

Inquiry Research Report #11

Monitoring the Moving Constellations

Formulate a Question, Pursue Evidence, and Justify Your Conclusion

Your task is to design an answerable research question, propose a plan to pursue evidence, collect data using heavens-above (or another suitable source pre-approved by your lab instructor), and create an evidence-based conclusion about some motion or position in the sky for the constellations that you have not completed before.

Research report:

Specific research question:

During which season is the constellation Orion high in the southern sky just after sunset?

Step-by-step procedure to collect evidence:

Using heavens-above.com to make observations:

1. Chose a day of the month to observe.
2. On each observation day, just after the sunset, determine if Orion is visible and determine in which part of the sky it is located.
3. Repeat the observation once a month for a year.

Data table and/or results:

Date	Visible	Location		Date	Visible	Location
4/1/09	yes	high SW sky		10/1/09	no	n/a
5/1/09	yes	low W sky		11/1/09	no	n/a
6/1/09	no	n/a		12/1/09	no	n/a
7/1/09	no	n/a		1/1/10	yes	low E sky
8/1/09	no	n/a		2/1/10	yes	high SE sky
9/1/09	no	n/a		3/1/10	yes	high S sky

Evidence-based conclusion statement:

From the evidence above, we can see that the constellation Orion appears to move from low in the eastern sky to low in the western sky from January to May.

Inquiry Research Report #12

Observing the Sun's Position and Motion

Formulate a Question, Pursue Evidence, and Justify Your Conclusion

Your task is to design an answerable research question, propose a plan to pursue evidence, collect data using heavens-above (or another suitable source pre-approved by your lab instructor), and create an evidence-based conclusion about some motion or position of the Sun in the sky that you have not completed before.

Research report:

Specific research question:

Over the course of a year, how does the amount of Sunlight each day at the equator compare to that of Laramie, Wyoming?

Step-by-step procedure to collect evidence:

Use heavens-above.com to make observations:

1. Choose a number of days over the course of a year to make observations.
2. Observe and record the Sunrise and sunset times on each of the of the observation days in Laramie, Wyoming and at the equator.
3. Use the Sunrise and sunset times to calculate the total amount of daylight on each of the observation days and at both locations.

Data table and/or results:

(All times are Mountain Standard Time)

Date	Laramie sunrise	Laramie sunset	Total daylight	Equator sunrise	Equator sunset	Total daylight
3/8/2009	6:25 AM	5:50 PM	11:35	6:10 AM	6:08 PM	11:58
3/15/2009	6:15 AM	6:00 PM	11:45	6:09 AM	6:06 PM	11:57
3/22/2009	6:00 AM	6:05 PM	12:05	6:08 AM	6:04 PM	11:56
3/29/2009	5:50 AM	6:15 PM	12:25	6:05 AM	6:02 PM	11:57

Evidence-based conclusion statement:

Over the course of a year, the Sun rises earlier and sets later in the summer than in winter in Laramie, Wyoming, so there is more daylight in summer and less in winter. The equator does not experience seasons so there is no change in the amount of daylight as the year progresses.

Inquiry Research Report #13

Monitoring the Zodiac Constellations

Formulate a Question, Pursue Evidence, and Justify Your Conclusion

Your task is to design an answerable research question, propose a plan to pursue evidence, and collect data using heavens-above (or another suitable source pre-approved by your lab instructor).

Research report:

Specific research question:

Does the altitude of the line of the zodiac constellations through the sky change over the course of a year in the same way as the path of the Sun? That is, does it move higher and higher above the southern horizon in spring and move lower and lower toward the southern horizon in fall?

Step-by-step procedure to collect evidence:

Use heavens-above.com to make observations:

1. Choose a day of the month to observe the zodiac.
2. Each month, right after sunset, record the direction and time the Zodiac is rising.
3. For clarity, label directions as: northeast, NE; east-northeast, ENE; east, E; east-southeast, ESE; etc.

Data table and/or results:

Date: Day of the year for observation; Time: Time after sunset when zodiac was observed;

Direction: The direction on the horizon where the zodiac was rising

Date	Time	Direction		Date	Time	Direction
1/15/2009	5:00 PM	ENE		7/15/2009	8:30 PM	ESE
2/15/2009	5:30 PM	ENE		8/15/2009	8:00 PM	ESE
3/15/2009	7:15 PM	E		9/15/2009	7:15 PM	E
4/15/2009	7:45 PM	E		10/15/2009	6:15 PM	E
5/15/2009	8:15 PM	ESE		11/15/2009	4:45 PM	ENE
6/15/2009	8:45 PM	ESE		12/15/2009	4:30 PM	ENE

Evidence-based conclusion statement:

Every month the path of the zodiac appears to move lower and lower from summer all the way through fall. After winter starts, the path moves higher and

higher above the horizon throughout spring until summer. This is nearly identical to the changes that the path of the Sun takes throughout the year, and also accounts for the changes in the seasons.