

Mini 4-H

Sun, Stars & Space



Draft

Developed by

Purdue University Cooperative Extension Service

Area 7 Youth Educators

(Blackford, Delaware, Fayette, Franklin, Henry, Jay,
Madison, Randolph, Rush, Union and Wayne Counties)

PURDUE UNIVERSITY, INDIANA COUNTIES AND U.S. DEPARTMENT OF AGRICULTURE COOPERATING
AN AFFIRMATIVE ACTION/EQUAL OPPORTUNITY INSTITUTION

Mini 4-H 'Parent's Page

Welcome to the Mini 4-H Program! Mini 4-H is designed for you to explore a variety of project areas.

Your child received this project manual when enrolling in Mini 4-H. This manual will provide fun, age-appropriate learning activities throughout their year (s) in Mini 4-H and their interest in this project.

As a Mini 4-H parent, your job will be to guide and encourage your child through the activity. It is highly suggested that you do not complete the activities for them. Instead, help them, guide them, work with them, and let them do all that they possibly can. The 4-H motto is "learn by doing" ... and is the best educational tool that we can provide for youth.

Additionally, the Mini 4-h program is set up to allow your child to exhibit a project at the 4-h Fair. The project is based upon information within this manual.

The 4-H Fair is an exciting time for 4-H members and families. It is a week that allows community youth to showcase their talents, interests and enthusiasm for learning.

Mini 4-H is fun! Your child will certainly enjoy it. You can have fun too, by guiding and helping as your child participates in the program. Encourage and praise your child as he/she has fun learning and sharing with you.

If you have any questions regarding Mini 4-H or other 4-H programs, please feel free to contact your local Extension Office.



Mini 4-Her's Page



Welcome to Mini 4-H! You are now a member of the 4-H family. You are a special person.

Mini 4-Her's have lots of fun! There are lots of activities for you to explore. You can try new things. You can share it with your friends and family.

Mom, Dad or another adult can help you with your project. Bring your project to the 4-H Fair and lots of people will be able to see what you have done. You also get a ribbon made just for Mini 4-Her's.



Here are some things to know about 4-H.

The 4-H Symbol: A four-leaf clover with an "H" in each leaf



4-H Colors: Green and White

The 4-H Motto: To make the best, better.

The 4-H Pledge: I pledge my *Head* to clearer thinking,
my *Heart* to greater loyalty,
my *Hands* to larger service, and
my *Health* to better living,
for my club, my community,
my country, and my world.



The Solar System



We live on the planet called Earth. The Earth is one of nine planets that orbit or go around the sun in a circle. Most planets, like Earth have a moon. Some planets have more than one moon. The sun, the planets and the moons make up the solar system.

The planets in our solar system are very different. The ones close to the sun are very hot. The ones that are far from the sun are very cold. Here is a list of planets and their order from the sun.

1. Mercury
2. Venus
3. Earth
4. Mars
5. Jupiter
6. Saturn
7. Uranus
8. Neptune
9. Pluto

Mercury is the planet that is very close to the sun.. Pluto is usually the planet that is the farthest. Sometimes Pluto is closer than Neptune ... it all depends on their orbit.

From Earth, the other planets all look like stars. Venus shines very bright and is close to the ground or horizon. It is usually the first “star” that you can see. You can sometimes see Mars and Jupiter. Mars has a red glow to it and Jupiter has a yellow glow. These planets usually are high in the sky.



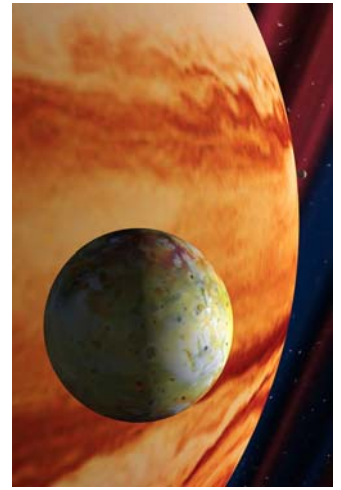
Activity 1 --Name Those Planets!

You will need these things.

·pencil

Here's what you do:

1. Read the following information about planets.
Each box has information about 1 planet.
2. Match the information with a planet name.



Planet _____ (a)

- ★ So small you can barely see it with a telescope
- ★ Know as the tilted planet - it looks like it is lying on its side
- ★ Has 15 moons and a ring
- ★ Looks like the planet is covered by a blue-green fog.
- ★ Is 1.8 billion miles from the sun
- ★ Third largest planet
- ★ Takes 84 years to orbit the sun
- ★ Temperature is -350°F

Planet _____ (b)

- ★ Half the size of Earth
- ★ Does not have any moons
- ★ The surface is a rocky desert - hot that nothing can live on it
- ★ Is 36 million miles from the Earth
- ★ So close to the sun, that you cannot look at it. Even with a telescope, it will damage your eyes
- ★ The second smallest planet
- ★ Takes 88 days to orbit the sun
- ★ Temperature is 666°F during the day

Planet _____ (c)

- ★ 11 times bigger than Earth
- ★ Has 16 moons and thin ring
- ★ Covered with colorful storm clouds
- ★ Is known for the Great Red Spot
- ★ Was hit by a comet in 1996
- ★ Is 480 million miles from the sun
- ★ The largest planet
- ★ Takes 11.9 years to orbit the sun
- ★ Temperature is -240°F

Planet _____ (d)

- ★ The last planet to be discovered
- ★ The smallest of all planets, even smaller than Earth's moon
- ★ Will be the furthest planet (again) in 1999
- ★ Has 1 moon
- ★ Is 3.6 billion miles from the sun
- ★ Takes 248 years to orbit the sun
- ★ Temperature is -240°F

Planet _____ (e)

- ★ Our home planet
- ★ Has 1 moon
- ★ Is 93 million miles from the sun
- ★ Takes 365 days, 6 hours to orbit the sun
- ★ The axis is tilted and gives different seasons
- ★ Average Temperature is 0°F

Planet _____ (f)

- ★ This planet spins backwards
- ★ Almost the same size as Earth
- ★ The surface is mostly flat
- ★ Has yellow clouds and traps in heat
- ★ Does not have a moon
- ★ Is 67 million miles from the sun
- ★ Takes 243 days to orbit the sun
- ★ Average Temperature is 870°F

Planet _____ (g)

- ★ The second largest planet
- ★ Has a lot of wide rings and is known as the most beautiful planet
- ★ Rings are made up of ice bits, rocks, and dust
- ★ Has 20 moons
- ★ Is 900 million miles from the sun
- ★ Takes 29.5 years to orbit the sun
- ★ Average temperature is -300°F

Planet _____ (h)

- ★ The fourth largest planet
- ★ Known as the blue planet
- ★ Very difficult to see in the sky
- ★ Is the furthest planet from 1990 to 1999
- ★ Has 2 moons and a very small ring
- ★ Is 2.8 billion miles from the sun
- ★ Takes 165 years to orbit the sun
- ★ Average Temperature is -360°F

Planet _____ (i)

- ★ About half the size as Earth
- ★ Has a white ice cap on its North Pole and gas freezes on its South Pole and looks like it is snowing.
- ★ Known as the red planet
- ★ Was explored by a small rover in 1997
- ★ Has 2 moons
- ★ Is 141 million miles from the sun
- ★ Takes 687 days to orbit the sun
- ★ Average temperature is -9°F

Planet X

- ★ Some scientists think there is another planet. Special satellites show heat rays coming from space. These heat rays are like the ones coming from other planets. If a planet does exist, it would be further from the sun than Pluto

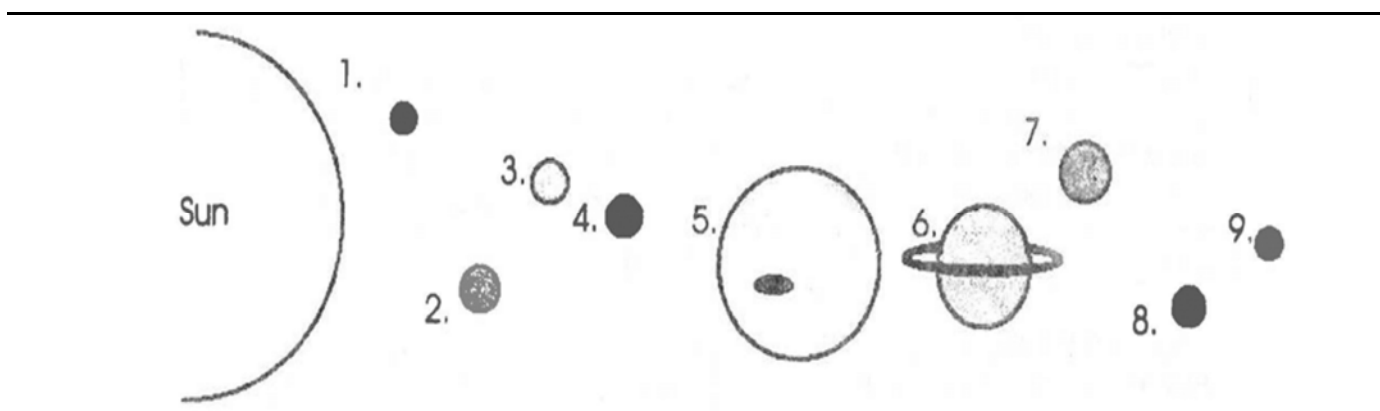
Activity 2 -- The Solar System

You will need these things:

- pencil

Here's what you do:

1. Now that you know more about each planet...let's see if you can label them in their correct order!
2. Match the planet with a planet name.



The Planets are....

- | | | |
|----------|----------|----------|
| 1. _____ | 2. _____ | 3. _____ |
| 4. _____ | 5. _____ | 6. _____ |
| 7. _____ | 8. _____ | 9. _____ |

(If you need help, see page 3!)



Mini Planets



There are a lot of other “planets” that orbit with us in our solar system. These mini planets are called asteroids. What are asteroids? They are large rocks and metal. These asteroids are as small as 1/4 mile across to as large as 685 miles across. Astronomers can keep track of about 3,000 asteroids.

Most asteroids are found in an asteroid belt. This belt is located between Mars and Jupiter. Like planets, asteroids travel in an orbit around the sun.

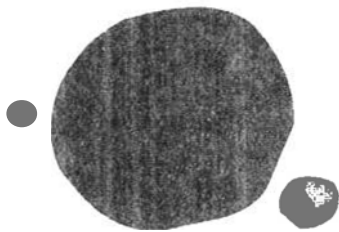
Asteroids hit each other. They also can leave their orbit. When this happens, asteroids can fly into planets or moons. If you look at pictures of our moon, you will see it has craters. Craters are “holes” in the ground. The Earth has also been hit by asteroids. Barringer Meteor Crater near Winslow, Arizona, is an example of a hit. This crater is 1.2 kilometers (0.75 miles) across and 200 meters (650 feet deep).

Meteorites are a small type of asteroid. Meteorites can be as small as a grain of sand. Finding meteorites are difficult. When the rock crashes through our atmosphere, they burn up. Meteorites are our “falling stars”. You can see meteorites in museums.

Activity 3 - - Asteroids Hit the Moon

You will need these things:

- foam ball (any size)
- brown paint
- paintbrush
- scissors
- paper
- pencil
- pins



Here's what you do:

1. Take the foam ball and pinch craters into it with your finger. You can push in the foam for a little crater or remove part of the foam for a large crater.
2. Paint the foam ball brown.
3. Create your own name for the craters. The biggest crater on the moon is called "Ceres".
4. Make small labels of the name of your craters. Cut the label so that it is small. Pin the label in the crater.
5. Now you have your own moon model complete with craters ... just like the real moon!



Comets have been popular these past few years. A comet is a ball of dust and ice. Like planets, it orbits the sun.

What makes a comet different than an asteroid or meteorite? As the comet travels close to the sun, the ice gets hot. The ice turns to water and then into a gas. This gas makes a long tail.

As the comet moves away from the sun, it gets cold. The tail gets small and goes away ... until it travels close to the sun again.

The most famous comet is called Haley's Comet. It went by the Earth in 1986. Its orbit around the sun is 76 years. How old will you be when we can see it from Earth in 2061?

Activity 4 -- Comets



You will need these things:

- foam ball (any size)
- cotton balls
- glue
- scissors
- paper
- pins

Here's what you do:

1. Glue cotton balls to your foam ball. This will give your foam ball a snowy or icy look. This will be the head of your comet.
2. Cut strip of paper. They can be long or short. Try to make them thin. About 1/2 inch or 1 inch.
3. Pin these to one side of the foam ball. This will make your tail.
4. If you want to make a longer tail, glue some of the pieces of paper together to make long strips.
5. Don't forget to name your comet!



The Sun & Stars



A very important part of our solar system is the sun. The sun is a star. Stars are big balls of hot gas. Like the Earth, they also spin.

The sun is very large. You can put over 1 million Earths into our sun.



sun is also very hot. Scientists think its temperature is 27 million°F. The sun is so big and so hot that it gives the Earth plenty of heat and light. The sun gives so much light that you should NEVER look directly at it. It will hurt your eyes.

Stars, like the sun, shine all of the time. So why do we have a day and night? The Earth rotates or spins. During the day, the part of the Earth where we live faces the sun. During the night, we face away from the sun.

Activity 5 --Check Your Shadow

You will need to find these things:

- a sunny day
- shadow table
- tape measure
- rocks
- a helper
- shadow chart

Here's what you do:

1. At about 10 a.m., go outside and stand in an open area. With a rock, mark where you are standing.
2. With a second rock, have your helper mark the end of your shadow.
3. Measure the length of your shadow. You can do this by measuring between the rocks.
4. At noon, go back outside. Stand in the same place as you did before. Mark the end of the new shadow. Measure the new length.
6. At 2 p.m., go back outside. Stand in the same place as you did before. Mark the end of the new shadow. Measure the new length.

- At 4 p.m., go back outside. Stand in the same place as you did before. Mark the end of the new shadow. Measure the new length.
- Keep track of your information in this shadow chart.

Time of day	Length of shadow	Where was the sun in the sky?
10 a.m.		
12 p.m. (noon)		
2 p.m.		
4 p.m.		

Question: What happened to your shadow during the day? Did it stay in the same place or did it move? _____

Question: Did your shadow length change? What was happening with the sun?

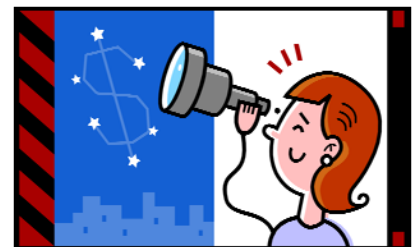
Question: Why did things change? _____

Stargazing

One fun thing you can do is look for patterns in the stars. These patterns are called *constellations*.

Hundreds of years ago, people from Greece looked at the stars and picked out constellations. They named them after animals and people. There are 88 constellations that are known to stargazers.

Some of the popular constellations are Leo,



the Lion and Orion, the Hunter. In the United States, many people look to the sky for the Ursa Major, the Great Bear and Ursa Minor, the Little Bear. These are easy to find because they use the Big Dipper and Little Dipper constellations ... most people can find the Dippers in the night sky.



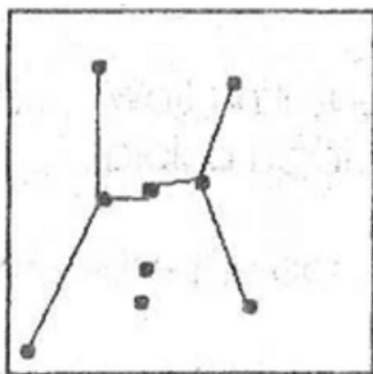
Activity 6 -- Constellations

You will need to find these things:

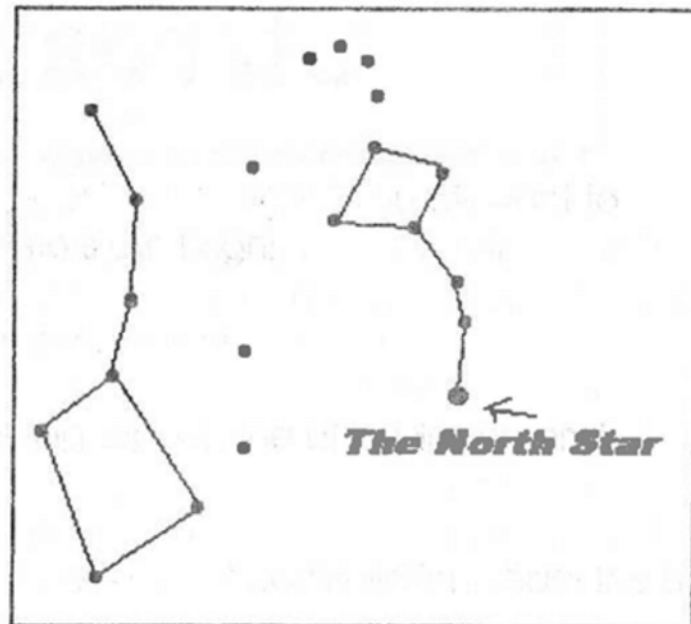
- a clear night
- constellation chart below

Here's what you do:

1. Wait until you have a good, clear night. You will want to pick a night when the stars are bright.
2. Use the constellation charts below.
3. See if you can find the Big Dipper, the Little Dipper, and the Great Bear.
4. If you are ready for a more difficult constellation, learn the Lion and Orion, the Hunter.



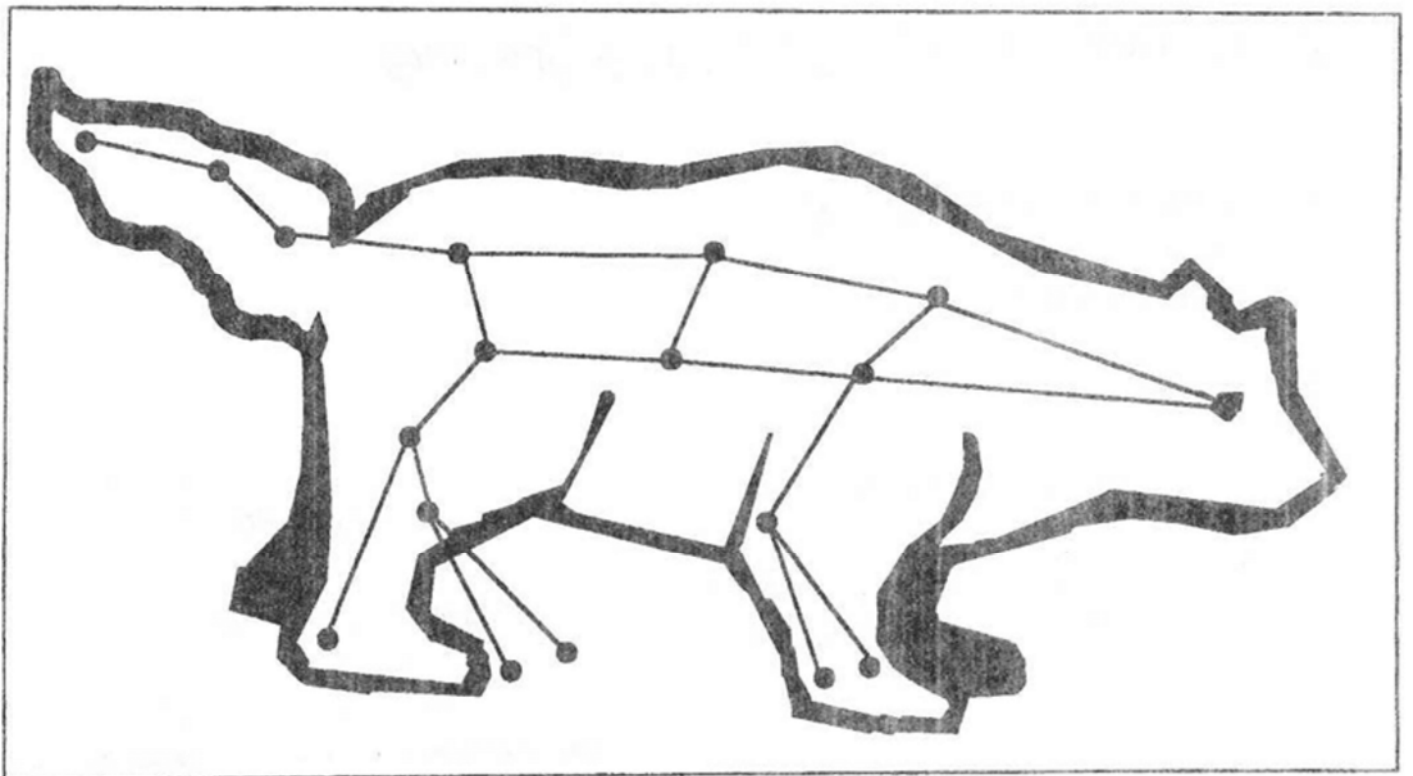
Orion the Hunter



Little & Big Dippers



Leo The Lion



The Bear



Exploring Space



Space travel is new to people. We have only been leaving Earth for 30 years. We have explored the land and ocean for thousands of years!

Man could not leave Earth's ground until he discovered a way to "fly". The Wright brothers were the first to do this in the early 1900's. Today, man travels to space almost every 8 weeks. Some people are live in space for a short time.

Each year we learn new things about space travel. As man gets better at science, we will travel further in space. Who knows where we might travel 50 years from now.



Activity 6 -- The Space Shuttle

You will need to find these things:

- pencil
- picture of the shuttle

Here's what you do:

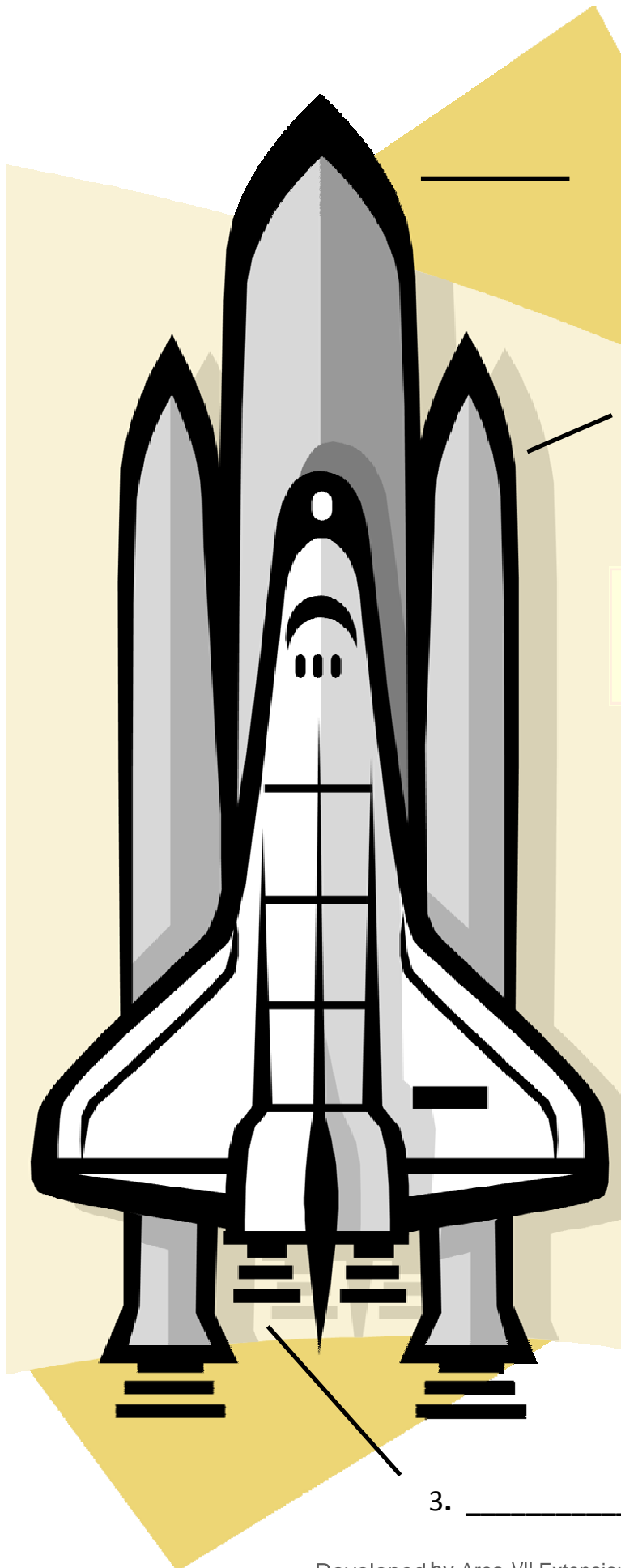
1. Look at the Shuttle picture.
2. Label the three parts of the shuttle from the word list..

Shuttle Parts

Space Shuttle Main Engine

External Tank

Solid Rocket Booster



1. _____

2. _____

Hint -- The Shuttle Main Engine is made up of a group of 3 engines and is on the back of the orbiter.

Hint -- The External Tank is the biggest or tallest part of the shuttle and contains liquid fuel.

Hint -- There are two solid Rocket Boosters which contain solid fuel and help the shuttle leave Earth

3. _____

What to Exhibit

Here is a list of projects that can be shown at the 4-H fair. Pick one of the projects you would like to exhibit at the fair. Use the label at the bottom of the page on your exhibit.

If you have any questions about your projects, please call the Extension Office. There are people there who can help you.

- * Make a poster showing one or two different constellations. You can use the ones in the manual or find new ones.
- * Make a poster about one or two different planets. Label the planets and tell something about them. You can use the information in this manual or find your own.
- * Make a solar system mobile. You may use any materials that you want. Make sure you label each planet.
- Exhibit the asteroid that you made in Activity 3.

For information on how to label your project, when to enter it in the fair, and where the project needs to go, please contact your Extension Office.

PROJECT EXHIBIT TAG

Mini 4-H Sun, Stars & Space

Name: _____

Grade: _____



**"SUN, STARS & SPACE"
RECORD SHEET
MINI 4-H PROGRAM**



Name _____

Grade _____

Address _____

Please answer the following questions. Attach this completed record sheet to your project. See you at the fair!!!

1. Why did you choose this project? _____

2. What was your favorite activity? _____

3. What is something new that you learned? _____

4. Did you enjoy this project? _____

Parent's signature: _____ Date: _____