Camp Eberhart Astronomy Program AstroCamp Constellation Award

1. **What is a constellation?**
An arbitrary arrangement of stars perceived as a figure or design. There are 88 official constellation named after characters from classical mythology or various common animals or objects.

2. **What are the reasons to learn the constellations?**
   - Determining time of day and time of year.
   - Determining compass direction.
   - Enshrining stories or objects in the sky.
   - Establishing location on the Earth.

3. **Are all the stars the same distance from the Earth? How do we know this?**
   - No, all stars are not the same distance from Earth.
   - We know this because stars that produce the same amount of light often appear to have different (apparent) brightness in the sky, indicating they are not the same distance from us. For example, a star like the Sun that is 32 light years away would appear as a dim 5th magnitude star. But the much closer Sun on our sky is much brighter.
   - We also know this because stars show parallax; their position in the in the sky shifts slightly as the Earth travels around the Sun.

4. **Will the constellations retain their present shapes?**

   No. As the stars move through space, the constellations change shapes. See Figure 1.

Figure 1

5. **What are circumpolar constellations?**
Constellations that are near the pole star Polaris and are visible at any time of year and any time of night. These can vary by location but from Camp Eberhart these are circumpolar:
   1. Ursa Major the Great Bear with the Big Dipper
   2. Ursa Minor the Little Bear and the Little Dipper
   3. Draco the Dragon
   4. Cassiopeia the Queen
   5. Cepheus the King

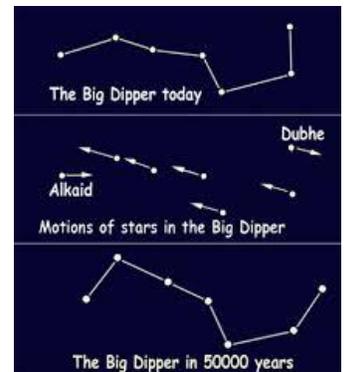6. **Where are the constellations of the Zodiac? Why are they important?**

These are found on the ecliptic, the apparent annual path of the Sun, Moon and planets in the sky. These constellations are important to the pseudoscience of astrology.

7. **What is Astrology?**

Astrology is the pseudoscience of determining the influences of the stars and planets upon human affairs and the foretelling of events based on the aspects and positions of the planets among the stars. Astrology was popular during the Middle Ages and was the parent of modern astronomy just as alchemy is the parent of modern chemistry. There are two kinds: judicial astrology, which assumed to foretell the fate of nations, kings and individuals and natural astrology, which undertook to predict events of inanimate nature, such as changes in the weather, etc. Horoscopes are prediction of events for an individual based on where the Sun and planets were at the moment of their birth.

8. **What is the Milky Way?**

The Milky Way is the galaxy in which our Solar System is located. Like all galaxies, it is a large group of stars, gas and dust, containing an average of 100 billion or more solar masses and ranging in diameter from 1,500 to 300,000 light years. The Milky Way is a barred spiral type disk galaxy and is seen as a luminous belt of stars and celestial objects stretching across the sky.

9. Make a star finder (planisphere) and explain how it works to help locate stars and constellations at different times during the night and different times of year.

10. Make a star clock and use it to tell time by the stars.

11. Use your star finder and a red flashlight to identify 10 constellations at night.

12. Know the names of 10 other constellations not in the zodiac.

13. Name 10 of the 12 constellations of the zodiac. They are:

Aries the Ram	Cancer the Crab	Libra the Scales	Capricornus the Goat
Taurus the Bull	Leo the Lion	Scorpius the Scorpion	Aquarius the Water Bearer
Gemini the Twins	Virgo the Virgin	Sagittarius the Archer	Pisces the Fishes