

HOW TO RUN REACH FOR THE STARS

DO NOT START EXACTLY ON TIME! The contestants will filter in (the process generally takes a few minutes). Only contestants are permitted in the room. Write **Reach for the Stars** (in BIG letters) on the blackboard: there's always someone who wanders into the wrong room.

DO NOT HAND OUT ANY OF THE QUESTION PAPERS until you have gone over the ground rules. Separate the different teams (one or two people) throughout the room so that they don't disturb each other during the event – they are allowed to talk to the other team member.

Welcome the contestants and introduce yourself (and your partner). Let everyone know that you will go over some ground rules which will take a couple of minutes.

Contestants should have a minimum of 40 to 45 minutes to complete the event. If you run multiple sessions, make sure each group has the same time.

Ground Rules:

The only resource permitted is one 8.5" by 11" single or double sided sheet of computer-generated or handwritten notes per team. Notes may include graphics, tables, and/or text. A map of the night sky is not permitted as part of the resource.

The event consists of two parts. In part I students identify constellations, stars, and deep sky objects on a star map. Part II deals with stellar evolution, properties of star clusters, structure of the galaxy, and so on.

NOTE: If contestants walk in late they should still be allowed to compete. However they will have to finish no later than everyone else.

2008 Reach for the Stars

Answer Sheet

School Name: _____

Team Number: _____

Student Names: _____ and _____

Please make sure that you print legibly on this sheet. You may tear this sheet off of the rest of the test to use as your answer sheet. All of your answers are to be recorded on this sheet of paper. For each question, decide which of the choices given is the BEST answer. Then write that answer below on this answer sheet. Please turn in the Answer Sheet and the test together at the end of the event. Good Luck!!!!!!!!!!

Part I.

- | | | | |
|----------------------|--------------------------------------|-----------|-----------|
| 1. _____ Auriga | 17. _____ Castor | 31. _____ | 46. _____ |
| 2. _____ Bootes | 18. _____ M 31
(Andromeda Galaxy) | 32. _____ | 47. _____ |
| 3. _____ Cancer | 19. _____ M 42
(Orion Nebula) | 33. _____ | 48. _____ |
| 4. _____ Canis Major | 20. _____ M 44
(Beehive) | 34. _____ | 49. _____ |
| 5. _____ Canis Minor | 21. _____ Pleiades | 35. _____ | 50. _____ |
| 6. _____ Cassiopeia | 22. _____ Polaris | 36. _____ | 51. _____ |
| 7. _____ Gemini | 23. _____ Pollux | 37. _____ | 52. _____ |
| 8. _____ Orion | 24. _____ Procyon | 38. _____ | 53. _____ |
| 9. _____ Perseus | 25. _____ Rigel | 39. _____ | 54. _____ |
| 10. _____ Taurus | 26. _____ Sirius | 40. _____ | 55. _____ |
| 11. _____ Ursa Minor | | 41. _____ | 56. _____ |
| 12. _____ Ursa Major | | 42. _____ | 57. _____ |
| 13. _____ Aldebaran | | 43. _____ | 58. _____ |
| 14. _____ Arcturus | | 44. _____ | 59. _____ |
| 15. _____ Betelgeuse | | 45. _____ | 60. _____ |
| 16. _____ Capella | | | 61. _____ |

Part II

- | | | | |
|-----------|-----------|-----------|-----------|
| 27. _____ | 31. _____ | 35. _____ | 39. _____ |
| 28. _____ | 32. _____ | 36. _____ | 40. _____ |
| 29. _____ | 33. _____ | 37. _____ | 41. _____ |
| 30. _____ | 34. _____ | 38. _____ | 42. _____ |
| | 35. _____ | 39. _____ | 43. _____ |
| | 36. _____ | 40. _____ | 44. _____ |
| | 37. _____ | 41. _____ | 45. _____ |
| | 38. _____ | 42. _____ | |
| | 39. _____ | 43. _____ | |
| | 40. _____ | 44. _____ | |
| | 41. _____ | 45. _____ | |

Do not write in this box

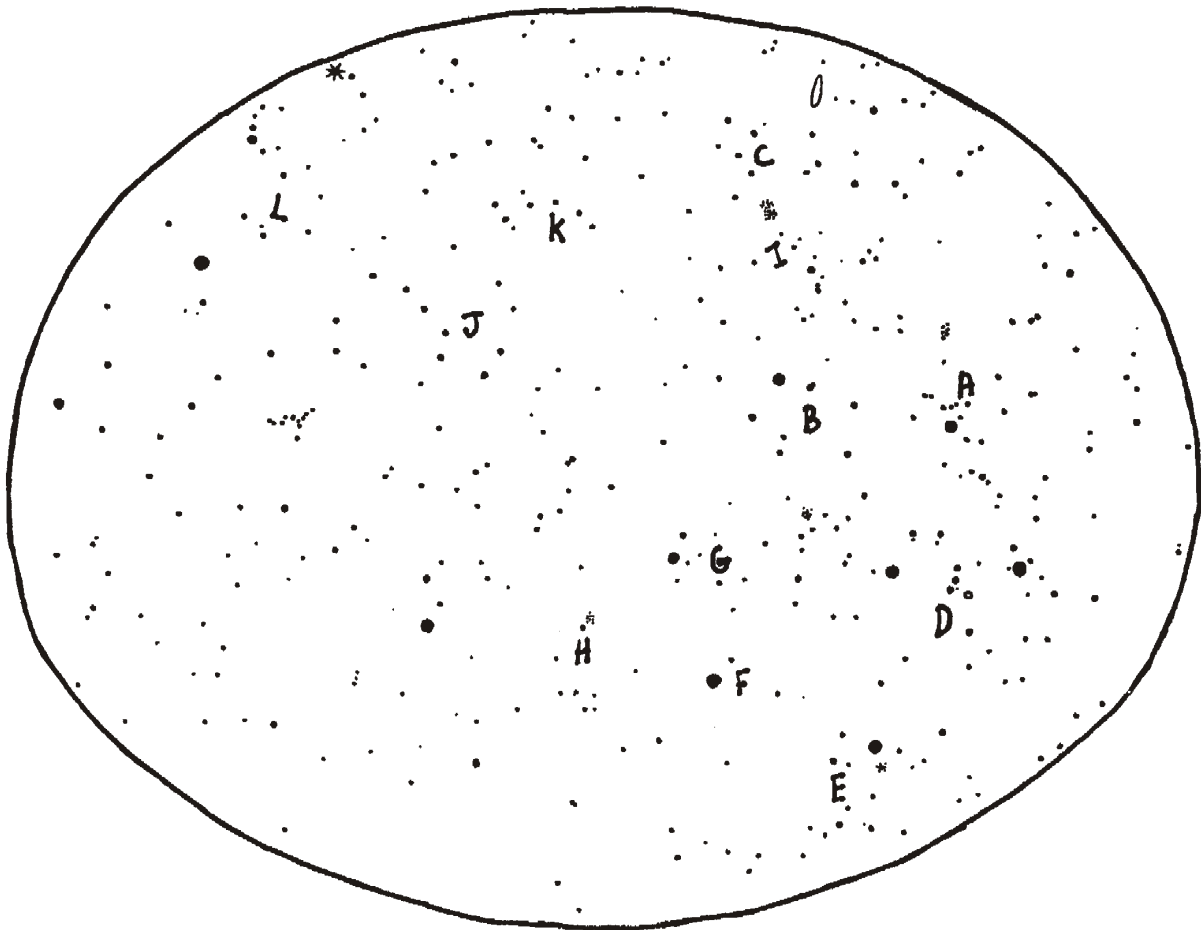
Score: _____

Rank: _____

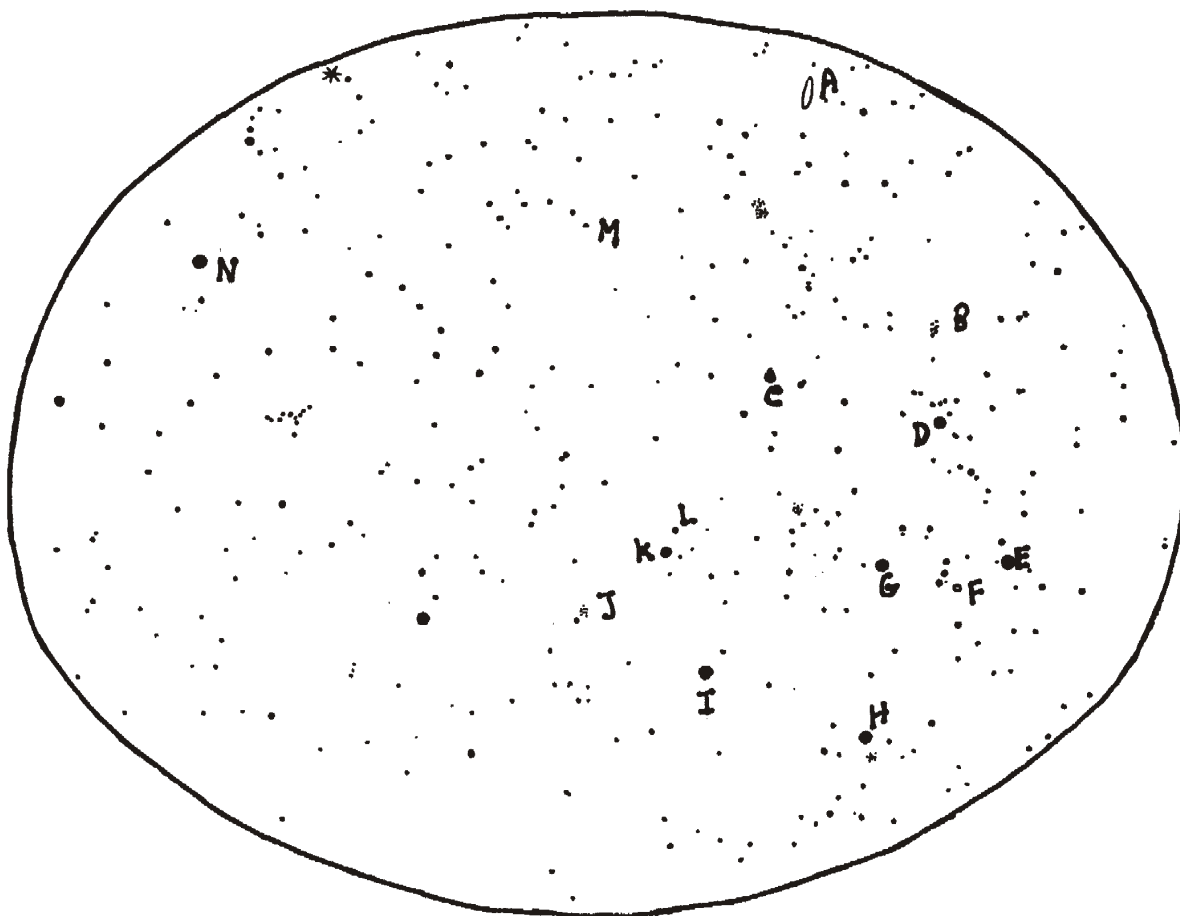
Reach for the Stars – 2008

Part I

The star chart below shows the night sky during the middle of April at roughly 9:00 p.m. The view is to the south and includes only the brightest stars and deep sky objects. On this chart, letters refer to constellations only. Place the letter associated with constellation next to its name on your answer sheet (Questions 1 - 12).



The star chart below shows the night sky during the middle of April at roughly 9:00 p.m. The view is to the south and includes only the brightest stars and deep sky objects. On this chart, letters refer to stars and deep sky objects only. Place the letter associated with the star or deep sky object next to its name on your answer sheet (Questions 13 - 26).



Part II

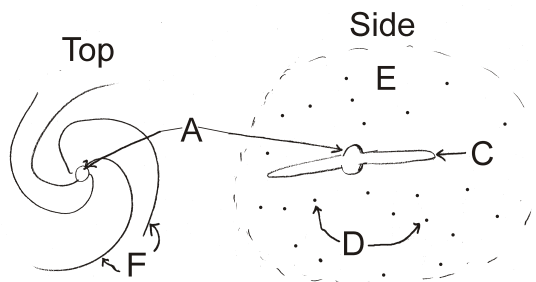
Questions 27 – 34 are a series of statements about open and globular clusters. If the statement refers to an Open Cluster write “O” on your answer sheet next to the corresponding number; if it refers to a globular cluster write “G” on the answer sheet; If the statement could refer to either type of cluster write “B”.

27. These clusters are as old as the galaxy
28. These clusters contain primarily red stars
29. These clusters can contain blue stars
30. These clusters contain cool stars
31. These clusters are made of young stars
32. These clusters have a few hundred stars
33. These clusters are spherical in shape
34. Some of these clusters are known to have a black hole at their centers

The objects listed below refer to stages in the lives of stars. Some of them refer only to massive stars, some to only sun sized stars, some to both, and some to neither. For questions 35 - 40 list the objects (stages) that a massive star goes through from youngest to oldest. For questions 41 - 46 list the objects (stages) that a sun-sized star goes through from youngest to oldest.

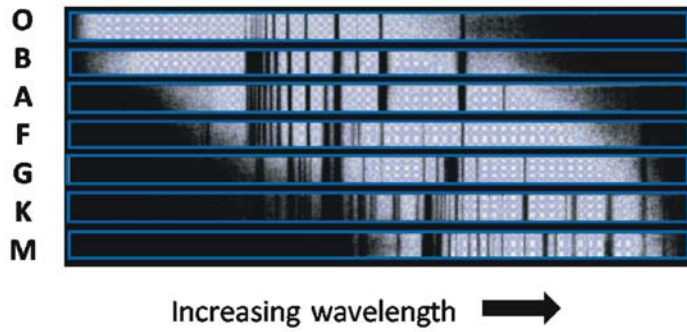
- | | |
|-------------------------------|------------------------------|
| A. Blue main sequence star | I. Proto star |
| B. Blue supergiant | J. Red Giant |
| C. Diffuse Nebula | K. Red main sequence star |
| D. Green giant | L. Red Supergiant |
| E. Green main sequence star | M. Spiral Nebula |
| F. Irregular Nebula | N. Super nova |
| G. Neutron star or black hole | O. White Dwarf |
| H. Planetary nebula | P. Yellow main sequence star |

To the right is a top view and side view drawing of the Milky Way. On your answer sheet indicate the letter which best indicates the position of each part of the galaxy. A choice can be used more than once.



47. Globular Clusters
48. Halo
49. Nucleus
50. Location of open clusters
51. Star forming regions

Spectral Classes



The following questions refer to the spectral sequence shown above. On your answer sheet list the spectral type which is best described by the statement.

52. The sun is this spectral class.
53. This spectral class contains the hottest stars.
54. This spectral class contains the coolest stars.
55. Stars in this spectral class emit most of their energy in the ultraviolet
56. Stars in this spectral class emit most of their energy in the infrared

Numbers 57 - 61 refer to the pictures of the galaxies shown below. On your answer sheet indicate the type of galaxy: "S" for spiral; "E" for elliptical; "I" for irregular.

57.



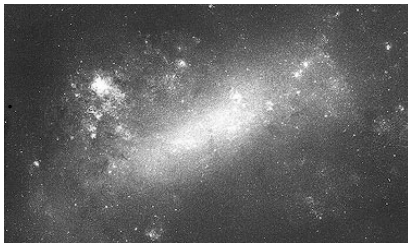
58.



59.



60.



61.



2008 Reach for the Stars

Answer Key

DO NOT PRINT OR COPY WITH EVENT

Tie breakers: (1) The first tiebreaker is the most correct responses for questions 1-12; (2) The second tiebreaker is the most correct responses for questions 13-26; (3) Third tie breaker most correct responses for questions 35 – 40; and (4) Fourth tie-breaker most correct responses for questions 41 – 46. If you need more go with most correct in column 1, then column 2, etc.

Part I.

- | | | | |
|------------------------|--|-----------------------|--------------|
| 1. ___B___ Auriga | 17. ___L___ Castor | 31. ___O___ | 46. ___O___ |
| 2. ___L___ Bootes | 18. ___A___ M 31
(Andromeda Galaxy) | 32. ___O___ | 47. ___D___ |
| 3. ___H___ Cancer | 19. ___F___ M 42
(Orion Nebula) | 33. ___G___ | 48. ___E___ |
| 4. ___E___ Canis Major | 20. ___J___ M 44
(Beehive) | 34. ___G___ | 49. ___A___ |
| 5. ___F___ Canis Minor | 21. ___B___ Pleiades | <i>Massive Star</i> | 50. ___C___ |
| 6. ___C___ Cassiopeia | 22. ___M___ Polaris | 35. ___C___ | 51. _F or C_ |
| 7. ___G___ Gemini | 23. ___K___ Pollux | 36. ___I___ | 52. ___G___ |
| 8. ___D___ Orion | 24. ___I___ Procyon | 37. ___A___ | 53. ___O___ |
| 9. ___I___ Perseus | 25. ___E___ Rigel | 38. ___L___ | 54. ___M___ |
| 10. ___A___ Taurus | 26. ___H___ Sirius | 39. ___N___ | 55. ___O___ |
| 11. ___K___ Ursa Minor | Part II | 40. ___G___ | 56. ___M___ |
| 12. ___J___ Ursa Major | 27. ___G___ | <i>Sun-Sized Star</i> | 57. ___E___ |
| 13. ___D___ Aldebaran | 28. ___G___ | 41. ___C___ | 58. ___S___ |
| 14. ___N___ Arcturus | 29. ___O___ | 42. ___I___ | 59. ___S___ |
| 15. ___G___ Betelgeuse | 30. ___G___ | 43. ___P___ | 60. ___I___ |
| 16. ___C___ Capella | | 44. ___J___ | 61. ___E___ |
| | | 45. ___H___ | |

Do not write in this box

Score: _____

Rank: _____