



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute  
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## Where Are We in the Milky Way

Guide for Curriculum Unit 98.06.09  
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This unit is designed for students who have traditionally met with little success in school and who are currently attending an alternative high school program. In general, these students have difficulty visualizing, comprehending, and expressing realities in numbers and in mathematical terms. The unit was developed in collaboration with an English teacher in order to integrate math and English into the instruction. The class, mixed grades and levels (9-12) will be team taught, with the goal of seeking to improve student math and English performance and skills at all levels. Because of the difficulty students have visualizing and comprehending realities in numbers and in mathematical terms, the unit will incorporate drawings of planets and their relationships in scale. Art and hands-on demonstrations will increase student participation and interest. Using multi-modalities will afford greater opportunities for students to demonstrate and reinforce learning.

The main focus of this course is to determine where the earth is located in our solar system and where the solar system is located in the Milky Way. One goal is to give students a sense of where they fit in this astronomical universal sense of location in the cosmic landscape based on mathematical calculations.

Students will compare positions of the nine planets and the sun, starting from earth, our home planet. Students should be able to determine and answer for themselves where our planet is in relation to the other planets in our solar system.

The Milky Way is our galaxy; it consists of several hundred billion stars and it is a complicated, vast, wheel-shaped system. In this huge galaxy called the Milky Way, our solar system is all but lost. Visualize it as if it were a single grain of sand on a vast beach. This image will help students grasp the problem of scale, as we locate our position in the Milky Way.

Students will do extensive work using mathematical formulas, units of measure, graphing, and drawing. They will use Bode's Law, find ratios and proportions, make estimates, and determine probabilities. Students will learn and practice vocabulary, and improve critical thinking, writing, and communication skills by analyzing and then interpreting charts and graphs. Students will submit written reports and make oral presentations to the group. Finally, students will read and discuss articles and books about the planets and astronomy.

At the conclusion of this unit, students will gain a better understanding of their place in the Milky Way, from a mathematical perspective. They will demonstrate and practice learning through problem-solving activities, oral presentations, written reports, and art projects allowing for demonstration of proficiency in a variety of

ways to accommodate the learning styles and strengths of every student.

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