

SCIENTIFIC CASE: What are the colour of the stars?¹

Team members

Writer: _____

Equipment manager: _____

Reader: _____

Spokesperson: _____

Ambassador: _____

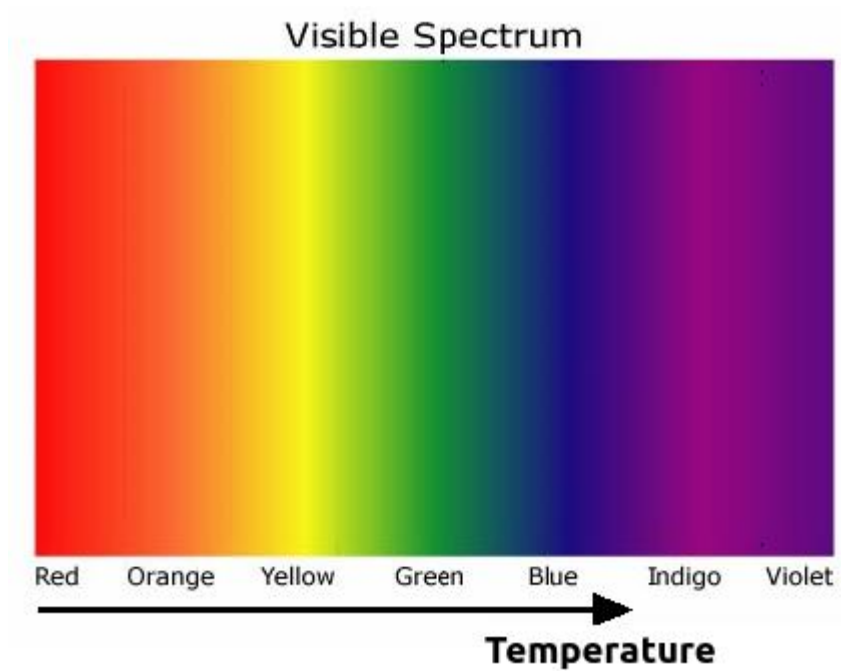
Context

The Sun is a star just like any other. We see stars as shiny dots because they are very far away from us. From Earth, what can we find out about stars? At first glance, we can see that stars' colour is one of their properties.

The hotter a star's surface is, the bluer it will be.

Because we can't touch stars, we must look for something that is as similar to one as possible, here on Earth. Something that can be really hot, like a light bulb.

¹ Educational material manufactured by "[Asociación Planeta Ciencias](#)" under the initiative and coordination of the [European Space Agency](#) inside the [CESAR](#) program framework.



Credit: <https://sohowww.nascom.nasa.gov/classroom/classroom.html>

We can observe filament light bulbs that get so hot that they emit light in a variety of colours. Depending on its temperature, we'll see a different colour.²

Similarly, we can relate the light bulbs' temperatures with the stars' temperatures.

² The spectrum emitted by a [blackbody](#) radiator at temperatures of incandescent bulbs does not match the sensitivity characteristics of the human eye; the light emitted [does not appear white](#), and most is not in the range of wavelengths at which the eye is most sensitive. Tungsten filaments radiate mostly infrared radiation at temperatures where they remain solid – below 3,695 K (3,422 °C). https://en.wikipedia.org/wiki/Incandescent_light_bulb

Temperature (° C)

550
630
680
740
770
800
850
900
950
1000
1100
1200
1300



*Relationship between colour and temperature of a light bulb.
Credit: <https://en.wikipedia.org/wiki/Incandescence> .*

More educational resources:

CESAR: <http://cesar.esa.int/index.php?ChangeLang=en>

ESAC Solar Observatory: <https://www.cosmos.esa.int/web/cesar/esac-solar-observatory>

ESA Kids: <http://www.esa.int/kids/en/home>

CESAR Booklets:

<http://cesar.esa.int/index.php?Section=Booklets&ChangeLang=en>

Scientific case 1: Temperature and colour of the stars.

We are going to study some Corvus constellation stars' temperature³.

Hypothesis

How hot are the hottest stars? And the coldest? Remember our body is at about 36°C

Research equipment

You have access to the following:

- Colour pencils, paper, rubber.
 - Picture of Corvus constellation.
 - Image of the relationship between temperature and colour of a light bulb.
 - *Hertzsprung-Russell stellar diagram.*

Procedure

We are going to fill in the table below.

1. Before filling the table in, we have to have a close look at the stars we're going to study in the picture.
2. We fill in the circle with the star's colour.
3. To write down the temperature of the star, look at the drawing of the light bulbs.
4. If you have any doubts, ask the educators or other groups. Never hesitate to ask questions or share your work with others!

³ The temperature always refers to the "surface" of the star, not to its core.

Results

Star number <i>(assigned on the image)</i>	Star colour	Star temperature
1	○	
2	○	
3	○	
4	○	
5	○	
6	○	

Conclusions and new questions

How cold are the coldest stars? And the hottest ones?

What would you say is the temperature on the surface of the Sun?

Do you think there's a relationship between the temperature and the brightness we see in a star?

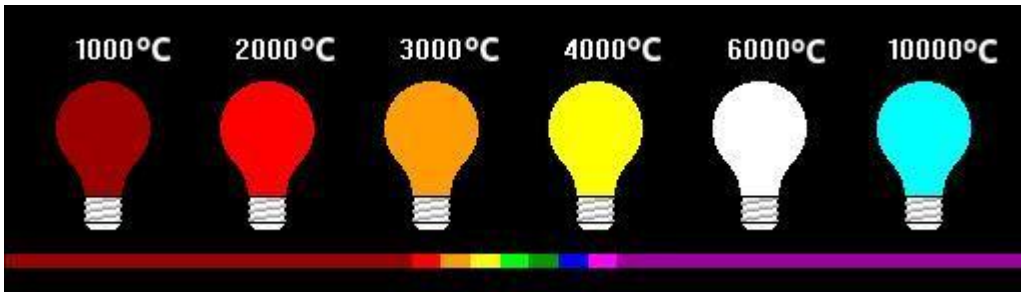
Have a close look at the Corvus constellation picture and the *Hertzsprung-Russell* stellar diagram. What type of star do you think is more common?

Aside of the color of a star, what other characteristics can we observe and study?



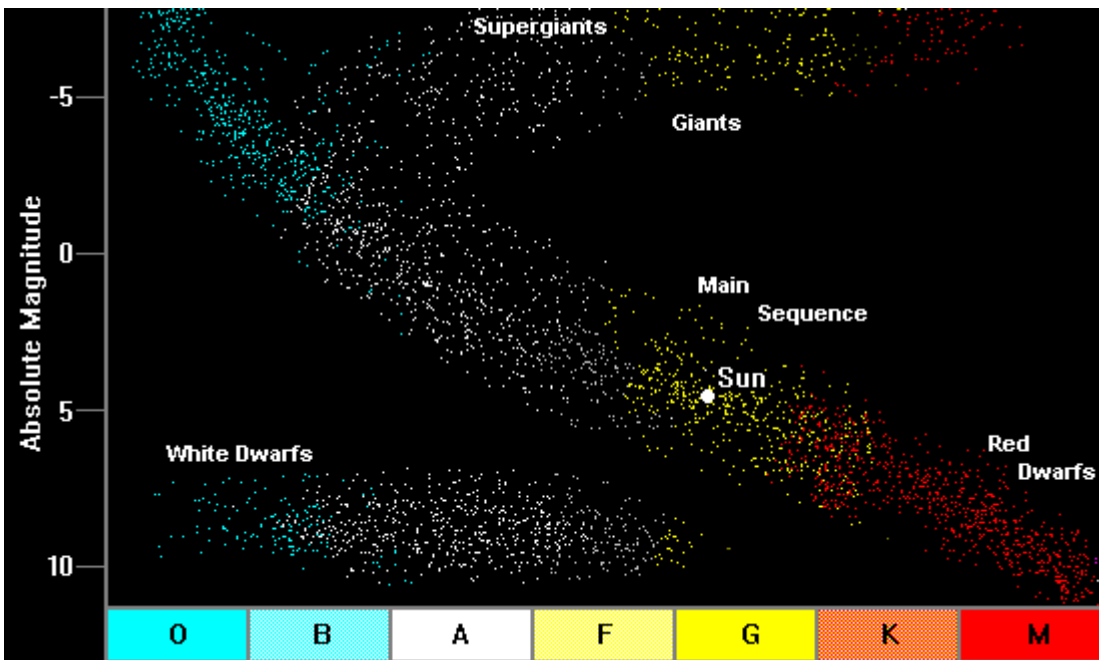
Research equipment

Relationship between temperature and color of a light bulb



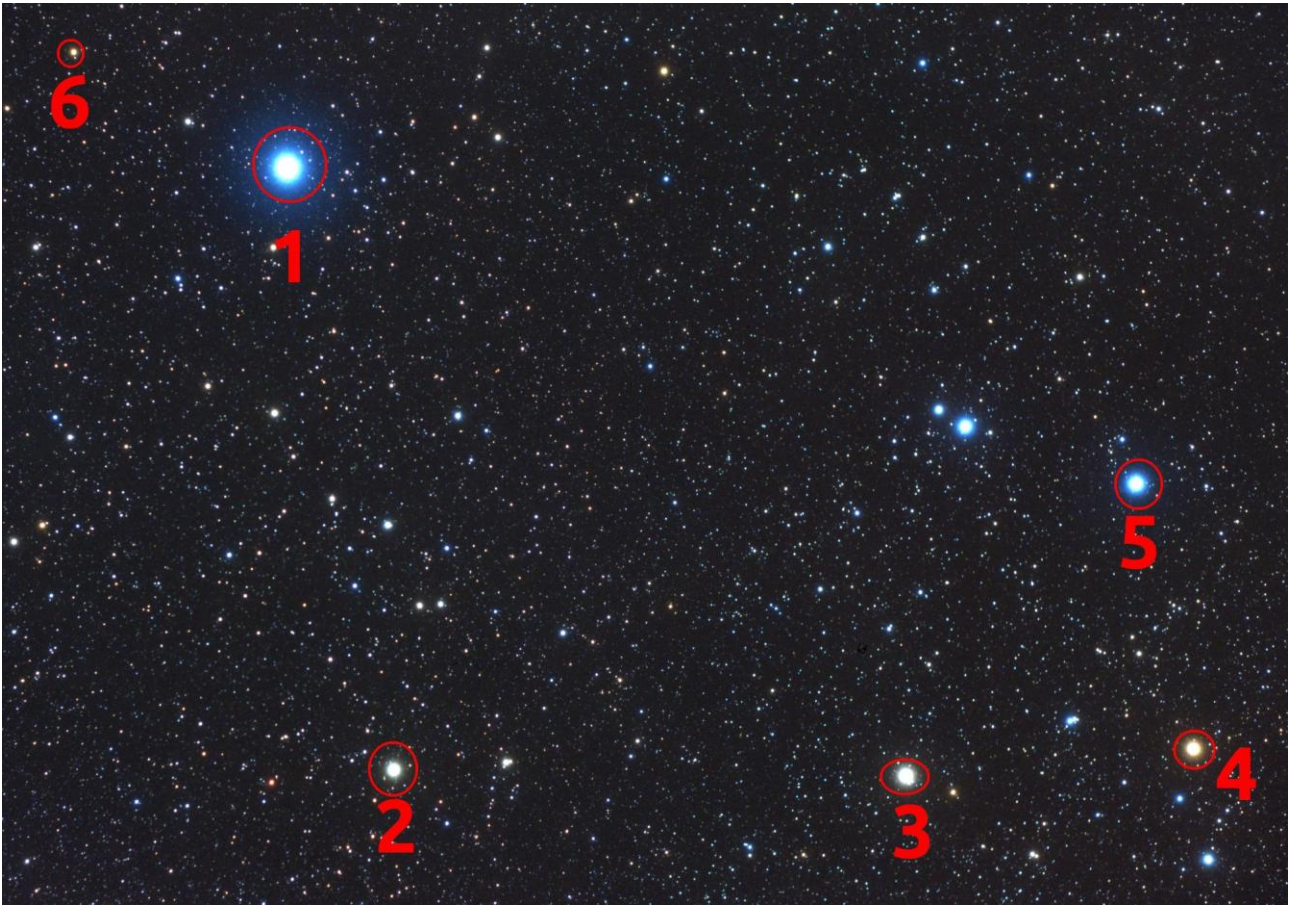
Credit: <https://www.uwgb.edu/dutchs/CosmosNotes/spectra.htm>

Hertzsprung-Russell stellar diagram



Credit: https://en.wikipedia.org/wiki/Hertzsprung%E2%80%93Russell_diagram#/media/File:HRDiagram.png (modified).

Corvus constellation pictures



Corvus constellation. Credit: <http://sci.esa.int/jump.cfm?oid=40145>

More information on the Applet <http://www.kcvs.ca/details.html?key=starColour>