Starry-Eyed

CREATE A CONSTELLATION

Focus To recognize specific constellations, rename and draw new figures based on its new name.

Group Size No more than 25

Time Required 40 minutes

Materials
Compass
Constellation Wheels
Handouts:
***What Stare Are** (pB8)*
***Shortcut To The Stars** (pB9)*
Create a Constellation

Physical Setting
Cispus Star Room
Cispus field near the Pavilion, or parking area adjacent to the Cispus community Volunteer Fire Station *(located 1/4 mile down Cispus Road towards Tower Rock Campground)*

Process

Activity 1: CREATE A CONSTELLATION

1. Figure out how to operate the light switches before the students enter. Note locations of both doors before turning room lighting off.

2. Have your group enter the Star Room with normal lights on only (the dimmer switch open all the way). The walls are covered with actual enlarged photos of areas around the Center. It's a pleasant setting just as it is. (suitable for creative writing!)

3. Review ***What Stars Are***, and use of the "Constellation Wheel".

4. Position the group facing North, and hold the Constellation Wheels with the current month pointing north. (It won't be a perfect match-up due to the obvious--the star locations on the ceiling of the Star Room don't change.)

5. Turn on the ultra-violet light switch; soon the students will see stars appear on the ceiling. Some may even pick out specific constellations.

6. Review how the ancient Greeks named the constellations thousands of years ago based on mythological beliefs of their gods' activities.

7. Now turn down the regular light's dimmer switch gradually (to simulate dusk) till it's all the way off.

8. Have the students begin to identify specific constellations using a Constellation Wheel, and ***Shortcut To The Stars.***

9. Have the group choose a constellation and do, ***Re-naming the Constellations,*** activity. This activity can be done outdoors too, at the two locations mentioned above in "Physical Setting. Make sure ultra violet lights are on for this activity.

10.Have the whole group now sit on the floor; and leave the door ajar (just a crack).

11.Før a special treat turn off the ultra violet lights. This is what the sky looks like on a clear night with a new (no) moon.

Extensions:

1.Use some of the Cispus cassette tapes and without using the ultra violet light respond to feelings, or sounds. (see activity, ***Cispus Dawn***)

2. Have students place themselves bodily into one of the pictures and describe...whatever you or they want to.
3. Have students become something in one of the pictures (or something you would expect to normally see in one of the pictures), and write,...."A day in the life of_____." It can be a whole day's account or season or even a whole year.

4. Students could create their own universe, renaming and re-drawing the shapes of all the constellations seen at a given time.

Create A Constellation

Choose a particular constellation group that appeals to you.

1. Give the accepted Greek name for your constellation, and write it below.

_____

2. Draw the pattern of stars of your constellation. Then connect the primary stars with straight lines. Now draw the surrounding outline of the Greek figure that goes with it in the space below. (Or, describe in detail what the constellation is "supposed" to depict.)

3. Now use your imagination: picture your constellation depicting something much different than its original name suggests (maybe even more contemporary--like pizza) . RENAME your constellation on the next line.

_____

Draw your newly named constellation in the space below. First, indicate key stars with "*'s" and, "x's," then name the stars with a name consistent to the name you gave the constellation. Connect the primary stars with straight lines, then draw the general outline of your constellations figure using a dashed line.-----

4. Now think of your favorite thing to draw. Picture it only as a "stick figure." Draw this "stick figure" below and show the main indicator points (as in question 3, using "*'s," and, "x's"). Again, with a dashed line ----- draw in its general shape. Your name for this constellation is_____

Draw it in the space below, or on the back, following the guidelines given above.

LUNAR LOOKOUT

Focus To observe the phases of the moon.

Group Size Entire class

Time Required 30 minutes

Materials ***Earth's Satellite***

Physical Setting Outside the Star Room
Field in front of the Pavilion

Process

Introduction:
Begin with an introductory lesson on the moon. ***Earth's Satellite*** contains basic facts about the moon to help you out.

Activity:
1. Begin in the auditorium. Just outside the Star Room is a poster displaying the phases of the moon, let each student read and study this poster.

2. Next, move outside to the large field. Study the moon and have the students decide which phase they believe the moon is in.

3. As a group, reach consensus about the current phase of the moon.

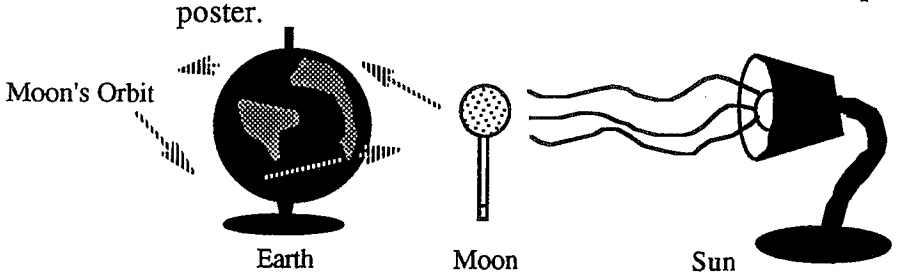
Discussion Questions:
A. At what side or angle are the sun's rays hitting the moon?

B. What phase will the moon move into next?

C. How will the moon appear then?

D. Where will the ray's of the sun be hitting the moon at that time?

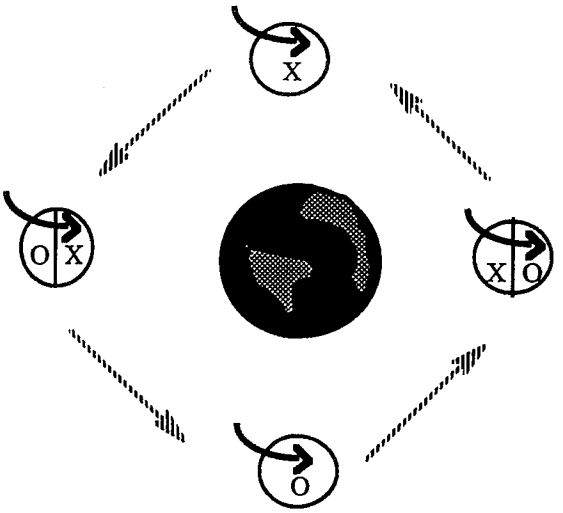
Extension:
Using a globe, small lamp, styrofoam ball and pencil, make a model of the Earth, Sun, and Moon that will graphically illustrate the information from the handout and moon phases poster.



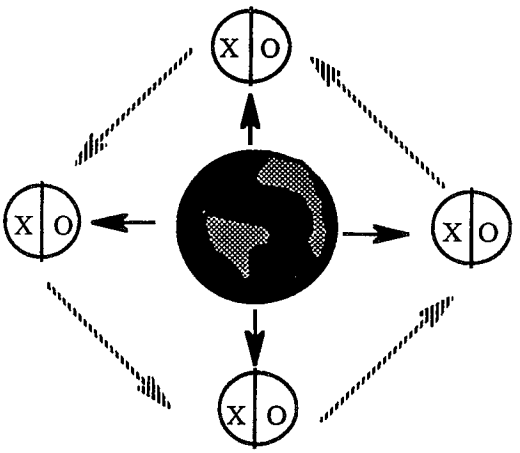
Earth's Satellite

The moon, Earth's satellite, circles around our planet as we make our yearly orbit around the sun. In stellar distances the moon and Earth are very near to each other, only a quarter of a million miles away. Every 29 and 1/2 days, the moon makes a complete circuit around the Earth. As it travels, the moon rotates on its own axis, just as the Earth does. Because of the synchronization of the moon's axial rotation and orbital movement around Earth, we are able to view only one side of the moon at all times (side X). If the moon had no axial rotation, we would see various portions of it throughout the month.

If you watch the moon throughout the night, it will seem to travel across the sky, moving from west to east. This apparent movement is caused partially by the moon's orbit around Earth, however the major cause is Earth's own axial spin. Every twenty-four hours, as we rotate from night into day, the view of the moon is left behind. The combination of Earth's axial spin, the moon's axial spin and orbit allow the moon to be viewed at night for two weeks. In the following two weeks, however, the moon rises during the day, when sunlight will usually outshine the moon's pale reflection. During these weeks you can sometimes glimpse a light image of the moon during the day.



With axial spin
Curved arrows show axial spin direction, straight arrows show direction of orbital movement.



Without axial spin. Short arrows point to portions viewed from earth, longer arrows show orbital direction.

METEOR SHOWER

Focus To observe a meteor shower and the rate at which the meteors are falling.

Group Size Entire class

Time Required 20 minutes

Materials ***Shooting Stars***

Physical Setting Field in front of the campfire pavilion

Process

Shooting Stars

Falling stars can be seen on any clear, dark night of the year. They are not actually stars, but pieces of cosmic rock or dirt (meteors) that have fallen through our atmosphere. The speed at which these meteors travel is faster than that of a bullet shot from a gun. The friction produced, when they crash through our atmosphere at these tremendously high speeds, causes the meteors to burn up and produce a star-like light. Most of these falling pieces are smaller than the size of a pea, and disintegrate before reaching the Earth. Only rarely is a meteor large enough to pass through the atmosphere without completely combusting. These huge chunks of rock will then crash into the Earth's surface, blasting out a crater.

At certain times during the year you can see many more meteors per hour than on other nights; these periods are called meteor showers. These meteor swarms occur when the Earth, in its orbit around the sun, passes through the remains of a comet. If the Earth is moving through these particles during daylight hours the meteor shower will not be visible to the naked eye. Certain meteor showers take place at approximately the same times every year. Each of these showers tend to come from the direction of a certain constellation, and so derives its name from that constellation.

Introduction:

Start with a basic lesson on meteors and meteor showers. Below are the approximate dates of some of the larger meteor showers:

Shower	Approximate Dates	Rate Per Hour
Quadrantids	January 3	40
Lyrids	April 22	15
Perseids	August 12	50
Orionids	October 21	25
Taurids	November 4	15
Leonids	November 16	15
Geminids	December 13	50

Activity:

1. Bring class to a large, open field with no bright lights nearby.

2. Now they need to adjust their eyesight to the dark. Have them close their eyes and together, slowly count to 100.

3. Upon reaching 100, they may open their eyes and for the next six minutes keep track of how many "shooting stars" they see.

4. At the end of the six minutes, have everyone add a zero to the number of meteors they counted. This is the rate of meteors per hour.

NIGHT SIGHTS

Focus To teach constellation identification.

Group Size Entire class

Time Required 1 hour

Materials
Compass
Constellation wheels (*available at Cispus*)
Handouts:
What Stars Are
Shortcut To The Stars
Constellations Wheel
(instructions and information)

Physical Setting
Outside the Star Room (*constellation wheel*)
Large field near the Pavilion

Process

Introduction:
Begin with a basic lesson on stars and constellations. For introductory information about stars and constellations, consult ***What Stars Are***.

Activity:
1. Outside of the Star Room, give every student a constellations wheel. Demonstrate on the poster wheel how their individual wheels work, and what they might expect to see. Check with the ***Constellations Wheel (instructions and information sheet)***.

2. Using Shortcut to the Stars, provide hints to finding various constellations.

3. Next, take the class to the large field and have them seat themselves facing north. Adjust the constellation wheels to the correct position.

4. To adjust your eyes to the dark, have everyone close their eyes and slowly count together to one hundred.

5. Once your eyes are adjusted, look up at the sky and use your constellation wheels to locate as many constellations as you can.

6. Follow-up by relocating constellations together, and confirming proper sightings.

What Stars Are

Stars are shining bodies in space that are made up of extremely hot gases. The nearest star to the Earth is our sun. Stars are in a constant process of cooling; the process takes an extremely long time, billions of years. Our own sun is slowly cooling, something we will never notice in our lifetimes. Even when our great, great, great grandchildren are grown-ups, the sun will not have cooled enough for people on the Earth to notice. Over time, stars undergo changes of color and brightness. The hottest stars are bluish white. As they cool, the stars become white, then yellow, and finally a dark red for the coldest stars (sometimes called red dwarfs).

The sun is 93 million miles away from the Earth, yet it only takes 8 and 1/2 minutes for its light to reach us. The light from other stars, that are much farther away, takes a longer amount of time to reach us. When we look into the sky at night, we may be seeing the light from a star that no longer exists. We could be seeing the light from stars today which stopped giving light in the year 1000 A.D.

Thousands of years ago, the Egyptians began to make records of the movements of stars. They came to the realization that the stars change as the seasons did, and invented calendars based on the changing skies. Gravitation causes some stars to travel together. Some travel in pairs, rotating about their common center of gravity. Other stars travel in groups of three, four or more. The ancient Greeks observed these groupings. Their ancient astronomers and storytellers looked at the night skies and saw pictures in the groupings of the stars, and named them after mythological beasts and heroes. Thus, giving name to the constellations that people look at even today.

Constellations Wheel

instructions and information

To begin using the constellations wheel, face north. Then, hold the wheel in front of you, with the present month on top. This position shows how the constellations will look at 9.00 p.m. tonight. To make adjustments for viewing at different hours, turn the chart one month clockwise for every two hours before 9:00 p.m., or one month counter-clockwise for every two hours after 9:00.

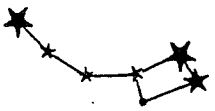
As you rotate the wheel, you may notice that the North Star will stay stationary in the sky, while all of the other stars will seem to circle around the North Star. Although the stars of pole-circling constellations (Big Dipper, Little Dipper, Draco, Cepheus, Cassiopeia) are always in view during the night, the other constellations are only visible at certain times. Some of the constellations are not far from the North Star, and most months of the year these appear some time during the night. Other constellations are much farther from the North Star and are visible only during certain seasons.

Remember, it is best to star-gaze on a clear, moonless night. You will also see more stars if observation is conducted far from bright lights, or from hazy or smoggy air.

Shortcut to the Stars

The first constellation to look for in the night sky is the Big Dipper. It is a bright group of stars that resemble exactly what the name implies: a big dipper. It's visible all night long from most places in the Northern Hemisphere.

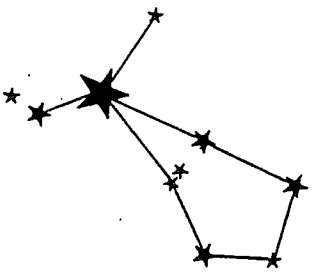
To find the Little Dipper draw a line, starting between the two end stars in the bowl of the Big Dipper and ending at the North Star. The North Star is not the brightest star in the sky, but it remains still while the others seem to revolve around it during the course of the night. The North Star makes up the outermost star in the handle of the Little Dipper.



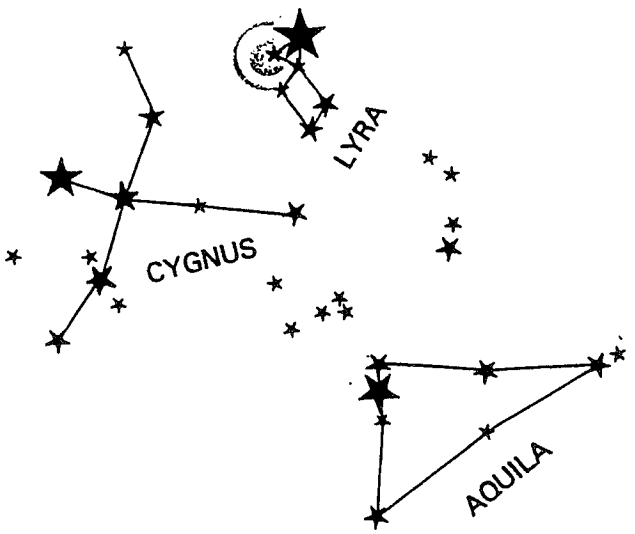
Cassiopeia can be found by drawing a line from the handle star nearest the bowl of the Big Dipper, to The North Star, and then an equal distance beyond. The line will reach a group of stars that look like an "M" or "W". This is the constellation Cassiopeia.

In between the Big and Little Dippers are a few bright stars. These form the tail of the constellation Draco. If you followe the tail around the bowl of the Little Dipper, you can find the head of Draco. It's formed by a cluster of four stars.

Bootes is found by following the curve of the handle in the Big Dipper to the bright star at the tail of Bootes' kite-shaped constellation.



Three bright stars, most prominent in the summer months, make up the Summer Triangle. From this triangle Cygnus, Lyra and Aquila may be located. Each of these constellations contains one of the three stars of the Summer Triangle.



WAY UP NORTH

Focus To learn the nightly movements of Polar Constellations, with historical and mythological trivia about Polaris, the North Star.

Group Size 20-25 students

Time Required 1 hour

Materials
Nightly and seasonal star chart
3 Traffic cones or other markers
Flagging ribbon

Physical Setting
Preparation: large classroom or soccer field
Viewing: Star Room or night sky

Process

Activity 1: STARRING ROLES

Role play star movement:

1. Use the Chart to show students the positions of the two dippers, Casseopia, Cepheus, and Draco at 9:00p.m.
2. Mark the " position" of Polaris on the floor or field with a cone.
3. Select students to be constellations:
   5-Cassiopea; 6-Little Dipper; 7-Big Dipper; 5-Cepheus
4. Give each group a long piece of flagging ribbon to represent the lines connecting the stars on the chart.
5. Mark the "position" of the pointers with two cones. Have the constellations take their places and lay their ribbon on the floor.
6. Regroup, rotate the star chart to show the sky at midnight, pass out new pieces of flagging tape; repeat.
7. Rotate the chart to 3:00 a.m.

Activity 2: TALKING STARS

1. Discuss the evidence--what happens to the stars during the day? What does it mean to steer by the stars? etc.
2. Discuss the origins of the names for Polaris: Starship, Steering Star, Lodestar; Stella Maris, Mongolia: The Golden Peg, India: The Pivot of the Planets, China: Emperor of the Heavens (Earthly emperors were the "Sons of Heaven".)

Activity 3: SEEING STARS

Identify the Polar constellations in the night sky/Star Room.

WRITTEN IN THE STARS

Focus To acquaint students with the five polar constellations and their legends

Group Size Entire class

Time Required One session, about 1 hour
Two sessions of 15-30 minutes (*with independent writing time provided after session one*)

Materials
Paper
Pencil
Cassette player
Tape of Native American star legends
Legends about the polar constellations
Available in the Cispus office and science room
pointer-flashlight
constellation chart
Handout: ***Stargazing Chart***

Physical Setting Indoor or Outdoor classroom with tables
Star Room

Process

Activity 1: FINDING THE PATTERN, TELLING THE STORY

1. In the Star Room: Turn on the ultra-violet lights and adjust so that only the brightest, (first magnitude) stars and major constellations are visible.
With the pointer-flashlight locate Polaris (the North Star) and the rest of the Little Dipper- Ursa Minor, the Little Bear. Then locate the Big Dipper-Ursa Major- the Big Bear.
2. Read or tell two or three legends about these constellations from Greek, Roman, Norse, and/or Native American mythology.Using the pointer stars on Ursa Major and the flashlight return to Polaris, home base for the lesson.
3. Find Casseopia , share the legends, return to Polaris. Repeat for Cephus and Draco.

Options:
Have each student mark Polaris
Have students create a constellation ont heir charts, then write a legend about it.

Activity 2: CREATING NEW PATTERNS AND STORIES

1. Return to classroom setting.
Distribute ***Stargazing Chart*** to students. Show them a star chart with the constellations depicted.

Activity 3: SHARING OUR IDEAS

1. In the Star Room meet in small groups for sharing of individual constellations and stories, and/or provide for large group sharing.
Collect student papers etc. before next activity.

ACTIVITY 4: Looking and Listening
"The Big Event" of the lesson
Turn down the lights (to simulate sunset), then completely off so that all the stars and the Milky Way suddenly appear. As the ahs subside start the tape. Enjoy!

Resource List

Her Seven Brothers by Paul Goble, Bradbury Press, New York, 1988- A beautifully illustrated retelling of the Cheyenne legend about the creation of the Big Dipper

Quillworker, a Cheyenne Legend by Terri Cohlene, Watermill Press, Mahwah, N.J- A slight variation of the preceding legend which includes a timeline and glossary.

Indian Tales by Joseph and Edith Raskin, Random House, 1969- *i*ncludes "How the bear lost his tail".

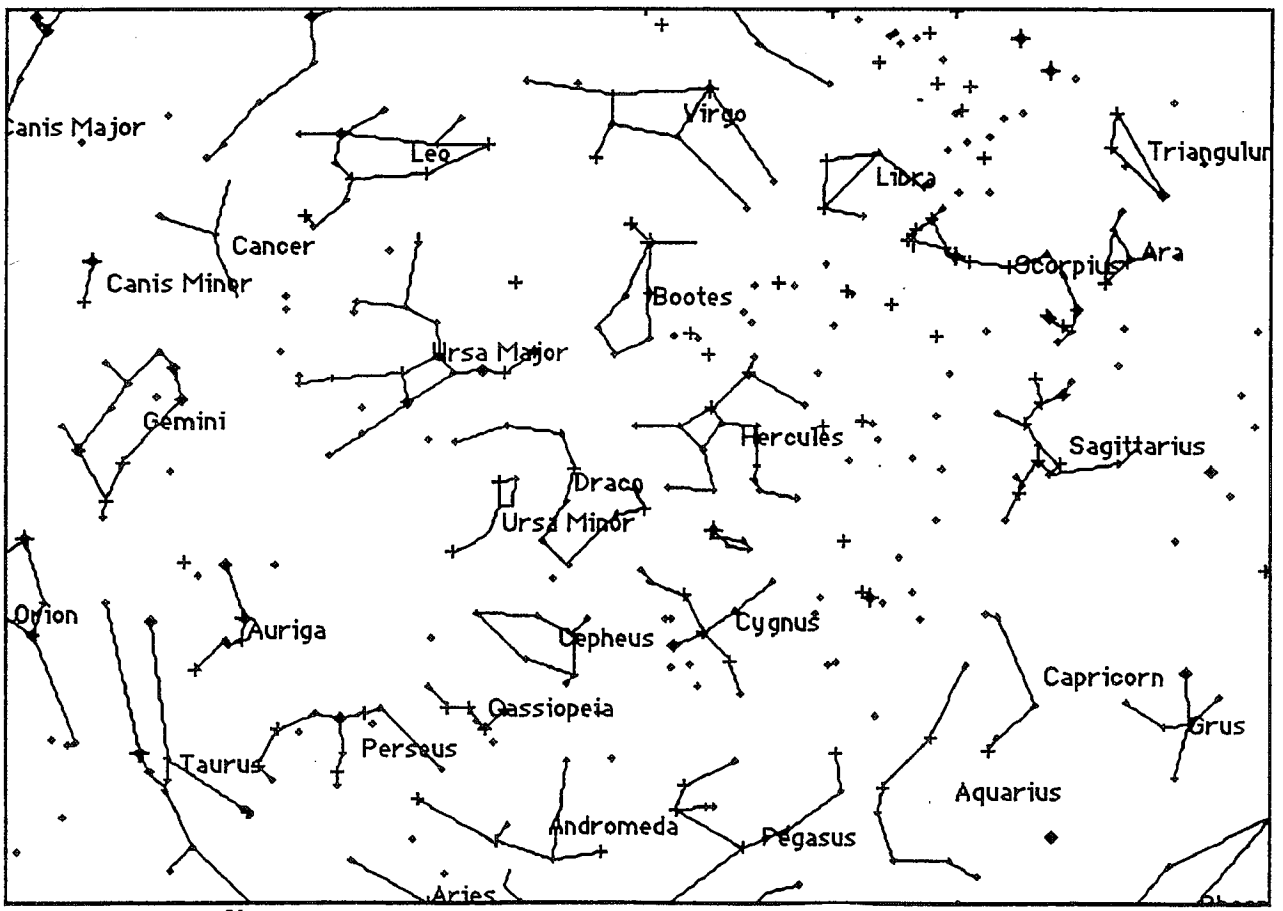
Star Tales by Gretchen Will May, 1987- North American Indian stories about the stars.

The Heavenly Zoo by Alison Laurie- legends and tales of the stars

Look into the Night Sky by Seymour Simon, Viking Press,1977

Stargazing Guide compiled by Lee La Due, Cispus Press,1988

Constellation Chart



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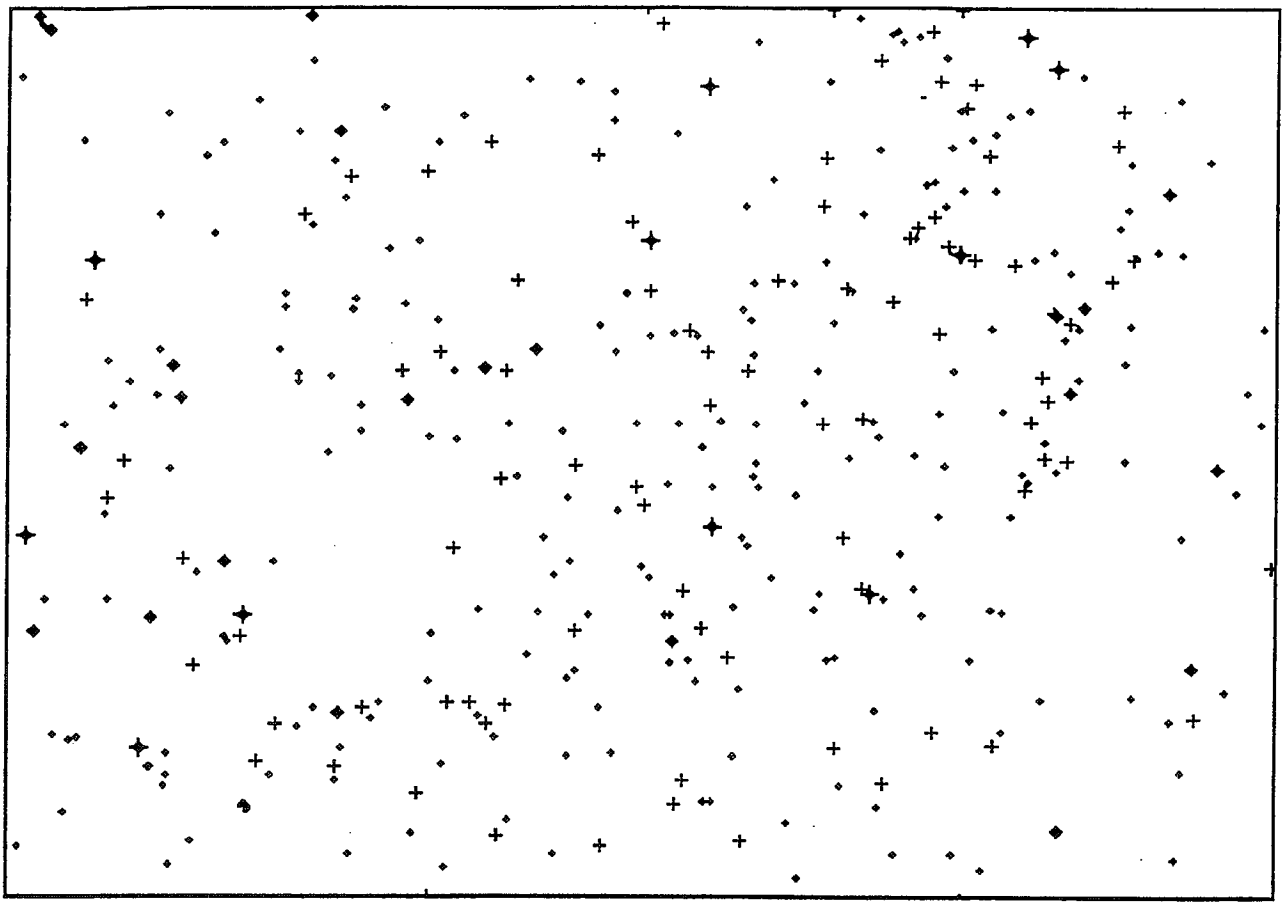
Stargazing Chart



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