

Sunrise and Sunset Times for the 22nd of each month of 2012 in New York City

January 2012

Sunrise: 7:14am
Sunset: 5:00pm

May 2012

Sunrise: 5:32am
Sunset: 8:12pm

September 2012

Sunrise: 6:43am
Sunset: 6:54pm

February 2012

Sunrise: 6:51am
Sunset: 5:38pm

June 2012

Sunrise: 5:24am
Sunset: 8:31pm

October 2012

Sunrise: 7:01am
Sunset: 6:06pm

March 2012

Sunrise: 6:45am
Sunset: 7:09pm

July 2012

Sunrise: 5:43am
Sunset: 8:21pm

November 2012

Sunrise: 7:08am
Sunset: 4:33pm

April 2012

Sunrise: 6:07am
Sunset: 7:42pm

August 2012

Sunrise: 6:12am
Sunset: 7:45pm

December 2012

Sunrise: 7:17am
Sunset: 4:31pm

	Sunrise AM	Sunset PM	
		Our Time	Military Time (Graph this one!)
Jan	7:14	5:00	17:00
Feb	6:51	5:38	17:38
Mar	6:45	7:09	19:09
Apr	6:07	7:42	19:42
May	5:32	8:12	20:12
June	5:24	8:31	20:31
July	5:43	8:21	20:21
Aug	6:12	7:45	19:45
Sept	6:43	6:54	18:54
Oct	7:01	6:06	18:06
Nov	7:08	4:33	16:33
Dec	7:17	4:31	16:31

Name _____

Learning from unrise and Sunset Times!

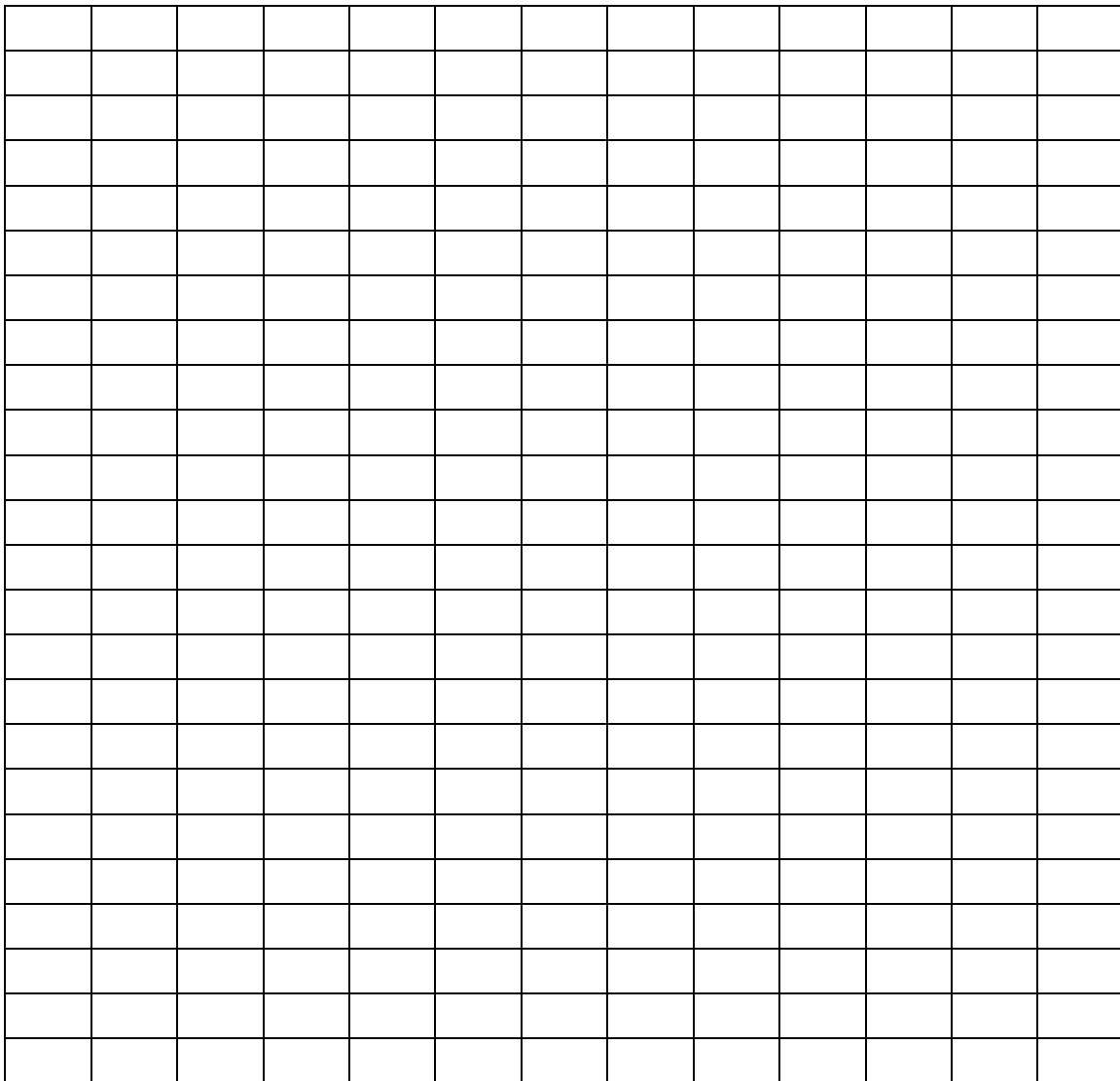
OBJECTIVE: What can we learn about how the lengths of daylight hours change over a year by looking at the sunrise and sunset times for the 22nd of each month of 2012 in New York City?

Graph The Data!

- Step 1: Title the graph (tell **exactly** what the graph is!)
- Step 2: Label the x-axis (with the independent variable)
- Step 3 Label the y-axis correctly
- Step 4: Number the x and y-axes in the correct scale.
- Step 5: Plot your data points. Graph the sunrise times and the sunset times in MILITARY TIME. *Be sure to make a legend to distinguish sunrise and sunset.*
- Step 6: Draw a line to connect the points.
- Step 7: On the Graph- shade in the daylight hours in light blue; shade in the nighttime hours in gray.

Graph Title:

Y- Axis Title:



X- Axis Title:

1. **OBSERVATION:** Make 3 observations about the length of daylight hours throughout the year. Be **VERY SPECIFIC!**

- _____

- _____

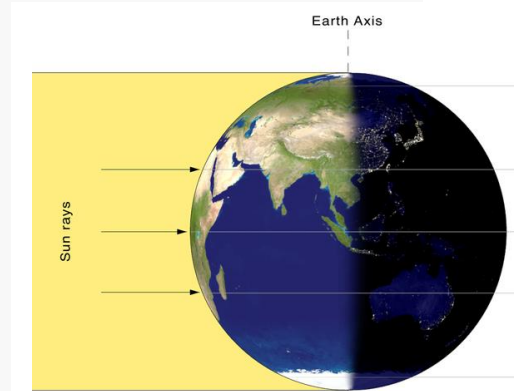
- _____

2. **Make a CONNECTION:**

What connection can you make between the daily temperature and the length of day? _____

3. **Find the Equinoxes:**

During an equinox, the Earth's North and South poles are not tilted toward or away from the Sun. The length of the day is the same at all points on Earth's surface so **day and night are of almost equal length (12 hours).**



a. Find these dates using the graph you created.

Look for the months where the sunset and sunrise are closest to 12 hours apart.

b. Then label them on the graph as Equinox 1 and Equinox 2.

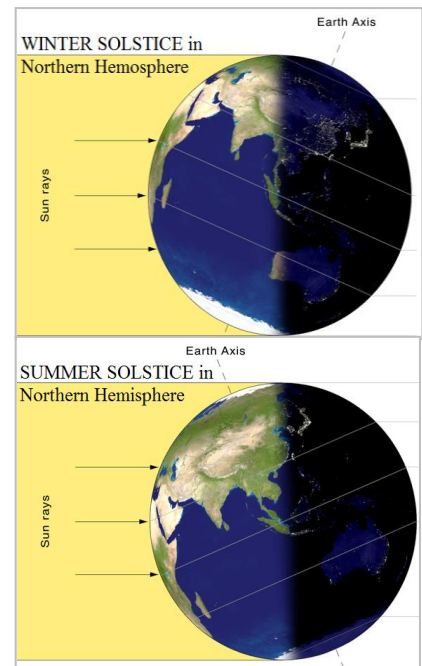
Equinox 1: _____ * **Label this on your graph.**

Equinox 2: _____ * **Label this on your graph.**

What causes an Equinox? _____

4. 🌞🌍🌞 the Solstices:

Solstices are the times when the tilt of the Earth's axis is most inclined toward or away from the Sun. The **winter solstice** is the day when the Sun is lowest in the sky at noon. This is **the shortest day** of the year in northern hemisphere. The **summer solstice** is when the Earth's axis is inclined towards the Sun. This is **the longest day** of the year.



- Find these days using the graph. Look for the months where sunset and sunrise are CLOSEST together. This is the Winter Solstice.
- Look for the months where sunset and sunrise are FARTHEST apart. This is the Summer Solstice.
- Then label them on the graph correctly.

Winter Solstice: _____ * Label this on your graph.

Summer Solstice: _____ * Label this on your graph.

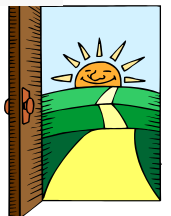
What causes a Solstice? _____

Make a CONNECTION:

During which season (summer or winter) are the Sun's rays hitting the Northern Hemisphere more directly? _____

What connection can you make between the season which gets the most direct Sun's rays and the daily temperature? _____

Using evidence from this activity, explain why it is warm in the summer in the NORTHERN Hemisphere. _____



Name _____

Category	Scoring Criteria	Points	Your Score
Variables 4 points	The independent variable is drawn on the X axis.	1	
	The dependent variable is drawn on the Y axis.	1	
Axis Identification and Point Plotting 8 points	Grid lines on each axis have an appropriate scale—SPREAD OUT!	2	
	Each axis is labeled, including the measurement units for each variable.	2	
	Points are plotted with the e correct data and points are connected with a line	2	
	A "legend" is provided to identify the data lines.	1	
Graph Title 2 points	A descriptive title is included in above graph.	2	
Facts 3 points	3 <u>GOOD</u> facts given about how lengths of daylight hours change throughout the year.	3	
Equinoxes	Identified, labeled and explained correctly	4	
Solstices	Identified, labeled and explained correctly	4	
Connections	Connection questions answered thoughtfully and completely	4	
Score	Total Points	26	

Name _____

Category	Scoring Criteria	Points	Your Score
Variables 4 points	The independent variable is drawn on the X axis.	1	
	The dependent variable is drawn on the Y axis.	1	
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	Each axis is labeled, including the measurement units for each variable.	2	
	Points are plotted with the e correct data and points are connected with a line	2	
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Graph Title 2 points	A descriptive title is included in above graph.	2	
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Equinoxes	Identified, labeled and explained correctly	4	
Solstices	Identified, labeled and explained correctly	4	
Connections	Connection questions answered thoughtfully and completely	4	
Score	Total Points	26	

Learning from unrise and Sunset Times!



TEACHER NOTE: THIS ASSIGNMENT IS MEANT FOR A CLASS IN THE NORTHERN HEMISPHERE!

1. **OBSERVATION:** Make 3 observations about the length of daylight hours throughout the year. Be **VERY SPECIFIC!**

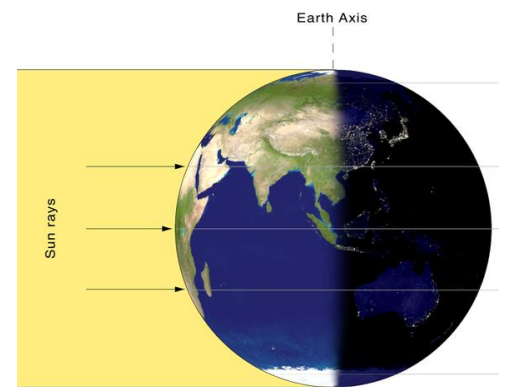
- Accept most answers but push students to make observations about the longest days/shortest days and the months they occur.

2. **Make a CONNECTION:**

What connection can you make between the daily temperature and the length of day? **The longer the daylight hours, the warmer the temperatures.**

3. **FIND the Equinoxes:**

During an equinox, the Earth's North and South poles are not tilted toward or away from the Sun. The length of the day is the same at all points on Earth's surface so **day and night are of almost equal length (12 hours).**



- Find these dates using the graph you created. Look for the months where the sunset and sunrise are closest to 12 hours apart.
- Then label them on the graph as Equinox 1 and Equinox 2.

Equinox 1: MARCH * Label this on your graph.

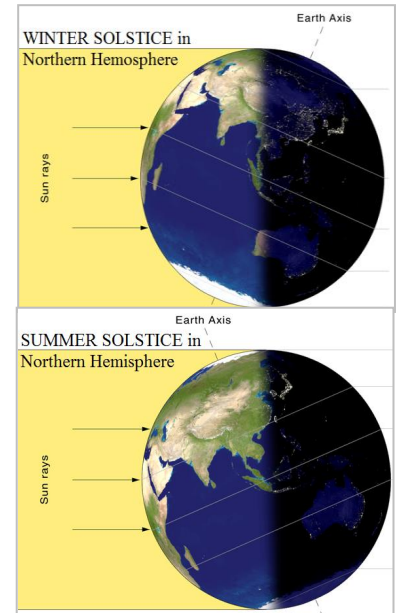
Equinox 2: SEPTEMBER * Label this on your graph.

What causes an Equinox? **The equator is pointing directly at the sun's rays (Earth is not tilted towards or away from the Sun).**

4. 🌍🌞🌙🌍 the Solstices:

Solstices are the times when the tilt of the Earth's axis is most inclined toward or away from the Sun. The **winter solstice** is the day when the Sun is lowest in the sky at noon. This is **the shortest day** of the year in northern hemisphere. The **summer solstice** is when the Earth's axis is inclined towards the Sun. This is **the longest day** of the year.

- Find these days using the graph. Look for the months where sunset and sunrise are CLOSEST together. This is the Winter Solstice.
- Look for the months where sunset and sunrise are FARTHEST apart. This is the Summer Solstice.
- Then label them on the graph correctly.



Winter Solstice: DECEMBER * Label this on your graph.

Summer Solstice: JUNE * Label this on your graph.

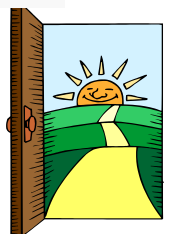
What causes a Solstice? The earth is tilted farthest away or closest towards the Sun.

Make a CONNECTION:

During which season (summer or winter) are the Sun's rays hitting the Northern Hemisphere more directly? **SUMMER**

What connection can you make between the season which gets the most direct Sun's rays and the daily temperature? Summer gets more direct rays and it is warmer.

Using evidence from this activity, explain why it is warm in the summer in the NORTHERN Hemisphere. More direct rays and longer daylight hours cause the temperatures to be warmer in summer in the Northern Hemisphere



Graph Title: Sunrise & Sunset times for the 22nd of each Month of 2012 in NYC.

