



Why stars have different colours?

Evolution of Stars. Activity 2

Classroom Activity

Material List:

- Worksheet

Outline

By using a computer animation you will explore the changing colours of the nail being heated. You will compare these colours with the colours of some flames. Later you will watch pictures of different stars and will give the answer to the question: Why stars have different colours?

Procedure

Step 1. To Do:

Run the *ClassAction* software and open the animation *Light & Spectra/Blackbody Curves of Melting*. Watch the animation, stop it at temperatures mentioned in table and fill the part of the table about heated nail (write in the colours).

Object	Temperature, K	Colour
Heated nail	1000	
Heated nail	1100	
Heated nail	1300	
Heated nail	1800	
Burning magnesium flame		
Burning acetylene flame		

Step 2. To Do:

Watch the *Powerpoint* presentation *Star Colours* and write down to Table 1 the temperature and colour of two flames.

Step 3. To Do:

Watch the presentation slide about different star colours and using the acquired knowledge of the colour of the heated bodies, arrange star colours in the sequence from the lowest temperature to the highest:

The Online Observatory collaboration consists of the following partners:

Baldone Observatory, Brorfelde Observatory, Cardiff University, Harestua Solar Observatory, Helsinki Observatory

Lowest temperature → Highest temperature

Colour 1, Colour 2, Colour 3, Colour 4, Colour 5, Colour 6, Colour 7

Step 4. To Do:

Discuss your results inside the group, between groups and with the teacher. Watch the slide of presentation where stars are arranged in the colour sequence. What is the answer to the question: Why stars have different colours? Write it here:

Step 4. To Do:

Go back to the animation *Light & Spectra/Blackbody Curves of Melting*. Set the animation to the temperature 1500 K. At the right part of the animation switch to the *Auto scale*. Here you can see the graph that shows intensity of light at different wavelengths. Corresponding colours of light are shown as well. In table mark the colours of light that are emitted.

Light (colour)	Emitted or not?
Violet	
Indigo	
Blue	
Green	
Yellow	
Orange	
Red	

Check the nail again. In total it looks yellow-white. You must understand that this combined (final) colour that we see actually consists of light emitted at different wavelengths (light of different colours), just some colours are more intense. Set the animation to the temperature 1200 K. You will see that now only green, orange and red light is emitted and the nail looks more yellow. Set the animation to the temperature 1800 K. Now the violet and blue light is emitted as well and the nail looks whiter.

Assessment:

Answer the questions:

1. What is the colour of the hottest stars? _____
2. What is the temperature of red stars? _____
3. Sun is a yellow star. What is the approximate temperature of the Sun? _____