

Using Timelines in Your Gifted & Talented Classroom

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Introduction

Teachers recognize the importance of integrated educational experiences for their students. STEM-based learning is one way of accomplishing this, as are special classroom challenges, and design competitions.

On the job, the world does not come neatly pre-packaged in discrete subject areas. Problem solving is characterized as an iterative, multi-constrained, multi-disciplined activity, most likely involving working with a team of professionals. Generally, it takes as much time to actually define the problem at hand and ask the right questions about it, as it does to solve it; and the solution will be one that takes into account a variety of potential impacts and arrives at a mediated, blended, or compromised answer. It won't just deal with the traditional technical or economic aspects, but will include other very important concerns like environmental impacts, safety, job creation, impacts on neighborhoods, and the social fabric, and perhaps global competitiveness.

To be prepared for this kind of integrated decision-making, gifted students need to perform school projects which demand and exercise these skills and problem solving. One way of preparing them is with the study of timelines.

The Value of Timelines

A timeline is a representation of a series of events that have occurred in time. This sequential method of portraying information is a common way of historically ordering a series of related events like perhaps the evolution of the automobile, the development of literature, the history of mathematics....etc. Charts with timelines abound in textbooks and classroom wall charts. They can cover a brief span of time or grand vistas—like the evolution of the universe, the rise and fall of the dinosaurs, or the history of man's development.

Much can be learned from the timeline educational tool, especially if timelines are superimposed. Suppose history during the last 200 years could be conveniently chunked into say 10-20 year periods; and timelines could be constructed for a number of subjects like:

-Mathematics -Science -Technology -Invention -Art -Music -Architecture -Law -Language -History -Social Studies -Politics

Wouldn't it be very interesting to construct timelines for each of these subject areas for a 20-year period, and observe how the various areas influenced and interacted with one another during this time span? How much better might G&T students be able to grasp the impacts and influences topical areas had on the fabric of countries....and civilization itself? Think of the insights this may propagate among your gifted charges. What kinds of complex question asking could this provoke?

Student teams could be assigned to perform investigative studies into these interactions, quoting examples which support their views and data. Teams could challenge and debate their findings. What a terrific way to see how subject matter integrates into a whole picture. Composite timelines could be constructed which attempt to capture the entire tone and spirit of a 20-year period. Students might try and name or "topicalize" the time period, referencing and comparing it against the main features/characteristics of preceding and succeeding time periods. Imagine what your gifted students could learn and synthesize from all this!

As students become adept at investigating time periods, they might discern trends and cycles within the fabric of our civilization as well as the interfaces between time periods. Perhaps they will see the warning signs of change and the parameters that foretell it. Could they forecast and test their hypotheses about the future?

Timeline study will be exciting and challenging to gifted students as they see their courses being woven into a panorama or continuum....rather than a loose confederation of subject information without any immediate or apparent connection to what they will be doing in real life. Individual subjects are important to study, and master, but their real beauty is fulfilled from their interrelationships with other subjects, much like the rich tapestry that is created when individuals band together to create something new. It is the richness of the orchestra over the soloist, both being important, but giving different perspectives. Gifted students must live in both worlds.

Armed with the viewpoint and perspective of timelines, G&T students will be better prepared to solve multi-dimensional problems where a variety of concerns must be integrated. Because they have become aware of the interrelationships of subjects, students will be

more receptive to understanding how pieces fit together to make up a whole story. Timelines are a tool to help understand the ever-changing nature of civilization and how changes rumble through time.

In some cases, students will inevitably learn that changes in one area may take quite a bit of time to show up in other areas, maybe even beyond the 20-year time chunk that is being studied. In other cases, the changes may be quick and very dramatic. Timelines will give your gifted students a chance to see the dynamics of change and come to appreciate civilization as a system.

Some Timelines to Research

Challenge your G&T students to investigate these key areas and determine how they impacted society and the speed or dynamics of the change in our country:

-Introduction of cell phones -Environmental movement -Solar and wind energy technologies -Television as a form of home entertainment -Computers in the workplace and home -Internet shopping and business transactions -Nanotechnology applications -Mass transit -Space program -Commercial airline travel -Rap music

How might a country's governmental and political system influence timeline changes?

What were the big changes in American education and the schools in the last 20, 50, 75 years?

How does war influence timeline changes and impacts?

Make sure your gifted students dig deep in their research and investigate how and when timelines began, merged, changed, stalled, and interacted. Having seriously investigated timelines, they are going to see learning in a very different light. Be there to guide them along on their quest to understand the complex world we live in, and never stop explaining how today's lesson plans and special projects tie into the larger picture.

Selected Links for Information on STEM (Science, Technology, Engineering and Mathematics) and Related Education Programs - Receive the complete list of over 160 STEM LINKS when ordering *STEM Education for Gifted Students* by Harry T. Roman – <http://amzn.to/qy9uBf>

Adventures in Rocket Science Educator Guide (NASA) <http://1.usa.gov/j9D6FX>

America's Best High Schools: The Elites (Newsweek Magazine) <http://bit.ly/c5u4IG>

Best Practices in Technology Education (Cisco Systems, Inc.) <http://bit.ly/g7zNas>

Challenger Learning Centers for Space Science Education <http://www.challenger.org/>

Children's Engineering Educators (CEE): Developing Technological Literacy at the Elementary Level
<http://www.childrengineering.com/CEEShop1.htm>

The Children's Engineering Journal – Virginia Children's Engineering Council <http://bit.ly/mNKjg6>

Discoveries Unlimited: Multiplying Possibilities. Provides STEM Mentors for Gifted Students.
<http://discoveriesunlimited.org/>

Edison Muckers – Edison Innovation Foundation. Presents numerous online lessons for elementary and middle school students on energy innovations and applications. <http://bit.ly/kykKOU>

Engineering is Elementary® – Engineering & Technology Lessons for Children. <http://bit.ly/AYmHU>

Engineering by Design™ – INTERNATIONAL TECHNOLOGY AND ENGINEERING EDUCATORS ASSOCIATION (ITEEA)
<http://www.iteaconnect.org/EbD/ebd.htm>

Engineering Empowerment is Mathematicians Collaborating for Children Indiana University Purdue University Indianapolis
<http://www.engr.iupui.edu/istem/content.php?id=42>

Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) – Study of Gifted Blacks in STEM Programs.
<http://www.giftedblackstem.org/>

Johns Hopkins Center for Talented Youth <http://cty.jhu.edu/ctyonline/ref/YR.html>

Junior Engineering Technical Society (JETS) <http://www.jets.org/>

MESA – Mathematics, Engineering, Science and Achievement – Prepares African-American, Native American, Latino and female students for college in mathematics, engineering, and science from elementary school and continuing through high school.
<http://www.seattlemesa.org/about.htm>

MIT Alumni Association: K-12 STEM EDUCATION TOOLKIT <http://bit.ly/jGOdGO>

National Girls Collaborative Project <http://www.ngcproject.org/directory/index.cfm>

National Institute for Women in Trades, Technology and Science – Provides resources and information for increasing the number of women in trades, technology and science fields. <http://www.iwitts.org/>