girl scouts of wisconsin badgerland

STEM Resources

Badge in a Box

Junior Space Science Investigator

We are grateful to Larry Lebofsky, University of Arizona, who obtained a grant to provide the materials for Requirement #1.

Overview for Leaders	These kits are designed to allow a leader to conduct a Junior meeting with less planning, less effort, and less cost. This kit is intended to provide the ideas and materials for three requirements. In the kit, there are activities and supplies. Many supplies are provided, but not all. Make sure to look at the Materials list for the activities so that you have some lead time to order or shop. Normal troop supplies, such as scissors and markers, may be needed. Those are specified. Copies may need to be made. Materials or game pieces for each activity are designed so that at least 10 girls can do the activity at a time. Please be a sister to the next troop when using these materials. Put them away in the same manner as you received them and report any broken/missing items when returning the box to Badgerland. There is another Badgerland Kit that can be used as an alternate for fulfilling Requirement #4: Use Tools to Explore. The kit's name is Solar System Classification: Junior Space Science Investigator Requirement #4 and Ambassador Space Science Master Requirement #1. Leaders can check this kit out via Checkfront.
This Activity Matches These Badge Requirements	#1: Model the Solar System #2: Circle the Sun #3: Discover the Stars #4: Use tools to explore: Use tools for finding your way #5: Share your sky: • Materials to help with Attend a Star Party • Materials for writing a poem for Create a space show.
Outcomes	STEM • STEM Interest: Girls are excited about STEM subjects and want to learn more about them. • STEM Confidence: Girls have confidence in their STEM skills and abilities. • STEM Competence: Girls think scientifically to solve problems. • STEM Value: Girls learn the importance and relevance of STEM to people and society.
Materials Troop Needs to Supply and Preparation Actions	1. Markers/crayons/pencils/pens 2. Make copies of activity sheets from master. Depending on your copier, you may be able to leave the master in the sleeve and just lay it on the copier bed. • Activty #2 – A: Copies of worksheet: Planet:

	Guess My Age for each Junior Scout. Notice that there are two sides to this worksheet. • Activity #3 - A: A copy of the Orion constellation for each 3-D model to be created • Activity #3 -B: Copies of worksheet Girl Scout Minute • Activity #4 – A: copy from master or via url of the Circular Sky Map and Star Wheel Outer Sleeve. • Activity $4 – A: take-home sheet on how to use the Star Wheel, copies optional. • How to use the Star Wheel instructions to be used if go out to use the Star Wheel during the troop meeting (qty = 10) • Activity #5 – A (optionally, for constellation snack activity, dot-to-dot sheet of constellations) 3. Activity #1 – D requires a bigger space: More than 50 yards is required which is half of a football field. Outside is ideal. A cafeteria or a long hallway will also work indoors. 4. Activity #2 – B, #3 - A: Scotch tape 5. Activity #3 – A, marshmallow option, per model: A sturdy box top, such as the top of a shoe box 6. Activity #3 – A, marshmallow option, per model: 6 mini marshmallows 7. Activity #3 – A, marshmallow option, per model: Two regular size marshmallows 8. Activity #3 – A, marshmallow option, per model: 8 one-foot long pipe cleaners or 8 shish kabob skewers (desperately short of time? How about spaghetti?) 9. Activity #3 – A, marshmallow option, per model: optionally, a bowl to hold the marshmallows 10. Activity #3 – B: A way to time 1 minute, such as a cell phone 11. Activity #4 – A: You may wish to 'start' the cutting of the hole in the middle of the Star Wheel's Outer Sleeve by poking an X in it in advance of your meeting. 12. Additional Party and Snack supplies for Activity #5 – A: • Constellation snack: • mini-marshmallows • pretzel sticks (or also uncooked spaghetti could be used) • plates/napkins/tablecloth – something to keep the workspace clean • Drink idea: Tang • Oreo Moon Phases snack idea • Oreo cookies

	• Popsicle stick or plastic knife • Paper plate – cheap plain white paper plates • Paper for creating poem, 1+ per Girl Scout. • Nice paper for copying the finished poem, 1 per Girl Scout.
Contents in the Box	00. Master set of activity sheets 01. Leader's Guide 02. There are 10 balls/beads representing the planets and the moon. They are labeled. The small ones are on a string to keep them from getting lost. Activity #1 – B. 03. The Sun is represented by a whole person, from the top of their head to their toes. There is a yellow t-shirt to be worn by the person representing the Sun. Activity #1 – B. #1 - D 04. There is one ½-inch bead labeled 'Sun placeholder or spare Earth or Venus'. Activity #1 – D. 05. There are 9 lengths of cord, one for each planet. Activity #1 – D. • Mercury, Venus, Earth and Mars are shorter lengths, labeled and packaged in a bag. • Jupiter, Saturn, Uranus, Neptune and Pluto are lengths of cord that are each wound individually around a dowel. 06. A scale model of the Earth and Moon, connected by a string, Activity #1 – E 07. Calculators (quantity = 5) Activity #2 – A and #3 - B 08. 12 pages in dry erase pockets, representing each month of the year, Activity #2 – B 09. An assortment of dry erase markers. (Please ensure that they are tightly capped when returning the markers to Badgerland in order to keep them from drying out) Activity #2 – B 10. A big gold beach ball, and a spare, to represent the Sun. Activity #2 – B 11. 12 inch ruler, quantity =10, Activity #3 - A 12. Laminated cards of a table that describes the constellation Orion, including the star names, the distance in light years from our solar system, the skewer/pipe cleaner length and the ball/marshmallow size, quantity = 6, Activity #3 - A 13. Laminated cards of the Orion star field, quantity = 6, Activity #3 – A 14. Styrofoam square, one foot by 1 foot, Activity #3 – A, styrofoam option, per model 15. 1-inch Styrofoam balls, Activity #3 – A, styrofoam option 16. 2-inch Styrofoam balls, Activity #3 – A, styrofoam option 17. Skewers, Activity #3 – A, styrofoam option 18. Clipboards (homemade) (qty = 10) (Actually low-cost binder clips on stiff cardboard), Activity #3 - B 19. Measuring tape, Activity #3 - B

	20. Masking tape, Activity #3 - B 21. 3 Samples of the Star Wheel, Activity #4 - A 22. 1 Compass, Activity #4 - A 23. 2 Staplers, Activity #4 – A 24. How to use the Star Wheel instructions to be used if go out to use the Star Wheel during the troop meeting (qty = 10), Activity #4 - A 25. Star Party decorations, Activity #5 – A: • 5 tent cards titled Girl Scout Astronauts • 5 tent cards titled Women of Color from NASA • Assorted 'photo booth' star and planet props • A galaxy back drop • 21 star and planet glasses 26. Constellation snack, Activity #5 – A: • diagrams/pictures of easy constellations • master of dot-to-dot sheets of constellations 27. Pictures/images of various space objects (Activity #5 – B) 28. Tent cards with instructions for poems that can be placed out on the table (Activity #5 – B)
#1 - A: **Requirement #1: Model the Solar System** **Background for Leaders for Activity #1 – B, the Size Model of the Solar System.**	There are three activities to help the Girl Scouts appreciate the sheer size of the sun and the planets as well as the distances in our solar system. The first activity (#1 – B) is focused on the sizes of the Sun and the planets. The second activity (#1 – D) is focused on the distances of the planets from the Sun. The third activity (#1 – E) combines an accurate portrayal of both size and distance for the Earth and Moon. Planetary scientists sometimes use the Earth as a reference point in making measurements. For example, the distance between the Earth and the Sun is called an Astronomical Unit or AU, and is used to describe distances in the Solar System. Another example is Earth's atmospheric pressure (14.7 lb per square inch); it is referred to as one atmosphere (1 atm), and the atmospheric pressures of the other planets are sometimes expressed in this unit. In the following tables, we use Earth's diameter and Earth's distance from the Sun as base units for constructing scale model diameters of the planets and scale model distances from the Sun to the planets and to objects beyond the Solar System.

You can think of these as roadmaps of the Solar System and the Universe. Below are two models of the Solar System, the first representing the diameters (sizes) of the planets and the second representing the distances to the planets. The third segment combines an accurate portrayal of both size and distance for the Earth and Moon,

TABLE I
MAKING A MODEL OF THE DIAMETERS OF THE PLANETS AND THE SUN

Scale: One Earth Diameter = 1.28 Centimeters (0.5 in)
(**1 cm = 10,000 km**, 1:1,000,000,000)

Planet	Diameter Kilometers	Diameter Miles	Dia. Relative to Earth	Diameter to Scale	Object
Sun	1392000	865000	108.7	139.20 cm	5-ft person
Mercury	4878	3031	0.38	0.49 cm	5 mm bead
Venus	12104	7521	0.95	1.21 cm	½ inch bead
Earth	12756	7926	1.00	1.28 cm	½ inch bead
Moon	3476	2160	0.28	0.34 cm	3 mm bead
Mars	6794	4222	0.53	0.68 cm	7 mm bead
Jupiter	142984	88730	11.21	14.3 cm	6 in ball
Saturn	120536	74940	9.45	12.1 cm	5 in ball
Uranus	51118	31763	4.01	5.11 cm	2 in ball
Neptune	49528	30775	3.88	4.95 cm	2 in ball
Pluto	2302	1430	0.18	0.23 cm	2 mm bead

(Adapted from Larry Lewbofsky.)

#1 - B:

Requirement #1: Model the Solar System

Activity: Size Model of the Solar System

Materials:

There are 10 balls/beads representing the planets and the moon. They are labeled. The small ones are on a string to keep them from getting lost. Their relative size is in the table below: focus on the far right column with the object size (in red) which lists their size.

The Sun is represented by a whole person, from the top of their head to their toes. There is a yellow t-shirt to be worn by the person representing the Sun.

Preparation:

You will need 11 people for this activity. If you have less Girl Scouts and adults, then some can hold a planet in each hand. The person representing the Sun should not hold a planet, if possible.

Activity:

Ask the Girl Scouts which star is closest to us. They should answer the Sun! Have one girl (about 5 feet tall) stand to the left of what will eventually be a line of 11 girls representing the Solar System. Have her put on the yellow Sun t-shirt.

Emphasize that the size of the sun is the size of the girl, or bigger, in this scale.

Next, ask the girls which planet is closest to the Sun. They should answer Mercury. The one who answers first should become Mercury and stand next to the "Sun."

We usually do left to right as you are facing them since that is the way one usually sees the Solar System illustrated in books. Hand that Girl Scout the bead that represents Mercury.

Explain to them that you are creating a scale model of the **sizes** of the planets in the Solar System.

Continue this with Venus, Earth (and the Moon), Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto.

Have the Girl Scout that has the moon partner with the girl that is the Girl Scout that has the Earth, as they are both the same distance from the sun.

Note: there is still disagreement as to how one should classify Pluto. Based on its physical properties (atmosphere, active surface, etc.) and not on just its size and location in the Solar System. Many planetary astronomers still consider Pluto to be a planet. Just a small one! Others commonly categorize it as a 'dwarf planet'.

What is good for the Girl Scouts to observe is its size compared to other planets. Also, in the next activity, they will experience the distances between the planets and learn the Pluto is unbelievably far away.

Discussion: Remind them that this is just a scale model of the **sizes** of the planets. Ask them what the beads and Styrofoam balls represent [answer: the relative sizes of the planets]. Have them marvel at the sheer size of the sun when compared to even the biggest planet.

Then ask them what is not represented by this model (what is not

	correct); [possible answers: planets not lined up all in-a-row like this and their distances are greater than in the model]. (Adapted from Larry Lewbofsky.)
#1 – C: **Requirement #1: Model the Solar System** **Background for Leaders for Activity #1 – D, the Distance Model of the Solar System.**	There are three activities to help the Girl Scouts appreciate the sheer size of the sun and the planets as well as the distances in our solar system. The first activity (#1 – B) is focused on the sizes of the Sun and the planets. The second activity (#1 – D) is focused on the distances of the planets from the Sun. In activity #1 – D, the focus will be to appreciate the enormous distances between the planets. The third activity (#1 – E) combines an accurate portrayal of both size and distance for the Earth and Moon. As we saw with the size model Activity #1 – B, we cannot do a reasonable scale model of planetary distances on the same scale as we do planetary sizes. We will use a scale that is 100 times smaller than in Activity #1 – B: 1:100,000,000,000 in Activity #1 - 4. For example, the scale distance from the Sun to the Earth (1 AU = 149,600,000 km = 14,960,000,000,000 cm) is 150 cm (149.6 cm, rounded; 1 cm = 1,000,000 km). Table II below gives the true (mean) distances of the planets from the Sun: • Columns 2 and 3, in millions of miles and kilometers; • Column 4, their distances in Astronomical Units (1 AU = the mean distance of Earth from the Sun); • and Column 5, their distances in solar diameters (e.g., 107 Suns laid side-by-side would be needed to stretch from the Sun to Earth). • Column 6, light time (minutes), gives the time it takes light to travel from the Sun to each planet (186,000 miles or 299,800 km in a second). • Note: for the Moon distances are from Earth, distance in Earth diameters, light time from Earth, and time it takes to orbit the Earth.

TABLE II: PLANETARY (SOLAR) DISTANCES

Scale: One Sun Diameter = 1.28 Centimeters (0.5 in)
(**1 cm = 1,000,000 km**, 1:100,000,000,000)

PLANET	DISTANCE			Solar Diameters	Light Time (Min.)	Distance to Scale (macramé length)
	Miles	Km (Millions)	AU			
Mercury	36.0	57.9	0.387	42	3.2	58 cm
Venus	67.2	108.2	0.723	78	6.0	108 cm
Earth	93.0	149.6	1.000	107	8.3	150 cm 1.5 m
Moon	0.238	0.383	0.003	30[a]	1.3[b]	
Mars	141.7	228.0	1.524	164	12.7	2.3 m
Jupiter	483.7	778.4	5.203	559	43.3	7.8 m
Saturn	885.2	1425.0	9.523	1025	79.5	14.2 m
Uranus	1785.0	2873.0	19.210	2061	159.7	28.7 m
Neptune	2797.0	4501.0	30.090	3230	250.4	45.0 m
Pluto	3670.0	5906.0	39.482	4238	328.6	59.0 m

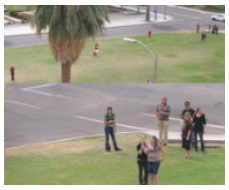
[a]Relative to diameter of Earth
[b]Number of seconds for light to travel from the Earth to the Moon

(Adapted from Larry Lewbofsky.)

#1 - D:

Requirement #1: Model the Solar System

Activity: Distance Model of the Solar System



Materials:

There is one ½-inch bead labeled ‘Sun placeholder or spare Earth or Venus’.

There are 9 lengths of cord, one for each planet.

- Mercury, Venus, Earth and Mars are shorter lengths, labeled and packaged in a bag.

- Jupiter, Saturn, Uranus, Neptune and Pluto are lengths of cord that are each wound individually around a dowel.

There is a yellow t-shirt to be worn by the person representing the Sun.

Preparation:

You will need a large area. Outside is best. Perhaps there is a gym or lobby in the area that you meet. Or a long hallway. Pluto is 200 feet away from the sun.

Activity:

Part 1

Tell the Girl Scouts that we are going to imagine that the Sun is the size of the Girl Scout wearing the t-shirt – about 5 feet tall.

Ask them where Mercury would be. You can have one Girl Scout or all the Girl Scouts guess the distance. This can be just a discussion, or you can have the Girl Scouts actually walk the distance that they think would represent the distance between the Sun and Mercury.

After a few guesses, tell them that, on this scale, Mercury would be almost 200 feet away! Therefore, you are going to use a smaller scale model to represent the distance to the planets. If they ask, Pluto is over 4 miles away when the Sun is represented by a ½-inch bead!

Tell the Girl Scouts that for this activity that we will be using a much smaller scale in order to experience how far apart the planets are.

Part 2

The girl who is the Sun should be given the ½-inch bead. Tell the Girl Scouts that this bead now represents the size of the Sun; it is now 1/100 of the original scale that was used in Activity #1 – B (which focused on the sizes of the planets).

Next, ask the Girl Scouts which planet is closest to the Sun. They should answer Mercury, as before. The one who answers first should become Mercury. Hand that girl the cord that represents the distance to Mercury.

Explain to them that you are creating a scale model of the distances to the planets in the Solar System.

	Continue this with Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. Have them go out in different directions and either ask them or tell them why they are doing this [planets are never exactly lined up in a row]. Caution: "Pluto" will be about 200 feet away and it takes time for that Girl Scout to get there and even longer to rewind the macramé! Closing discussion: Remind them that this is a scale model of the distances from the Sun to the planets in the Solar System. Tell them that, as they stand at the ends of the macramé and look back at the "Sun," the bead is what the Sun would look like from that planet. Also, while they are not lined up, in the real Solar System, the individual planets are all moving around the Sun at different speeds. Finally, on this scale, the next nearest star is about 250 miles away. (Adapted from Larry Lewbofsky.)
#1 - E: **Requirement #1: Model the Solar System** **Activity: Scale Model of the Earth-Moon system**	**Materials:** A scale model of the Earth and Moon, connected by a string (provided) **Preparation:** None. **Activity:** 1. Discussion: We have done 2 activities. The first was to accurately portray how the sizes of the Sun and the planets in our Solar System compare, from the teeny Mercury to the ball-sized Jupiter and Saturn to the 5-foot tall Sun. The second was to accurately portrays the distances of the planets from the Sun and from each other. We saw that the first four planets were clustered close to the Sun and the next planets were further and further away, all the way to the very distant Pluto. We had to do this as two separate activities because if we were to do this as a single combined activity, Pluto would have been *almost a mile* away. And that wasn't practical.

	What would be practical, however, is to look at just a subset of the Earth and the Moon where both the size of the object and the distance between them was accurately portrayed. 2. Crunch up the string and the white pearl bead representing the Moon in the palm of your hand. Just show the Junior Girl Scouts the blue ball representing the Earth. 3. Tell them that this blue ball represents the Earth. Ask them to suggest how far the Moon would be from the Earth if it was accurately to scale. There can be a variety of answers. (You might have them point to the spot of their prediction. If you meet in a room with a whiteboard/chalkboard, hold the blue ball at one end and they can mark the spot of their prediction. Or use the floor, hold the blue ball at a particular spot; give each girl a piece of masking tape to place on the floor to indicate her view of where the Moon would be.) Work to keep the string and the Moon hidden within your hand to avoid giving away the answer and missing the opportunity for an Ah-ha! Surprise! Moment. 4. Keeping the blue ball in the same spot, reveal the string and the Moon. Ask one of the Junior Scouts stretch out the string by holding the Moon. Talk about if their predictions were close to the right answer.. Tell them that the distance between the Moon and the Earth equals 30 times the Earth's diameter. Also tell them that the relative size of the Moon is accurately portrayed by the white pearl.
#2 - A: **Requirement #2: Circle the Sun** **Activity: Find your age on other planets** There are 2 options included for this	**Materials:** • Copies of worksheet: Planet: Guess My Age for each Junior Scout. Notice that there are two sides to this worksheet. (copies needed; master provided) • Calculators (quantity = 5) (provided) • pencils (troop provides) **Preparation:** None **Activity:** 1. Each Junior Scout should have a copy of the worksheet and a pencil. There is a calculator for every two Scouts.

requirement. You only need to do one.	2. Have the Girl Scouts do step one first. That is, they need to figure out how many days old that they are. a. A clever Girl Scout might notice that we are only calculating the number of days based on how many years since they were born. She might ask what about the months that have happened or the days that have happened since my birthday occurred. If you choose, the girls can add on the days for the months and days since their birthday. b. However, that will add some complication to this task and it really isn't needed. c. In addition, some girls who are less confident of their math skills may not be able to follow along in this conversation. d. Therefore, you may wish to simplify this first step and just keep it to how many days based on the number of years old that they are and ignore the fact that there's extra days that have to do with the months and days since their birthday. 3. In Step 2, have the Girl Scouts fill in the second column in Table 1 with their age on earth in days based on the calculation that they just did in Step 1. 4. In Step 2, in order to find their age on the three inner planets, they will be taking their age in days and dividing it by how long it takes for that planet to go around the sun. The time it takes for that planet to go around the sun is in the third column of Table 1 and is titled Planet Orbital Period. They will write their answer in the fourth column. a. Ask the girls, if their goal is to eat lots of cake and ice cream, which planet they would like to live on? 5. Turn the page over. 6. For the outer planets, we will do a different calculation because those planets take so long to make a trip all the way around the sun. a. For instance, the girls can look at the first line in Table 2. This is Jupiter and it takes 12 years for Jupiter to go all the way around the sun. Ask the girls if any of them are 12 years old if. If not, then in the time that they've been alive Jupiter has not even gone around the sun one time. 7. Have the Girl Scouts fill in their age on earth in the second column of Table 2. 8. Now, in order to calculatetheir age on other planets, they are going to take their age and divide it by the time it takes for that planet to go around the sun (found in column 3). This answer goes in the fourth column titled Age on Planet.
#2 - B: **Requirement #2: Circle the**	**Materials:** • 12 pages in dry erase pockets, representing each month of the year. (provided)

Sun **Activity: Dance the Earth's Year** There are 2 options included for this requirement. You only need to do one.	• An assortment of dry erase markers. (Please ensure that they are tightly capped when returning the markers to Badgerland in order to keep them from drying out) (Provided) • A big gold beach ball, and a spare, to represent the Sun. (Provided) • Optionally, tape, if you decide to put the pages up on the wall. (Troop provides) **Preparation:** Minimal. 1. Blow up the beach ball, which represents the Sun. 2. Think about your meeting space: The goal is that the girls are to "dance" in a circle, stopping at each month to think about that month. • In your meeting space, it might be best to put the month flee pages on a wall and they would travel around the outside of the room. • Alternatively, it might be best if you put your tables in a square or a circle so that they go around the outside of the table and stop at each page. • Lastly, you might just end up with the pages in a circle on the floor. • Place the beach ball in the center of the circle, representing the sun, which they are dancing around. **Activity:** 1. Divide the dry erase markers among your troop. Have each girl stand in front of the pocket with her birthday month. Give your Junior Scouts the following instructions, in order. a. Write your birthdate, your age and your name. o Ask: how many trips have you made around the sun? o State: Now we are going to make pretend that you are traveling around the sun one more time. b. Move one month to the left. o Draw an animal that you might see during this month c. Move one month to the left. o When water falls from the sky, what is it? Draw it. d. Move one month to the left. o Draw a bug that you might see during this month, e. Move one month to the left. o If you visited a small lake, what could you do there? Swim? Hike around it? Walk on the ice? Draw it. f. Move one month to the left. o Draw a plant or a tree that would be green during this month.

	g. Move one month to the left. o Draw a bird that you might see during this month. h. Move one month to the left. o Draw the kind of hat you would wear on your head during this month. i. Move one month to the left. o Write a holiday that happens during this month: (January: New Year's/MLK Day; February: Valentine's Day/President's Day/Mardi Gras/Washington's Birthday; March: Easter/St. Pat's/Girl Scout Birthday ; April: April Fool's Day/Easter/ Eid-Al;-Fitr/ Passover ; May: Mother's Day/Memorial Day/May Day/Cinco de Mayo; June: Father's Day/Juneteenth/Flag Day; July: Fourth of July; August: Back to School ; September: Labor Day/First Day of School; October: Halloween/Columbus Day/Indigenous People's Day; November: Veteran's Day/Thanksgiving; December: Christmas/Hanukkah/Kwanza/St. Nick's) j. Move one month to the left. o Write down the name of a movie you'd like to watch again. k. Move one month to the left. o Draw what you would wear on your feet during this month. Would it be winter boots, rain boots, sandals or sneakers? l. Move one month to the left. o In one more month, you will have your birthday again. Write down your name and what age you will be at your birthday celebration. Wipe off the pockets as part of the cleanup. Also, make sure the markers are tightly capped to keep them from drying out between uses. If the dry erase markers are not any good anymore, provide that feedback on the feedback form when you return this kit to Badgerland.
#3 - A: **Requirement: Discover the Stars** **Activity: Make a 3-D Model of**	**Background:** The Constellation Orion the Hunter includes the easily-spotted Orion's belt: three bright stars in a row. Other stars in the constellation include Betelgeuse (a massive red supergiant nearing the end of its life), the blue supergiant Rigel (the sixth brightest star in the night sky) and the blue giant Bellatrix. Orion is best seen from late fall to mid spring. The intention of this activity is to allow the Junior Girl Scouts to understand that the Orion constellation that we see in the sky is the result of stars that

Orion There are 2 options included for this requirement. You only need to do one.	form a pattern in our eyes but in reality are not very close to each other. Thus, the goal is to create a 3-D picture of the stars that make up the constellation Orion and allow the girls to see how they are a mix of large and small stars and a mix of some stars that are close by and other stars that quite far apart. As suggested by the badge pamphlet requirement, the assembly of this 3-D constellation is done with a Styrofoam block and then Styrofoam balls on skewers. Styrofoam pieces are expensive. It wouldn't be practical to buy enough Styrofoam balls and platforms for each Junior Girl Scout to build their own 3-D constellation. Therefore, for this activity, there are presented two options: • There are supplies in this kit so that a troop can build one 3-D constellation out of Styrofoam pieces as an entire group. The supplies need to be handled gently because they need to be disassembled and then returned to the kit so that the next troop has the option of building a 3-D constellation. This is called the 'Styrofoam' option. • There are directions if a troop wants to allow each Junior Scout (or pairs of Junior Scouts) to create their own 3-D constellation. This option is one where the troop needs to assemble the needed supplies, but the supplies are much less expensive and readily available. This is what allows for more Girl Scouts to get the hands-on experience of building this model. This is called the 'marshmallow' option. **Materials:** Both options: • 12 inch ruler, quantity =10 (Provided) • Laminated cards of a table that describes the constellation Orion, including the star names, the distance in light years from our solar system, the skewer/pipe cleaner length and the ball/marshmallow size, quantity = 6 (provided) • Laminated cards of the Orion star field, quantity = 6 (provided) • Sturdy Scissors (troop provides) • Pencils or markers (troop provides) • Scotch Tape (troop provides) • A copy of the Orion constellation for each 3-D model to be created (troop makes copies, master provided) Styrofoam option: • Styrofoam square, one foot by 1 foot (provided) • 1-inch Styrofoam balls (provided) • 2-inch Styrofoam balls (provided)

- Skewers (provided)

Marshmallow option supplies, for each model to be built:

- A sturdy box top, such as the top of a shoe box (troop provides)
- 6 mini marshmallows (troop provides)
- Two regular size marshmallows (troop provides)
- 8 one-foot long pipe cleaners or 8 shish kabob skewers (desperately short of time? How about spaghetti?) (troop provides)
- optionally, a bowl to hold the marshmallows (troop provides)

Preparation:

Make copies of Orion constellation diagram.

Activity:

Styrofoam option:

1. Hand out the laminated pages with the star field that represents the constellation Orion. Ask the Junior Girl Scouts if they can see a pattern or a figure in this collection of stars.
    a. To help them get oriented, have them look at the three stars in a row in the middle of the star field. Ask them to think about that as the belt on a person. Once they see the belt, then they probably can find the two feet below and the shoulders above.
    b. Below the three stars that make up Orion's belt is a fuzzy, bright lighted area. Often, that's called Orion's sword because a sword would have been hanging from his belt. However, that bright area is not a star. Rather it is the Orion Nebula, which is a dusty area where many, many new stars are being created and that is why it is so bright.

    Because it is a nebula, not a star, it will not be one of the one of the parts of our 3D model.
2. With the black side of the card facing them, that includes the star field, have the Girl Scouts hold the paper up to the light or towards a window. They should be able to see the diagram of the constellation from the back of the paper through to the front of the paper so that they can see a sketch of how the Orion constellation is usually portrayed.
3. You have made a copy of the diagram sketch of the Orion constellation. Tape the Orion constellation drawing to the piece of Styrofoam.

4. Have the Junior Girl Scouts mark each skewer to match the length of a star as shown in the table on the card that describes the Orion constellation. The Girl Scouts should measure from the pointy end to the flat end so that they keep the pointy end to push into the Styrofoam.
5. Cut 8 skewers into the lengths indicated on the table. You may wish to have an adult do this step.
6. Distribute the skewers to the Junior Scouts. Make sure they understand the length of the skewer that they are holding in their hand.
7. Using the chart, the Junior Scout should add the appropriate Styrofoam ball to the flat part of their skewer.
8. Have the Junior Girl Scouts look at the Diagram of Orion taped on the Styrofoam block.
9. Taking turns, have the Junior Scouts put their skewer into the Styrofoam at the right spot in the diagram of the Orion constellation.
10. Once finished, hold the Styrofoam square so that it is perpendicular to the table and the Girl Scouts are looking at it by standing directly in front of the square.
11. This is a 3D version of what Orion looks like from earth.
    a. Ask if the Girl Scouts if they've ever seen Orion in the sky. Then ask them if they think that they could tell that some stars are closer to our planet and some stars are further from our planet just by looking up?

       The flat patterns the stars appear to form are an illusion. The stars in a constellation actually form three-dimensional patterns that look different from different angles.

    b. Ask the girls to think about if they were to travel in space and travel to the <u>side</u> of the 3-D diagram of Orion. Now have the Junior Scouts look at the diagram and decide if it look like the constellation Orion as we see it from the earth?

Marshmallow option:

12. Hand out the laminated pages with the star field that represents the constellation Orion. Ask the Junior Girl Scouts if they can see a pattern or a figure in this collection of stars.
    a. To help them get oriented, have them look at the three stars in a row in the middle of the star field. Ask them to think about that as the belt on a person. Once they see the belt, then they probably can find the two feet below and the shoulders above.
    b. Below the three stars that make up Orion's belt is a fuzzy, bright lighted area. Often, that's called Orion's sword because a sword would have been hanging from his belt.

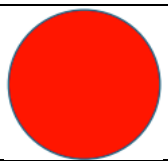
However, that bright area is not a star. Rather it is the Orion Nebula, which is a dusty area where many, many new stars are being created and that is why it is so bright.

Because it is a nebula, not a star, it will not be one of the one of the parts of our 3D model.

13. With the black side of the card facing them, that includes the star field, have the Girl Scouts hold the paper up to the light or towards a window. They should be able to see the diagram of the constellation from the back of the paper through to the front of the paper so that they can see a sketch of how the Orion constellation is usually portrayed.
14. You have made copies of the diagram sketch of the Orion constellation. Tape the Orion constellation drawing to the box tops.
15. Have the Junior Girl Scouts mark each pipe cleaner or skewer to match the length of a star as shown in the table on the card that describes the Orion constellation. (If using a skewer, the Girl Scouts should measure from the pointy end to the flat end so that they keep the pointy end to push into the box.)
16. Cut 8 pipe cleaners/skewers into the lengths indicated on the table. You may wish to have an adult do this step.
17. Make sure the Girl Scouts understand the length of the skewer that they are holding in their hand.
18. Using the chart, the Junior Scout should add the appropriate marshmallow.
19. Have the Junior Girl Scouts look at the Diagram of Orion taped on the box top.
20. Have the Junior Scouts put their pipe cleaner/skewer into the right spot in the diagram of the Orion constellation.
21. Once finished, hold the box top so that it is perpendicular to the table and the Girl Scouts are looking at it by standing directly in front of the square.
22. This is a 3D version of what Orion looks like from earth.
    a. Ask if the Girl Scouts if they've ever seen Orion in the sky. Then ask them if they think that they could tell that some stars are closer to our planet and some stars are further from our planet just by looking up?

       The flat patterns the stars appear to form are an illusion. The stars in a constellation actually form three-dimensional patterns that look different from different angles.

b. Ask the girls to think about if they were to travel in space and travel to the side of the 3-D diagram of Orion. Now have the Junior Scouts look at the diagram and decide if it look like the constellation Orion as we see it from the earth?

Star Name	Distance from Earth in light-years	Skewer or pipe cleaner length (in cm.)	Ball or Marsh-mallow size	Description	Color and Size
Betelgeuse	640	18	Large	massive red supergiant nearing the end of its life	
Meissa	1,050	10	Small	Actually 2 stars rotating around each other	
Bellatrix	240	26	Small	4,000 times brighter than our Sun	
Alnitak	800	15	Small	ultrabright, blue, & super hot consum-ing its fuel incredibly fast.	
Alnilam	1,340	5	Small	Its name is Arabic which means a 'string of pearls'	
Mintaka	915	13	Small	of the 3 stars forming the Belt, it is the smallest	
Saiph	700	16	Small	Such a hot star that it radiates much of its energy as UV light which	

					we can't see with our eyes	
	Rigel	800	15	Large	sixth brightest star in the night sky	

#3 - B:

Requirement: Discover the Stars

Activity: Create your Girl Scout Minute

There are 2 options included for this requirement. You only need to do one.

Materials:

- Clipboards (homemade) (qty =10) (Actually low-cost binder clips on stiff cardboard) (provided)
- Measuring tape (provided)
- Masking tape (provided)
- There are 5 calculators as part of activity #2 – A (provided)
- Copies of worksheet Girl Scout Minute (troop makes copies; master provided)
- Pencils (troop provides)
- A way to time 1 minute, such as a cell phone (troop provides)

Preparation:

Needed: A long hallway, a sidewalk, a parking lot or a field.

Establish the starting point; there is masking tape, if helpful.

Activity:

1. Provide some background on the concepts of light years and a Girl Scout Minute as a means to measure distance, per below.

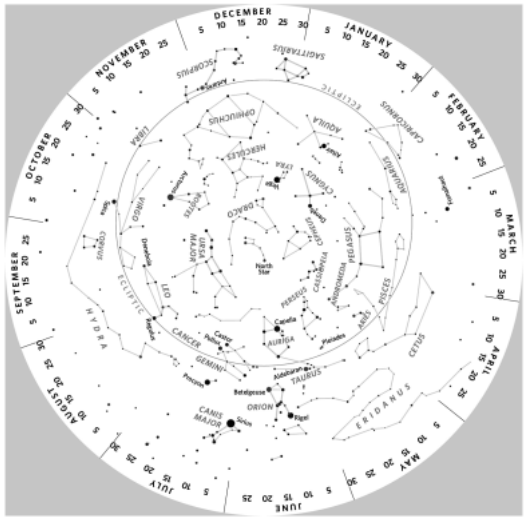
   Astronomers created a way to measure the distances in outer space by making up a new unit of distance measurement. It's called a light year. That is the distance that light travels in a year.

   There are units that are used for measuring distance that you know: inches, feet, yards, meters, miles, and so on. But a light year is another one that you can add to this list.

   As Girl Scouts, we can make up a new distance unit of measure, too. Our new unit of measure is called a Girl Scout Minute. That is, it is the distance that a Girl Scout travels in one minute.

   Because every Girl Scout is different, then each Girl Scout Minute is different. Therefore, each Girl Scout will create her own Girl Scout Minute and use that unit of measure to think about how to measure distances with it.

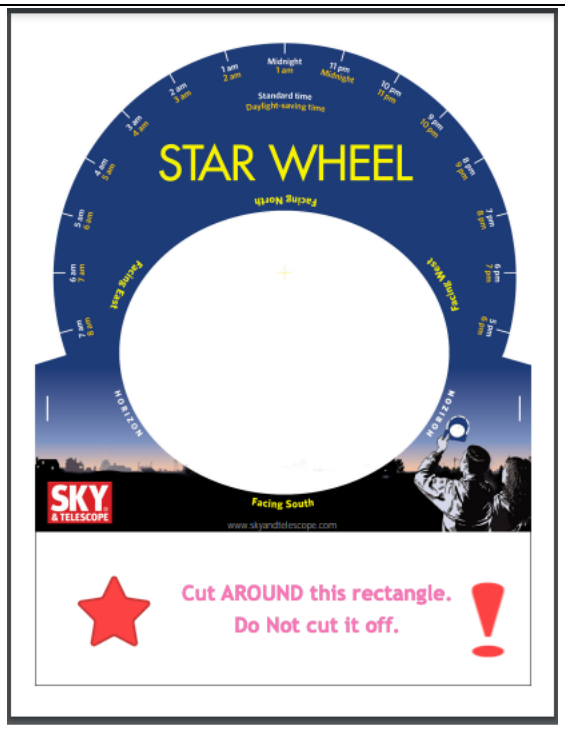
	2. Girls can work individually or in pairs. 3. Each girl needs a copy of the worksheet, a writing instrument and a 2-3 inch piece of masking tape. Optionally, one of the homemade clipboards. 4. Demonstrate the heel-to-toe walking technique that the Junior Scouts are to use. 5. Designate a starting spot. 6. At your direction to start, have the Junior Scouts walk heel-to-toe for one minute. 7. After you announce 'stop', have each Junior Scout place her masking tape to indicate her end point. 8. Determine the distance traveled. There is a measuring tape provided. However, in a hallway, they could measure the size of the squares and how many squares were traveled. On the sidewalk, the sidewalk sections could be measured and then counted. Find something that is fast and easy. There are calculators to help. 9. Each Junior Scout writes her distance on the worksheet. 10. Have the Junior Scouts complete the bottom of the worksheet about traveling to grandma's house during a power outage Hint: for the last question, "*How many minutes will it take you to get to grandma's house if you walk the exact same heel-to-toe step that you used to create your Girl Scout Minute?",* the number of minutes is equal to the distance in Girl Scout Minutes.
#4 - A: **Requirement #4: Use tools to explore** **Activity: Make a Star Wheel (planisphere)** There are 2 options included for this requirement. You only need to do one.	**Materials:** • A printed Circular Sky Map for each Girl Scout. (copies needed; master provided or use url) • A printed Star Wheel's Outer Sleeve for each Girl Scout. (copies needed; master provided or use url) • A take-home sheet on how to use the Star Wheel, copies optional. (copies needed; master provided) • How to use the Star Wheel instructions to be used if go out to use the Star Wheel during the troop meeting (qty = 10) (provided) • 3 Samples (provided) • 1 Compass (provided) • 2 Staplers plus extra staples (provided) • Pencil/pens/markers for putting name on back (troop provides) • Scissors (troop provides) **Preparation:** • Make copies:

	• A printed Circular Sky Map for each Girl Scout. Print on card stock. ○ There is a master provided that can be used for copying. Or it can be printed from this url: www.girlscouts.org/SpaceScienceStarWheel . It looks like this:  • A printed Star Wheel's Outer Sleeve for each Girl Scout. Print a few extras. Print on card stock. ○ There is a master that can be used for copying. Or it can be printed from this url: www.girlscouts.org/SpaceScienceStarWheel . ○ It looks like this:

- You may wish to 'start' the cutting of the hole in the middle of the Star Wheel's Outer Sleeve by poking an X in it in advance of your meeting.
- You may have particular constellations that you wish to emphasize. You might want to mark then using a yellow highlighter in advance on those so it is easy for the Girl Scout to spot them.
    - The Big Dipper (which is part of Ursa Major) is handy to have highlighted so it can be spotted easily. Also, the Little Dipper (unlabeled on the chart but the North Star is the end star of its handle) is also a good anchor constellation to get started.

Activity:

1. Each Girl Scout needs
    - Circular Star Map
    - Star Wheel's Outer Sleeve
    - Scissors
    - Pencil
2. Cut out Star Map.
3. Cut out Star Wheel's Outer Sleeve. CAUTION: Cut *around* the lower box; do not cut at the bottom of the blue section.



4. Cut out the center circle of the Outer Sleeve.
5. Fold up the bottom white rectangle of the Outer Sleeve, behind the printed side of the paper. (that is, it is underneath the front.) It will make a pocket.
6. Staple the sleeve where indicated on each side of the pocket.
7. Write name on the back.
8. Place the circle in the pocket so that it shows through the oval opening.
9. Find these things on the Star Wheel
    - The sleeve has various times of the night. The white numbers are standard tine; the yellow numbers are daylight savings time.
    - The Star Map has the months of the year, with divisions for every 5 days.
10. How to Use the Star Wheel:
    - Pick the date and hour you want to observe, and set the Star Wheel so this date (on the rim of the circular disk) matches the time indicated along the edge of the outer sleeve.
    - The Star Wheel's large oval shows the whole sky, and the oval's curved edge represents the horizon you're facing.
    - Once outside, hold the Star Wheel out in front of you and look at the yellow "Facing" labels around the oval. Turn the entire wheel so that the yellow label for the direction

	you're facing is on the bottom, with the lettering right-side up. That is, you can read the phrase normally. o There is a provided compass so that you can find North. o Now the stars above the map's horizon should match the real stars in front of you. Remember that star patterns will look much larger in the sky than they do on the map. The farther up from the edge of the oval the stars appear, the higher up they'll be shining in your sky. Stars in the center of the oval will appear directly overhead. o Depending on how dark the sky is in your area, there may be more stars overhead than are shown on the map. Everyone's sky looks a little different. If there are fewer stars visible to you than appear on the Star Wheel, try to find an observing site that is not flooded by house or streetlight. ▪ Also, the longer you're outside, the better the chance that your eyes will adapt to the darkness and the more stars you'll be able to see. 11. This is a good first activity: o Stars in the northern sky do not rise or set — instead, throughout the night they seem to slowly turn counterclockwise around Polaris, the North Star, which seems to stay in the same place in the sky no matter what time of night or season of the year. So let's find the North Star! o Begin by locating the Big Dipper. This giant spoon is actually part of a larger constellation called Ursa Major, the Great Bear. Find the two end stars in the Dipper's bowl — look opposite the handle. ▪ They're known as the "pointers." Why? Because a line drawn between them and extended away from the bottom of the bowl leads you to the North Star. Now that you know how find the North Star, you also know how to find due north no matter where you are in the Northern Hemisphere! o If you have North Star, then you also have found the Little Dipper. The North Star is the end star of the handle of the Little Dipper. (The Little Dipper is not labeled on the Star Chart but the North Star is, and it is all by itself in the middle of the circle.)
#4 - B: **Requirement #4: Use tools to explore**	There is another Badgerland Kit that can be used as an alternate for fulfilling Requirement #4: Use Tools to Explore. The kit's name is Solar

Activity: Classifying solar system objects There are 2 options included for this requirement. You only need to do one.	System Classification: Junior Space Science Investigator Requirement #4 and Ambassador Space Science Master Requirement #1. Leaders can check this kit out via Checkfront.

#5 - A:
 	
Materials for Planning a Star Party (with younger Girl Scouts)
 	
There are 2 options included for this requirement. You only need to do one.
	Materials:
	• 5 tent cards titled Girl Scout Astronauts; the inside of the tent card identifies the name of each woman featured (provided)
	• 5 tent cards titled Women of Color from NASA (provided)
	• Assorted 'photo booth' star and planet props (provided)
	• A galaxy back drop (provided)
	• 21 star and planet glasses (please be gentle so that future troops can also use them) (provided)
	• All other party materials (troop provides)
	• Constellation snack:
	  ○ mini-marshmallows (troop provides)
	  ○ pretzel sticks (or also uncooked spaghetti could be used) (troop provides)
	  ○ diagrams/pictures of easy constellations
	  ▪ Easiest: in blue circles (5 copies provided)
	  ▪ Two-sided constellation diagrams with stories (5 copies provided)
	  ▪ or make copies of the dot-to-dot sheets of constellations and have the Girl Scouts do the dot-to-dot and then pick one (or more) to make their snack. (master provided)
	  ○ pencils needed for each Girl Scout if doing the dot-to-dot constellation sheet (troop provides)
	  ○ plates/napkins/tablecloth – something to keep the workspace clean enough that the Girl Scouts can eat their creation when they are done (troop provides)
	• Drink idea: Tang
	• Oreo Moon Phases snack idea
	  ○ Oreo cookies (troop provides)
	  ○ Each Girl Scout needs a popsicle stick or a plastic knife (troop provides)

- Paper plate – cheap plain white paper plates, 1 per Girl Scout (troop provides)
- Earth sticker (provided, 1 per girl)
- Pen/pencil, 1 per Girl Scout (troop provides)

Preparation:

- Only some party materials are provided.
- The troop will need to do most of the planning and provide the materials for activities and food for treats.
- Some treat ideas are suggested under the Activities section, below.

Activity:

- ***Constellation snack idea:***

  - Materials:
    - mini-marshmallows (troop provides)
    - pretzel sticks (or also uncooked spaghetti could be used) (troop provides)
    - diagrams/pictures of easy constellations
      - Easiest: in blue circles (5 copies provided)
      - Two-sided constellation diagrams with stories (5 copies provided)
      - or make copies of the dot-to-dot sheets of constellations and have the Girl Scouts do the dot-to-dot and then pick one (or more) to make their snack. (master provided)
    - pencils needed for each Girl Scout if doing the dot-to-dot constellation sheet (troop provides)
    - plates/napkins/tablecloth – something to keep the workspace clean enough that the Girl Scouts can eat their creation when they are done (troop provides)
  - Activity
    - Gather one marshmallow for each star in your constellation.
    - Start by placing the marshmallows down on the table to make the constellation's pattern.

- Use the pretzel sticks (alternatively, spaghetti) to connect the marshmallows together to make a model of your constellation.

- ***Drink idea:*** Tang (what the astronauts drank when they first went into space in the 1960s and 1970s)

- ***Oreo Moon Phases snack idea:***

Picture above from [Oreo Cookie Moon Phases - ScienceBob.com]

Materials

- Oreo cookies (troop provides)
  - Double stuff cookies are better
  - There are reports that cookies that are at room temperature will twist off more easily.

- You may wish to 'twist off' the cookies and bag them in advance.
- You may wish to have Girl Scouts work in pairs so that each Girl Scout has 4 cookies – which is plenty of cookies for any one Girl Scout!

- Each Girl Scout needs a popsicle stick or a plastic knife (troop provides)
- Paper plate – cheap plain white paper plates, 1 per Girl Scout (troop provides)
- Pen/pencil, 1 per Girl Scout (troop provides)

Background

To start, the phases of the Moon are the different ways the Moon looks from Earth over the course of about a month!

As the moon orbits around the Earth, the half of the moon that faces the sun will be lit up. The different shapes of the lit up portion of the moon that can be seen from the Earth are known as the phases of the Moon.

Each phase repeats itself every 29.5 days. There are 8 phases that the moon goes through.

Activity

- Find a cookie that has at least half of its frosting. Use the edge of a knife/popsicle stick to draw a line down the center of the icing, carefully scrape off half the icing, and set onto the top of the paper plate to begin your first quarter Moon cycle.
  - This cookie is placed at the 12 o'clock spot.
  - The frosting part of the cookie should be on the right hand side.
  - Label it **FIRST QUARTER:** Half of the lit portion of the Moon is visible.
- Find a cookie that has all of its frosting as a complete circle.
  - This cookie is placed at the 9 o'clock spot.
  - Label it **FULL MOON**: The entire moon is lit.
- Find a Cookie that has no frosting.
  - This cookie is placed at the 3 o'clock spot.
  - Label it **NEW MOON:** A new moon cannot be seen because we are looking at the unlit half of the Moon.
- Find a cookie that has at least half of its frosting. Use the edge of a knife/popsicle stick to draw a line down the center of the icing, carefully scrape off half the icing, and

	set onto the top of the paper plate to begin your first quarter Moon cycle. ▪ This cookie is placed at the 6 o'clock spot. ▪ The frosting part of the cookie should be on the left hand side. ▪ Label it **LAST QUARTER:** Half of the lit portion of the Moon is visible. ○ Find a cookie that has most of its frosting. Carve off the edge of its frosting; the part that is carved off should look like a banana.  ▪ This cookie is placed between the Full Moon and the Last Quarter. ▪ The frosting part of the cookie should be on the left hand side. ▪ Label it **WANING GIBBOUS:** This occurs when more than half of the lit portion of the Moon can be seen but it gets smaller in size day by day. ○ Find a cookie that has most of its frosting. Carve off the edge of its frosting; the part that is carved off should look like a banana. It should be much less than half of the frosting.  ▪ This cookie is placed between the Full Moon and the First Quarter. ▪ The frosting part of the cookie should be on the right hand side. ▪ Label it **WAXING GIBBOUS:** This occurs when more than half of the lit portion of the Moon can be seen. It gets bigger in size day by day.

	○ Find a cookie that has at least half of its frosting. Carve off some frosting so that the frosting looks like a banana.  ▪ This cookie is placed between the New Moon and the First Quarter. ▪ The frosting part of the cookie should be on the right hand side. ▪ Label it **WAXING CRESCENT:** This is when the Moon looks like a crescent and gets bigger in size from one day to the next. ○ Find a cookie that has at least half of its frosting. Carve off some frosting so that the frosting looks like a banana.  ▪ This cookie is placed between the New Moon and the Last Quarter. ▪ The frosting part of the cookie should be on the left hand side. ▪ Label it **WANING CRESCENT:** This is when the Moon looks like a crescent and gets smaller in size from one day to the next. ○ Outloud, say all the phases of the moon in order. Now you have earned the prize of eating the cookies!
#5 - B: **Create a poem and share it with family and friends** Adapted from Nancy Lebofsky's blog entry	**Materials:** • Pencils/Pens, 1 per Girl Scout (troop provides) • Paper for creating poem, 1+ per Girl Scout. Can be scrap paper because there will be edits and changes and crossed-out sections (troop provides) • Nice paper for copying the finished poem, 1 per Girl Scout. Can be letter sized paper, scrapbook paper, card stock, poster sized paper. (troop provides) • Markers for writing completed poem on nice paper (troop provides) • Pictures/images of various space objects to inspire their poetry m,(provided)

titled “Putting the ‘Verse” in the Universe”, dated 10/24/2019.
 	
There are 2 options included for this requirement. You only need to do one.
	• Tent cards with instructions for poems that can be placed out on the table for the Girl Scouts to refer to as they work. (provided)
	  ○ Cinquain poem, format 1
	  ○ Cinquain poem, format 2
	  ○ Two word poem
	  ○ Name poem
	
	Preparation:
	• Gather needed materials
	• Read the four suggested poem format options, copied below, and decide what fits your Girl Scouts. One or two choices is best; Four is too many for the Girl Scouts to easily choose between, especially on an activity as unfamiliar as writing a poem.
	• In your mind, determine how much time you will give the Girl Scouts to create their poem, and then how much time for creating the presentation document of their poem.
	• You may wish to focus the Girl Scouts to a specific topic. You can use some of the ‘photo booth decorations’ from Activity #5 – A above to help them visualize the objects they would find in space. Or if you are ambitious, you can Google images from the James Webb telescope or the Hubble telescope, print them, and display them to inspire their poems.
	
	Activity:
	1. Tell the Girl Scouts that they are going to write a poem, and then when it is finalized, they will copy it on to nice paper to share with others.
	2. Set a time line
	  • Tell them how long they have to create their poem
	  • Tell them how long they have to create the presentation version of their poem
	3. Read the ‘rules’ for the formats of poems that you have chosen in advance. Possibly, the troop as a whole might write one poem together, quickly, to help them understand how to be spontaneous in their writing.
	4. The Girl Scouts will work on their poem and the presentation document of their poem.
	5. Share their poems:
	  • Display them
	  • Read them aloud to each other, to another troop, or to their family
	  • Mail them to a grandparent or other family member with a note that they wrote this poem about space at their Girl Scout meeting and that they thought that this person would enjoy seeing their work.

For reference, here is the information on the table tent cards for the four kinds of poem formats, from easiest format to hardest format:

Name Poems:
Choose a word about astronomy. Write each letter, one-by-one, from top to bottom on your paper. Each letter of your chosen word is the beginning letter of one line of the poem. Each line should relate in some way to your chosen word.

For instance, if your chosen word is "Saturn", then your poem could be:

Saturn
Awesome
Turning
Uranus's neighbor
Rings
Nightly sight

Two Word Poems
Pick a word or an idea about astronomy. Write a series of two word lines about it. It can be any number of lines, but should be at least 3 or 4.

Example:

Solar System
One star
Nine planets
Many moons
Chunky asteroids
Traveling together
Through space
Through time
To where?
Until when?

Cinquain - format 1
The poem contains 5 lines which follow this format

1. Line 1 has one word which states the title.
2. Line 2 has two words which describe e the title.
3. Line 3 has three words which express an action.
4. Line 4 has four words which express a feeling.
5. Line 5 has one word which is a synonym for the title.

Example:

	Jupiter Colorful, banded Turning, traveling, spinning Beautiful object of wonder King ***Cinquain - format 2*** The poem contains 5 lines which follow this format: 1. Line 1 has two syllables. 2. Line 2 has four syllables. 3. Line 3 has six syllables. 4. Line 4 has eight syllables. 5. Line 5 has two syllables. Example: Our Sun Huge, yellow, bright Glowing, heating, burning Pretty star that gives light to Earth Shine on! Adapted from Nancy Lebofsky's blog entry titled "Putting the 'Verse" in the Universe", dated 10/24/2019, https://www.vaticanobservatory.org/sacred-space-astronomy/putting-the-verse-in-the-universe/
End	**Great! You have completed three requirements of the Junior Space Science Investigator badge. Hope you had fun!**

gs Jr Space Circle Sun Month Names

gs Orion star table for 3-D Model