

Adopt a Constellation: Final Project

Instructions

CARMEL HIGH SCHOOL

ASTRONOMY – MR. KEITH TURNER

FOR HIGH SCHOOL ASTRONOMY OR EARTH/SPACE SCIENCE COURSES, GRADES 10-12

PURPOSE:

To creatively apply knowledge, labs/activities, and skills performed and acquired in this course; to weave the semester together and finish it in a fun way!

OBJECTIVES:

1. Develop a greater understanding of the unifying principles related to the study of Astronomy.
2. Apply prior knowledge of Astronomy, skills developed during the semester, and class activities to compare and contrast different constellation patterns and characteristics.
3. Identify and explain different stellar properties in the assigned constellation.
4. Gather information regarding deep sky objects within the assigned constellation, analyze it, and present it in a logical format.
5. Challenge creative abilities to artistically construct the project, actively focusing on the science of the constellation.

NATIONAL SCIENCE STANDARDS:

1. SCIENCE AS INQUIRY: Developing abilities necessary to do and understanding about scientific inquiry
Found specifically in Part 4: A Closer Look, where students formulate a question(s) of interest and conduct methodical research in pursuit of answers.
2. EARTH AND SPACE SCIENCE: Origin and evolution of the universe
Found specifically in Part 3: Deep Sky Objects, where students will learn different stages of celestial evolution with respect to different celestial objects/phenomena.
3. SCIENCE AND TECHNOLOGY STANDARDS: Abilities of technological design and Understanding about science and technology
Found specifically in Part 3: Deep Sky Objects and Part 4: A Closer Look, where students develop an understanding of the Hubble Space Telescope's technological contributions to scientific understanding of the universe.
4. HISTORY AND NATURE OF SCIENCE: Nature of scientific knowledge
Found specifically in Part 1: Constellation/Stellar Properties and Part 2: Application of Stellar Properties, where students gather and compare quantitative/qualitative scientific data and information specific to Astronomy.

PROJECT GUIDELINES:

Steps:

- Read through **Required Information**, **Format**, and **Resources**.
- Research/gather information.
- Keep track of your sources
- Create presentation in acceptable format.
- Be prepared to present the week before final exams on your assigned date.



Format:

Your presentation will be displayed on the "big screen" – the Planetarium Dome. Acceptable formats include:

- ✓ Microsoft PowerPoint (recommended/most often used)
- ✓ Flash video
- ✓ Slideshow in video format
- ✓ Similar programs (ask Mr. Turner!)

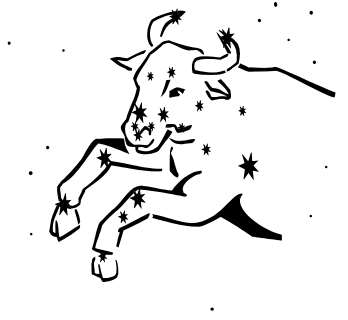
You will also have the opportunity to speak over the Planetarium microphone behind “mission control” during your presentation – *be prepared to answer questions from the class and Mr. Turner.*

Required Information

All of this information should be highlighted in a cohesive presentation and in an appropriate order.

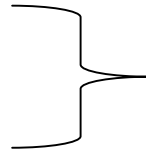
CONSTELLATION/STELLAR PROPERTIES

- Constellation **Name** and **Boundary**
- Dates** and **Time** of when constellation is best viewed from Carmel, IN
- Brief history** of this constellation (one PowerPoint slide will suffice)
- Visible planets**/time of visibility (if your constellation is on the **ecliptic**)
- Ten Brightest Stars** in the constellation and **Stellar Properties**:
 - Name
 - Apparent Magnitude
 - Absolute Magnitude
 - R.A. and Dec.
 - Distances from the Sun
 - Spectral Class
 - Size Compared to the Sun (from calculations)
 - Scale Model (*procedure will be shown*)
 - Color (to be *displayed* also)
 - Temperature



APPLICATION OF STELLAR PROPERTIES

- H-R Diagram** of Ten Brightest Stars (**display** with correct **color** and **size vs. the Sun**)
 - Star Names
 - Temperature
 - Spectral Class
 - Absolute Magnitude Scale
 - Luminosity Class – What kind of star is it?



Look at an example to see how all of this information is incorporated into one diagram.

DEEP SKY OBJECTS

- MINIMUM OF 5 Deep Sky Objects** found in constellation
 - Images
 - Location in constellation (use connections/links – see example)
 - MINIMUM OF 2 paragraphs of information for each object

A CLOSER LOOK

- Choose one Deep Sky Object or planet (if applicable) to analyze and explain in detail.
For example: In the constellation Taurus the Bull is The Crab Nebula. This object is the result of a supernova explosion in 1054 AD. Explain super giant stars and their end state and how the Crab got to the state we see today.

Use diagrams and Hubble Space Telescope images to display the topic. Make it thorough and visually stunning!

OTHER

- List of sources
- Remember: Plagiarism is not tolerated!*

Resources

- ✓ PowerPoint (or any other presentation program)
- ✓ The Sky software
- ✓ Websites:
 - <http://www.astro.uiuc.edu/~kaler/sow/sow.html>

<http://www.astro.wisc.edu/~dolan/constellations/constellations.html>

<http://www.seds.org/messier/>

http://antwrp.gsfc.nasa.gov/cgi-bin/apod/apod_search

<http://www.daviddarling.info/encyclopedia/C/constell.html>

(Good constellation boundary source!)

<http://einstein.stcloudstate.edu/Dome/constellns/constlist.html>

<http://nedwww.ipac.caltech.edu/>

<http://www.intint.com/andy/gallery.html>

<http://hubblesite.org/newscenter>

http://www.ccs.k12.in.us/chsES/Turner/adopt_a_constellation_final_project.htm

<http://www.dibonsmith.com/menu.htm>

<http://www.allthesky.com/constellations/const.html>

<http://www.hawastsoc.org/deepsky/lists.html>

<http://members.nova.org/~sol/chview/chv5.htm>

✓ Star Maps

✓ Textbook

List of Constellations: Circle yours!

1. Orion
2. Taurus
3. Leo
4. Hercules
5. Scorpius
6. Gemini
7. Virgo
8. Cygnus
9. Aquila
10. Ursa Major
11. Bootes and Serpens
12. Lyra
13. Pegasus
14. Sagittarius
15. Andromeda
16. Ophiuchus
17. Auriga
18. Cassiopeia
19. Cetus
20. Cepheus
21. Canis Major
22. Draco
23. Ursa Minor
24. Carina
25. Aquarius
26. Perseus
27. Pisces
28. Eridanus
29. Centarus
30. Vela
31. Hydra
32. Libra
33. Camelopardilis and Lynx
34. Canes Venatici and Coma Bernices
35. Corvus and Crater

