

# Hertzsprung-Russell Diagram Exercise I

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**Activity:**

Plotting near stars and bright stars on a color magnitude diagram

**Science Standards:**

Energy & Matter, Systems & Interactions, Stability & Equilibrium

**Objectives:**

- The student will describe differences between *Near* and *Bright* stars visible.
- The student will discern a relationship between temperature and brightness.
- The student will correlate the evolution of stars to the HR Diagram plotted.

**Materials:**

- Photocopies of Bright Stars Table
  - Photocopies of Near Stars Table
  - Photocopies of Student Answer Sheets
  - Graph Paper
  - Two different colored pencils/pens
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**Introduction:**

There are essentially two ways to describe the brightness of stars; apparent magnitude and absolute magnitude. Apparent magnitude is the brightness of a star as seen from Earth; absolute magnitude is how bright a star would be if it were 32.6 light years (10.0 pc) away. For historical reasons, astronomers still call the brightest stars magnitude 1 stars, the next brightest 2, then 3, 4, 5, and on down to the dimmest naked-eye stars, magnitude 6 stars. This backwards scale is now defined as mathematically as:

$\text{brightness of star 1} = \text{difference in magnitude}$   
 $\text{brightness of star 2 (2.512)}$