Intergalactic Interdisciplinary Curriculum: Our Place in the Universe

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Introduction
Interdisciplinary curriculum is a way for teachers to unite disciplines and invite students to learn through multiple doorways. Interdisciplinary curriculum is especially appropriate for gifted students and middle school students. I will describe how interdisciplinary curriculum can meet the needs of students in your classroom and the process of creating an interdisciplinary unit across two disciplines: creative writing and physics. When planning and revising this unit, I used the Parallel Curriculum Model’s Curriculum of Connections as a guide. I will include an overview of the unit to show how creativity, language arts, and physics were combined during the study of the science-fiction novel A Wrinkle In Time by Madeline L’Engle.

Student Learning Goals
The seed for any piece of good curriculum is sitting down and asking yourself, what do I want students to learn? In other words, what do I want students to Know, Understand, and Do (KUDs)?

I know that I want students to make connections between:
1. Their lives and the content
2. Ideas: seeing and formulating the relationships between ideas
3. Their life and the larger world (and in the case of this unit, the universe)

I also want students to engage in creative acts and grow in creative, critical, and independent thinking skills. Creativity is about making connections and the process of seeking out ideas in order to connect them in a fresh way. One definition of creativity is: the putting together of disparate pieces in a novel
These are ambitious learning goals, especially when you have a million other things to do as a teacher. What is a helpful vehicle to meet these goals? My answer: consider interdisciplinary curriculum, and more specifically, the Curriculum of Connections in PCM.

**Why Use Interdisciplinary Curriculum?**

When properly executed, interdisciplinary curriculum can provide in-depth and memorable learning experiences that are more authentic because the world is not truly separated into disciplines—we do this merely for the ease of human understanding and organization.

Interdisciplinary Curriculum is:
- in-depth
- authentic
- developmentally appropriate for middle school students

Middle school students are interested in relationships between
- Self and others
- Self and the world
- Self and ideas
- Interaction between people and ideas

Use the social dynamics and interests of students as fuel for engagement and learning

Gifted students tend to look inward on a deeper level and outward on a broader scale at a younger age, interdisciplinary curriculum may also be appropriate for gifted elementary school students.

Interdisciplinary curriculum can help you become a better teacher or be more efficient. More importantly, you can understand what a student's learning experience in your classroom is potentially like, such as learning in a
discipline that may be uncomfortable for them. When you venture out of your comfort zone as a teacher, you will learn more and empathize with a student's experience.

**Collaboration**
Through collaborating with a teacher in another discipline, you will need to verbalize and further crystallize your ideas in order to explain clearly and concisely the guiding questions for your discipline and specific unit. Through this process, you will more thoroughly understand your discipline, while expanding your knowledge in another discipline.

**Multiple Entry Points**
An interdisciplinary unit provides more than one entry point for students, provides a wealth of options for differentiation, and appeals to various learning styles.

For example, in my unit on *A Wrinkle in Time*, some students connected to the novel through simply loving reading or relating to the characters and their conflicts. Other students connected to the novel and proclaimed it their favorite book (later asking to read the entire series) through an emphasis on entering the novel through science. The entry point moved from being creative writing alone, to a wider doorway or entry point that also included science.

**The Seeds for an Interdisciplinary Unit**
Many questions began to arise as we read the novel *A Wrinkle in Time*:

- What is a tesseract?
- Is tessering possible?
- What are the 4th and 5th dimensions?
- What is ESP and is it possible?
- Could we travel to other planets and meet beings there?

Now, if we were to teach this science fiction book in only language arts (disciplines of creative writing and literature), we certainly would not find satisfying answers to these questions. We might even erroneously assume that these questions have no answers.
This is when the opportunity to teach an interdisciplinary unit arises quite organically. Student curiosity and specific questions are the driving force, and those questions are currently being examined in the context of another discipline—in this case, physics. In this way, connections can be made that are not forced or on the surface level, but fundamental or deep within each discipline.

**The Essential Questions**

To work in the Parallel Curriculum Model’s Curriculum of Connections, you must understand first of all the core curriculum for each discipline and build on that. Use essential questions that pinpoint the true nature of the discipline, which is simply the way a disciplinarian views the world. The Essential Questions connect conceptually across disciplines. Good curriculum and especially interdisciplinary curriculum must include such meaningful and enriching questions. For this unit, the essential questions include:

What is my place in the universe?
How can I find it and fit in there?

These questions can be answered literally in the realm of physics, and figuratively through creative writing, self-reflection, and physics.

Creative Writing: These questions are essential to creative writing because in a way, these are the most fundamental and abstract questions characters in literature over time ask. Writers ask this question when they write to discover; readers read to find the answer and ask themselves this question in different ways. The act of reading is an attempt to answer or merely conceive of this question. The act of writing great literature sets an ambitious goal to answer these essential questions in the way only each individual author could uniquely answer it.

Physics: Why did the earliest human beings and later scientists examine our universe? They were attempting to understand our place in the universe. Today, using photos of space we can “see” our planet floating out in space—we can see photos of our galaxy, and in that way, we can literally study the location of our “place” in the universe. Like writers, physicists also use the information they gather to consider deeper philosophical questions about our place in the universe, why we are here, and where human beings fit into the bigger picture of the universe and its origins.
The Essential Questions could fly over our heads like a comet. But today it is possible for eleven and twelve year olds, like the 6th graders in my class, to glimpse our universe and be truly awed as they begin to grasp visually and then on a deeper level “our place in the universe.”

**Integrating Technology for a Purpose:**
In the unit, Google Earth and Powerpoint were used to structure this encounter for students as well as telescopic photos of space. The journey began with an aerial view of our school, our town, our state, our country and the coastline (pointing out familiar sights along the way), our earth from space, our solar system, and more. For many students it was their first encounter with thinking this big. For middle school students who sometimes feel like the world revolves on them, this presentation gave them perspective. It also helped them to understand the distances for time travel discussed in the novel A Wrinkle in Time.

**What does the essence of Creative Writing and Physics have in common?** Writers and physicists are both concerned with, as I said before, understanding our place in the universe. These two disciplines formulate answers to the enigmatic questions and research those answers in different ways which both separates and complements. Writers and physicists have several basic things in common:
- Pay close attention
- Detailed observations
- Reserve judgment

**Overview of Lessons**
**Introductory Activity: Four Corners:** touches on beliefs about aliens, ESP, the universe
Perceptions of Giftedness Bibliotherapy lesson

**Science pre-physics lesson:** "The Science Behind A Wrinkle in Time" and questions with essay varied resources reading levels AIDS

**Physics lesson:** "Your Place in the Universe." Discusses aliens, extrasolar planets, time travel from a science experts' perspective.
Culmination activity: review the elements of a short story and delineate the science fiction genre, then write a sci-fi story integrating the physics knowledge we've gained.

A Wrinkle in Time Movie/Book Comparison: graphic organizer, discussion nature of each genre film and novel: We discussed the difficulty of translating abstract and even theoretical hypothetical ideas to the screen visual and animation effects do we understand it better on screen or in print as a text and using our imaginations as we read.

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