



# GLOBE AT NIGHT

## Family Activity Packet: Observation Guide

[www.globeatnight.org](http://www.globeatnight.org)

2013 Campaign Dates that use Orion: January 3 – 12, January 31 – February 9 & March 3 – 12

Children and their families are encouraged to participate in a global campaign to observe and record the brightness of the faintest stars visible as a means of measuring light pollution in a given location. By locating and observing the constellation Orion in the night sky and comparing it to “magnitude” charts, children from around the world will learn how the lights in their community contribute to light pollution. Their contributions to the online database will document the visible nighttime sky.

### Materials Needed:

- GLOBE at Night Teacher or Family Activity Packet
- Something to write on (clipboard or cardboard)
- Something to write with (pencil or pen)
- Red light to preserve night vision (A red light can be made by covering a flashlight with a brown paper bag or a red balloon with the neck cut off.)
- Optional: smart mobile device, GPS unit, or a topographic map to determine your latitude and longitude

### Remember Safety First!

- Please use your judgment as to whether your child should be supervised outside after dark at your location. **We encourage you to do this activity with your child.**
- Be sure your child is wearing suitable clothing for the weather and for being outside at night (light colored and/or with reflective colors).
- When choosing the darkest area in your location, make sure your student is not close to traffic, the edge of a balcony, or near danger in any other way.

### Multiple Observations:

You can enter more than one observation by moving to a new location at least 1 km away from your original location. Don't forget to get new latitude and longitude coordinates. This can be done on the same night or on another night any time during the dates of the campaign.

Charts in this document were prepared by Jan Hollan, CzechGlobe (<http://amper.ped.muni.cz/jenik/astro/maps/GaNight/>).

### Five Easy Star-Hunting Steps:

([www.globeatnight.org/observe.html](http://www.globeatnight.org/observe.html))

- 1) Find your latitude and longitude** using any of the following:
  - a. Use the interactive tool in the web application at [www.globeatnight.org/webapp/](http://www.globeatnight.org/webapp/). With a smart cell phone or tablet, the latitude and longitude are automatically determined as you report the observation. If you are reporting it later on your computer, input the address of the observation. Or input your city; zoom in/out and pan around until you find it. The latitude and longitude will be displayed.
  - b. Visit [eo.ucar.edu/geocode](http://eo.ucar.edu/geocode) online for a similar tool.
  - c. Use a GPS unit where you take a measurement. Report as many decimal places as the unit provides.
  - d. Use a topographic map of your area.
- 2) Find Orion by going outside at least an hour after sunset** approximately between 8-10 pm local time. (**Note for latitudes >45 South:** due to twilight, do your observations after 10pm in Jan., after 9:30pm in Feb. and after 8:30pm in March. Moonrise on Jan. 3 is ~ 11pm (e.g., avoid the Moon).
  - a. Determine the darkest area by moving to where the most stars are visible in the sky toward Orion. If you have outside lights, be sure they are all off.
  - b. Wait outside for at least 10 minutes for your eyes to adapt to the darkness. This is called becoming “dark-adapted.”
  - c. Locate Orion in the sky. For help use the appropriate Orion Finder Chart for your latitude. See ([www.globeatnight.org/observe\\_finder.html](http://www.globeatnight.org/observe_finder.html))
- 3) Match your nighttime sky to one of our magnitude charts** (pp. 2-3 or [www.globeatnight.org/observe\\_magnitude.html](http://www.globeatnight.org/observe_magnitude.html)).
  - a. Select the chart that most closely resembles what you are seeing.
  - b. Estimate the cloud cover in the sky.
  - c. Fill out the Observation Sheet (page 4).
- 4) Report your observation online** (if not done already by smart mobile device) at: [www.globeatnight.org/report.html](http://www.globeatnight.org/report.html).
  - a. There are 3 sets of campaign dates in 2013 that use Orion: January 3 through 12, January 31 through February 9 & March 3 through 12. During those dates, take observations from different locations!
  - b. Your observations can be reported online any time up to the 28<sup>th</sup> day of the campaign month (e.g., January 28, February 28 and March 28, respectively).
- 5) Compare your observation** to thousands around the world at: [www.globeatnight.org/analyze.html](http://www.globeatnight.org/analyze.html)






## Family Activity Packet: Magnitude Charts

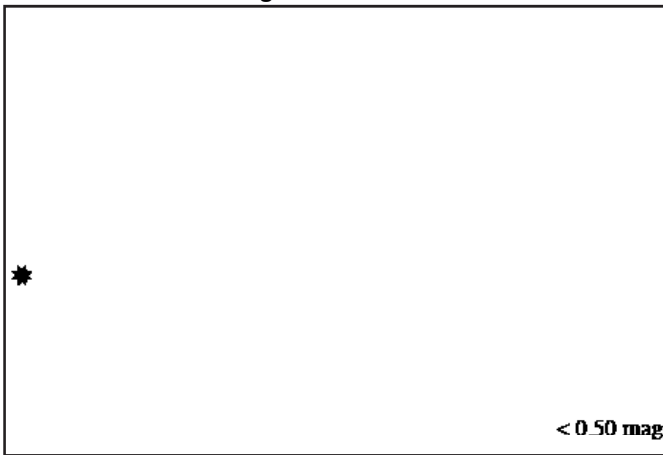
[www.globeatnight.org](http://www.globeatnight.org)

2013 Campaign Dates that use Orion: January 3 – 12, January 31 – February 9 & March 3 – 12

Please orient this page with the arrows up according to your location (e.g., in the Northern Hemisphere, near the equator or in the Southern Hemisphere).

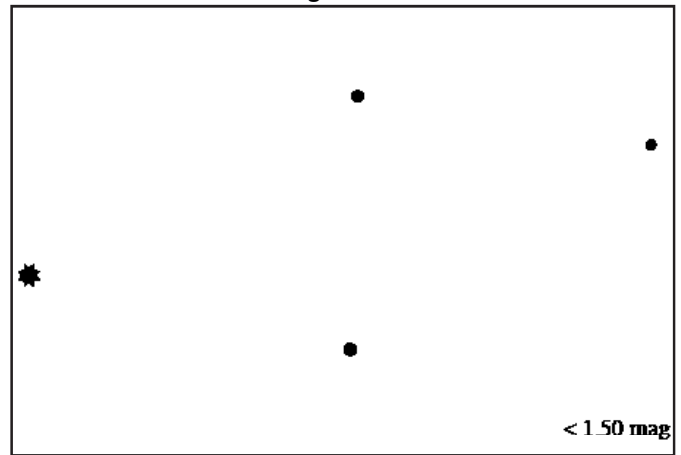
 March 3 – March 12    
  January 31 – February 9    
  January 3 – January 12    
 Northern Hemisphere View

**Magnitude Below 1**



**Hint: You can't see stars in Orion because the sky is too bright. The star you see is Sirius in the constellation, Canis Major**

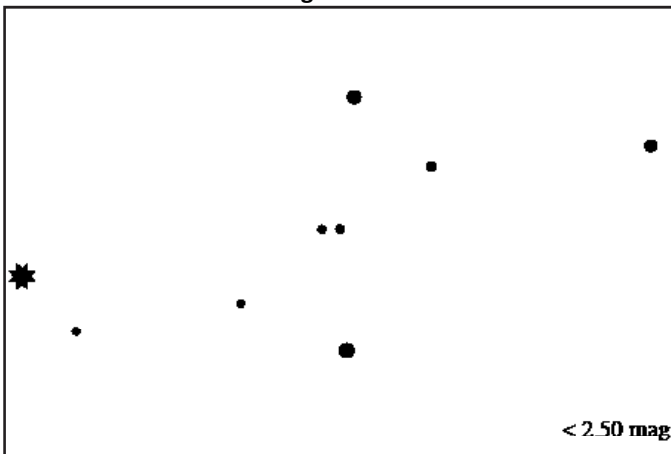
**Magnitude 1**



**Hint: You can only see a couple of the brightest stars in Orion**

 March 3 – March 12    
  January 31 – February 9    
  January 3 – January 12    
 Near Equator View

**Magnitude 2**



**Hint: You can see two stars in Orion's belt.**

**Magnitude 3**



**Hint: You can see three stars in Orion's belt**

 March 3 – March 12    
  January 31 – February 9    
  January 3 – January 12    
 Southern Hemisphere View


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## Family Activity Packet: Magnitude Charts

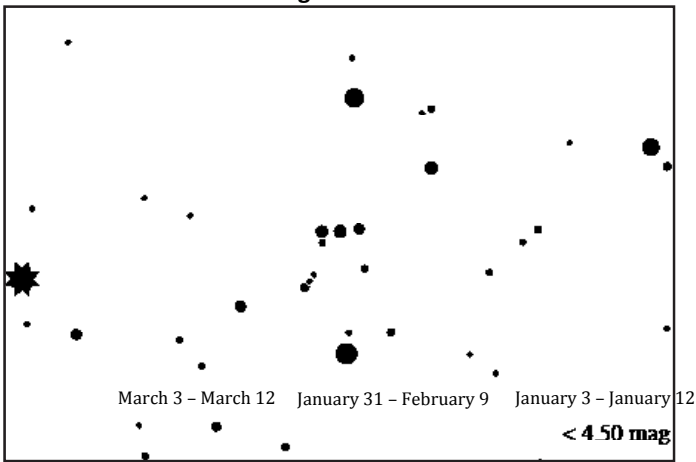
[www.globeatnight.org](http://www.globeatnight.org)

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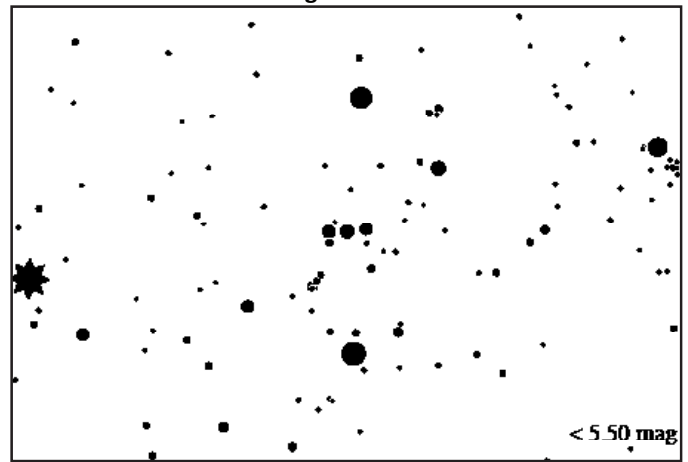

Northern Hemisphere View  
 March 3 – March 12    January 31 – February 9    January 3 – January 12

**Magnitude 4**



**Hint: You can see four stars in Orion's belt**

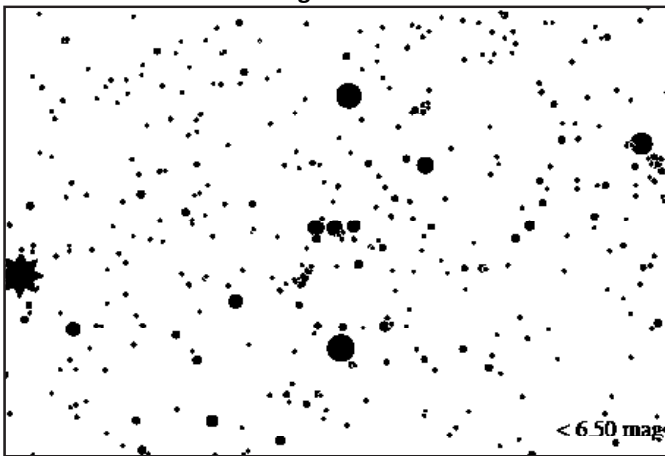
**Magnitude 5**



**Hint: You can see six stars in Orion's belt, and also you can easily find his sword**

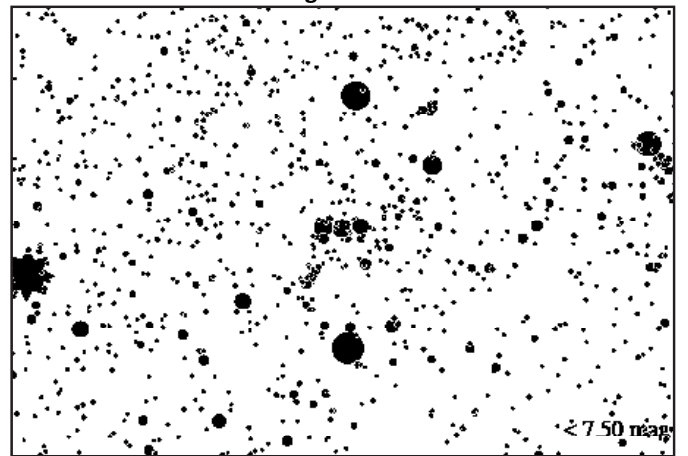

Near Equator View  
 March 3 – March 12    January 31 – February 9    January 3 – January 12

**Magnitude 6**



**Hint: You can see many stars in Orion's belt, and his sword is clearly visible**

**Magnitude 7**



**Hint: You can't count that many stars!**


Southern Hemisphere View  
 March 3 – March 12    January 31 – February 9    January 3 – January 12

# GLOBE AT NIGHT

## Family Activity Packet: Observation Sheet

[www.globeatnight.org](http://www.globeatnight.org)

2013 Campaign Dates that use Orion: January 3 – 12, January 31 – February 9 & March 3 – 12

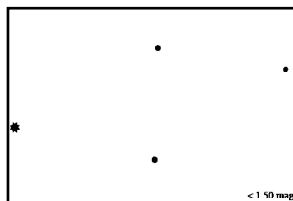
Only fields marked by \* are required.

\*Date: January / February / March (circle month) \_\_\_\_\_, 2013  
\*Observation Time: \_\_\_\_:\_\_\_\_ PM local time (HH:MM) \*Country: \_\_\_\_\_  
\*Latitude (in deg/min/sec \_\_\_\_ deg \_\_\_\_ min \_\_\_\_ sec (North / South) circle direction  
or decimal degrees): \_\_\_\_\_ decimal degrees  
\*Longitude (in deg/min/sec \_\_\_\_ deg \_\_\_\_ min \_\_\_\_ sec (East / West) circle direction  
or decimal degrees): \_\_\_\_\_ decimal degrees  
Comments on location: (e.g. There is one street light within 50 m that is shielded from my view.)

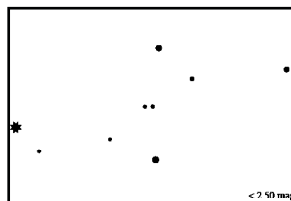
\*Match your nighttime sky to one of our magnitude charts :



Stars in Orion not visible



Magnitude 1 Chart



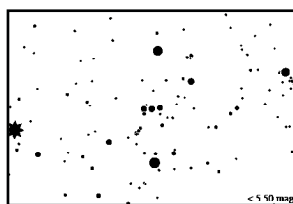
Magnitude 2 Chart



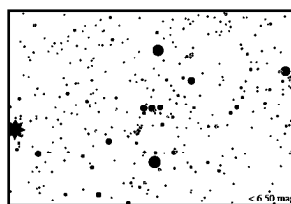
Magnitude 3 Chart



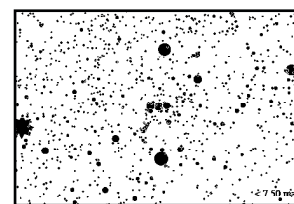
Magnitude 4 Chart



Magnitude 5 Chart



Magnitude 6 Chart



Magnitude 7 Chart

Reading from the Unihedron Sky Quality Meter (if applicable): \_\_\_\_\_

Serial number from the Unihedron Sky Quality Meter (if applicable): \_\_\_\_\_

\*Estimate the cloud cover in the sky:

Clear       Clouds cover ¼ of sky       Clouds cover ½ of sky       Clouds cover > ½ of sky

Comments on sky conditions: (e.g. a little haze to the north)

Report online at [www.globeatnight.org/report.html](http://www.globeatnight.org/report.html)