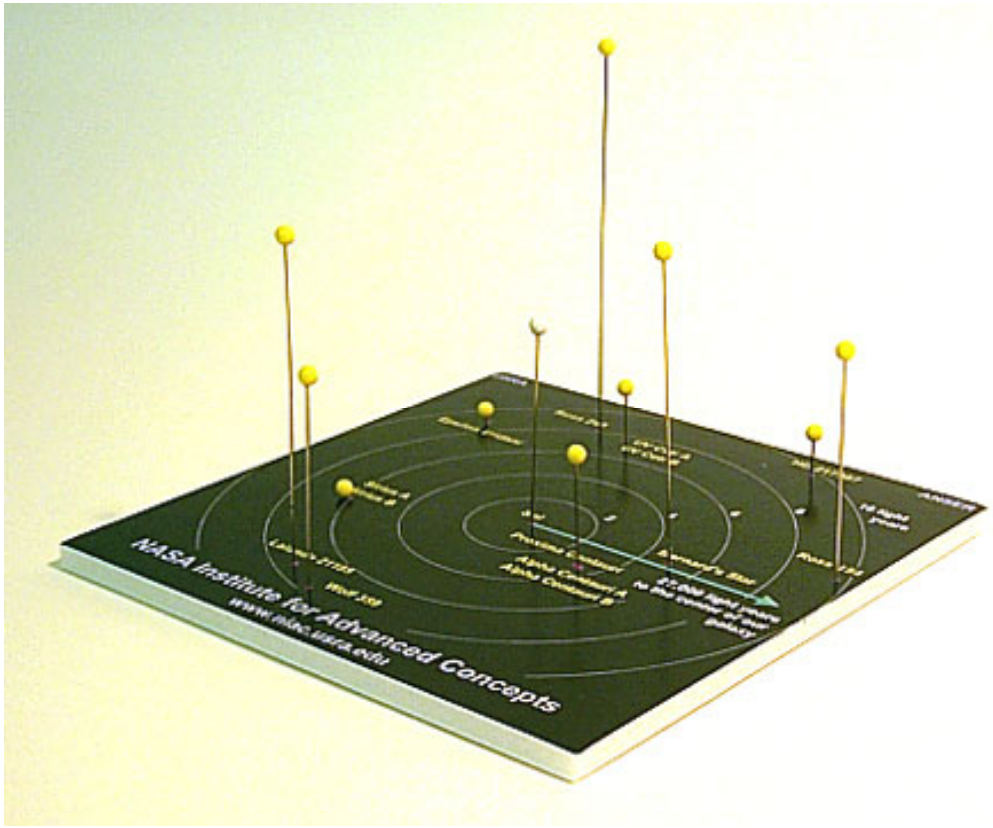
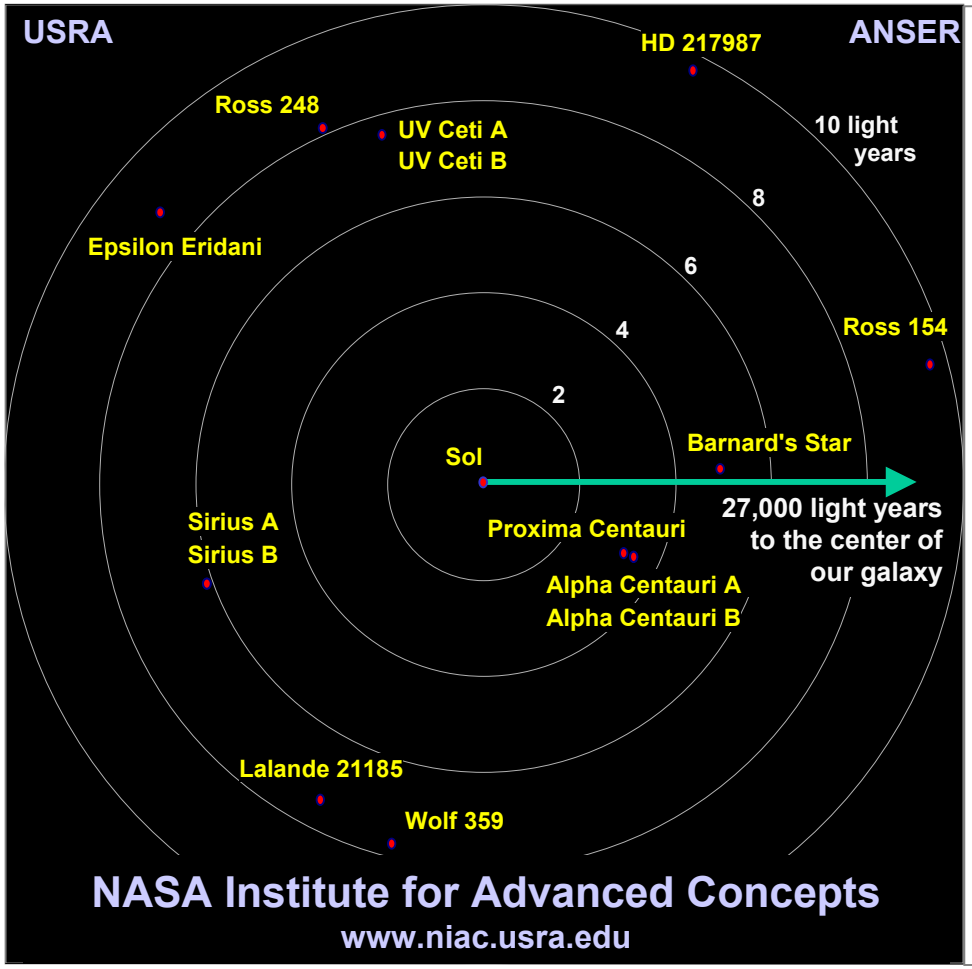
A 3-dimensional Star Map of the 15 Nearest Stars

An outreach project developed by the NASA Institute for Advanced Concepts



Star Map Base

Top



Bottom

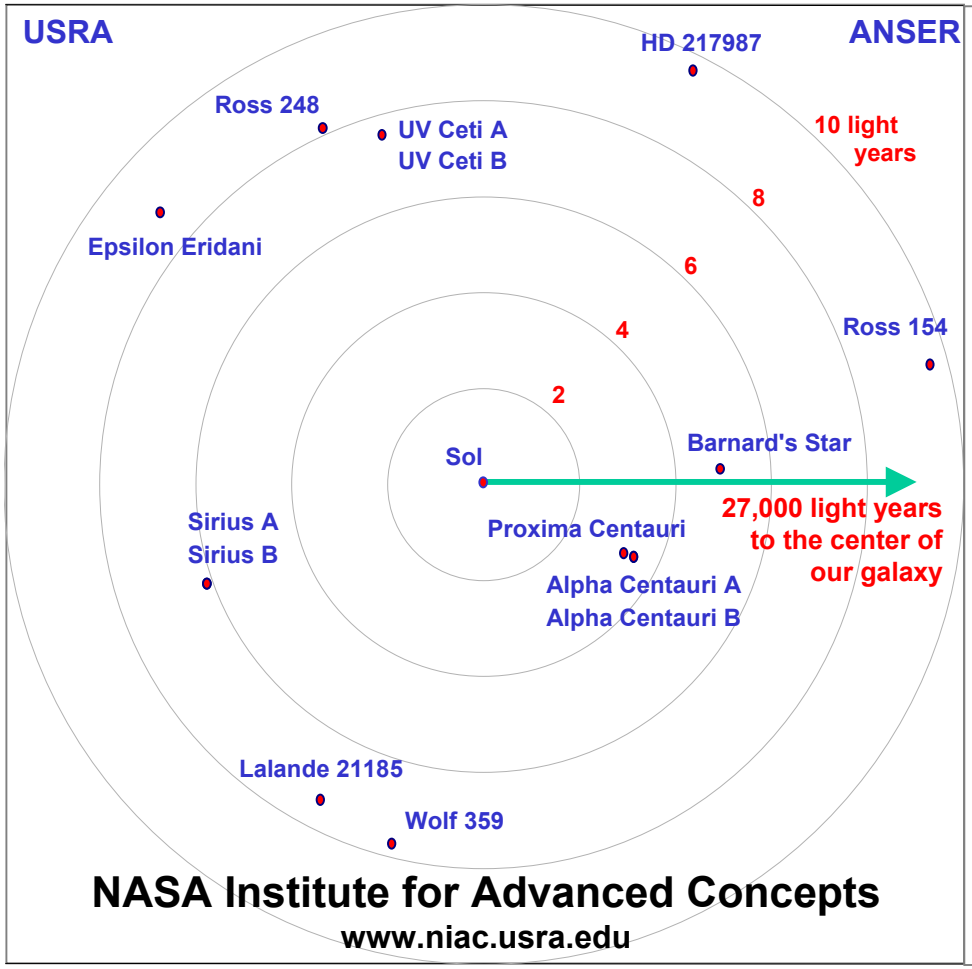
Star	Type	Distance (lt-yrs)
Sol	G2V	0
Proxima Centauri	M5Ve	4.22
Alpha Centauri A	G2V	4.39
Alpha Centauri B	K1V	4.39
Barnard's Star	sdM4	5.94
Wolf 359	M6.5Ve	7.8
Lalande 21185	M2V	8.31
Sirius A	A0m	8.6
Sirius B	DA2	8.6
UV Ceti A	M5.5Ve	8.7
UV Ceti B	M5.5Ve	8.7
Ross 154	M3.5Ve	9.69
Ross 248	M5.5Ve	10.3
Epsilon Eridani	K2V	10.5
HD 217987	M2/M3V	10.73

One inch equals 4 light years

The arrow from the Sun points toward the galactic center, the black surface is parallel to the galactic plane, and the wires point "up" normal to the galactic plane.

Star Map Base (White Background)

Top



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Epsilon Eridani	K2V	10.5
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One inch equals 4 light years

The arrow from the Sun points toward the galactic center, the white surface is parallel to the galactic plane, and the wires point "up" normal to the galactic plane.

Preparing the Components of the Star Map

Materials list:

- 5-inch square, quarter-inch thick foam board
  (the kind commonly used as backing for science fair projects or for mounting posters)
- 18 inches of .020-inch straight, stiff wire
  (go to a hardware store or hobby store)
- 12 "quilter's pins" with round, colorful heads
  (found at fabric stores)
- Rubber cement
- White glue

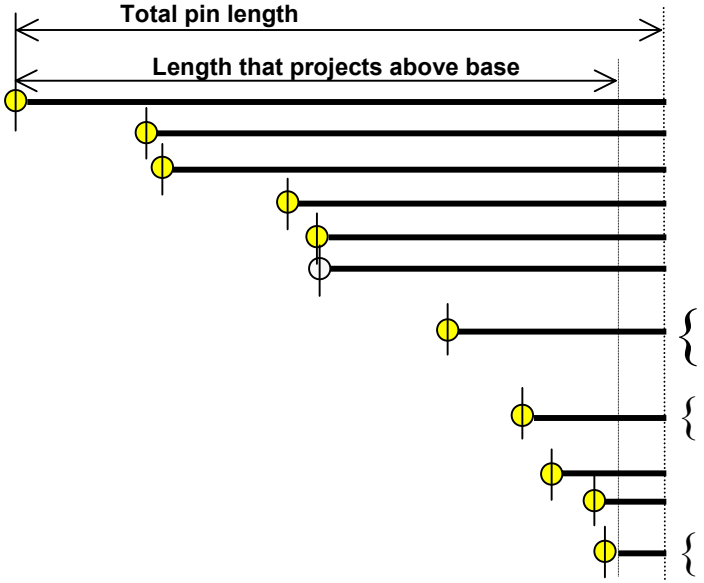
Tools:

- Pliers
- Wire cutters
- Eye protection

1) Choose the black background or white background style
2) Print the top and bottom of the base and the Star Pin Identification Table on quality paper
3) Cut out the top and bottom
4) Using rubber cement or a similar adhesive attach the two faces to the foam board
   1) Don't use white glue or it will warp the paper
   2) Trim the foam board if the printed base is not a close fit
5) With the Star Pin Identification Table as your guide, use the wire cutters to carefully cut the eleven lengths of wire indicated
   1) Be sure to leave room for the small length of wire that will go into the pin head
   2) Wear eye protectors, as the tip of wire may fly off when cutting
6) Use the pliers to pull the heads off eleven of the quilter's pins
   1) A gentle twist is usually all it takes
   2) The twelfth pin is a starter pin to make holes in the foam board
7) Dip each length of wire into a drop of white glue to get a tiny speck of glue on the end of the wire and then carefully press the wire into a pin head
   You may want to use a different color head for each star type (M,G, K, A, and D) or just use two colors—one for the sun and one for all the other stars
8) You are now ready to begin assembling the Star Map

Assembling your 3-Dimensional Star Map

Star Pin Identification Table



Star	Type	Distance from Sun (lt-yrs)	Wire length (inches)
Ross 248	M5.5Ve	10.3	3.33
Lalande 21185	M2V	8.31	2.66
Barnard's Star	sdM4	5.94	2.57
Ross 154	M3.5Ve	9.69	1.92
Wolf 359	M6.5Ve	7.8	1.76
Sol	G2V	0	1.75
Alpha Centauri A	G2V	4.39	1.09
Alpha Centauri B	K1V	4.39	1.09
Proxima Centauri	M5Ve	4.22	1.08
UV Ceti B	M5.5Ve	8.7	0.69
UV Ceti A	M5.5Ve	8.7	0.69
HD 217987	M2/M3V	10.73	0.56
Epsilon Eridani	K2V	10.5	0.32
Sirius A	A0m	8.6	0.25
Sirius B	DA2	8.6	0.25

Star features obtained from "Norton's Star Atlas and Reference Handbook," 19th edition, edited by Ian Ridpath, Addison Wesley Longman Limited, England

Instructions to complete your 3-dimensional Star Map

- **Poke a starter hole in the base plate for each of the 11 star systems**
  - **Poke the hole using the left-over "starter pin"**
  - **Make sure the starter hole only penetrates the upper cardboard, not the foam beneath**
  - **The two binaries, UV Ceti and Sirius, and the triple star system Alpha and Proxima Centauri only get one pin (optional: thread and glue small beads on the wires to represent these additional stars)**
- **Line up the Star Pins, arranged by length as shown above in the "Star Pin Identification Table"**
- **Insert each of the pins, starting with the shortest and working your way up**
  - **Hold the pins near the bottom (away from the "star")**
  - **Press carefully until the pin meets resistance from the bottom layer of cardboard**
  - **Make sure the pin sticks straight up from the board**
- **Your Star Map is now ready for display!**