it covered in water? Mountains? What color is its sky? Is it hot or cold? You might even want to draw a map of it.

Now imagine what kind of creatures and plants might live there and make a guidebook with pictures and information about them.

Just grab 3-5 sheets of paper and staple them together in the middle to make a book. Be sure these creatures and plants are prepared to survive on the planet you've created! Include information about each plant or animal's name, habitat, eating habits, size, and lifespan.

Build a Planetary Habitat: Grab some blocks or Legos or cardboard and design a space station that could house people on the moon or a planet. What would astronauts need to keep them safe and help them feel at home? What kinds of scientific instruments or vehicles would help them do their job? What would their laboratories look like? Their kitchens? Their recreation spaces? For ideas: <https://www.youtube.com/playlist?list=PLTUZypZ67cdssByW4FxLdF-pbtAsWslymu>

With An Adult

BALLOON ROCKET

This simple experiment will help you learn about force, thrust, and pressure in rocketry. Try playing with your independent variables a little - with how much you inflate the balloon, with the angle of your string. And see if your balloon rocket can haul cargo!

<https://www.sciencefriday.com/educational-resources/balloon-rockets/>

POP ROCKET LAUNCHER

Take your rocketry to the next level with this simple pressure launcher. Fun for all ages, but adult help will definitely be required.

https://www.nasa.gov/pdf/295790main/Rockets_Pop_Rocket_Launcher.pdf

Day Five: Constellation Conversations

TODAY IS ALL ABOUT

Ancient people looked up at the night sky and saw more than a bunch of dots - they saw pictures and stories. Today, we still see those pictures and stories and have even added some new ones. But with the help of telescopes and other tools, we can now see what stars are made of and learn the histories of these bundles of energy and light. Learn to identify some constellations and create some new ones all your own!



On Your Own METEOR BLITZ

This is like Sly Fox, but imagine you're meteors hurling through space. One person is the Earth and stands with their back to everyone else. Everyone else stands at a line in the distance. When the Earth has their back turned, the meteors walk or run closer to Earth, but when Earth turns around, they freeze. If the Earth catches them moving, they have to go back to the start line. The first meteor to reach the Earth becomes the next Earth.

MOVE

With an Adult

INDOOR ASTRONAUT TRAINING COURSE

To move around in low gravity, astronauts need to be strong and agile. Make your own training course inside your house!

See instructions below.



On Your Own SPACE TRIVIA

You've learned a lot of facts this week. Make a trivia game that uses those facts. How many points will each fact be worth in the game? Will there be different fact categories?

Try playing your new game with the family at lunch or dinner.

JUST FOR FUN



On Your Own WATCH AND RESEARCH

Early Elementary: Constellations: Connect the Dots:
<https://www.youtube.com/watch?v=1sZ155UeS9w>

Late Elementary: The Universe: The Constellations (History):
<https://www.youtube.com/watch?v=QXeEAQtC75g>

How Do We Study the Stars?:
<https://www.youtube.com/watch?v=i7930fj3T54>

INVESTIGATE

With an Adult CONSTELLATION FLASH CARDS

Print these out, then take them outside at night. Do any of them match what you see?

<http://www.supercoloring.com/dot-to-dots/constellation-map?version=print>

You can also use the app Sky Walk on your phone to identify stars, planets, and even satellites.



CREATE

On Your Own CONSTELLATION SHOW

Create your own flashlight constellation cards and put on a show in your room! Why not add some new constellations you've invented, too? Then make a story to go with your new creation!

<https://www.pbs.org/parents/crafts-and-experiments/create-flashlight-constellations>

With An Adult EARLY ELEMENTARY: LOW TECH SPACESHIP

Take a large box and make it into a spaceship! You can make one for a toy or, if you have a REALLY BIG box, make a space ship you can climb into. You'll need scissors (and maybe have the adult do some of the cutting). Markers, tape, empty paper towel rolls, streamers, aluminum foil, and cling wrap (for the windows) are all good ideas. You'll want to make lots of buttons that do different functions on the space ship. What else will it need?



Snap a pic and share your creation! Tag us on Instagram @umprecollege

Day Five: Constellation Conversations



MOVE

With an Adult

INDOOR ASTRONAUT TRAINING COURSE

Instructions:

Agility Training: Tape crepe paper to the walls in zig zags, then try to get through the course without touching the crepe paper.

Strength Training: Pick a long room or hallway for this one. You have to go down it one way doing inchworms and come backwards the other way doing burpees.

Inchworm: Bend forward at the hips and place your hands on the ground with knees slightly bent, then walk them forward until you're in a plank position. Now walk feet in to meet your hands and stand back up.

Burpee: From standing, squat down, place your hands on the ground, and jump your feet back into a plank position. Lower body to the floor for a push-up. Push back up to plank. Hop feet back in and stand up.

Speed Training: Take 9 pieces of construction paper and draw one planet (and the sun) on each piece of paper. Decorate them so they look like the planets and the sun. Then lay them out on the floor in order, starting with the sun, so they're about one giant jump or one giant step apart for you. For this part of the training course, if you miss landing on a planet, you have to go back to the beginning of the planets and start again.