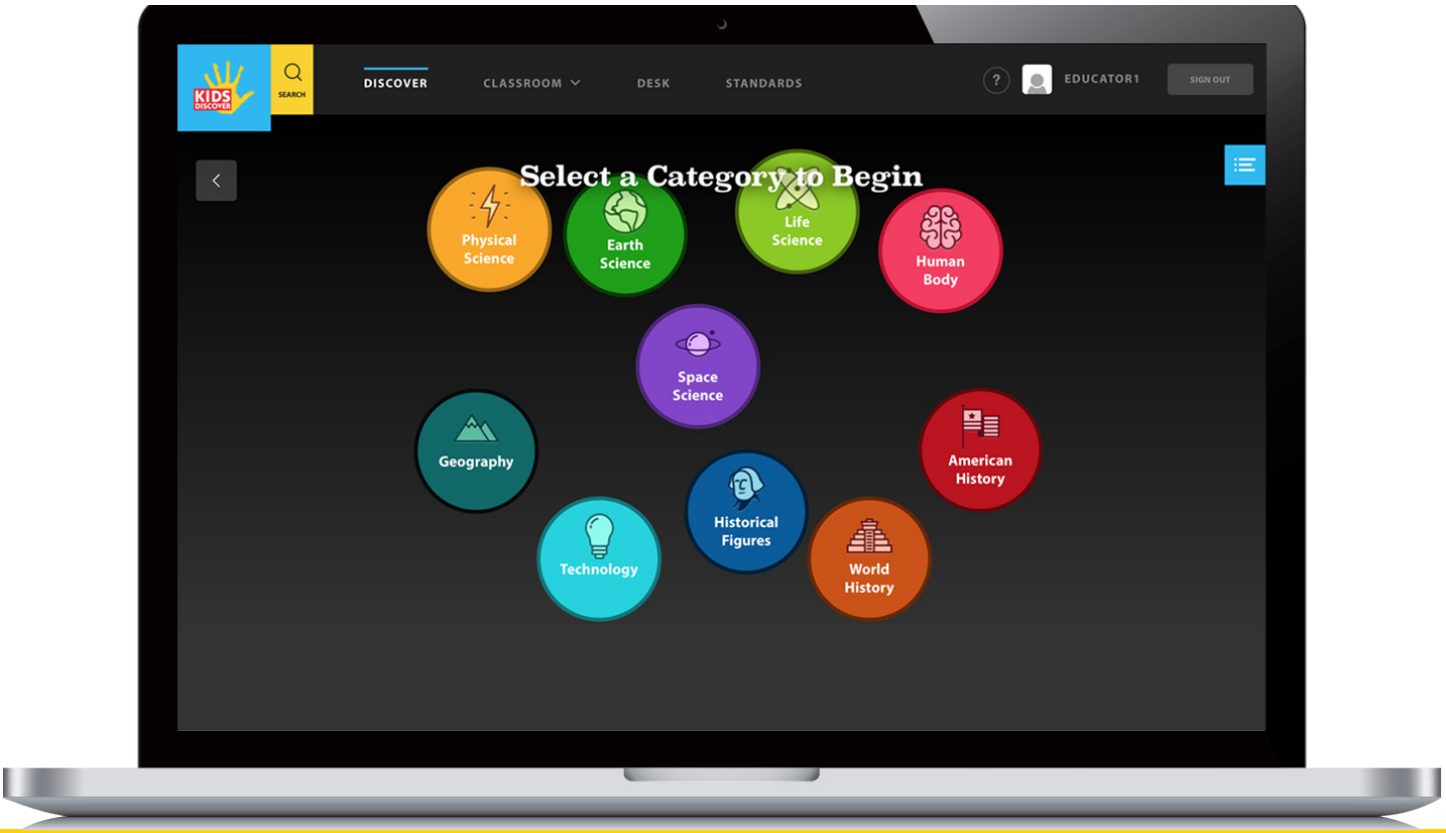
Improving Student Engagement and Outcomes with Cross-Curricular Application



KIDS DISCOVER

Cross-curricular teaching involves a conscious effort to apply knowledge, principles, and values to more than one academic discipline simultaneously. The disciplines may be related through a central theme, issue, problem, process, topic, or experience. By developing cross-curricular activities that are both fun and motivating, teachers can easily integrate different subject areas throughout the day—it only requires a bit of planning and creativity!

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01 Introduction

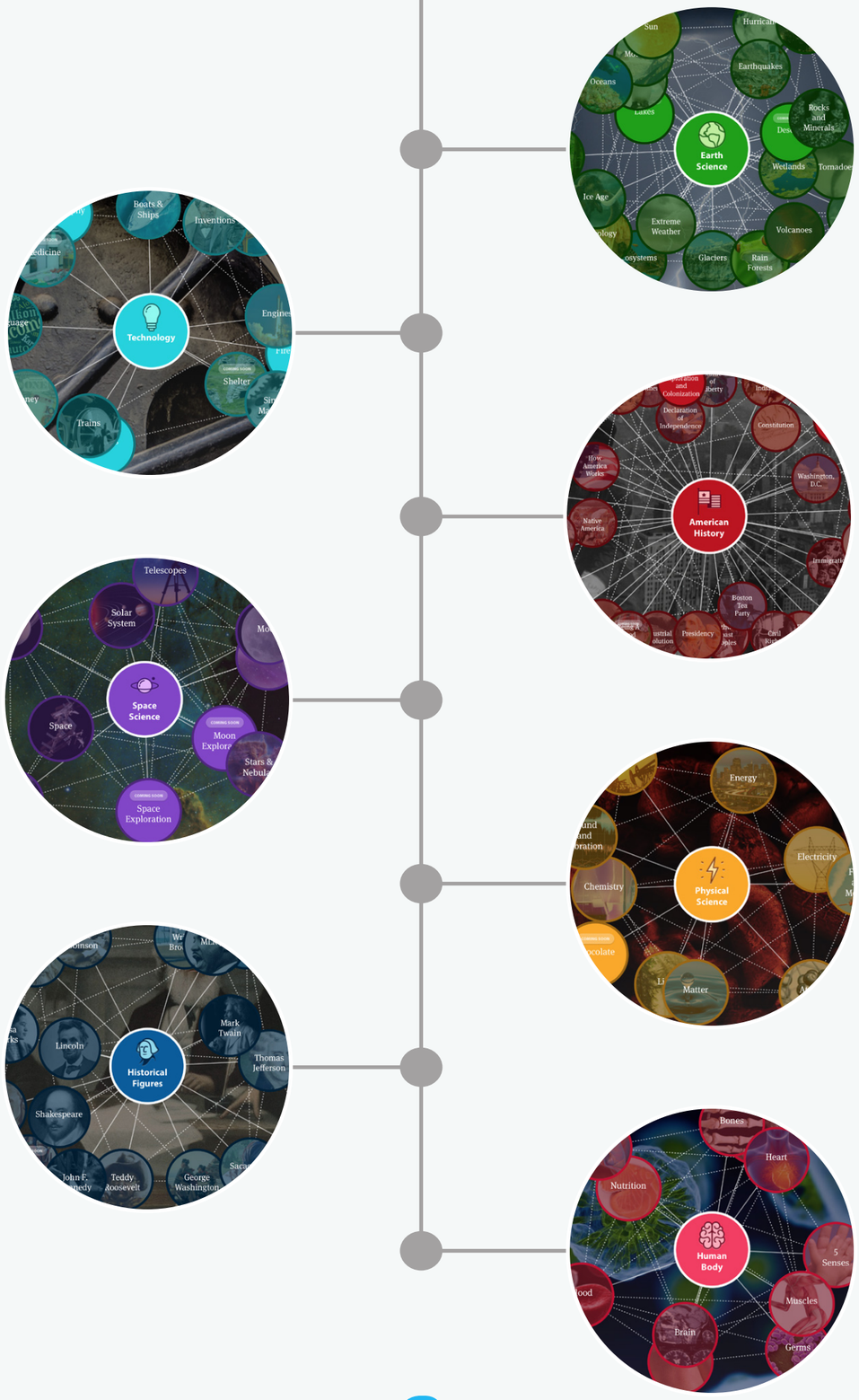
Research shows that when educators create lessons that require students to combine knowledge from various areas of study, students engage more with those lessons and retain more information. Cross-curricular application in the classroom naturally promotes critical thinking and problem-solving skills, and helps students prepare for modern careers that don't mimic the silos of the traditional break-down between subjects.

"Jobs of the future will require creativity, imagination, and experience… This means that educators are going to have to stress concepts and principles, rather than drudgery of memorization."

—Michio Kaku, in his recent address to the International Society for Technology in Education Conference

Historically, textbooks have put the onus on individual teachers to take it upon themselves to collaborate with their colleagues to create meaningful cross-curricular lessons for their students. That is no longer the case! With the continued adoption of technology in the classroom, customizable cross-curricular learning is gaining traction as an effective model for deeper student engagement and stronger understanding of what they are learning.

With powerful, customizable, cloud-based content, we now have the opportunity to make cross-curricular studies a regular part of every student's daily learning and educator's daily planning! The following text outlines the research behind cross-curricular application; how it benefits students and how teachers can easily implement this application in their classrooms, with real-life examples and useful lesson plans.



02 Why Cross-Curricular Applications Matters

It Provides Context for Learning

In a cross-curricular lesson, math is no longer an isolated set of algorithms. Adding other disciplines gives the material real-world context, from shopping at the local store to figuring out which materials would best withstand the pressure of an oil spill gushing out of a ruptured pipeline.

History ceases to be an endless series of past dates and names of people from long ago and becomes an examination of how basic astronomy was vital to the success of the Underground Railroad or why Word War II may have continued much longer had math and computer science not been employed to crack the Enigma codes.

It Dramatically Increases Students' Critical Thinking Skills

> "To a man with a hammer, everything looks like a nail."
> —Mark Twain

When lessons focus on a singular discipline, children are not being taught to think outside the box and develop their problem-solving skills as they would in the real world. Cross-curricular lessons and multi-dimensional critical thinking enables students to look at a problem or situation from multiple angles and use every tool in their metaphorical toolbox to understand and apply it.

Cross-curricular learning opens opportunities for critical thinking, a skill that should be a fundamental goal in our work as educators. President Obama publically identified critical thinking as a crucial 21st-century skill that learners of all ages need to master in order to be successful in their academic careers and our ever evolving, connected world. An even older adage from John Dewey emphasizes how learning experiences that stimulate thinking by having students engage in creating meaning out of a variety of facts, scenarios, and variables (rather than just memorizing a single, linear timeline or algorithm with no context or supportive background) creates a learner-centric environment for each student the learner in the center of the learning process.

02 Why Cross-Curricular Applications Matters Cont.

It Increases Interest and Engagement in STEM Fields

Research shows that Cross-curricular learning may also be the key to increasing interest in STEM fields. Unlike Common Core, Next Generation Science Standards (NGSS) have been widely accepted and welcomed by educators. The standards aim to address a critical challenge of 21st-century society in the United States: a shortfall of STEM talent across the country.

At the highest level, NGSS differs from previous science standards in that it calls for a deeper level of context. In the past, science standards have aimed for teachers to present lessons that place emphasis on memorization and, more often than not, for students to be tested on what they've memorized. The standards didn't call for application of that material beyond regurgitating that information within a test. When considering this sort of learning as opposed to cross-disciplinary teaching, recall Kaku's quote—we need to raise a generation of thinkers and doers, not just test-takers. Fortunately, the NGSS emphasizes "doing" as a key component of science education.

A great example of how an NGSS-designed lesson differs from a traditional science lesson comes from Dr. Lauren Madden, an Assistant Professor of Elementary Education at the College of New Jersey. Instead of teaching a traditional lesson on the different forms of matter—in which students might be taught the basic principles of solids, liquids, and gases—Dr. Madden includes an activity that brings these principals front and center through experience. She asks her students to create their own boats out of everyday materials (solids), put those models into water (liquid), and evaluate how well the boats perform. Based on their observations, students rework their models, all while constantly applying the principles of solids and liquids.

In this example, the remodeling of boats through observation requires some degree of creativity. But what if we take the concept of "context" and extend it even further? What if we add a historical component into this lesson? How does this lesson apply to the broader world in which we live, not just the principals of solids and liquids?

03 Benefits of Cross-Curricular Lessons

Engaging Students in Their Own Learning

When a student has to think through how a situation occurred, making sense of why the various components came together and their results, learning becomes a personal process of discovery, an ongoing exploration of facts, figures and events that could have turned out differently had the variables played out otherwise (http://bit.ly/2llf3r4). Critical thinking empowers students to care about their learning because they are a part of it, they own it. They are figuring out mysteries of history, science, and math rather than simply being passive receptacles of data fed to them.

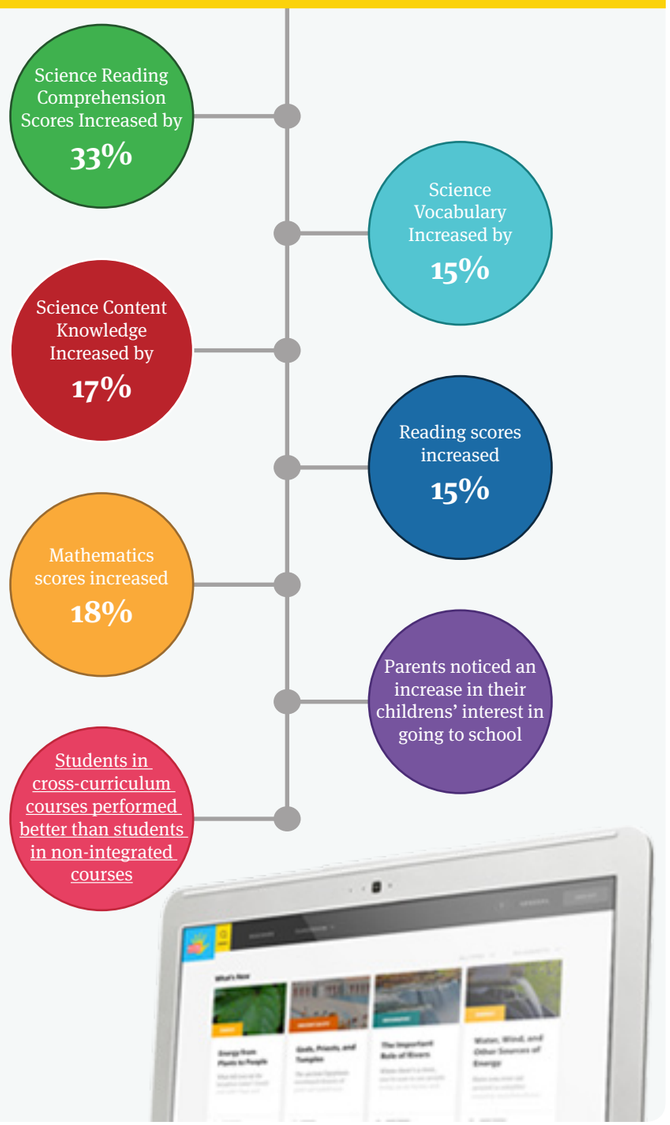
Engaging with their own cognition within real-world context inspires students to think through all areas of their lives and ask questions about the direction of the world around them. Creativity and problem solving are strongly connected to critical thinking, thus it behooves us as educators to ensure students are learning not just what to know, but how to think through problems and questions effectively.

Research shows that the application of concepts across the curriculum, such as social studies and science, not only fosters a deeper understanding of a given topic or skill, but also dramatically increases student retention of information.

DOWNLOAD FREE CROSS-CURRICULAR LESSON PLANS

Increasing Student Achievement: A look at the Numbers

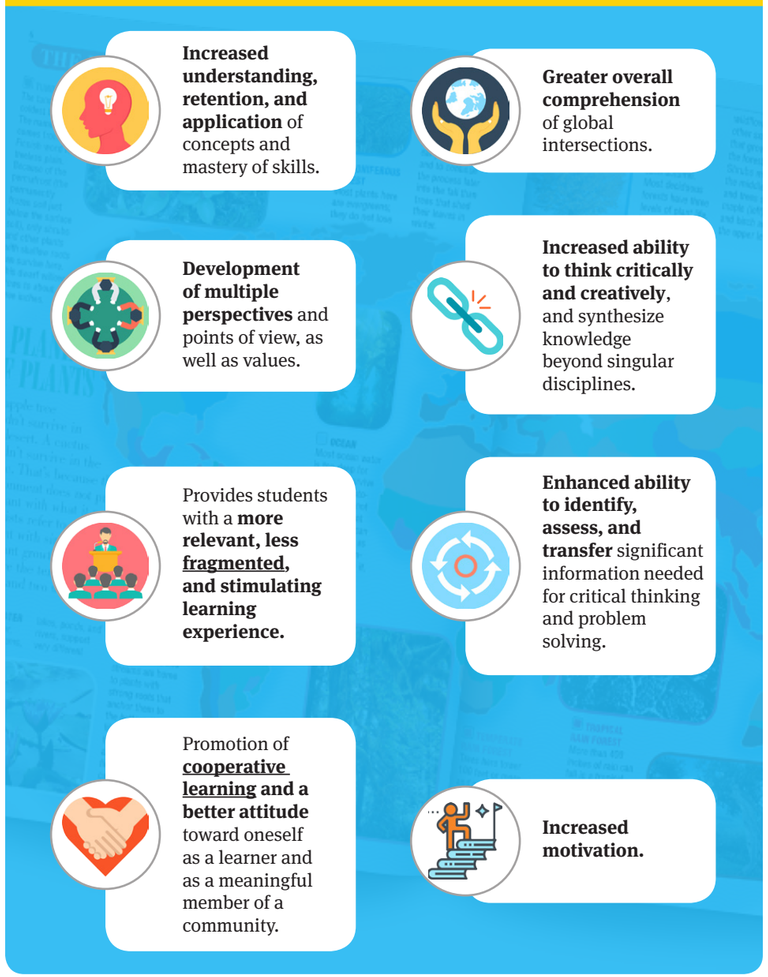
A recent study of a school-wide approach to cross-curricular lessons produced the following results:



Building Real World Skills and Creating Lifelong Learners

As the Virginia Department of Education's guide to cross-curricular instruction puts it, "This approach allows students to build on their current knowledge base and connect what they know with what they are learning; and it promotes higher-level thinking and collaborative skills needed for lifelong success."

Students involved in cross-curricular lessons display:



In short, when school and district leaders provide teachers with the opportunity to apply concepts within their discipline to other subjects, teachers have the ability to more effectively entice students to embrace and master that subject and the ability to solve problems and engage in discussion.

04 Effective Models for Cross-Curricular Lessons

Interconnected digital curriculum can increase the range of topics from which to build cross-curricular lessons. Digital curriculum enables students to explore a topic and its relation to other disciplines with speed and ease. With interactive concept maps, like those found on Kids Discover Online, students can explore links between subjects and topics in their online library.

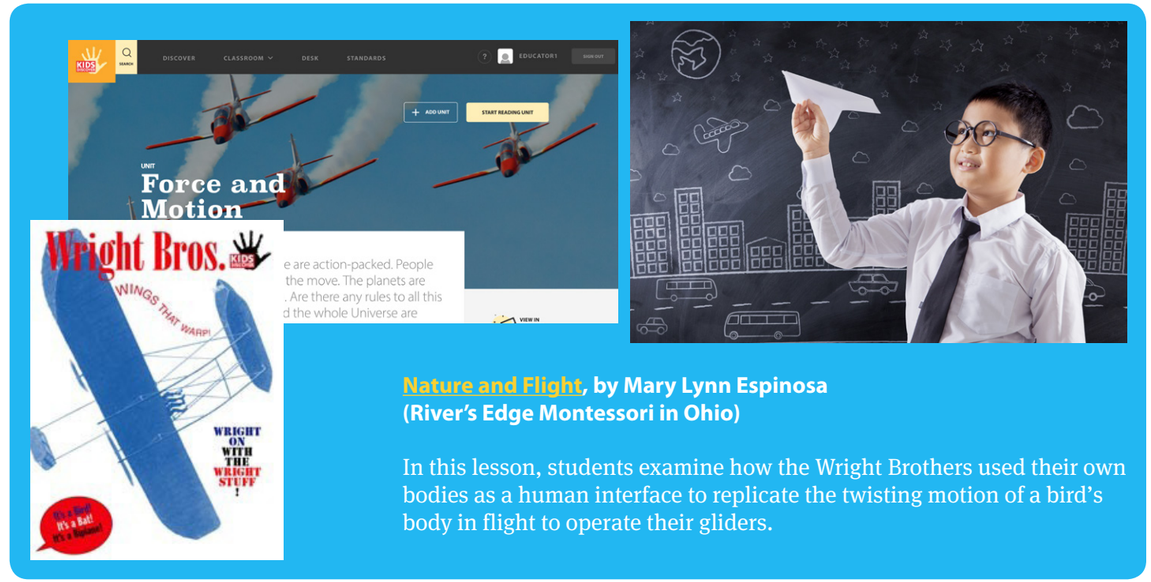
Here are three cross-curricular lesson plans designed by educators using Kids Discover lessons as part of a Cross-Curricular Lesson Building Contest hosted this past fall:

Geography as Destiny, by Kelly Grant Horrocks
(DeWitt Middle School in New York)

Here students explore how government, economy, and social structures developed differently across cultures according to their environment.

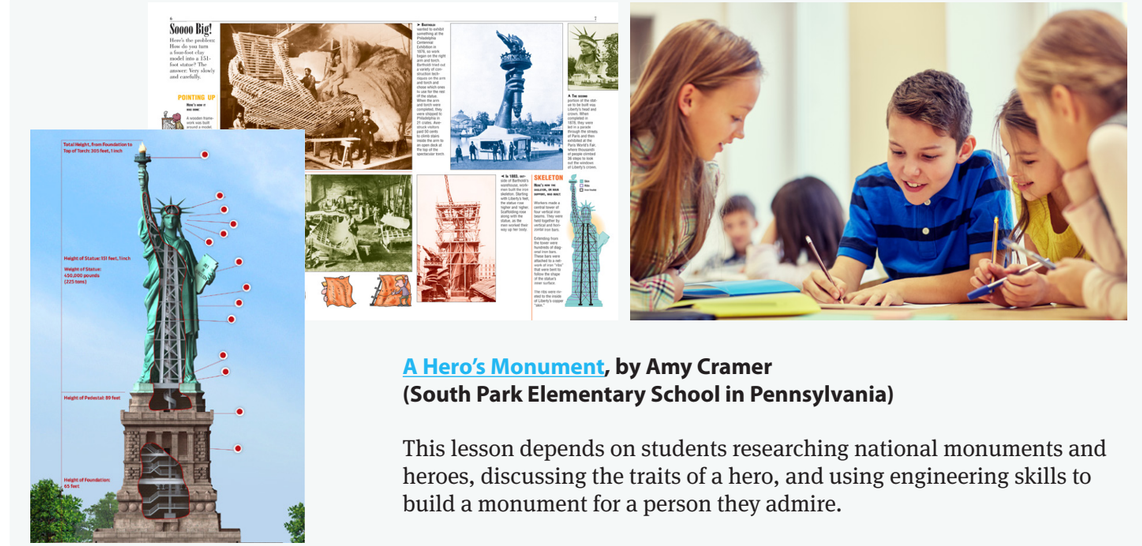
"Cross-curricular lessons create a flexible framework for learning that enables students to focus on the big ideas and essential questions and to consequently use multiple skill sets to solve problems instead of being boxed in by preconceived notions that one content area will provide the best solutions."

—Amy Cramer, Teacher at South Park Elementary School



Nature and Flight, by Mary Lynn Espinosa
(River's Edge Montessori in Ohio)

In this lesson, students examine how the Wright Brothers used their own bodies as a human interface to replicate the twisting motion of a bird's body in flight to operate their gliders.



A Hero's Monument, by Amy Cramer
(South Park Elementary School in Pennsylvania)

This lesson depends on students researching national monuments and heroes, discussing the traits of a hero, and using engineering skills to build a monument for a person they admire.

05 Creating a Cross-Curricular Culture in your School or District

Moving beyond the traditional education setting created by print textbooks will benefit students of all ages and ability levels; however, it can be intimidating project to take on. It requires shifting away from a natural human impulse: to categorize and classify. The key takeaway from the examples shown on the previous page is to ensure that we don't ignore the differences between different subjects, but rather acknowledge how those differences interact to achieve the same outcome. Identifying overarching projects and activities that require multiple disciplines in order to be successful will allow teachers to construct lesson plans that achieve the manifold benefits addressed in this eBook.

Creating a cross-curricular culture requires teacher input and collaboration, transparency, as well as a curious, supportive environment. Traditionally, school days have been rigidly divided into isolated sections for different subjects. As the editor of Interdisciplinary Curriculum, Heidi Hayes Jacobs notes, **"Students feel this fragmentation keenly."**

Teachers need to be encouraged to work with their colleagues to identify and strengthen their understanding of other subjects and their real-world dependency on one other. In an article from Edutopia, educator Ben Johnson recommends that teachers begin with alignment to lay the framework necessary for cross-curricular studies. Aligning rubrics and grading systems between subject departments cues students to see the interdependence of material from math to history to language arts.

Administrators have the ability to facilitate more transparency of content and lesson plans in order to create additional opportunities for collaboration and increased awareness of what is occurring in other classrooms within a school or district. Often, the digital curriculum being used makes this open exchange of ideas seamless and simple. [How One Teacher Uses Kids Discover Online in his Classroom]

Finally, both educators and students require an environment that supports trial and error and gives room for unique and creative approaches to a problem or activity. The fundamental point of cross-curricular education is to inspire students to be innovative and to think critically. A district or school culture that emphasizes and embraces an approach such as this allows for these ideas to be more free flowing. You know your teachers and students well—with the right atmosphere and support, they are capable of amazing things!

06 Conclusion

What many of us have failed to realize along the way is that subjects like science and social studies are often taught in isolation not because that's the best way to teach them, but because that's how content and information have been distributed in the past. Further, a specific scope and sequence of lessons are based on the distribution of a finite amount of content, traditionally in the form of a textbook.

We don't need to follow these same "rules" any longer. In fact, designing lessons and experiences in ways that encourage a 360-degree view of a particular concept or principle, encompassing content and context that span several areas of study, provides students with skills that will serve them well in school and life thereafter.

Incorporating physical science, geography, world history, and earth science in the same lesson may sound like an unlikely scenario, but it is a worthy challenge—and with the power of digital curriculum, an attainable goal. If we can all put on Kaku's lens for a moment, we can envision entirely new kinds of lessons that harness the power of cross-curricular design and achieve a level of context never before seen in K-12 education.

We understand this is a journey—a marathon not a sprint—and are here to help. Below are a number of valuable resources that will help you get started, provide new ideas to those of you that have already begun your cross-curricular journey, and more!

Additional Reading:

Why every class should be cross-curricular
S'Cool Tools, Teacher Voice Edition: CueThink, Kids Discover Online
Two Educators Explain Their Experience Working with Digital Assessment Platforms

Additional Resources if Needed:

1. Writing Prompts for Science - Integrating ELA/Science Concepts:
6 Writing Prompts to Jumpstart Your Science Class

2. Cross-Curricular Games and Activities:
Cross-Curricular Activities on the Great Depression
Games & Activities on Mesopotamia
Games and Activities About Pioneers
Games and Activities on Electricity
Games and Activities About Plants

3. Darren Faust Cross-Curricular Share to Care:
Student Choice and Creating Valuable Connections

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