



Science Exemplary Text Student Handout

Sunlight and starlight are composed of waves of various lengths, which the eye, even aided by a telescope, is unable to separate. We must use more than a telescope. In order to sort out the component colors, the light must be dispersed by a prism, or split up by some other means. For instance, sunbeams passing through rain drops, are transformed into the myriad-tinted rainbow. The familiar rainbow spanning the sky is Nature's most glorious demonstration that light is composed of many colors.

The very beginning of our knowledge of the nature of a star dates back to 1672, when Isaac Newton gave to the world the results of his experiments on passing sunlight through a prism. To describe the beautiful band of rainbow tints, produced when sunlight was dispersed by his three-cornered piece of glass, he took from the Latin the word spectrum, meaning an appearance. The rainbow is the spectrum of the Sun.

[...]

In 1814, more than a century after Newton, the spectrum of the Sun was obtained in such purity that an amazing detail was seen and studied by the German optician, Fraunhofer. He saw that the multiple spectral tings, ranging from delicate violet to deep red, were crossed by hundreds of fine dark lines. In other words, there were narrow gaps in the spectrum where certain shades were wholly blotted out.

We must remember that the word spectrum is applied not only to sunlight, but also to the light of any glowing substance when its rays are sorted out by a prism or a grating.

Cannon, Annie J. (1926). "Classifying the Stars." *The Universe of Stars*. Edited by Harlow Shapeley and Cecilia H. Payne. Cambridge, Mass.: Harvard Observatory.

This is an example of exemplary text found in *Common Core Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects: Appendix B Text Exemplars and Sample Performance Tasks*. Retrieved from http://www.corestandards.org/assets/Appendix_B.pdf

Science Exemplary Text Teacher Resource

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Teacher introduces the text with minimal commentary and students read it independently. Teacher then reads passage aloud. Give a brief definition to words students would likely not be able to define from context (underlined in text). Teacher guides the students through a series of text-dependent questions. Complete the performance task as a cumulative evaluation of the close-reading.

Text-Dependent Questions

1. Why do we need a prism to sort out colors of the spectrum?
2. Explain the origins of the word spectrum.
3. How did Newton experiment with light?
4. Who was Fraunhofer and what did he do?
5. What are the fine dark lines in the spectrum called?

Performance Tasks for Informational Texts

Students cite specific textual evidence from Annie J. Cannon's "Classifying the Stars" to support their analysis of the scientific importance of the discovery that light is composed of many colors. Students include in their analysis precise details from the text (such as Cannon's repeated use of the image of the rainbow) to buttress their explanation. [RST.9–10.1]

EFL 5
Word Count 259

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