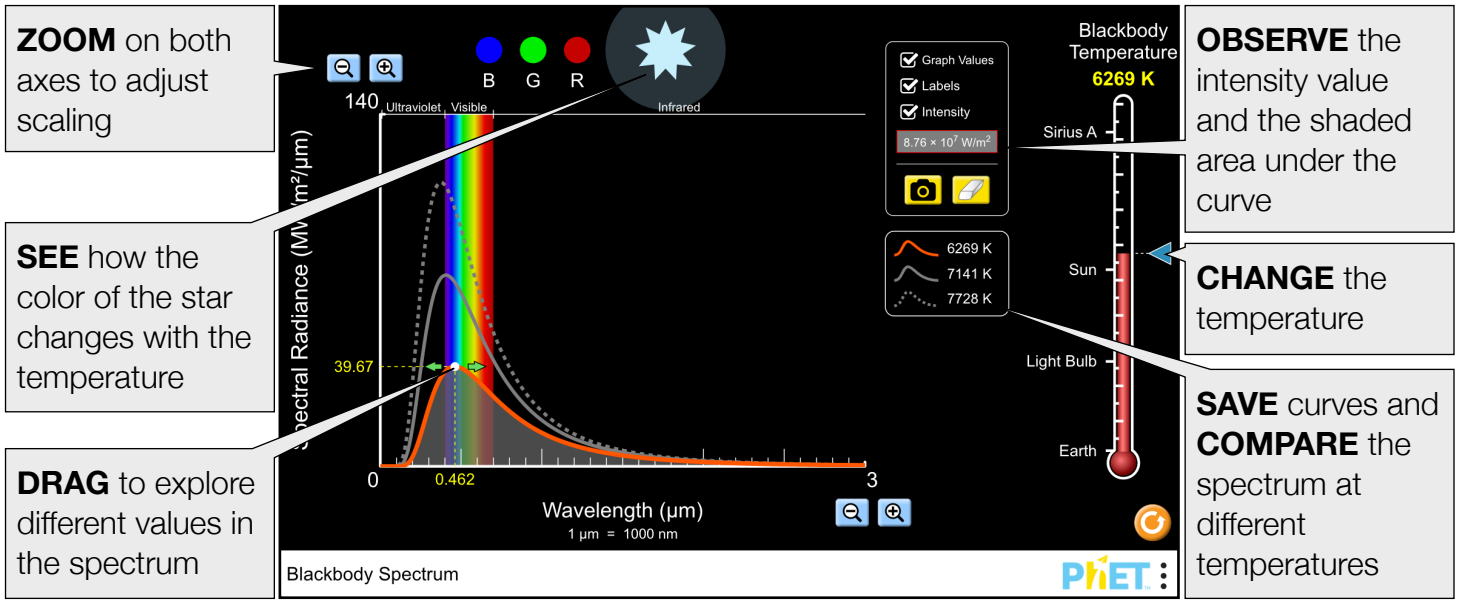
PhET Tips for Teachers — Blackbody Spectrum

The ***Blackbody Spectrum*** simulation allows students to explore how the blackbody spectrum of an object is affected by its temperature. Discover the relationship between the temperature of a blackbody and the peak wavelength and spectral radiance.



Suggestions for Use

Sample Challenge Prompts

- Compare the blackbody spectrum of the sun to visible light.
- Describe the blackbody spectrum of a light bulb. Where is the peak of the spectrum? Why do light bulbs get hot? Do they seem efficient?
- Describe what happens to the shape and peak value of the spectral radiance curve as you change the temperature.
- Imagine that you see two stars in the sky, one is glowing orange and the other is glowing blue. Which one is hotter?
- Determine the relationship between the peak wavelength and temperature of the blackbody.

Customization Options

Query parameters allow for customization of the simulation, and can be added by appending a '`?`' to the sim URL, and separating each query parameter with a '`&`'. The general URL pattern is:
`…html?queryParameter1&queryParameter2&queryParameter3`

For example, in Blackbody Spectrum, if you want to turn on projector mode (`colorProfile=projector`), with links disabled (`allowLinks=false`) use:
https://phet.colorado.edu/sims/html/blackbody-spectrum/latest/blackbody-spectrum_all.html?colorProfile=projector&allowLinks=false

To run this in Spanish (`locale=es`), the URL would become:
https://phet.colorado.edu/sims/html/blackbody-spectrum/latest/blackbody-spectrum_all.html?locale=es&colorProfile=projector&allowLinks=false

Query Parameter and Description	Example Links
`locale` - specify the language of the simulation using ISO 639-1 codes. Available locales can be found on the simulation page on the Translations tab. Note: this only works if the simulation URL ends in "_all.html".	`locale=es` (Spanish) `locale=fr` (French)
`colorProfile` - changes simulation colors for easier projection.	`colorProfile=projector`
`allowLinks` - when `false`, disables links that take students to an external URL. Default is `true`.	`allowLinks=false`

Model Simplifications

- The intensity of the blackbody spectrum is calculated as the integral of the Spectral Radiance with respect to the wavelength from zero to infinity, and the value will not change when students zoom.
- Even though the x-axis starts at 0 μm, the smallest wavelength that can be interacted with in the sim is 0.001 μm. For that reason, the Labels checkbox will display Ultraviolet with the shortest wavelength in the electromagnetic spectrum.
- The background of the simulation can be changed for easier projection by going to the PhET menu bar, selecting Options, and checking Projector Mode.

See all published activities for Blackbody Spectrum here.
For more tips on using PhET sims with your students, see Tips for Using PhET.