

Visit the "Scouting with Mr. R." web site at
www.relia.net/~thedane/scouting.html

7	2	2	4
1			5
1			5
3	6	6	8

This passport belongs to:



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 (revised 2003)

"The Stars" by H. A. Rey



THE ZODIAC

(Greek "zoion" = Animal)

The zodiac is a belt 8° wide on either side of the ecliptic (the path the sun, moon, and planets pass through in the sky). Within this belt lie the twelve* constellations of the zodiac: Pisces, Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpius, Sagittarius, Capricornus, Aquarius.

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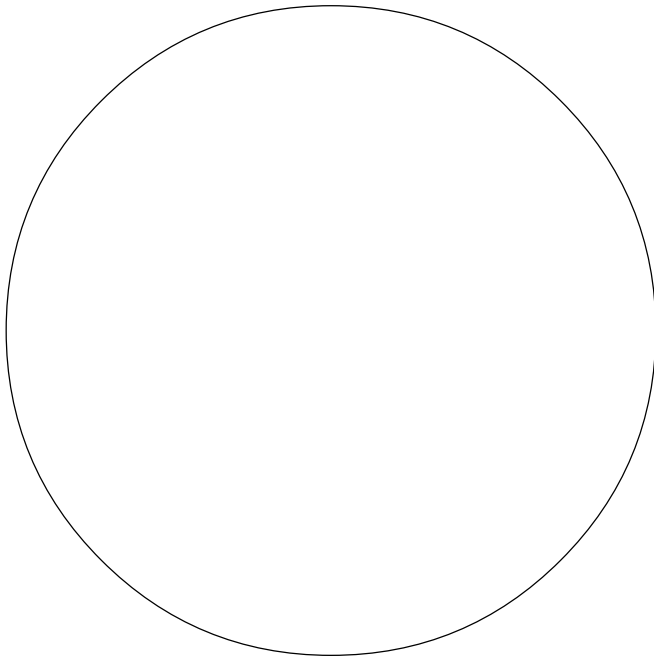


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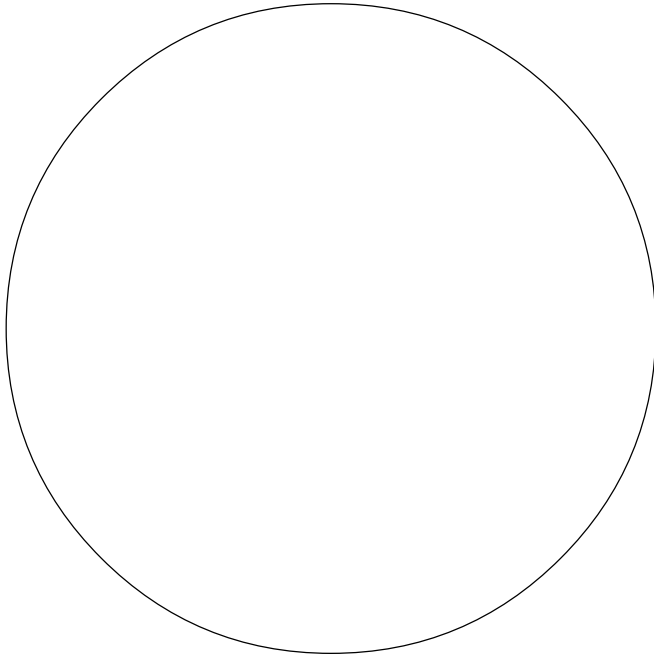
MOON DRAWING (1a)



Sketch the face of the moon, indicating on it the locations and names of **at least five (5) seas** (mare) and **five (5) craters**.

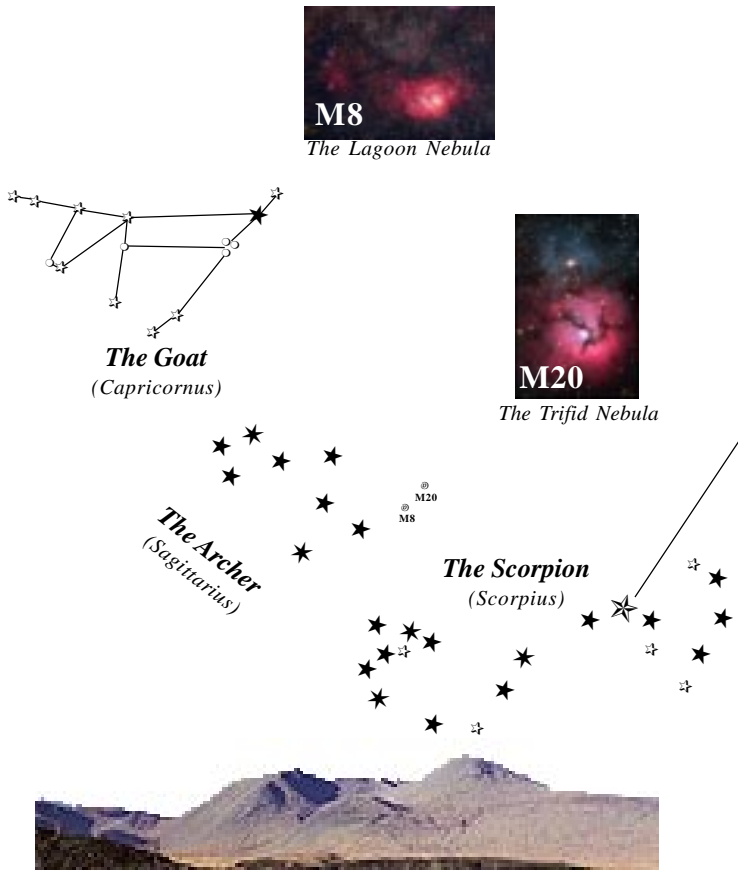
M65
 M66
 The Lion (Leo)
 NGC 3628
 M66 M65
 The Leo Triplet
 M44
 The Crab (Cancer)
 The Twins (Gemini)
 Magnitude 0 1 2 3 4 5

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M8
The Lagoon Nebula

M20
The Trifid Nebula

The Goat
(Capricornus)

The Archer
(Sagittarius)

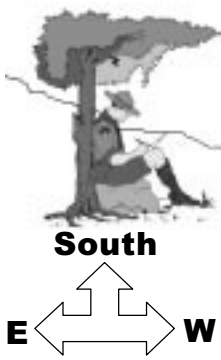
The Scorpion
(Scorpius)

MOON SKETCH (1b)

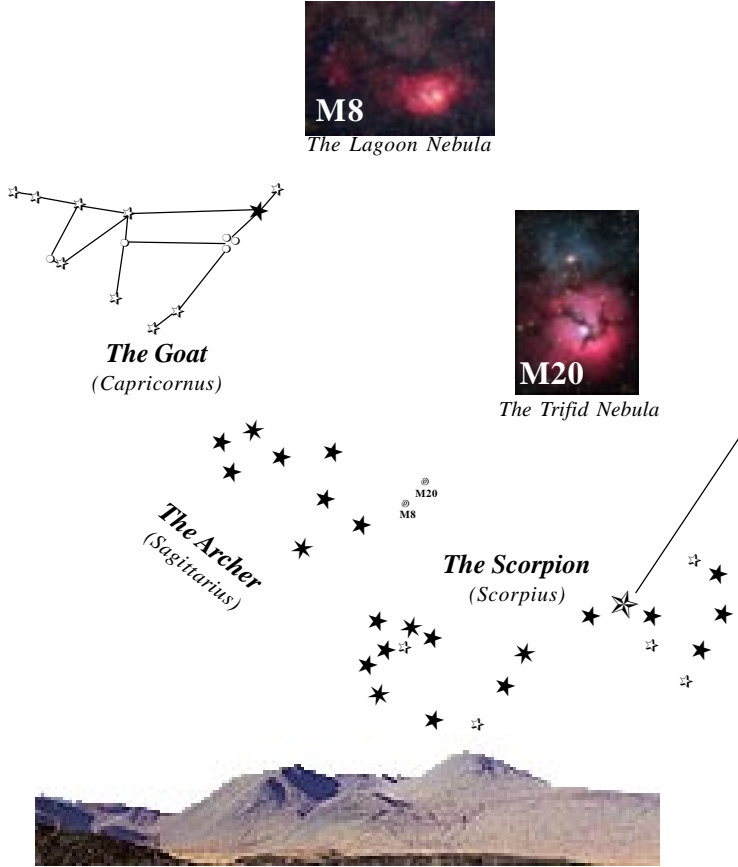
During a single week, observe the moon three (3) separate nights at the same hour (Time: _____). Sketch the positions **and** phases of the moon.
(Note: The moon will move right to left!)



_____	_____	_____	_____	_____	_____	_____
Date	Date	Date	Date	Date	Date	Date



What changes took place during the week? _____



M8
The Lagoon Nebula

M20
The Trifid Nebula

The Goat
(Capricornus)

The Archer
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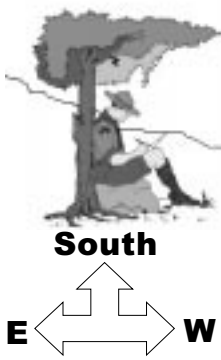
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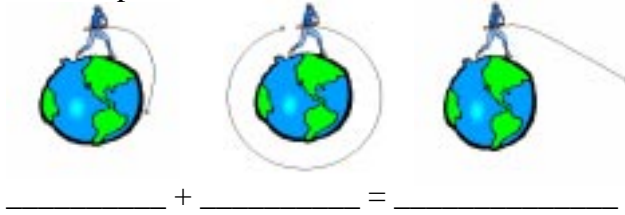
_____	_____	_____	_____	_____	_____	_____
Date	Date	Date	Date	Date	Date	Date



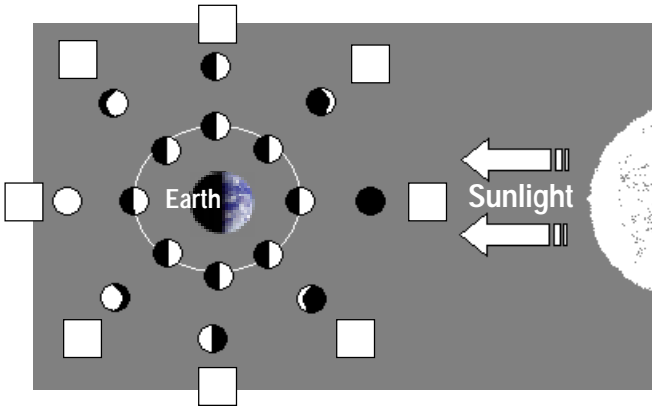
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MOON & EARTH (1c & 3c)

What keeps the moon in orbit around the Earth?



Explain the relative positions of the sun, earth, and moon at the times of new, first quarter, full, and last quarter phases of the moon.

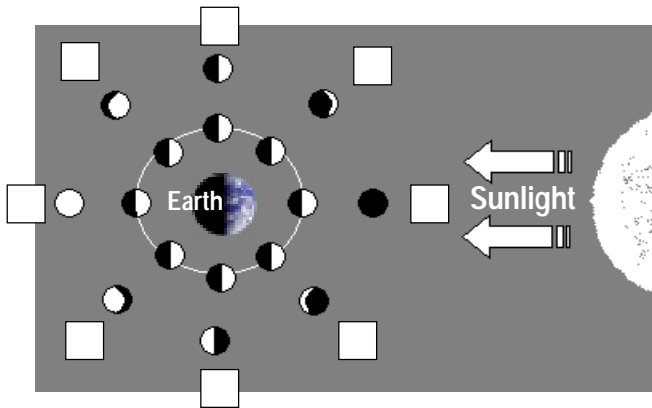


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The Herdsman (Boötes)

The Northern Crown (Corona Borealis)

The Scales (Libra)

The Virgin (Virgo)

M13
The Hercules Globular Star Cluster

Magnitude 0 1 2 3 4 5

The Herdsman (Boötes)

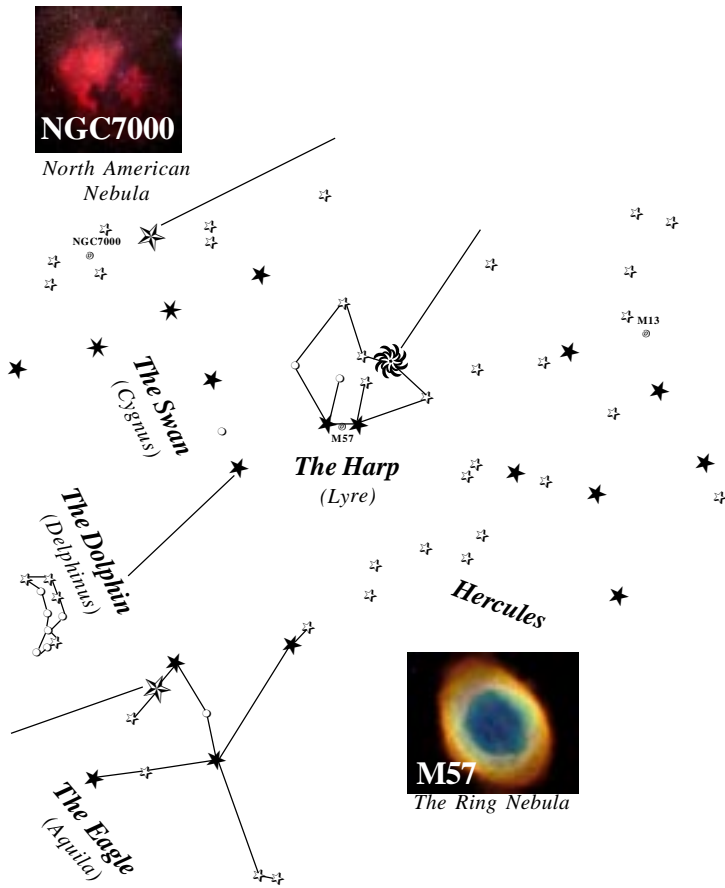
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



MOON PHASES




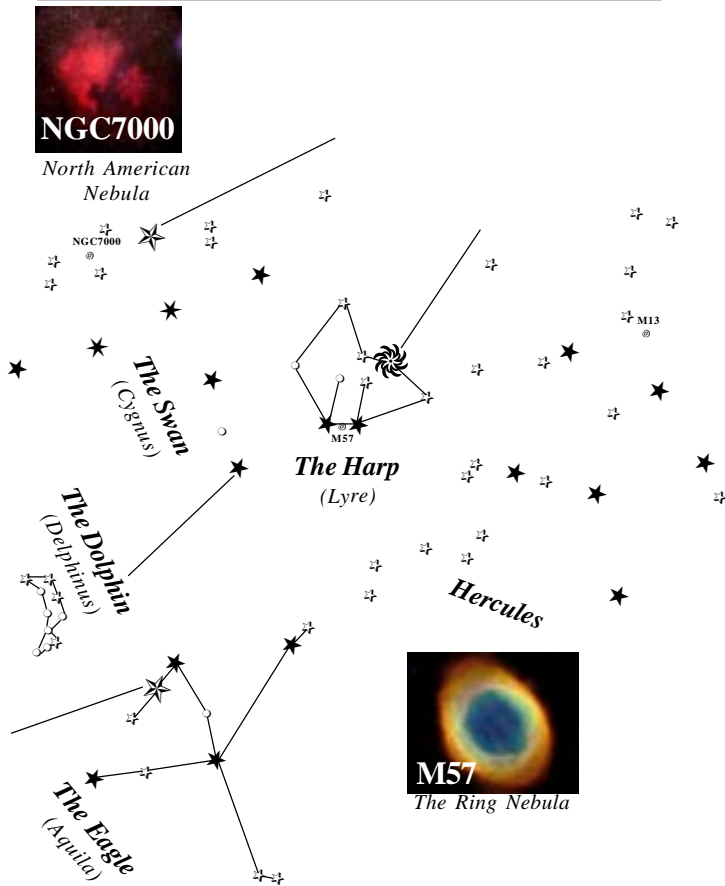
- 1) Waxing Crescent
- 2) Waning Crescent
- 3) First Quarter
- 4) Third Quarter
- 5) Waning Gibbous
- 6) Waxing Gibbous
- 7) New Moon
- 8) Full Moon

Waxing means _____  aring

Waning means _____  autious

 Crescent means _____ than half (1/2) showing


 Gibbous means _____ than half (1/2) showing





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


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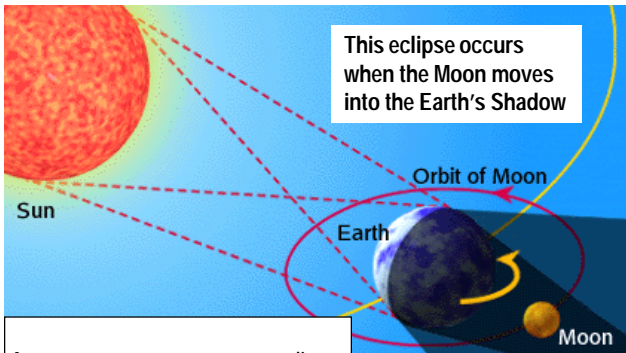
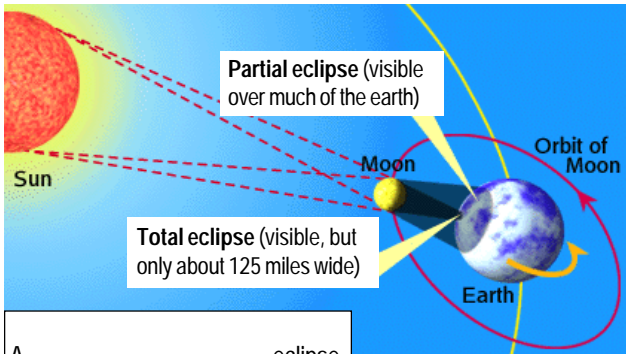
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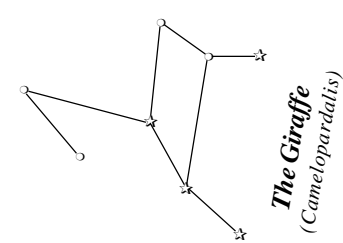
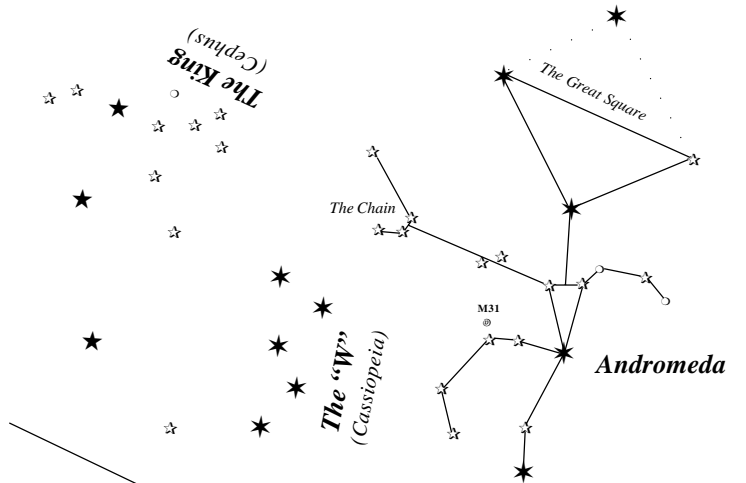
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ECLIPSES (3c)

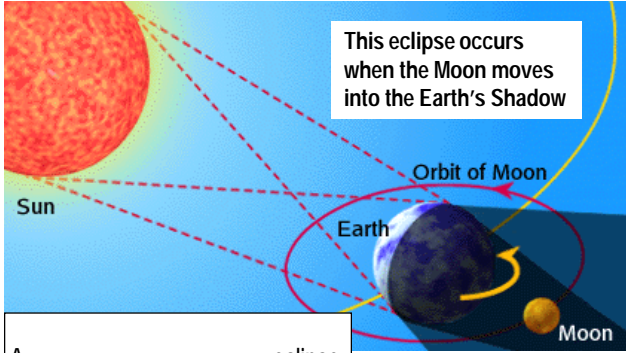
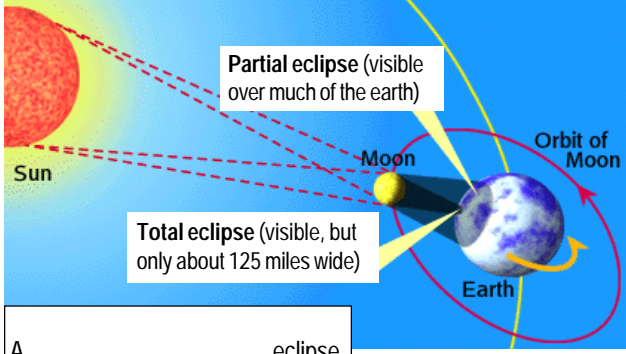


http://spaceboy.nasa.gov/jp/note/tentai/e/ten08_e.html

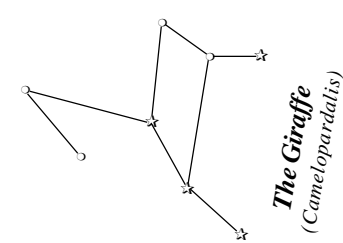
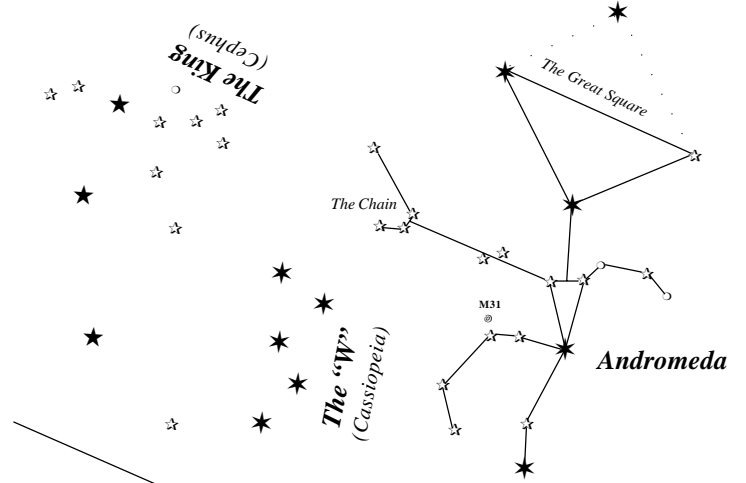


★ ★ ★ ★ ★
Magnitude 0 1 2 3 4 5

ECLIPSES (3c)



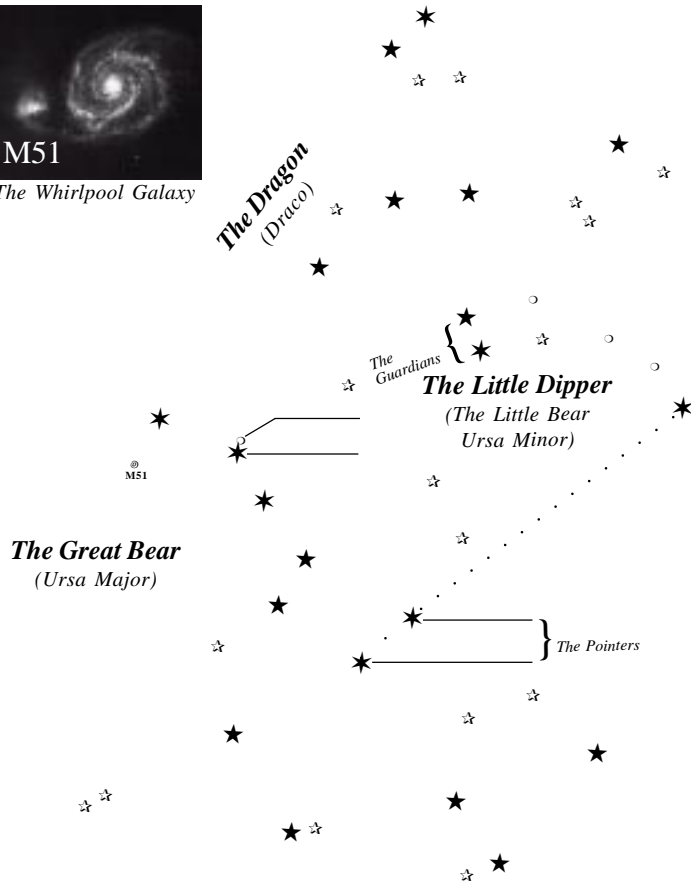
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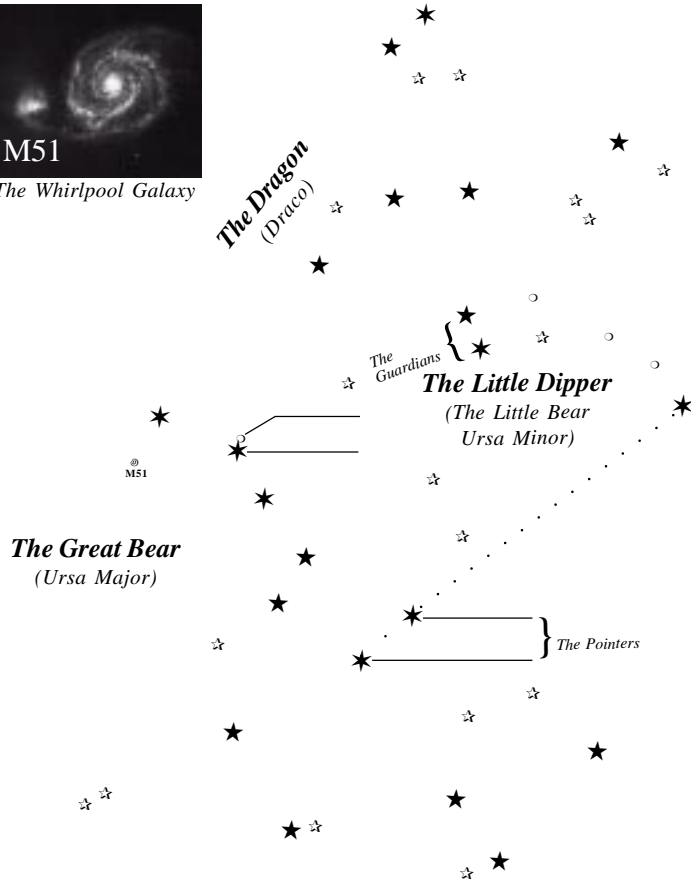
M51
The Whirlpool Galaxy



Locations of the five (5) visible planets for the next year (2b)	Mercury	Venus	Mars	Jupiter	Saturn
2003 June					
July					
August					
September					
October					
November					
December					
2004 January					
February					
March					
April					
May					
June					
July					
August					



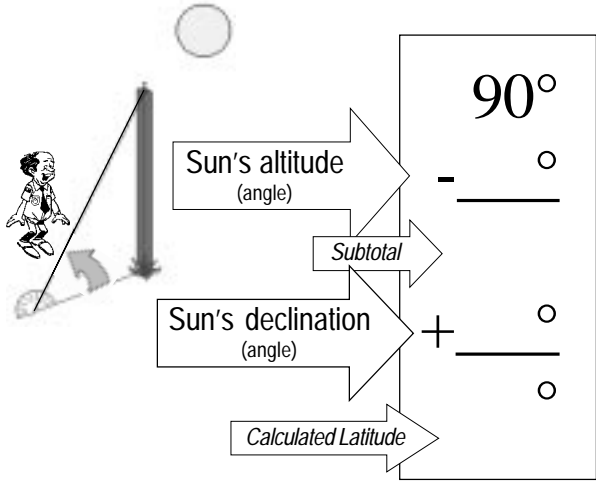
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November					
December					
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February					
March					
April					
May					
June					
July					
August					

LATITUDE ON EARTH (4)

Using a vertical pole, measure the angle the sun's shadow forms with the ground at **exactly 1:00 PM** (if during *daylight saving time* months or 12-noon otherwise). Look up today's date in the chart to find the sun's declination and calculate your latitude with this formula:



NOTE: For dates between Sept. 23rd and May 21st, the declination will be negative. Basically speaking, in order to subtract a negative, add it instead.

CAREERS (9)

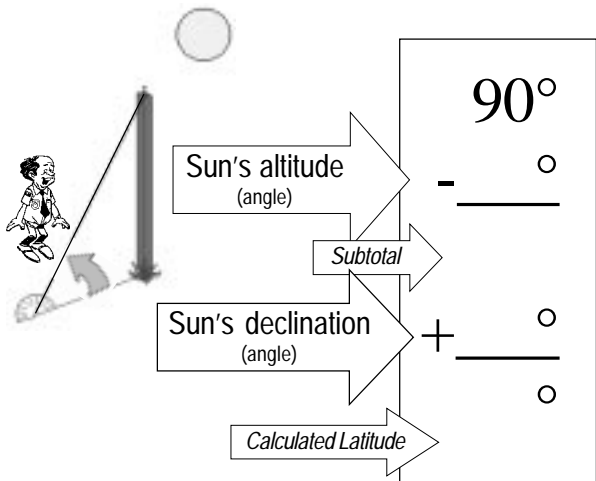
Name different career opportunities in astronomy.

Explain how to prepare for one of them. _____

List the high school courses most useful in beginning such preparation. _____

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SUN PROPERTIES (7a)

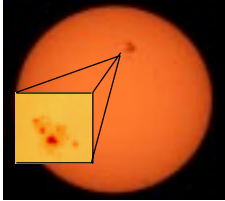
What is the sun composed of? _____

How does our sun compare to other stars? _____

How does the sun's radiation effect the Earth's weather? _____

What are sunspots? _____

Describe some of the effects sunspots may have on this radiation. _____



http://www.christian-astronomy.org/photos.htm

SUN'S DECLINATION

Jan 01 S -23° 01'	Jun 27 N 23° 21'	Jul 23 N 20° 10'	Aug 21 N 12° 15'
Jan 15 S -21° 11'	Jun 28 N 23° 19'	Jul 24 N 19° 58'	Aug 22 N 11° 58'
Feb 01 S -17° 12'	Jun 29 N 23° 16'	Jul 25 N 19° 44'	Aug 23 N 11° 36'
Feb 15 S -12° 49'	Jun 30 N 23° 12'	Jul 26 N 19° 31'	Aug 24 N 11° 16'
Mar 01 S -07° 44'	Jul 01 N 23° 06'	Jul 27 N 19° 19'	Aug 25 N 10° 54'
Mar 15 S -02° 15'	Jul 02 N 23° 03'	Jul 28 N 19° 06'	Aug 26 N 10° 35'
Apr 01 N 04° 23'	Jul 03 N 23° 01'	Jul 29 N 18° 50'	Aug 27 N 10° 14'
Apr 15 N 09° 40'	Jul 04 N 22° 56'	Jul 30 N 18° 38'	Aug 28 N 09° 53'
May 01 N 14° 57'	Jul 05 N 22° 49'	Jul 31 N 18° 23'	Aug 29 N 09° 30'
May 15 N 18° 46'	Jul 06 N 22° 45'	Aug 01 N 18° 07'	Aug 30 N 09° 11'
Jun 01 N 22° 00'	Jul 07 N 22° 37'	Aug 02 N 17° 55'	Aug 31 N 08° 48'
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Jun 10 N 22° 59'	Jul 16 N 21° 25'	Aug 11 N 15° 25'	Dec 21 S -23° 27'
Jun 11 N 23° 03'	Jul 17 N 21° 17'	Aug 12 N 15° 06'	Dec 31 S -23° 07'
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Jun 25 N 23° 23'			
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Photo by Dennis di Cicco at <http://www.uwm.edu/~kahl/Images/Weather/Other/andalemma.html>

SUN PROPERTIES (7a)

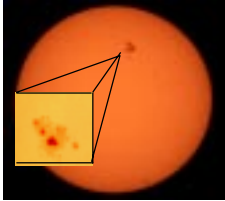
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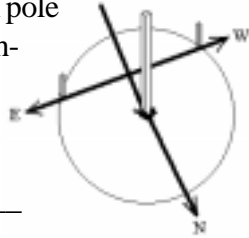
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MERIDIAN LINE (4)

Using the shadow of a vertical pole in sunshine, lay out a true north-south line (a meridian).



Date _____

Adult Leader Signature _____

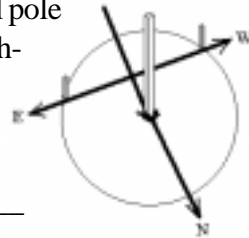
STAR COLORS (5)

Draw lines to match star colors with their meanings and earthly examples.

Red	Extremely hot. Young in age. Recently formed.	A very bright welder's torch.
Blue	Very large in size. Very old. Cool (for a star).	Large bonfire. Building burning down.
Yellow	Avg. temperature. Avg size. Middle aged.	Smoldering fire. Burning coils on a stove.

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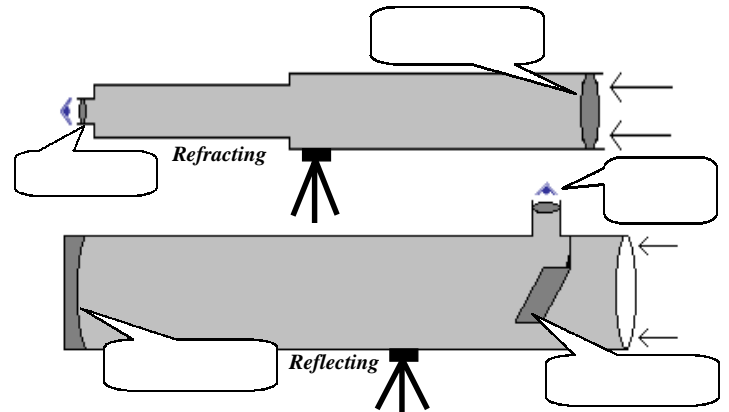
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TELESCOPES (6)

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What is the basic purpose of a telescope? _____



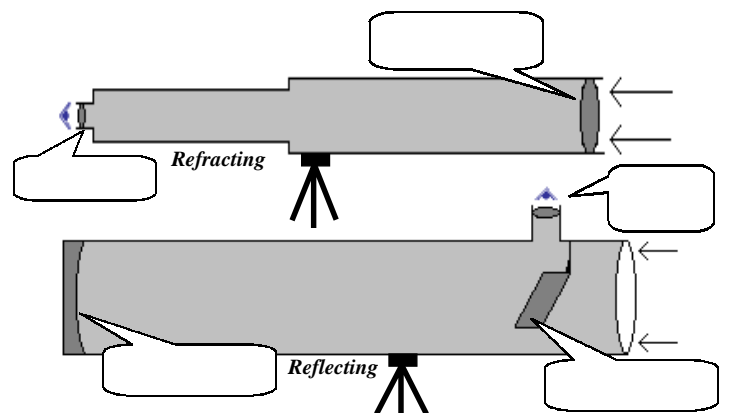
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- 1) _____
- 2) _____
- 3) _____

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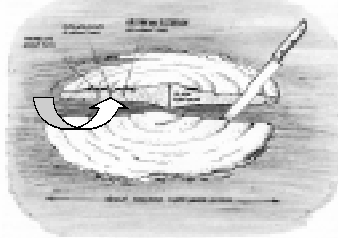


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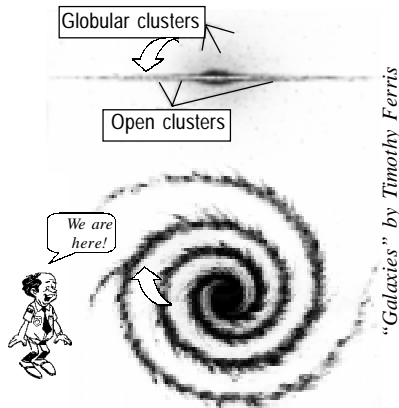
THE MILKY WAY (5b)

"The Stars" by H. A. Rey



Our solar system (the sun, planets, comets, etc.) is part of a large galaxy called the Milky Way. We are located about half-way from the center.

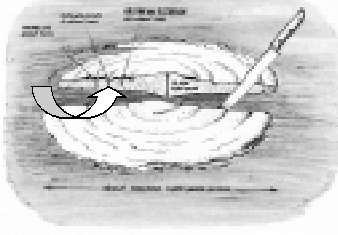
When we see the Milky Way in the sky, we are looking sideways through the galaxy, seeing millions of stars, open star clusters, and nebulae. When we look away from the Milky Way we see far fewer stars, but we can see a number of globular star clusters, groups of stars that never were drawn into the swirl of the Milky Way.



"Galaxies" by Timothy Ferris

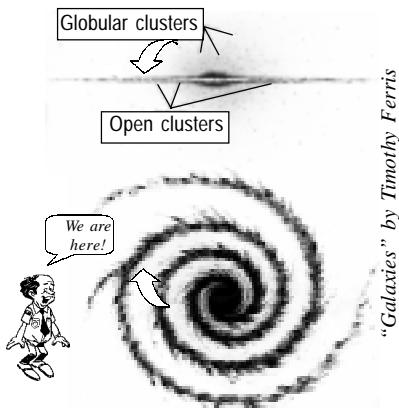
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"The Stars" by H. A. Rey



Our solar system (the sun, planets, comets, etc.) is part of a large galaxy called the Milky Way. We are located about half-way from the center.

When we see the Milky Way in the sky, we are looking sideways through the galaxy, seeing millions of stars, open star clusters, and nebulae. When we look away from the Milky Way we see far fewer stars, but we can see a number of globular star clusters, groups of stars that never were drawn into the swirl of the Milky Way.



"Galaxies" by Timothy Ferris

SUMMER STARS (5)

These stars may be seen during the summer. You must **point out and name eight (8) stars** of which 5 must be **1st** magnitude or higher (the bold number following a star's name is its apparent magnitude).

- { **ALCOR (4)** *The Big Dipper* (Color: **White**)
- { **MIZAR (2)** *The Big Dipper* (Color: **White**)
- { **MERAK (2)** *The Big Dipper* (Color: **White**)
- { **DUBHE (2)** *The Big Dipper* (Color: **Yellow-Orange**)
- { **POLARIS (2)** *The Little Dipper* (Color: _____)
- { **ALBIREO (3)** *The Swan* (Color: _____/_____)
- { **DENEK (1)** *The Swan* (Color: _____)
- { **VEGA (0)** *The Harp* (Color: _____)
- { **ALTAIR (1)** *The Eagle* (Color: **White**)
- { **ANTARES (1)** *The Scorpion* (Color: _____)
- { **SPICA (1)** *The Virgin* (Color: _____)
- { **GEMMA (2)** *Northern Crown* (Color: **Yellow-Orange**)
- { **REGULUS (1)** *The Lion* (Color: _____)
- { **ARCTURUS (0)** *The Herdsman* (Color: _____)
- { **CAPELLA (0)** *The Charioteer* (Color: _____)

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SUMMER CONSTELLATIONS

These constellations can be seen during the summer. You are required to **point out and name ten (10) constellations** of which 4 must be part of the Zodiac.

- * **GREAT BEAR** *Ursa Major {The Big Dipper}*
- * **LITTLE BEAR** *Ursa Minor, The Little Dipper*
- * **DRAGON** *Draco*
- * **The “W”** *Cassiopeia, The Queen*
- KING** *Cepheus*
- ANDROMEDA**
- PERSEUS**
- * **SWAN** *Cygnus, The Northern Cross*
- * **EAGLE** *Aquila*
- HARP** *Lyre*
- HERCULES** *{The Keystone or Bowtie}*
- * **HERDSMAN** *Boötes*
- * **NORTHERN CROWN** *Corona Borealis {Smile}*
- *^z **LION** *Leo*
- *^z **VIRGIN** *Virgo*
- ^z **SCALES** *Libra*
- *^z **SCORPION** *Scorpius {The Fishhook}*
- *^z **ARCHER** *Sagittarius {The Teapot}*
- ^z **GOAT** *Capricornus*

(* denotes the most easily seen; ^zdenotes part of the Zodiac)

BIG DIPPER DRAWINGS (5a)

Sketch the position of the Big Dipper in relation to the North Star at the start of the night and then again six (6) hours later. It often helps to also include Cassiopeia in the drawing for reference.

Polaris
(The North Star)
★



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