

H-R Diagram

Main-sequence

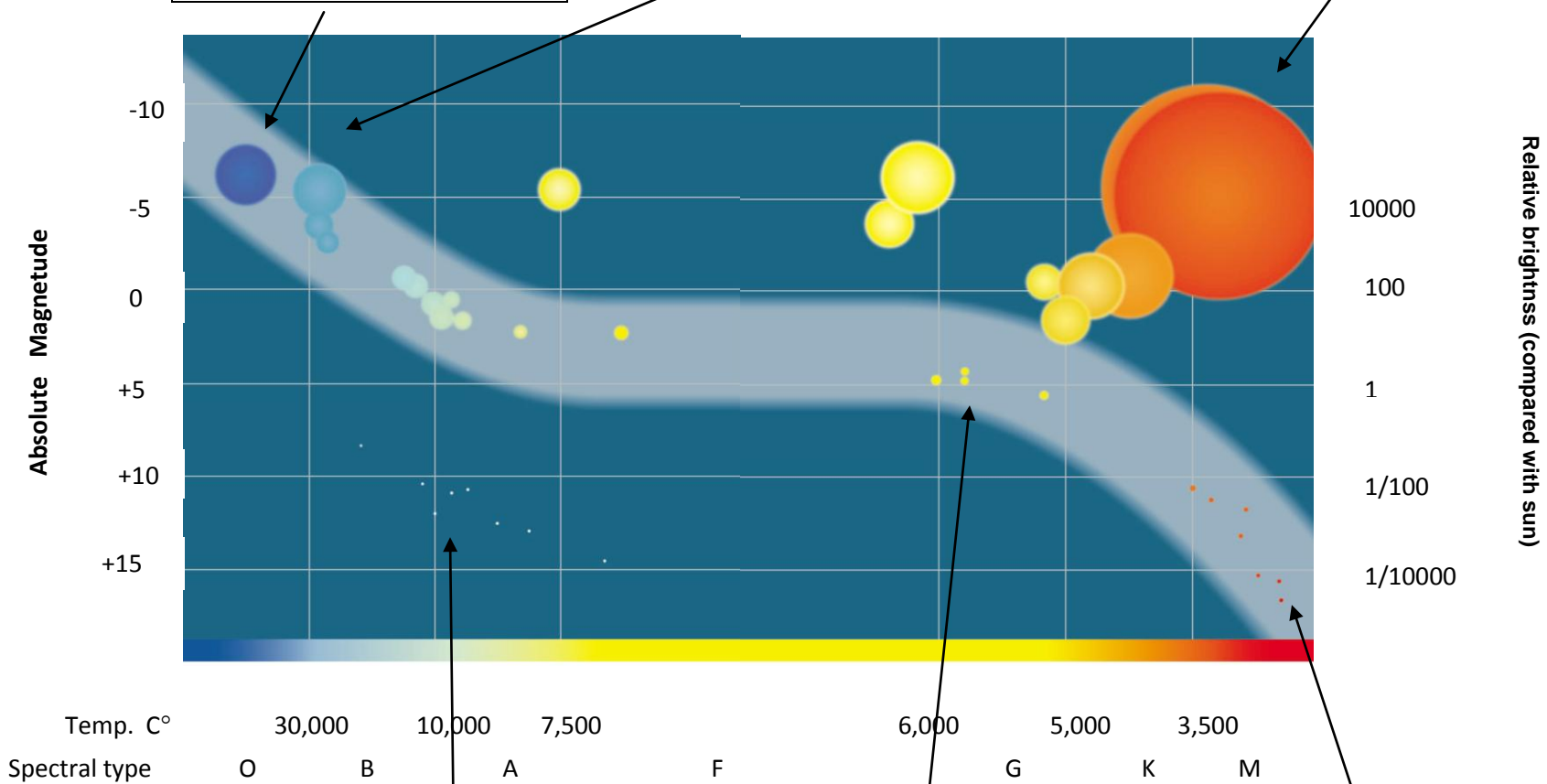
Stars in the main sequence form a band that runs along the middle of the H-R diagram. The sun is a main-sequence star. Stars similar to the sun are called *dwarfs*. The sun has been shining for about 5 billion years.

Blue stars

Very massive blue stars are not in the main sequence very long. They quickly use up the hydrogen in their cores, expand, and turn into giants or supergiants.

Giants and supergiants

When a star runs out of hydrogen in its core, the center of the star shrinks inward and the outer parts expand outward. In a star the size of our sun, the atmosphere will grow very large and cool. When this happens, the star becomes a **red giant**. If the star is very massive, it becomes a *supergiant*.



Absolute magnitude is measured upside down. That means the larger the number, the dimmer the star. At +5, the sun is not as bright as a -7 star.

White-dwarf stars
These small, hot stars—the leftover centers of old stars—are near the end of their lives. The leftover center of an old star is very hot. At this stage, a star is called a **white dwarf**. According to astronomers, the sun will eventually become a white dwarf.

The sun is an average star. As you can see, it is a main sequence star and is located in the middle of the diagram. Astronomers use the sun to compare all other stars. By definition, the sun is one solar diameter and has one solar mass. The relative brightness of stars can also be measured against the sun's brightness.

Red-dwarf stars
At the lower end of the main sequence are the red dwarf stars. Red dwarfs are low-mass stars. Low-mass stars remain on the main sequence a long time. The lowest mass stars may be some of the oldest stars in the galaxy.