MY PLACE IN SPACE

Stewardship of My Universe

- ❑ **Display today's topic**
- ❑ **Song service**
- ❑ **Opening prayer**

Reinforcement Time
With Show and Tell Volunteers

What did you do this week to make your country a better place? Did you learn anything more about taking care of your continent?

[Invite the show and tell volunteers to present what they have brought that illustrates good stewardship. You may be able to add some of their contributions to the Stewardship Bulletin Board.]

[Ask for volunteers who will bring something to the next meeting that relates to stewardship of the universe.]

Introduction: We have been studying stewardship for quite a long time. Today we are going to learn that we are a part of something much bigger than our country, or even our hemisphere. We are a part of the whole universe. Our planet earth revolves around the sun which is one moderate sized star among trillions of other stars in our galaxy which is called the Milky Way. But that is still

MATERIALS NEEDED

Activity 1: use items listed in activity; or Little Folk Visuals Solar System felt set; or have participants draw, color, and label the sun and nine planets

Activity 2: the facts about nine planets written on separate strips of paper

Activity 3: flip chart or writing board

Activity 4: large pan of water

Activity 5: ball; flashlight

Activity 6: if using Solar System Felt Set, make copies of cover sheet for everyone to color or find illustration from a library book; color crayons

Activity 7: arrange a field trip to a planetarium; invite someone who studies stars to help you find constellations one evening; see graphics of various constellations including Orion, black construction paper for each participant

NOTE: For Program 9, invite someone to come and play a reveille on the trumpet.

not all. The universe has trillions of galaxies! And God created all of them and guides them and loves each one of the creatures who inhabit any part of the universe. Do you think we have a responsibility as stewards in the universe?

Throughout the universe God has created many worlds where beings are living.[For example, see Job 1:6; and 2:1; Job 38:4, 7; I Corinthians 4:9; Hebrews 1:2; and 11:3.] They are not contaminated by sin, so they have much greater abilities than we do. They are watching what is happening on our earth. They are amazed when people choose to sin rather than live happy lives in harmony with God and His Son Jesus.

We have the privilege of showing them that we appreciate God's love and forgiveness. We can make them happy by showing that God has faithful friends here on this sinful earth. In a few years when we go to heaven, we will be able to visit those other worlds and talk to the people who were watching to see what choices we would make.

Let's begin today by learning a little about our solar system, which is the sun plus the bodies that revolve around it. We call the bodies planets, moons, asteroids, comets, meteoroids and dust. The solar system is just a tiny part of a galaxy, or major group of stars. What is the name of the galaxy where we live? (The Milky Way.) Our sun, which is named Sol, is the center of our solar system, and we live on one of the nine planets revolving around it. Does God give us any responsibility for the solar system? [Wait for offered ideas.]

Unless you are an astronaut in a rocket flying around in outer space, there is not a lot you can do to make a physical difference to the other planets. But part of good stewardship is enjoying the beautiful things that God has created.

Activity No. 1: *Make a table display of the planets.*

Our earth is not the only planet that has a special relationship with the sun. There are eight other planets that revolve around the sun, some too close to it to support any life (it's much too hot), and some too far from the sun's warming rays (brrrrr). Can you name the other planets in our solar system? Did you know that six of the other eight planets also have moons?

You can make a table-top display of the planets with foods and things found right in your kitchen (well, you may not keep a beach ball there). Use the chart below to round up the foods, or roll small bits of colored clay or play dough into balls that match the relative sizes shown.

Sun - beach ball (27")
Mercury - tiny pea (3/32")
Venus - pea (1/4")
Earth - pea (1/4")
Mars - small pea (1/8")
Jupiter - orange (2 3/4")
Saturn - tangerine (2 1/4")
Uranus - walnut (1")
Neptune - walnut (1")
Pluto - a sesame seed (1/16")

Here's a good way to remember the planets in their proper order: *M*en *V*ery *E*arly *M*ade *J*ars *S*erve *U*seful *N*eeds, *P*eriod.

[This activity is adapted from *The Kids' Nature Book,* page 80, by Susan Milord. Williamson Publishing, Charlotte, Vermont, 1989. ISBN 0-913589-42-X]

Activity No. 2: *Stewards of our solar system.*

Let's be good stewards of our solar system by learning a little about the sun and the planets in order to intelligently enjoy God's creation.

The sun is our nearest star. Its gravitational pull holds the solar system together. It is 93,000,000 miles away from us. The other stars are so much farther away that it would take an entire blackboard to write all the zeroes for the millions of miles. Scientists have found an easier way to measure great distance. They measure the distance between earth and the other stars by how far light travels in one year. They call that distance a light year. Then the numbers don't look so big. (Light travels at approximately 186,000 miles per second.)

When we measure by light years, our sun is only 8 light-minutes away. What does that mean? (The distance between the earth and the sun is the distance that light can travel in 8 minutes.) Our next nearest star is 4 1/3 light-years away, so you can see that even the next closest star is a great distance from our sun.

The planets. There are nine planets that we know of in our solar system. How many of the planets can you name? [Allow time for answers. If your group has completed Activity No.1, they should know the names and order of the planets. If not, challenge them to line the planets up in order beginning with the sun. This activity can be repeated until everyone can do it.]

[Cut the following facts into nine strips of paper and have a different person present each one.]

Mercury is the closest planet to the sun. It is sizzling hot in the daytime and very cold at night. Mercury is only a little bigger than our moon and has craters in it just like the moon. There is no air or water there, only a desert.

Venus is the hottest planet in the solar system. Scientists believe that it is about 480 degrees centigrade on this planet. One hundred degrees centigrade makes water boil, so 480 degrees is very hot! Venus is covered with thick clouds of poisonous sulfuric acid and the air is carbon dioxide. It is 60 times heavier than the air on earth. We would not be able to live there because of the heat, and we would not be able to breathe the air.

Earth is our planet, the third from the sun, the jewel of the solar system. It has water on it and beautiful plants and birds and fish, and animals. People can thrive here, loving and laughing and caring about each other. God made all the conditions just right for life.

Mars is called the red planet because of the reddish rocks on its surface. There are ice caps at the north and south poles that actually melt in summer and refreeze in the winter. Mars has two moons and the largest volcano in our solar system, but it is a dead volcano; it does not erupt anymore.

Jupiter is a giant made of gas and liquid, so if you went to Jupiter on a rocket, you wouldn't be able to land or walk there. Jupiter has 16 moons and a red spot on the side that scientists tell us is probably a huge wind storm that has been going on for a long, long time. Jupiter is so big that it would take more than 300 planets the size of our earth to equal its size, but it is only a little heavier than water.

Saturn is another planet that is made of gas and liquid. We could not stand or walk on Saturn either. It spins much faster than the

earth and it has pretty rings around it which are made of rocks and ice, but you wouldn't be able to walk on them either. Saturn is so light it could float in water.

Uranus is a frozen gas planet. It is the only planet that orbits the sun tipped over on its side, so sometimes its North or South Pole points directly at the Sun.

Neptune is also a giant gas planet. It looks greenish-blue because of the chemicals that are in its gas, and it spins very fast.

Pluto is 6 light-hours away, which means _____? It is the smallest planet; about half the size of Mercury, the next smallest planet, and only 1 ½ times as big as our moon. Pluto is the farthest away from the sun–most of the time. It takes 248 years for Pluto to make its orbit all the way around the sun, but for 20 years of that orbit it loops inside Neptune's orbit, making Neptune the farthest planet from the sun until the 20 years passes and Pluto is farther out again. From February 7,1979 to February 11,1999 Pluto's orbit was inside Neptune's orbit, making Neptune the farthest planet from the sun. When will that happen again? (Add 1979 to 248.)

[Your group may want to construct a model of the solar system to hang from the ceiling. Many solar system sets are available today in toy stores and museum stores and nature stores.]

Activity No. 3: *Time on earth.*

Time on planet Earth is determined by the way the earth turns. One turn of the earth all the way around takes about 24 hours and it includes a light time and a dark time. In chapter 1 of Genesis this is called a day. The time it takes the earth to go all the way around the sun is what we call a year. By comparing the length of days and years on the various planets, we will see the great difference that is made by size and speed and distance from the sun.

[On the flip chart or writing board, make three columns and title them Planet, Day, and Year, as you see in the illustration below. Under Planet write Earth and have a volunteer write 24 hours in the Day column and 365 days in the Year column. Gradually add the information for the other planets, giving opportunities for questions and comments from the participants.]

[Study Day/Year Chart (P-5). It will not be interesting to the participants if you present it already filled in. Use some kind of visual aid of the solar system so the group sees the relative sizes and distance from the sun. Then as you talk about each planet, ask the group to try and predict how the length of the day and year will compare with earth's day and year.]

Mercury takes about 59 earth days to spin around one time. Its year is 88 earth days in length.

Venus: It takes 243 earth days for Venus to spin around once. That means that one day on Venus is 243 of our days. But a year for Venus is only 225 days. A year on Venus is shorter than one day!

Mars spins around one time in approximately 25 earth hours. Its year is almost twice as long as ours on earth.

Jupiter: One day is a little less than 10 earth hours, but one year, or one orbit around the sun, takes about 12 earth years.

Saturn: One day on Saturn only takes about 11 earth hours. But a year, or one loop around the sun, takes 29 ½ earth years.

Uranus: Because of the lying down spin

with the North or South Pole pointing directly at the Sun, light and dark on Uranus can be many earth years long. That is because when the South Pole is pointed toward the Sun, the North Pole will not be exposed to any sunlight, etc. However, the planet spins completely around in 16 hours, so, in the Day column write 16 earth hours. In the Year column write 84 earth years.

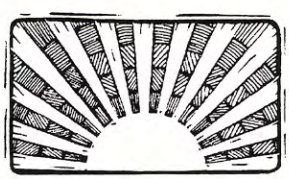
Neptune: One day takes 18 ½ earth hours, but one year takes 165 earth years.

Pluto: Little Pluto takes almost 6 ½ of our days to spin around one time. One year is 248 earth years.

[Have the group figure out how old they would be in earth years if they were that same age on Jupiter. You can get this by multiplying their age times 12.]

Sabbath would come at different intervals on every planet. On Neptune, Sabbath would come every 5 ½ days, (18 ½ hours X 7 days divided by 24 hours = about 5 ½ days). On Venus Sabbath would come every 4 ½ years. (243 days X 7 days divided by 365 days = about 4 ½ years. It is clear that God especially designed the Sabbath for us on planet earth.

Activity No. 4: *Solar System*



Thinking.

1. Which is bigger, the earth or the sun? (The sun is MUCH bigger than the earth.)
2. Where is the hottest place in our solar system? (The core or center of the sun.)
3. What is the sun made of? (Burning gas, mostly hydrogen and helium.)
4. What is the most important job of the sun? (Several answers could apply.)

–Provides warmth and light for plants to grow, which then feed all the people and animals on earth

–Activates in our skin some of the vitamins in the food we eat

–Holds the planets in place by gravity

–Is responsible for wind and evaporation

–Plays a part in the changing of the seasons

–With the moon it causes the movement of tides

–Is responsible for all the colors we see

–(Read Genesis 1:14-19 to discover more that the sun does for us)

5. Why do some planets have much longer years than ours? [They are farther from the sun so have farther to travel as they circle the sun.]
6. What is a safe way to look at the sun? (NEVER LOOK DIRECTLY AT THE SUN BECAUSE IT COULD BLIND YOU.) Here is a safe method: Set a large pan of water where the sun will reflect in it. Look at the sun's reflection in the pan.
7. How fast is our earth traveling around the sun? (67,000 miles /107,823 kilometers per hour. In one year we all travel more than 583 million miles /938,221,900 kilometers.)
8. How fast is our earth spinning? (At the equator it is spinning at 1,000 miles per hour. But the north and south poles move very slowly. If you can't figure out why this happens, spin a ball around and watch it.)

Activity No. 5: *Moonlight.*

Seven of the nine planets in our solar system have moons circling around them. Only Mercury and Venus have no moon. Jupiter has 16 moons and Saturn has at least 21.

A moon does not generate its own light (only stars do that). So the moonlight we see is actually reflected light from the sun. Our moon is only 1 ½ light-seconds away. What does that mean? [It means the moon is the distance from the earth that light can travel in 1 ½ seconds.]

Our moon is much smaller than the earth. In fact, it would take 50 moons to fill a ball the size of our earth.

Do you know why the shape of the moon changes? [Give the participants time to offer answers.] The moon doesn't really change its shape at all. It just looks that way from here because sunlight shines on it differently as the moon goes around the earth. The moon is traveling around the earth each 29 ½ days while the earth is traveling around the sun in 365 days.

[Try the following experiment which shows how the apparent shape of the moon changes as it goes around the earth.]

[Go outdoors and have one child hold a ball and one a flashlight. The ball represents the moon, the flashlight the sun, and the child holding the ball represents the earth.]

[The ball is held directly in front of "earth" while the other child aims the flashlight toward the ball. Make sure "earth" is standing with the ball in the beam of the light. The one holding the ball will notice that it's hard to see the "moon" because the light is shining on its other side.]

Keeping the ball held out on the hand, move it slowly around toward the left. The shape of the ball will seem to change. Soon the lighted side will look like a "banana." As the ball is continually moved toward the left, more and more of the lighted side can be seen. Soon the ball will have the shape of the capital letter "D," with its right-hand side lit up. That's called a "first quarter" moon.

Keep moving the ball around and it will seem to get bigger and bigger. When the ball is opposite the flashlight, "earth" will see a full round shape. This is called a "full" moon.

Continue to move the ball around to the left, and you will see a smaller and smaller part of it lighted up until you have completed the full circle and once again it is hard to see the "moon."

In this experiment, the "moon" can be moved around in just a few minutes, but the real circuit of the moon around the earth takes about 29 ½ days.

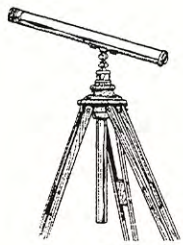
[If possible, arrange an evening for children to look at familiar stars or planets through a telescope. Encourage them to watch for shooting stars.]

Activity No. 6: *Coloring sheet.*

[Make copies of P-6 for each of your participants to color.]

[If you are using the Solar System Felt Set from Little Folk Visuals, the children can use

them as color guides. Be sure children understand the planets' proper sequence from the sun which is in the lower right-hand corner. Make sure they understand that the broken lines represent each planet's orbit or path around the sun.]



Activity No. 7: *Constellation Study.*

[After this introduction to constellations, if at all possible, arrange a field trip for the group to a planetarium where you can sit comfortably in the middle of the day and see the night sky while someone points out the stars and constellations, and galaxies.]

[Invite someone in your area who studies stars to come and help you find some constellations in the night sky. Or at least ask them to tell you what constellations you should be able to see at this time of year.]

When you look up in the sky and see a group of stars, do you know what that is called? (a constellation) A constellation is different from a galaxy. A galaxy is almost impossible to see, even though it is huge. A constellation is a group of just a few stars we can see. They look close together in the sky. For thousands of years people around the world have been studying the stars. They have remembered where certain stars are, because the groups of stars always look the same. And the star group reminds them of some picture, such as a bull with horns, or the letter W, or a great big square, or a dipper. These star "pictures" are easy to remember.

Here are the shapes of some constellations you can learn and then look for at night. [Choose which constellations (P-7 through P-18) to teach after finding out which ones you can see at this time of year.]

Make a constellation:

[Display the constellation charts. Pass out black construction paper. Let participants choose a pattern and copy it by poking holes in their black construction paper. Then they can shine a flashlight through their paper and project their constellation on the wall. An alternative to this would be to use star stickers on the black construction paper to make posters of their favorite constellations. Let them make several black construction paper constellations to take home.]

Make a constellation projector:

[A good way to review the names and shapes of several constellations.]

[Use an empty oatmeal box (cut off the bottom, too) or other round container approximately five inches in diameter. On a length of paper the width of the cylinder punch holes in the shapes of constellations, one after the other, down the length of the paper.]

[Feed the paper through two slits you make on opposite sides of the cylinder near one end.]

[Shine a flashlight inside the box.]

[The constellations will show up wherever you point the box.]

The Great Nebula in the constellation of Orion:

Let's find the chart of the constellation of Orion (P-10). This group of stars looked like a hunter to early students of the stars.(See P-19.) In the middle, three stars go across forming the hunter's belt. Three stars stretch down from the belt forming the hunter's sword. The center star in the sword is called the Great Nebula. When astronomers look through their

telescopes at this star, they see beautiful clouds in an awesome tunnel of stars. They think that a nebula is where smaller stars are born and where stars come from, but they can't really see through the clouds that hide whatever is behind them.

We know something very special about this Great Nebula in Orion's sword. In 1848 when Ellen White was only 21 years old, she had a vision in which she saw what the coming of Jesus would be like. Here is what she wrote (Early Writings, p. 41):

"Dark, heavy clouds came up and clashed against each other. The atmosphere parted and rolled back; then we could look up through the open space in Orion, whence came the voice of God. The Holy City will come down through that open space."

Can you imagine why God has clouds covering the nebula? [Allow time to discuss this.] Revelation 6:14 tells about a time when the sky will roll up like a scroll. Maybe then we will be able to see what is behind the clouds in the Great Nebula.

❑ **Summary**

[Suggested questions to ask: What was the most interesting thing you learned today? Did anything amaze you or surprise you? What kind of ideas are you developing about your responsibilities as a steward?]

[Listen carefully to responses. You may need to react to a misunderstanding of what was studied during the program.]

❑ **Reminder to Show and Tell Volunteers**

[Call the names of those who volunteered for the next program and hand them written reminders. See the Sample Program for a suggested reminder.]

❑ **Closing prayer**