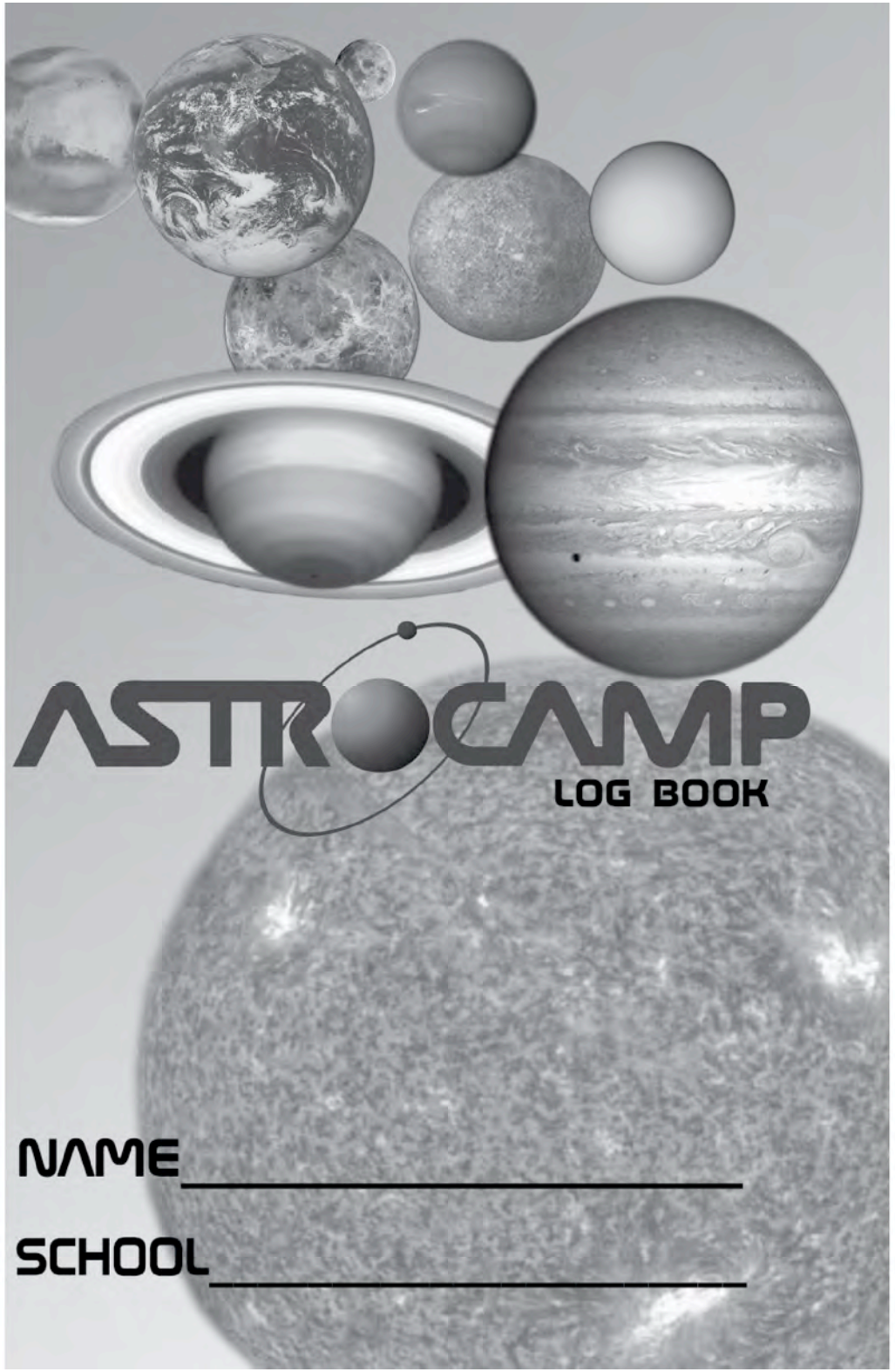
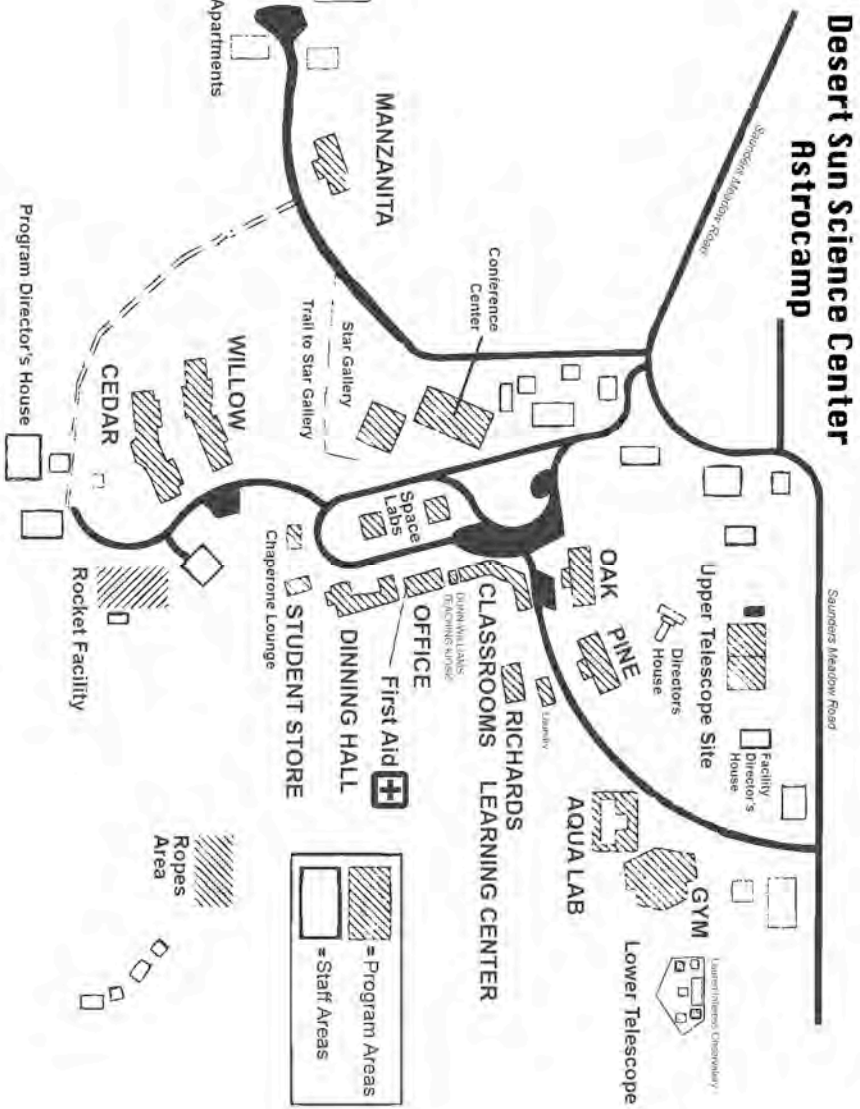

ASTROCAMP
LOG BOOK
NAME_____
SCHOOL_____

TABLE OF CONTENTS



PRE-MISSION BRIEFING

Name:

Arrival Date:

School/Date:

Housing Assignment:

Room Number:

Roommates:

Chaperones:

Instructor:

Research Group Name:

MISSION LOG

For each day, write down the activities for your research group and record the daily weather conditions.

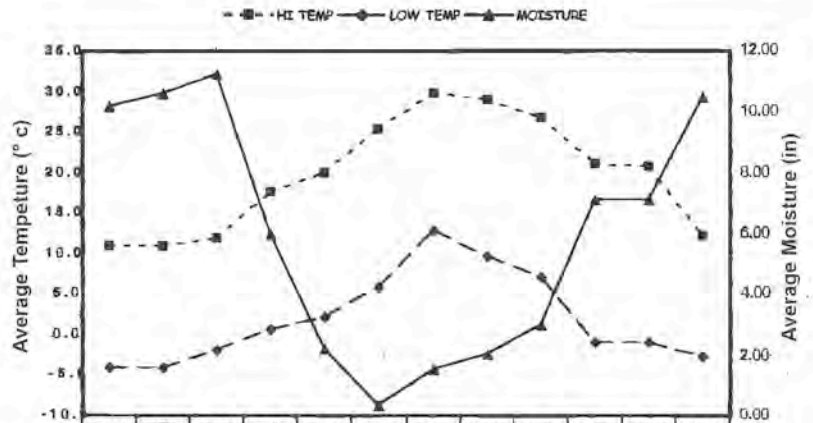
Day 1 Weather:	
Activity 1:	
Activity 2:	
Night Activity A:	
Day 2 Weather:	
Activity 3:	
Activity 4:	
Activity 5:	
Activity 6:	
Night Activity B:	
Day 3 Weather:	
Activity 7:	
Activity 8:	
Activity 9:	
Activity 10:	
Night Activity C:	
Day 4 Weather:	
Activity 11:	
Activity 12:	
Activity 13:	
Activity 14:	
Night Activity D:	
Day 5 Weather:	
Activity 15:	
Activity 16:	

ASTROCAMP LOCATION

Latitude 33 44'01" North
Longitude 116 42'42" West
Elevation 1685 meters (5,530 feet)

CLIMATE OF ASTROCAMP

While the cooler upper elevations of San Jacinto mountain experience mostly winter and spring conditions, the climate at the base of the mountain involves mostly spring and summer conditions all four seasons. Winter storms bring a combination of rain and fast-melting snowfall. Spring comes in March or April and lasts several months with gradually warming days, melting snow, and blooming wild flowers. Within two months of the final snow flurries in May, summer is upon the mountain, with hot , dry conditions and violent afternoon thunderstorms. The fall is characterized by warm days and Santa Ana winds can come either gradually with cooling days and cold, crisp nights or suddenly with early winter storms.



	JAN	FEB	MAR	APR	MAY	JUN	JUN	AUG	SEP	OCT	NOV	DEC
High Temp	10.9	10.9	11.8	17.6	19.9	25.4	29.7	29.1	26.7	21.1	20.7	12.1
Low Temp	-4.2	-4.2	-1.9	0.6	2.2	5.8	12.9	9.6	7.1	-1.0	-1.0	-2.7
Low Temp	10.19	10.62	11.25	5.97	2.18	0.33	1.52	2.03	3.00	7.11	7.11	10.46

How is the climate here at Astrocamp different from the climate in your home town?

GEOLOGY OF ASTROCAMP

San Jacinto Mountain is a giant chunk of granite rock! 135 million years ago, molten magma slowly cooled deep underground to form the Southern California Batholith, which extends from Riverside down through most of Baja California. The San Jacinto Mountains are the oldest and tallest part of this batholith, which means "deep rock." Starting around 92-97 million years ago, this batholith began uplifting and overlying rock was eroded away, exposing the granite we see today.

The mountains were uplifted during several " growing" periods. At intervals of elevation, there are large prominent flat areas, or benches, indicating "resting" stages that lasted around 10-20 million years between uplifts of similar lengths of time. Astrocamp is located in one of these benches known as Strawberry Valley. San Jacinto Mountain now rises 10,000 feet above the surrounding desert and has some of the longest, steepest rock faces in North America.

The San Jacinto Mountains are located between two of the most active faults in North America - the San Andreas Fault system and the San Jacinto Fault. The San Andreas Fault system divides two major tectonic plates, the North American Plate to the east and the Pacific Plate to the west. The Pacific Plate is gradually moving towards the northwest, and resulting friction between the two plates creates many earthquakes in the area.

SOURCE: The San Jacintos, Historical Commission Press, 1990.

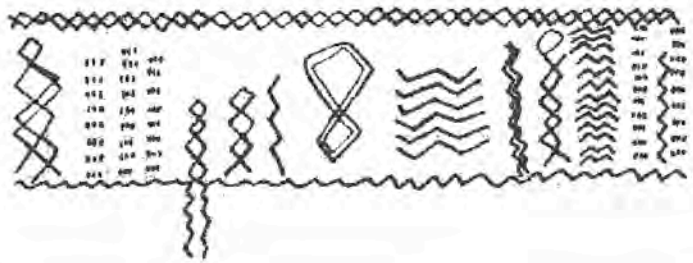
HISTORY OF ASTROCAMP

Cahuilla History

While several Native American cultures have occupied the San Jacinto region including the San Dieguito and the Millingstone, the most recent inhabitants prior to European contact were the Cahuilla. Archaeologist estimate that the Cahuilla arrived in the San Jacinto Mountains and surrounding desert around 2,500 to 3,000 years ago. The Cahuilla built permanent villages in the lower valleys, with preferred locations nearby hot springs such as those in Palm Springs.

The Cahuilla were a well-organized society, divided into about a dozen clans, each with its own name, territory, and leader known as a net. These clans were divided into family groups that occupied distinct village sites and claimed specific land rights for hunting and gathering. The culture possessed legends that helped explain the forces and guidelines shaping the world and their daily lives. The positions of constellations and the phases of the moon governed seasonal activities. Tahquitz Peak, visible from Astrocamp, was thought to be a resting place for an evil, powerful spirit named Tahquitz, who killed people and destroyed souls. Earthquakes occurred when Tahquitz stomped about his mountain cave or hurled boulders at his victims.

The Cahuilla lived in the high areas of the San Jacinto Mountains only during the warm seasons while they collected and processed foods, like acorns and pine nuts. There are still many signs of seasonal inhabitation around Astrocamp, including over three dozen bedrock mortars on campus used for grinding acorns and the pictograph reproduced below, located not far from Astrocamp.



Recent History

Juan Bautista de Anza, a Spaniard, led the first recorded expeditions of Europeans through the San Jacinto Mountains in 1774. The town of Anza is named after him.

Beginning in the 1860s, mining and ranching flourished in the mountains. In 1875, a toll road was built that opened the forest to logging. By the late 1870s, sawmills were located throughout the mountains, and the Cahuilla had been pushed onto reservations. In 1880, Amasa Saunders bought a mill at the present site of Astrocamp where he logged mainly incense cedar. The mill was probably located where the gymnasium has been built.

Later the Saunders' property was leased by Mary and John Keen, who operated a camp. For most of the 1900's, Idyllwild has been a popular resort and tourist area. With hiking trails, rock climbing, a good climate, and clean air. Idyllwild continues to attract large numbers of visitors annually.

The Desert Sun School, founded in 1932 by Edith Elliot and her sister at their family ranch in the Coachella Valley, provided a summer camp in Idyllwild. In 1944, the Elliott family purchased the 40-acre Saunders Meadow Lodge and Golf Course. By 1946, the school had moved to Idyllwild for the whole year. Mrs. Elliott served as headmistress until her death in 1971. In 1983, the school changed its name to the Elliot-Pope Preparatory School.

In December, 1990, the Elliot-Pope Preparatory School closed its doors. Guided Discoveries moved Astrocamp to the site in mid-February, 1991. The facility was renamed the Desert Sun Science Center (DSSC) to acknowledge its heritage.

Imagine that you are living during one of the historic times described above. You are a member of a Cahuilla clan 2,000 years ago. You are part of the first European expedition to the area in 1774. You work at Saunders' sawmill. Or, you are a student at the Desert Sun School back in the 1940s. Pick one of these, or make up your own, and describe what life was like, Continue your thoughts on the blank pages at the end of this log book.

MEMBERS OF ASTROCAMP

As you drove up to Astrocamp, you may have noticed different ecological zones at different elevations. Astrocamp is located in dry pine forest. Pine, oak, and cedar trees are common, and Manzanita's with smooth red bark are found throughout the campus. The checklist below shows several common species of plants and animals in the area. Check off the organisms that you find during your stay.

TREES AND SHRUBS:

- ☐ Coulter Pine
- ☐ Ponderosa Pine
- ☐ Jeffrey Pine
- ☐ Sugar Pine
- ☐ Incense Cedar
- ☐ California Black Oak
- ☐ Live Oak
- ☐ Manzanita

MAMMALS:

- ☐ Western Gray Squirrel
- ☐ Brush Rabbit
- ☐ Coyote
- ☐ California Ground Squirrel
- ☐ Greater Massive Bat
- ☐ Merriam's Chipmunk

REPTILES:

- ☐ Southern Alligator Lizard
- ☐ Western Fence Lizard
- ☐ Western Skink
- ☐ Gopher Snake
- ☐ Western Rattlesnake

AMPHIBIANS:

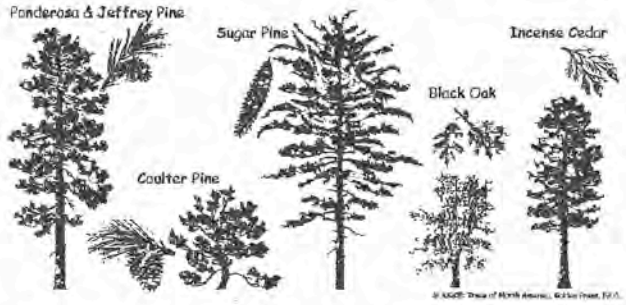
- ☐ Pacific Treefrog
- ☐ Western Toad

BIRDS:

- ☐ Acorn Woodpecker
- ☐ Common Raven
- ☐ Western Scrub Jay
- ☐ Stellar's Jay
- ☐ American Robin
- ☐ Dark-Eyed Junco
- ☐ Western Bluebird
- ☐ Cooper's Hawk
- ☐ Red-shafted Flicker
- ☐ White-breasted Nuthatch

WILDFLOWERS:

- ☐ Common Yarrow
- ☐ Giant Red Paintbrush
- ☐ Lupines
- ☐ Mistletoe
- ☐ Scarlet Columbine
- ☐ Snow Plant
- ☐ Skyrocket Bugler



BURNING QUESTIONS & ANSWERS

Write down 3 questions you have always wanted to know the answers to. Your questions can be about anything: astronomy, geology, weather, space, the environment, science, history, whatever. Write down the answers to these burning questions here at Astrocamp or later after you return home.

Question #1:	
Answer #1:	
Question #2:	
Answer #2:	
Question #3:	
Answer #3:	

ATMOSPHERE & GASES

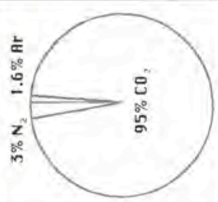
The table below gives information about five different gases you may experiment with in this class.

Gas	Freezing Point (@ 1 bar pressure)	Density air=1.29 kg/m³	Flammable?	Something interesting you learned about this gas during Atmosphere and Gases?
Hydrogen H_2	-253°C	0.09 kg/m³	YES	
Helium He_2	-269°C	0.18kg/m	NO	
Nitrogen N_2	-196°C	1.25 kg/m	NO	
Oxygen O_2	-183°C	1.43 kg/m	YES	
Carbon Dioxide CO_2	-78°C	1.98 kg/m	NO	

Record the results of your experiment to identify the mystery gases in Atmosphere and Gases.

	Gas 1	Gas 2	Gas 3
Test 1:			
Test 2:			
Name of Gas:			

ATMOSPHERE & GASES

Planet	Venus	Earth	Mars
Atmosphere Composition			
Average Surface Pressure	90 Bars	1 Bar	1/140 Bar
Average Surface Temperature	470°C 880°F	15°C 59°F	-50°C -60°F

What would happen if you tried to light a match on Mars? Explain.

Vacuum This!

Below are two vacuum chambers. Draw an object you experimented with (balloon, marshmallow, shaving cream, water, whatever) both before and after you removed air from the chamber.

Before: In Idyllwild

After: In Space

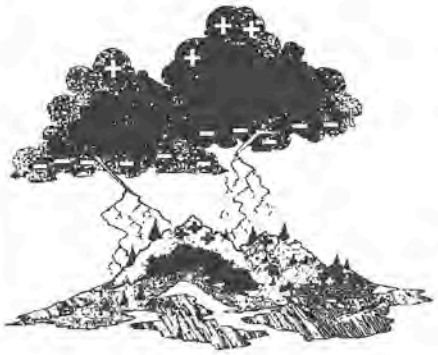
ELECTRICITY & MAGNETISM

The table below lists three sub-atomic particles and their relative masses. Describe the electrical charge for each.

Particle	Mass	Charge
Proton	Heavy	
Neutron	Heavy	
Electron	Light	

MAKING LIGHTNING

As water and air move around in a cloud, negative charges can build up at the bottom of the cloud. When these electrons jump from the cloud to the ground, they cause a gigantic shock called lightning. In a similar way, the Van de Graaff generator at Astrocamp places electrons on the large sphere. These charges can jump from the large sphere to the ground causing a small lightning bolt.



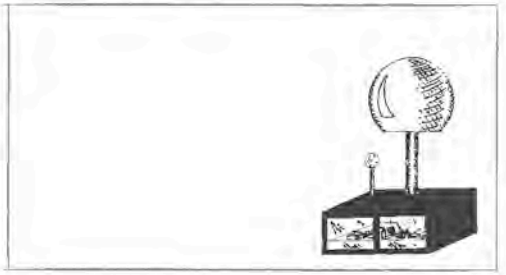
Up in the sky!!!

At Astrocamp!

As described above, a shock occurs when electrons jump from one place to another. Describe what it feels like to be shocked:

ELECTRICITY & MAGNETISM

Complete the drawing by showing one experiment you did with the Van de Graaff generator. Explain what was happening.



Describe the most interesting experiment or activity you did in Electricity and Magnetism. What did you do? What did you learn? Draw Magnetic field lines on the magnet below.

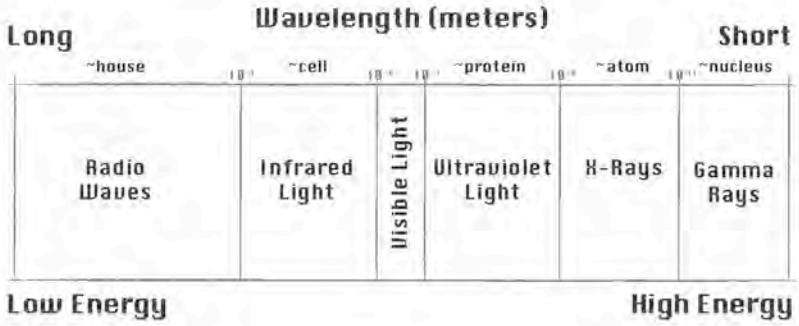
What do magnets have to do with electricity?

What does electricity have to do with magnetism?

LIGHT AND LASERS

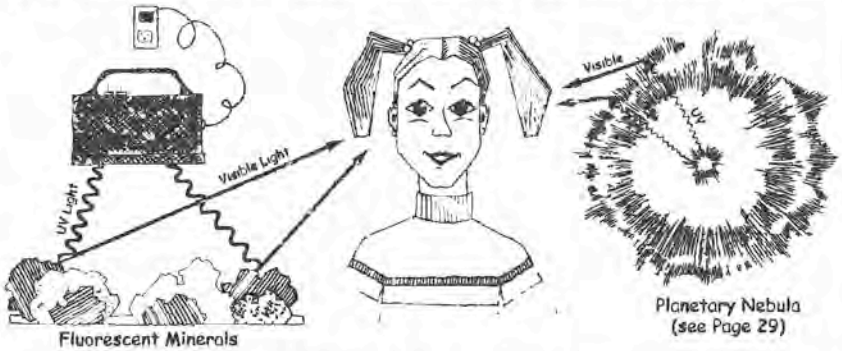
THE ELECTROMAGNETIC SPECTRUM

All electromagnetic energy travels at the same speed, the speed of light (300,000 km/sec or 186,000 miles/sec). However, not all light has the same frequency or color. The electromagnetic spectrum includes all the frequencies of electromagnetic energy.



FLUORESCENT MINERALS AND PLANETARY NEBULAE

When a black light (ultraviolet light) is shined on a fluorescent mineral, the mineral absorbs the UV light and re-radiates visible wavelengths. The same thing happens in dying stars - the dying star's outer shell absorbs UV light from the hot white dwarf in the center and re-radiates visible light.



If astronomers can't travel to the stars yet, how do they know anything about them?

LIGHT AND LASERS

GLOW WALL

The glow wall in Light and Lasers is a wall made of phosphorescent material. Draw a picture to the right of what one of your glow wall "images" looked liked. Why were you able to see images on the glow wall?

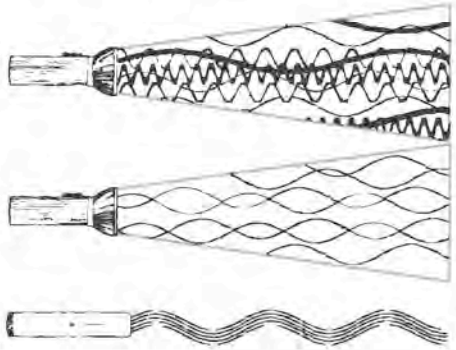
WHAT KIND OF LIGHT IS IT, ANYWAY?

Below is a drawing of three light sources you will see in Light and Lasers.

WHITE FLASHLIGHT
Many wavelengths & incoherent

RED FLASHLIGHT
One wavelength & incoherent

RED LASER
One wavelength & coherent



What is one difference between light from a white flashlight and a laser light?

What does LASER stand for?

What was the most interesting part of Light and Lasers?

BUILDING ROCKETS

Sir Isaac Newton wrote the three laws of motion that help us design our rockets and make them go.

1. Inertia
2. F=M x A
3. Interaction

MAY THE FORCE BE WITH YOU

Many forces act on your water rocket as it moves through the air. The diagrams below show a rocket rising and a rocket falling, along with the forces acting on both.

Based upon the diagrams above, which force is:

Pushing the rocket up?

Always pulling the rocket down?

Caused by the rocket running into air?

YOUR ROCKET DESIGN

Draw a picture of your rocket. Label the different parts of your rocket (water bottle, fins, nose cone, nozzle, etc) and write down what each part does.

LAUNCHING ROCKETS

Complete the description of your rocket below. Estimates of your rocket's flight time will be taken during the launch. Using these time estimates and the equation below, come up with an approximate height for your rocket launch.

Rocket Name:

Rocket Mass:

Number of Fins:

Fin Orientation: straight gyro other

Record Altitude:

Time 1: Time 2: Time 3:

$$\text{Average Time} = \frac{\text{Sum of Times}}{\text{Number of Times}}$$

MEASURING ROCKET HEIGHTS

$$\text{Height} = 1/2\ A \times T^2$$

In this equation A is acceleration due to gravity (9.8 meters/second or 32.19 feet/second) and T is the average time measured and calculated.

With this equation we can calculate the approximate distance the rocket travels up by measuring the time the rocket traveled up and fought against gravity.

What are some possible sources of error in the estimated height of your rocket?

COSMIC LANDER

In your opinion, should humans explore other planets? Why or why not?

Draw a picture of your cosmic lander model. Label the materials you used for each part.

Describe the results of your drop tests. Did your cosmic lander protect the water balloon from popping? Why or why not?

How would you build your cosmic lander differently next time?

FLOATING IN SPACE

In Microgravity you get the chance to train as astronauts train.

Microgravity

SIMULATION:

How does this simulation prepare astronauts for space missions?

What did the simulation feel like?

What was difficult about the simulation?

What did you learn from the simulation?

Did you find it harder or easier to build when you were floating rather than if you were standing on the ground?

Expedition Valles Marineris

Mars, the rusty planet is covered by amazing features but is mostly made up of iron ore and is covered by oxidized dust from the rusty planet. It is the next closest planet from the sun after the earth, having a distance of 227,936,640 km from the sun. It is approximately 1/3 the size of the earth and has almost no atmosphere.

What did you think of Mars and MIRA?

What is Valles Marineris?

Draw a picture of the Valles Marineris replica wall that you climbed?

Write the facts that you learned about Mars.

In reality has anyone traveled to Mars yet?

Micro Meteorites

Space material fall to earth everyday. A good number of them get burnt up in our atmosphere, but a considerable amount actually hit the earth's surface. Due to the fact that 2/3 of the earth is covered by water we do not see much in terms of scars left on our earth. Also the fact that we have an atmosphere helps as the ever-changing surface renews and wipes the slate clean with weather (rain, wind, snow, ect.). Most of the meteorites that fall are actually MICROMETEORITES that are extremely small and to the human eye would look like a grain of sand.

On average what is the weight of all of the micrometeorites that fall to the earth on a daily basis?

What device did you use to find the micrometeorite?

How many micrometeorites did you find?

Draw a micrometeorite that you saw.

Remote Sensing

In remote sensing we are trying to obtain and transfer information from one place that is some distance away and bring it to us.

Name some devices that we use to remotely sense.

Is it difficult to sense remotely?

What was the word that you found from using the GPS and finding the letters?

DAY HIKE JOURNAL

Where did you hike around Astrocamp?

What was the weather like?

What was the hike like? Was it easy or tiring? Did you run out of breath?

Describe what some of the rocks you saw. What color were they? What texture were they?

Think of one of the coolest things you saw or found on your hike. Draw a picture of it or describe what happened.

What did you learn from the hike?

ADVENTURE ACTIVITIES

In which of the following adventure activities did your group participate?

- ☐ InthaHves
- ☐ Cat Walk
- ☐ Vine Walk
- ☐ Power Pole
- ☐ Sky Coaster

Below, describe the favorite adventure activity you did.

Favorite Adventure Activity:

What did you have to do?

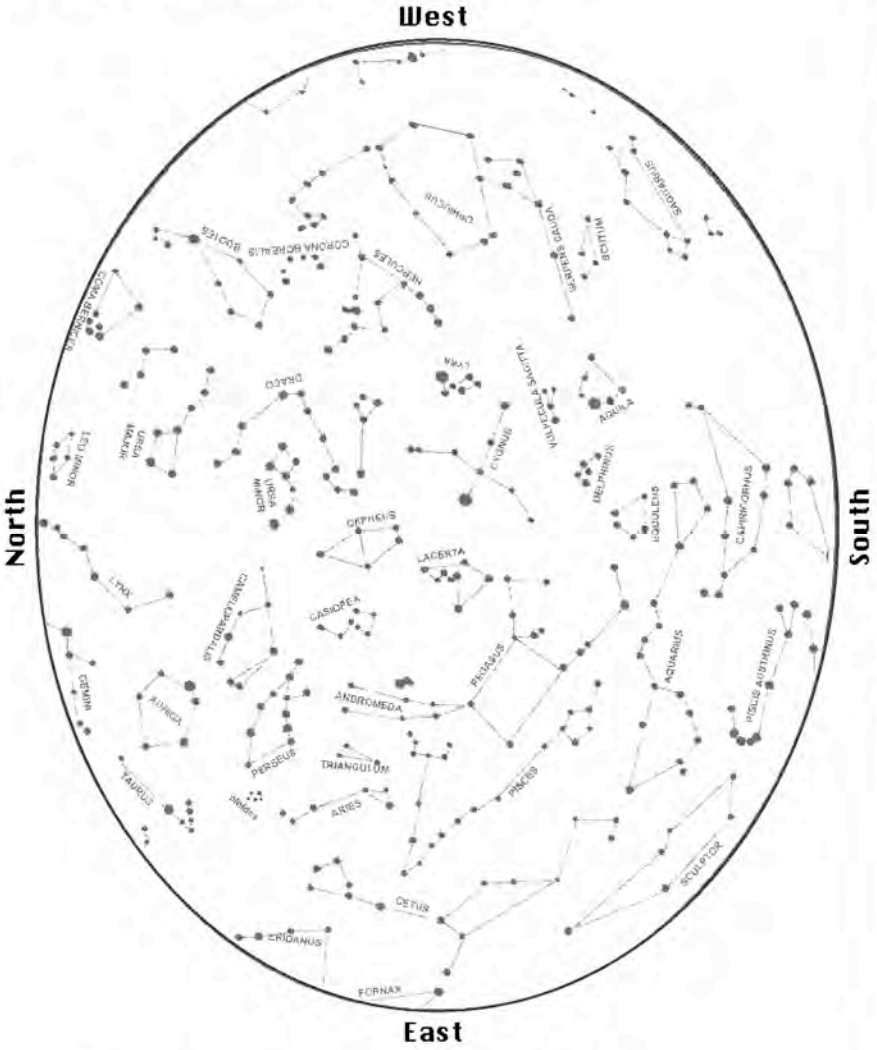
What thoughts of feelings went through your mind before doing the activity?

What thoughts or emotions did you experience after completing the activity?

What did you learn through doing this activity?

STARS OF FALL

Below is a star chart showing some constellations visible during the fall months.

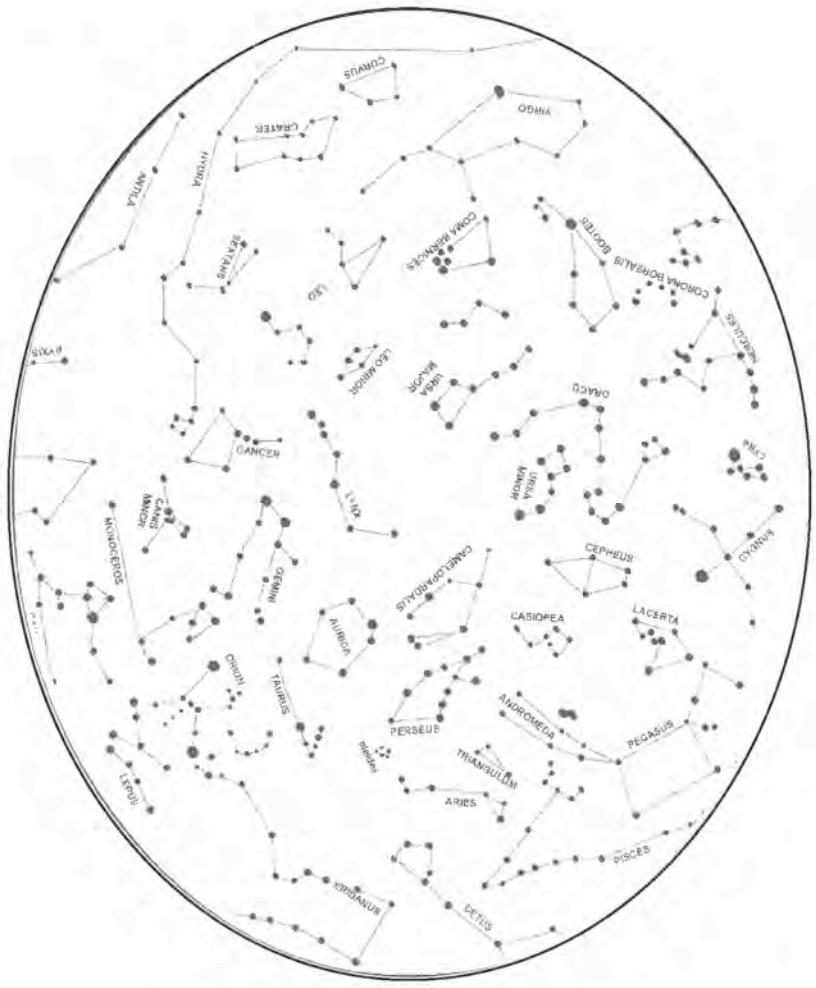


What constellations did you see and learn?

STARS OF SPRING

Below is a star chart showing some constellations visible during the spring months.

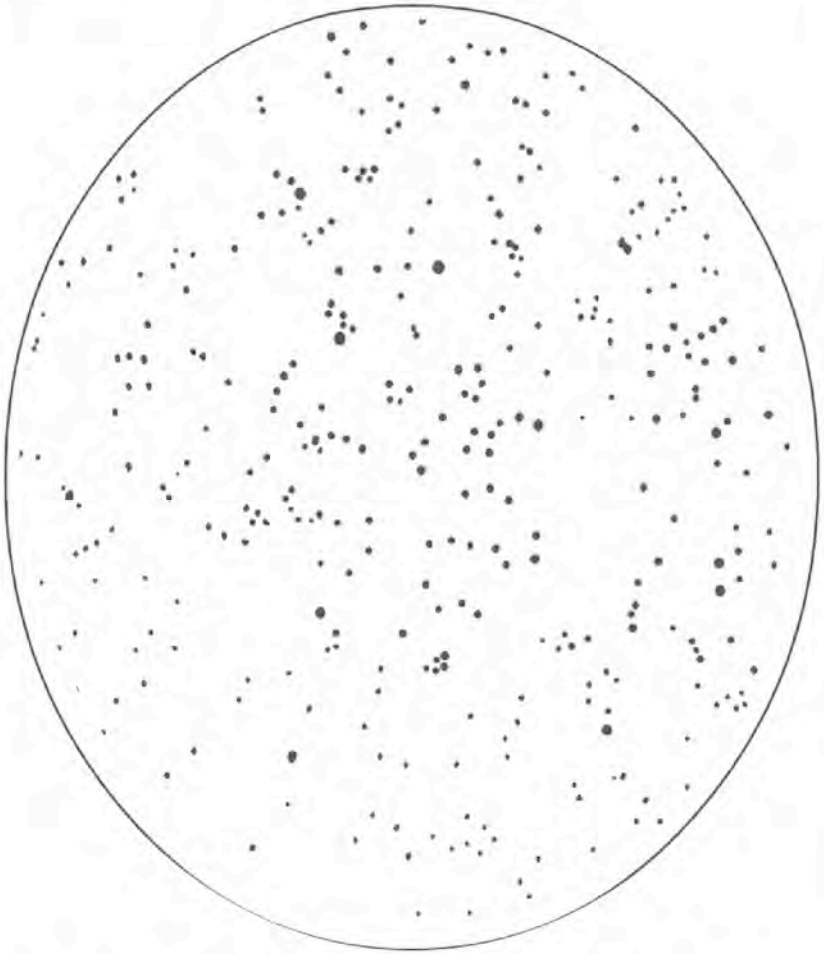
East



What myths or legends about the night sky did you learn?

STARS OF Me

Below is a diagram of stars in the sky. Use your imagination to make up your own constellations. Draw and label the constellations that you come up with.



Start a story about some of the constellations you drew above. Continue the story on the blank pages at the back of this log book.

TRUSTING THE NIGHT

It takes about 10 minutes for your eyes to adjust to darkness. However, If you turn on a flashlight, your eyes have to adjust all over again. Keep lights off during night hikes and star-watching.

Describe some of the sounds you heard on the night hike:

Describe or draw some of the interesting things that you sensed (saw, heard, felt, smelled, or tasted) on the night hike:

How was the night hike the same as or different from what you expected?

What was the best part of the night hike?

OUR STAR, THE SUN

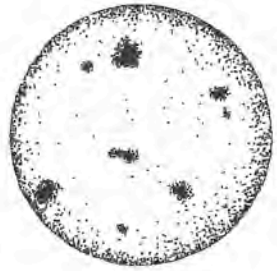
The Sun is the closest star to the Earth. It takes sunlight about 8 minutes to travel the 150 million kilometers (93 million miles) between the Sun and our planet. The distance is known as one Astronomical Unit (AU).

While it may look and feel like the Sun is on fire, it is not "burning" in the same way a candle burns. The core of the Sun is actually a giant nuclear fusion reactor, where hydrogen atoms are fused into helium atoms and enormous amounts of energy are released.

Never Look Directly At The Sun!!!
At Astrocamp, you may be able to observe the Sun, but only with special filters that are designed to protect your eyes during viewing. The two diagrams below show some features you may observe.

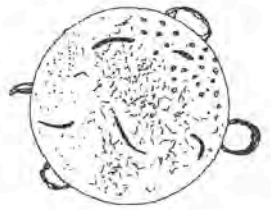
PHOTOSPHERE: Brightest part of solar surface

SUNSPOTS: Sunspots are darker, cooler regions of the Sun's surface associated with strong magnetic fields on the Sun.
LIMB DARKENING: The Sun's outside edge, or limb, may appear darker than the center of the Sun because you are seeing a more shallow, cooler part of the photosphere when you look at the outer edges.
GRANULATION: Granulation represents giant bubbles of gas rising up and sinking down on the solar surface.



CHROMOSPHERE: Region of hot gas above photosphere

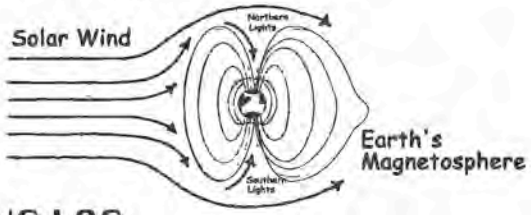
PROMINENCES: Prominences are loops of dense, ionized gas trapped in the Sun's magnetic field around the edges of the sun.
FILAMENTS: Filaments are prominences seen on the edge as they cross the disk of the Sun.



OUR STAR, THE SUN

SOLAR WIND AND AURORAE

Solar wind is a stream of electrons flowing from the Sun. These charged particles are forced towards the north and south magnetic poles of the earth by our magnetic field, or magnetosphere. As the energetic particles collide with gas molecules in our atmosphere, they make these gases glow, creating brilliant light displays called aurorae, known as the Northern and Southern Lights.



SOLAR VIEWING LOG

Imagine that the Sun is the circle to the right. Draw and label a circle that would be the size of the Earth to scale. For reference:
Sun Diameter = 1,390,000 km
Earth Diameter = 13,000 km

Draw and describe the features you saw in the two different telescope views of the Sun.

White light (Photosphere)

Date:
Time:

H-Alpha (Chromosphere)

Date:
Time:

Why is the Sun important to our lives? Give several examples.

What did you learn about the Sun in this class?

OUR SOLAR SYSTEM

While most of the stars appear to remain fairly fixed relative to each other, there are at least five "stars" visible to the naked eye that move or wander through the sky. These wanderers were labeled planets: Mercury, Venus, Mars, Jupiter, and Saturn. After the invention of the telescope, we found there are even more wanderers - Uranus, Neptune, Pluto, and asteroids were all discovered. We now know that all of these moving objects, and even the Earth, are part of our solar system: a collection of planets, moons, asteroids, comets, and debris that rotate around the Sun. We notice their motions and not the motions of the stars because objects in our solar system are so much closer to us than stars.

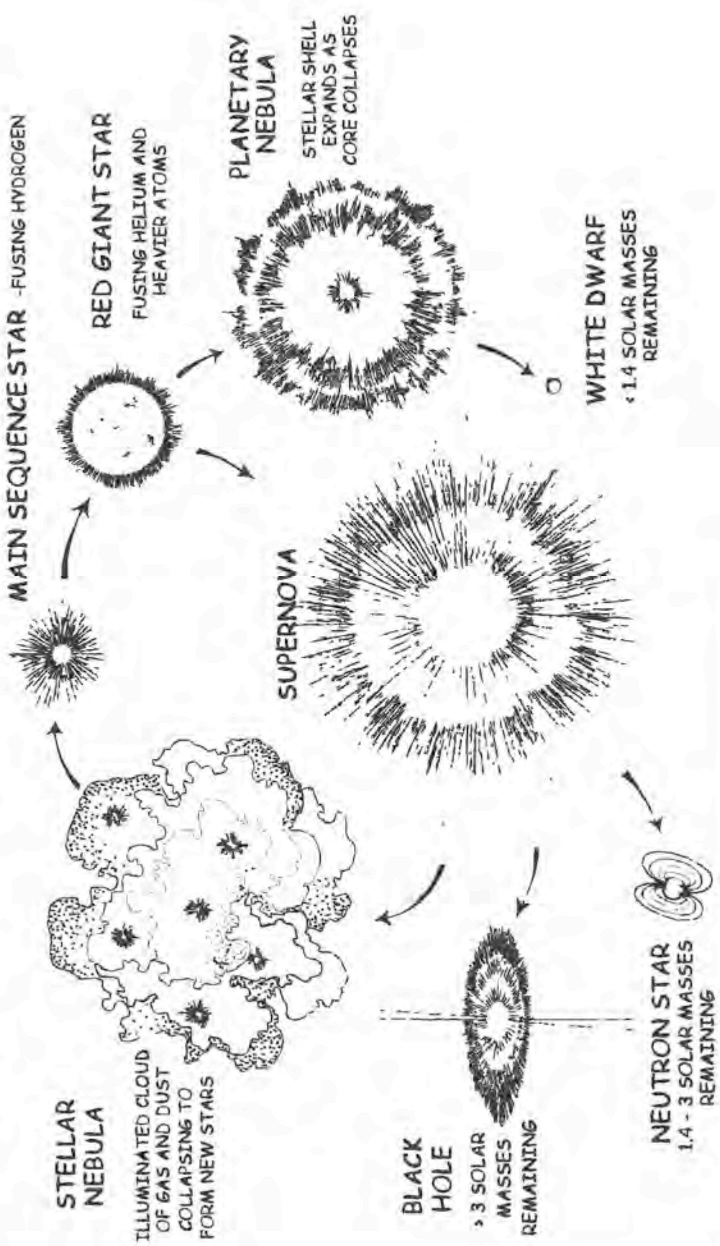
Mercury, Venus, Earth and Mars are the four inner planets and are called terrestrial planets because they are made up mostly of metals and silicate rocks. Beyond Mars is a collection of rocky and metallic objects known as the asteroid belt. The largest of all the asteroids, Ceres, is about the size of Texas. Jupiter, Saturn, Uranus, and Neptune, the four gas giants, are made up mostly of hydrogen and helium gas. If you tried to land on any gas giants, you would just fall right in. The pressures would increase as you fell deeper into the planet and you would eventually be crushed before you landed on anything solid. Beyond Neptune is a collection of icy objects that make up the Kuiper Belt. Pluto and its similarly sized moon, Charon, are the largest of these icy objects found very distant from the sun. Comets that come sweeping past the sun possibly come from the Kuiper Belt as well as from the Oort Cloud even farther beyond.

Planet	Distance from Sun	Distance of Planets	Length of Day	Length of Year
Mercury	0.39 AU	0.38 Earths	59 Days	88 Days
Venus	0.72 AU	0.95 Earths	243 Days	225 Days
Earth	1.0 AU	1.0 Earths	23hr 56min	365 Days
Mars	1.5 AU	0.53 Earths	24hr 37min	687 Days
Jupiter	5.2 AU	11 Earths	9hr 55min	11.9 years
Saturn	9.5 AU	9.5 Earths	10hr 39min	29.5 years
Uranus	19 AU	4.0 Earths	17hr 14min	84 years
Neptune	30 AU	3.8 Earths	4.4 years	165 years

1 AU = 150 million km = 93 million miles; Earth Diameter = 12,700 km = 7,900 miles

LIFE OF A STAR

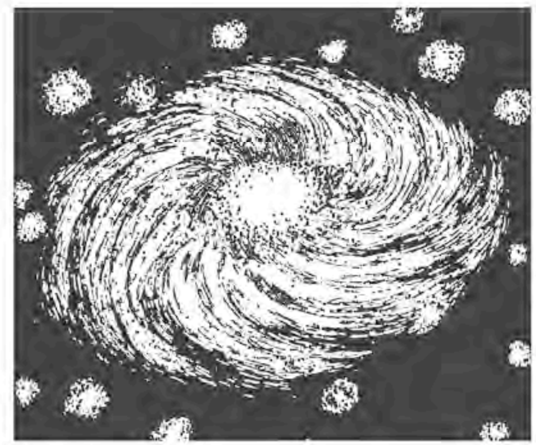
The life of a star is based upon its mass at the beginning of its life. The diagram below shows the birth, life, and three different endings for stars of different masses.



OUR GALAXY & BEYOND

Before we talk about galaxies, we need to talk about light years. A light year is the distance light travels in one year moving at the speed of light. Light travels very fast (300,000 kilometers/second or 186,000 miles/second), and a light year is about 10 trillion kilometers or 6 trillion miles.

A galaxy is a collection of hundreds of billions of stars. Galaxies are scattered throughout the universe, separated by vast expanses of relatively empty space. We live in the Milky Way Galaxy, spiral galaxy that is about 100,000 light years across and some 1,000 light years thick. Our solar system, located in a spiral arm over half way from the galactic center, rotates around the galaxy every 250 million years.



Two satellite galaxies, visible in the southern hemisphere as the Magellenic Clouds, orbit around our Milky Way Galaxy and are within 200,000 light years from Earth. After the Magellenic Clouds, we need to travel over 2 million light years to get to the next closest galaxy, the Andromeda Galaxy. Beyond Andromeda, ranging from millions to billions of light years from our home galaxy, are another hundred billion galaxies. Each of these galaxies has around a hundred billion stars. That's around 10,000,000,000,000,000,000,000 (ten billion trillion) stars in the visible universe. That's a lot of stars!!!

TELESCOPE VIEWING LOG

Hopefully you were able to view the night sky through telescopes and binoculars while at Astrocamp. Draw and describe two of the neatest objects you observed (planets, nebulae, star clusters, dying stars, shooting stars, constellations, anything).

Object: Description:	Sketch/Drawing
Object: Description:	Sketch/Drawing

At Astrocamp, you may have had the chance to use a CCD (Charge Coupled Device) - a digital camera which can be used to image objects in the sky. Describe the difference between CCD images you saw and what you saw when looking directly through the telescope.

What was the most amazing part of telescope viewing? What did you learn?

FAVORITE EXPERIMENT

Pick an experiment or lab that you or your research group did to answer a question like scientists would - by testing your ideas. Describe what question you were trying to answer, how you tried to answer it, and what you learned.

Class:

Experiment/Lab Activity:

What was the question? What were you trying to figure out?

What materials did you need to answer this question?

What experiment did you do to answer the question?

What happened in the experiment?

What did you learn?

ASTROCAMP ART

Write a poem, draw a picture, compose a song, and/or write a story about your experience at Astrocamp. No rules - it can be any art form you want. It can describe anything - something exciting, something funny, something scary, an event, an activity, a class, a thought, a person, a meal, a star, an animal, even an eaglemorp (whatever that is). It can even describe your entire Astrocamp experience. Whatever you decide, spend some time thinking about what you did at Astrocamp, what you learned, and what you will always remember!!!

MISSION DEBRIEFING

Departure Date:

Best Thing About Astrocamp:

Your Favorite Class and Why:

Most Interesting Thing You Learned:

What You Liked About Your Instructor:

What You Would Do Differently If You Could Do Astrocamp All Over Again:

Thing You Will Remember The Most:

ASTROCAMP AT HOME

Hopefully your interest in science and astronomy has been sparked while at Astrocamp. Below are some activities and resources to help you continue to explore and learn about the world around you and above you after you arrive back home.

LUNAR PHASES

1) Look at a calendar with lunar phases and find out when the next new moon is.
2) Two or three days after the new moon, go outside at sunset and find the moon in the western sky.
3) Draw a picture of the moon on a sheet of paper or in this log book. Notice how high above the horizon the moon is.
4) Go outside at about the same time every day (or every other day) for the next two weeks. Continue drawing pictures of the moon each day and noting the position of the moon in the sky.
   What's going on? Why does the moon move in the sky and change shape from day to day?

LOCAL PLANETARIUM, OBSERVATORY, AND LIBRARY

Locate the planetarium, observatory, and/or library closest to you. Planetarium offer informational shows about the night sky and astronomy. Observatories often provide tours and public viewing nights. At the local library, you will find many books on astronomy and several magazines such as Astronomy Magazine and Sky & Telescope.

HTTP://WWW.ASTROCAMP.ORG

Check out the Astrocamp web site at http://www.astrocamp.org for a host of games and activities. Weigh yourself on Jupiter, test your astronomy trivia knowledge, compare your water rocket with other Astrocamp rockets. And don't forget to sign our guest book.

WRITE YOUR INSTRUCTOR

Instructors love to get mail. You can send cards and letters to the following address:

Instructor's Name
c/o Astrocamp
P.O. Box 3399
Idyllwild, CA 92549

*Remember that instructors work with several hundred students a year, so it in not always possible for them to write back.

NOTES/DRAWING/DEEP THOUGHTS

NOTES/DRAWING/DEEP THOUGHTS

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NOTES/DRAWING/DEEP THOUGHTS

NOTES/DRAWING/DEEP THOUGHTS

SUN DIAL ASSEMBLY

Cut out sun dial along labelled line. Also, cut along the two "Notch Here" lines.
Fold along labelled fold line so that two sections of paper are at a right angle.
Feed ends of a piece of string through the two notches. Tape down string with sections still at right angle.
Secure sun dial to a level surface facing south. Adjust so string shadow matches local standard time.
Watch shadow move as earth spins! Sun dial should be accurate for at least an hour at a time.
(Activity modeled after concept by the Pacific Science Center.)

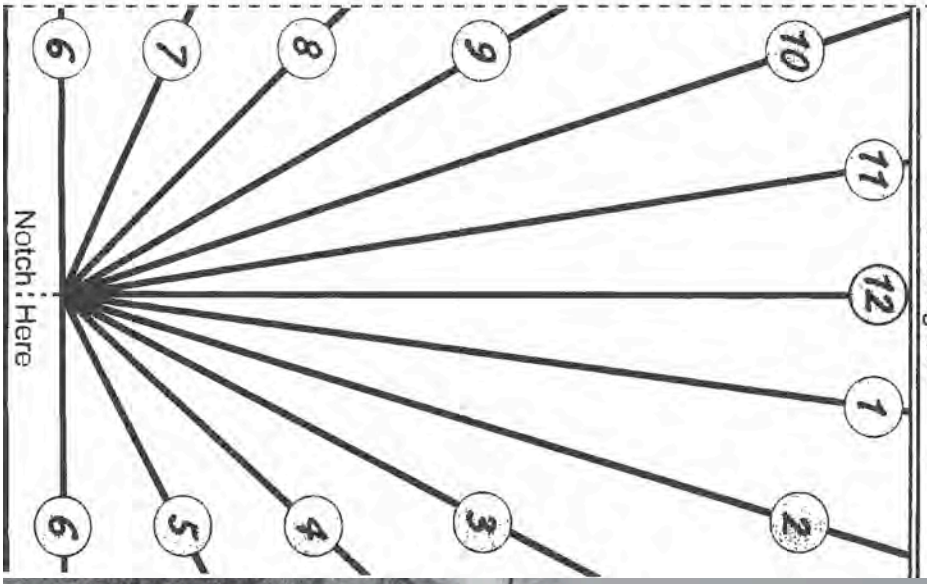
Cut along line - Cut along line - Cut along line - Cut along line - Cut along line - Cut along line - Cut along line

Notch Here

Astrocamp

Sun Dial

Fold along line



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1-800-645-1423

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Join us for our next Summer Mission

For Boys and girls ages 8-15

ACCREDITED