

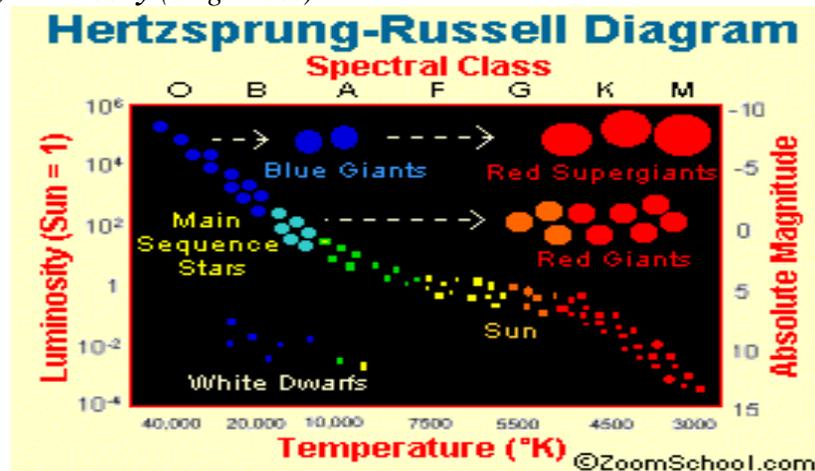
Reach for the Stars

Why are some stars red while others get to be blue? Do they get to choose? And why are some stars so much bigger than others? In this activity, we'll explore the properties and life cycles of all sorts of stars and be able to classify them by their size and color. We'll then go on a scavenger hunt to find "different types of stars" in your own house!

Science Topic	<i>Classification of stars</i>
Ideal Age	5+
Driving Question	<i>Can you find objects in your home to represent each type of star?</i>
Materials Needed	<i>Just you and the "star scavenger hunt" list</i>
Activity Instructions	<p><i>Stars can be classified based on their temperature, which is also an indication of their color, using the letters OBAFGKM (A fun mnemonic you can use to remember these letters is "Oh Be A Fine Girl/Guy, Kiss Me"). On the main spectrum, these stars are not only unique in their temperature and color, but also their size.</i></p>  <p><i>We'll go on a scavenger hunt to find spherical objects that can represent each of these types of stars. For example, a smaller, red M type star could be a bouncy ball while a bigger, blue O type star could be a beach ball! The scavenger hunt list gives suggestions of sizes for each type of star, so try to find all of them!</i></p>
Questions Parents, ask your kids these questions as you work on the activity together.	<ul style="list-style-type: none"> • <i>Where have you seen stars before? What colors do they appear?</i> • <i>Where do we see different colored flames on Earth? (Fire, Gas stove, etc.)</i> • <i>What object could we find to represent a _____ type star? The scavenger hunt list says we need an object of about this size.</i> • <i>*After finding a star* how does the size of this star compare to the last one we found?</i> • <i>On our scavenger hunt list, it says this type of star is _____ in color. How does this compare to the last one we found?</i> • <i>Our sun is a star that appears yellow. What type of star do you think our sun is? (Answer-G type star)</i> • <i>Red giants are stars that are nearing the end of their stellar lives. Given that these stars are red in color, what types of stars could they be? (Answer-K and M type stars)</i> • <i>White dwarves are dead stars that are extremely bright. If they are usually blue or white in color, what type of stars could these be? (Answer- O and B type stars)</i>

Science Content

Stars come in all sorts of sizes and colors. They are split up into **spectral classes** (different types) based on their surface temperatures. The spectral classes of stars are identified with letters including **O, B, A, F, G, K, and M** with M being the coolest (3000K) and O being the hottest (up to 40,000 K). In addition to surface temperature, knowing a star's spectral class can also tell us a lot about other properties like its color, size, **luminosity** (brightness).



The chart above, known as a **Hertzsprung-Russell Diagram**, is a useful tool for visualizing these relationships between star properties. Generally, as you move up the **main sequence of stars** (the line of stars from the bottom right to the top left of the chart where most stars lie), the temperature, luminosity, and size of the star all increase. For example, a hot blue O type star will generally be bigger and brighter than a cooler red M type star.

In addition to the main sequence of stars, there are **red giants** (upper right corner) and **white dwarfs** (lower left corner). These stars can be classified by spectral type, but don't follow the general trends of the main sequence. Red giants are generally cool K or M type stars, but are very large and bright! White dwarves are extremely hot B type stars, but are small and dim.

Process of Science

This scavenger hunt activity is an active way for your child to learn about the types of stars and how they scale to one another! With each new type on the list, they will need to make connections about how the spectral class of this star relates to its size to in order to find a household item to represent it. While searching, ask your children questions like “How do we know this is an M star?” or “how does the size/color/temperature of this type of star compare to the last one we just found?”

This will allow them to make those connections between a star's type and its temperature, color, and size! In addition, asking them to speculate (like “what spectral class do you think our sun is in?”) will further their understanding and strengthen these connections. Remember, this type of information is not always intuitive, so using a reference like the hints given on the scavenger hunt list is also an effective way to engage with the content.

Authors

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