Meeting-in-a-Box: Space Night

*This meeting is aimed at **Guides** and covers most of the **Astronomy badge**. There are enough elements for about three hours worth of activities but you can pick and choose or run more than one meeting with this theme.*

Craft  Discussion  Game  Skills  Science 

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Supplies

- ☐ Masking Tape
- ☐ 2 pens/pencils per girl
- ☐ Paper
- ☐ Canadian $5 bill (or a picture)
- ☐ A basket ball
- ☐ A hula hoop
- ☐ A stress ball
- ☐ A tennis ball
- ☐ A golf ball
- ☐ A volley ball
- ☐ A ping pong ball
- ☐ A beach ball
- ☐ A soccer ball
- ☐ A piece of paper folded info a fan
- ☐ Freeze-dried ice cream
- ☐ 1 tin can/girl
- ☐ 1 tea light/girl
- ☐ 1 balloon/girl
- ☐ 1 straw/girl
- ☐ String
- ☐ Hammer
- ☐ Nail

Activity 1: Intro 

(10 minutes)

Start by asking questions:

- Can you name any planets? (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune)
- Do you know the names of any astronauts? (Chris Hadfield, Neil Armstrong, Roberta Bondar, John Glenn, Alan Shepard, Marc Garneau, Julie Payette, Yuri Gagarine…)
- Why do you think astronauts wear space suits? (temperature control, air, pressure, radiation, debris, eating/drinking, diaper, communication)
- Do you think girls can be astronauts?
- What requirements do you think you need to meet to become an astronaut?
- Did you know Roberta Bondar (the first Canadian woman in space) was a Girl Guide? She even took a box of Girl Guide cookies into space)
- Why do you think people go to space?
- What kinds of things are up in space?

Activity 2: True or False Game 

(15 minutes)

Using masking tape, make a series of horizontal lines across the floor and ask all the girls to line up behind the first one. Give each of them two pens.

Read the statements at the end of this document (print-out 1) and have the girls cross their pens if they think they are false and leave them uncrossed if they think they are true.

If they get it right, they get to move to the next line. If they get it wrong, they learn something new and stay where they are.

Activity 3: The Canadarm and Space in Pop Culture

(20 minutes)

Think about where you get the knowledge and assumptions you have about space exploration. How has popular culture impacted your beliefs? How accurate are movies and books in their depiction of reality?

Part A: Divide girls into groups and have them pick a movie about space they have all seen (e.g.: Space Buddies, ET, Wall-E, Star Wars, Muppets from Space, Gravity). Have the girls try and make a list of everything that is wrong and everything that is right about the movie.

Are the characters dressed appropriately? Are they weightless? Does sound carry? Do the space ships travel at a reasonable speed?

Movies are made to be entertaining and aren't always accurate for various reasons (budget, practicality, etc).

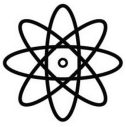
As long as you are aware of any illogical moments, the movies can still be educational.

Space Buddies might cause you to wonder what the first animal in space was (a dog) and watching *Wall-E* might make you question what space probes are currently out in space and what we use them for.

Part B: Ask the girls if they know what the picture is on the back of a $5 bill. Show them a bill or a picture of one and explain to them that it is the Canadarm2 and the Canadian Hand (Dexter). These are two of Canada's main contributions to the Space Program. Although Canada doesn't send astronauts up in its own rockets (these days they typically go up with Russians), our country has made important contributions.

Did you know that the feet on the lunar modules were made in Quebec? We could almost say that Canada was the first country on the moon.

Ask the girls why they think that countries pour so much money into space exploration. Do they think it is worth it? Do they think the science done is important? Does it make them proud? What do they think our next destination should be?

Activity 4: Balloon Rockets  

(25 minutes)

Have one girl stand holding one end of a long piece of string. Pass the straw through the string and have another girl hold the opposite end. If you are short on girls, you can always tie the ends to doorknobs. Have a girl inflate a balloon and without tying a knot, tape it to the straw. As she lets go, the straw should travel from one end of the string to the other thanks to the force being created by the air flowing out of the balloon.

Activity 5: Your Trip to the Red Planet  

(25 minutes)

Have the girls discuss what they think living conditions are like on Mars. Is it hot or cold? Can you breathe the air? Is there gravity?

Split them into small groups and tell them that you are sending them on a mission to Mars. They will be the first astronauts ever to land there and will have to survive for as long as possible. Unfortunately, most of the room in their tiny capsule is being taken up by food and they have very little room for supplies. They can take a maximum of seven things with them. They may choose from the list you give them, or come up with their own items.

Items: Bicycle, paper and pen, compass, digital camera, drinking water, empty containers, family photograph, GPS, hiking boots, laptop, Mars rover, cell phone, pencil, solar panel, space suit, spare oxygen, sunglasses, toothbrush, watch, screwdriver.

Once the items have been chosen, you can have the girls explain their choices or, if you have some extra time, challenge them with emergency situations to see how they manage with their supplies.

Sample situations:

- While you are out wandering around your new environment, you find yourself in the middle of a sandstorm. Once the wind dies down, you realize you are lost. Can you find your way back to the base?
- You find out that one of your companions fell into a large crater a fair distance away and broke her leg. As the astronaut with the most medical training, you must go help her. How will you get there?
- One of the rovers on Mars that sends information back to Earth was broken in the latest sand storm. Engineers on Earth ask if they can give you instructions so that you can go fix it for them. How will you proceed?

Activity 6: Solar System Game  

(15 minutes)

Divide the girls into two teams and explain that they will be travelling around the Solar System in order to visit all the planets. They must stop at each one, complete the required action and return to their team before the next person may begin. The first team to have all its astronauts return to the starting line wins (See appendix 1 for diagram).

Mercury (ping pong ball): As Mercury is the smallest planet, they must jump over it.

Venus (tennis ball): As Venus is the hottest planet, they must fan themselves on it.

Earth (volley ball): Since we live on Earth, they must wave to it.

Mars (golf ball): As Mars is NASA's nest destination, they should act out a rocket landing on it.

Jupiter (beach ball): As Venus is the largest planet, they must travel all the way around it.

Saturn (hula hoop): As Saturn is the planet best known for its rings, they must hula hoop on it.

Uranus (soccer ball): As Uranus rotates on its side, the girls should drop to the floor and roll to the next planet.

Neptune (basketball): Since Neptune is the coldest planet, the girls must shiver on it.

Pluto (stress ball): Since Pluto is no longer a planet, the girls get to stomp on it.

Activity 7: Space Food 

(10 minutes)

Ask the girls what they think astronauts eat in space. While you pass out pieces of freeze-dried ice cream (available many places online as well as museum gift shops and MEC), tell them some cool facts about eating in space.

- Astronauts eat freeze-dried food because it stays good for longer outside a fridge and it is lighter to pack than most typical food.
- Even though astronauts may eat together, they don't all eat the same thing. They each have an individualized menu they chose with a dietician before they left Earth.

- The only food astronauts don't eat is bread. It makes too many crumbs that end up floating all over the place.
- Astronauts don't eat at a table. Since there is nothing to keep them sitting on a chair, they simply eat floating around.
- They have to drink out of a straw, otherwise their beverages would make a mess by floating around them.
- Astronauts love eating m&m's because they can make a game out of chasing them around and trying to catch them with their mouths.
- Although astronauts take freeze-dried food into space, they rehydrate it before eating it.
- If they want to heat their food, they simply add warm water when rehydrating it.
- A portion of the water they drink is recycled from urine, moisture in the air and other "dirty water."
- A special Coke dispenser was once sent up in a space shuttle to experiment with drinking carbonated beverages in space.
- Astronauts season their food with salty and peppery water because normal salt and pepper grains would simply float around.
- Astronauts lose most of their sense of taste in space because they end up stuffed up due to mucus floating up in their noses.

Activity 8: Constellations and Legends

(20 minutes)

Read the girls the legend of the Great Bear and the Big Dipper (printout 3) before challenging them to come up with their own legend.

Have the girls sit in a circle and tell a legend together. Taking turns, they can each tell part of the story, but as soon as the girl who is talking says the word "and," switch to the next girl.

You can let them come up with their own theme or give them a topic such as: "How Saturn got its rings," "Why Mars turned red" or "The day the sun got too hot."

Activity 9: Tin Can Constellations

(30 minutes)

Have each girl bring a tin can from home filled with frozen water. Lay one of the constellation print-outs over the side of the can and, carefully, using a hammer and a nail,

make holes for each of the stars in the constellations. Alternatively, girls could invent their own constellations.

Once the holes are made, you can let the ice melt and send girls home with a tea-light to put inside their lantern so that they can see their constellations glow!

Program work completed

Activity	Program Work Completed
Introduction	
True or False Game	Astronomy #1, 3 Weather # 4
Canadarm	Science #2, 8
Balloon Rockets	Try New Things #4 Engineering #4 Physics #8 Science #5
Red Planet	Understand the Promise and Law and Motto #3 Build Skills in Communication #6 Learn How to Plan #6 Learn About Safety #5 Understand How to Be Responsible #4
Solar System	Stay Fit and Healthy #6 Astronomy #2
Space Food	Try New Things #6 Body Works #1 Kitchen Creations #6
Constellations and Legends	Discover Your Creativity #5 Heritage #5 Folklore #2, 6 Performing Arts #4 Astronomy #3
Tin Can Constellations	Discover Your Creativity #6 Try New Things #2 Art Production #2 Creative craft #8 Recycling #5 Astronomy #4, 6

Meeting Submitted by Elizabeth Knowles from the 85th Montreal Guides in June 2014

Print-out 1: True or False Game

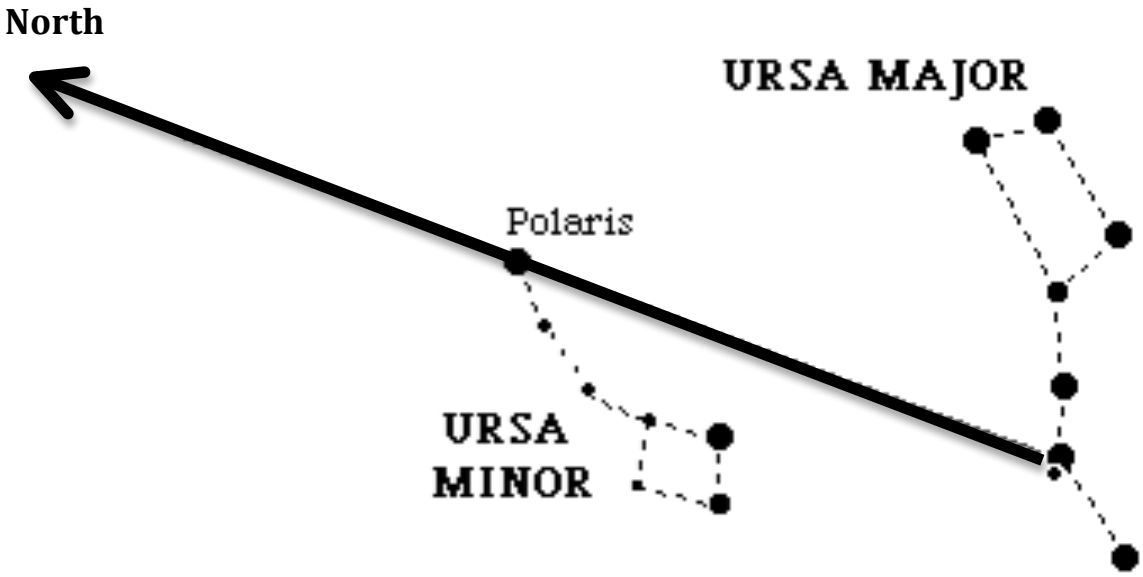
Statements	Answers
Pluto is a planet.	**False.** It was considered a planet until 2006. Now it is a dwarf planet.
The Sun is a star.	**True.** But it is not the largest. It just seems that way because it is the nearest.
Jupiter is the smallest planet in the Solar System.	**False.** The smallest is Mercury. Jupiter is the largest.
Neptune is a gas planet.	**True.** Jupiter, Saturn, Uranus and Neptune are the four gas planets.
It would take two days to get to Mars by rocket.	**False.** It would take six to eight months.
It is cold on Venus.	**False.** The average temperature on Venus is 460°C.
The Earth is the only planet with a moon.	**False.** There are many other moons. Almost all the planets have at least one and Jupiter has at least 63.
It rains diamonds on Neptune.	**True.** It has been suggested by many scientists that the methane in the air causes diamonds to rain down on Neptune.
Only two astronauts have ever visited Mercury.	**False.** No human has ever set foot on a planet other than Earth.
Saturn is the only planet with rings.	**False.** All the gas planets have rings.
The first animal in space was a dog.	**True.** Her name was Laïka. She unfortunately didn't survive.
Sally Ride was the first woman in space.	**False.** She was the first American woman in space, but the Russians got there first with Valentina Tereshkova.
Mercury is about the same size as our moon.	**True.** They are both about a quarter of the Earth's size.
There is a Chinese space station.	**True.** Its name is Tiangong.
It is hot on Neptune.	**False.** It is the coldest planet with an average temperature of -201°C.
Russian astronauts are called cosmonauts.	**True.** And Chinese astronauts are Taikonauts.
There are robots on Mars.	**True.** Among them are Curiosity, Phoenix, Spirit and Opportunity.
The sun rises in the North	**False.** The sun rises in the East
Julie Payette is Canadian	**True.** She is from Montreal
The first person in space was Canadian	**False.** Yuri Gagarine was Russian
There is a mountain on Mars that is 3 times as tall as Mount Everest	**True.** Olympus Mons or Mount Olympus is 24km tall
Our galaxy is called Andromeda	**False.** It is called the Milky Way. Andromeda is another galaxy about 2.5 million light-years from Earth.
Meteors and shooting stars are the same thing	**True.** They are both the streaks of light produced when a meteoroid burns up in the Earth's atmosphere.
Comets are made mostly of ice	**True.** Comets are balls of frozen gasses, dust and rocks. When they get close to the sun, they start to melt and that's what creates their tail.

Print-out 2: Your Trip to the red planet options

Items		Items	
Bicycle	Cell Phone	Bicycle	Cell Phone
Pen & Paper	Pencil	Pen & Paper	Pencil
Compass	Sandwiches	Compass	Sandwiches
Digital Camera	Solar Panel	Digital Camera	Solar Panel
Drinking Water	Spacesuit	Drinking Water	Spacesuit
Empty Containers	Spare Oxygen	Empty Containers	Spare Oxygen
Family photo	Sunglasses	Family photo	Sunglasses
GPS	Toothbrush	GPS	Toothbrush
Hiking Boots	Two-way radio	Hiking Boots	Two-way radio
Laptop	Watch	Laptop	Watch
Mars Rover		Mars Rover	
Items		**Items**	
Bicycle	Cell Phone	Bicycle	Cell Phone
Pen & Paper	Pencil	Pen & Paper	Pencil
Compass	Sandwiches	Compass	Sandwiches
Digital Camera	Solar Panel	Digital Camera	Solar Panel
Drinking Water	Spacesuit	Drinking Water	Spacesuit
Empty Containers	Spare Oxygen	Empty Containers	Spare Oxygen
Family photo	Sunglasses	Family photo	Sunglasses
GPS	Toothbrush	GPS	Toothbrush
Hiking Boots	Two-way radio	Hiking Boots	Two-way radio
Laptop	Watch	Laptop	Watch
Mars Rover		Mars Rover	
Items		**Items**	
Bicycle	Cell Phone	Bicycle	Cell Phone
Pen & Paper	Pencil	Pen & Paper	Pencil
Compass	Sandwiches	Compass	Sandwiches
Digital Camera	Solar Panel	Digital Camera	Solar Panel
Drinking Water	Spacesuit	Drinking Water	Spacesuit
Empty Containers	Spare Oxygen	Empty Containers	Spare Oxygen
Family photo	Sunglasses	Family photo	Sunglasses
GPS	Toothbrush	GPS	Toothbrush
Hiking Boots	Two-way radio	Hiking Boots	Two-way radio
Laptop	Watch	Laptop	Watch
Mars Rover		Mars Rover	

Print-out 3: Great Bear Legend

To the ancient Greeks, Callisto was goddess of the crescent moon. Zeus, king of all the gods, fell in love with her and she gave birth to his son, Arcas. Hera, Zeus' wife, became jealous and changed Callisto into a bear. One day, Arcas came upon the bear and thought he was being attacked when she stood on her hind legs to welcome him. Not knowing she was his mother, he prepared to shoot her with his bow. Zeus, seeing what was about to happen, transformed him into a small bear to stop him and put them both up into the sky where they have lived together ever since.



Print-out 4: Constellations

Orion

Pegasus

Cygnus

Hercules

Appendix 1: Solar System Game Diagram