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Firefighting and Fire Safety in the Gifted Classroom

(This article has been modified from its previously published version in "Technology Education: Themes, Issues and Classroom Activities," Kelvin, 2006.)

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Here is a ready-made topic for the gifted classroom. Look me in the eye and tell me that you have students in class who do not get excited by the sound of a fire siren or at the thought of fighting a fire. Of course there is interest, and where there is interest, there is opportunity for education. Firefighting and fire safety is a topic of great relevance and G&T students can instantly identify with it.

The History and Basics of Fire and Combustion

Like any technology, firefighting has a history. Man has been fighting fire since it was first put to use as a source of warmth and for cooking food. As fire was brought inside man's dwelling space, fire fighting and fire safety took on a whole new perspective. Technology was developed to prevent, contain, and extinguish fires before extensive damage was incurred. We don't fight fires like we did during the early colonial periods of this country; and the types of fires we encounter today are very much different than the fires of yesteryear.

As our nation advanced technologically, our methods of dealing with fire changed too. What was once a volunteer activity for all able-bodied men has become now a professional firefighting organization – with well defined roles for the firefighters, specialized equipment, highly mobile response capability, and time proven tactics for containing and extinguishing complex fire events. So how does one teach this in the gifted classroom?

The key is to partition the subject into bite-sized chunks. Obviously the first thing to do is trace the history of firefighting to bring the subject into focus. Next I would recommend some basics of fire, the science behind combustion, and how to deal with the various types of fires likely to be encountered. Here, a discussion of the basic types of fire extinguishers and classes of fire (A, B, C) is important, as well as a discussion and demonstration of how smoke alarms work and where they should be placed in the home.

As gifted students understand what causes fires to erupt, a discussion of fire safety in the home can then be undertaken. Students can form teams to identify areas of their homes where fire hazards can exist and then develop safety rules to prevent outbreaks of fire. The teams can take one room in the house at a time and develop their safety rules for one room, and then see if they are applicable to other rooms in the house. It is important for the students to comprehend that the design of the house and whether it has an attached garage affects the fire safety concerns of the home. Once your G&T students develop their rules, they can compare them to fire safety rules that are already published in the literature or available from local town fire departments; and they can try extending them to multifamily dwellings or even commercial buildings.

For especially troublesome areas of the home, which are highly prone to fire, like the kitchen, fireplace, basement, attic, and garage, gifted students may be motivated to redesign certain appliances or structures to mitigate against destructive fires. They may even want to try redesigning the entire house to make it more fireproof and hence safer for human occupancy – exploring the types of building materials now in use and perhaps suggesting alternative materials. Research can be conducted to determine the major causes of fire and the consequent damage inflicted on wooden versus non wooden structures, and conclusions can be drawn from this research and reflected in improved designs.

Modern composite and synthetic building and furniture materials also present new firefighting challenges that students can investigate. Learning about building materials and house construction can be very instructive for your gifted students. They may even be able to trace the specific problems or firefighting challenges that new building materials and techniques presented as they were introduced into new homes. In a very real sense, the architectural appeal and the building materials used in a home can influence its fire safety. G&T students can take pictures of their homes, bring them to class, and compare them for fire safety concerns.

The Technology of Firefighting

Firefighting equipment has certainly changed over the years from horse-drawn hand operated conveyances used to pump water to today's sophisticated fire engines and ladder trucks. It's no exaggeration to think of today's fire engine as a complex water pumping station and multi purpose apparatus – not to mention its rather significant cost.

Why not investigate how these trucks are designed and identify the scientific and technological principles that are employed in their operation. Students could contact fire engine manufacturers to learn more about the types and styles of fire trucks and support equipment available. Different trucks could be compared to see how their capabilities differ, and what size fires they might be used against. Pumping pressures, hose lengths, and water delivery rates to a fire can all be explored.

And don't forget the firehouse itself. This structure has changed over the years as well. Why did they change? Was it because of larger fire trucks or were different techniques used to house the firefighting support equipment? Maybe there are both old and new firehouses in your town that can offer a basis for comparison. It sounds like a field trip might be in order for your gifted class to investigate just how a firehouse operates and gets notified of a fire. How does a town know where to locate a firehouse for maximum protection of its citizens? What are the normal working hours for firemen and how do they cope with the stress of fighting fires and saving lives?

What has also changed quite a bit is how the well dressed firemen looks. The technology associated with modern firefighting has enabled the fireman to have more fire resistant clothing, two-way radio communication, portable air breathing apparatus, and better water delivery systems. Have the students take a deep look at the new technologies being developed for firemen like sensors that allow the fireman to see through smoke, or beacon detection systems that allow a fireman to find a fallen comrade who may be injured.

There is tremendous student interest in firefighting. Build on that enthusiasm and make it work for you when you teach technology education. I'll bet your gifted students will never think of firefighting the same way again.

Discussion of New Book on Teaching Advanced Students in the Regular Classroom

For those teachers who are having difficulties in setting up stimulating programs for gifted students in the regular classroom, I highly recommend the following book by Joan Franklin Smutny and S.E. von Fremd: ***Teaching Advanced Learners in the General Education Classroom: Doing More with Less!*** (2011, Corwin). These difficulties may stem from the lack of proper resources or information related to teaching the gifted. By discussing major areas of education, the authors have provided an excellent resource for helping to overcome various obstacles including: identifying highly capable students, determining their interests, selecting and organizing stimulating lessons (at basic and more intensive levels, depending upon available resources), and differentiating instruction in the four essential subject areas. Smutny and von Fremd also emphasize the importance of developing gifted students' creative thinking, and interests in the arts and humanities. This practitioners' guide was developed by obtaining suggestions and feedback from classroom teachers in many different states. In addition, both authors have extensive hands-on experience in teaching the gifted and helping teachers to design effective programs for these students.

I would like to discuss some the key features of ***Teaching Advanced Learners. . . .*** as examples of why the book can help to improve instruction for the gifted in the regular classroom. Chapter 1, Understanding Advanced Learners, emphasizes that the current testing mentality in the public schools hinders the identification of students with high intellectual, creative and sensibility levels. It provides many practical ways for overcoming this problem by improving teachers' observational and assessment skills. Chapters 2 and 3 are concerned with Making the Most of Your Resources and Creating Appropriate Goals for Advanced Learners. Both of these chapters have detailed recommendations for identifying available resources and setting up appropriate goals. The chapter on goals is particularly useful because it includes a ten-point summary for establishing effective goals.

Chapters 4 and 5 focus on Meeting the Needs of Advanced Students, first by using beginning strategies and then by applying more advanced ones to extend learning. The beginning strategies in Chapter 4 emphasize modifying current teaching strategies to make lessons more challenging, and providing gifted students with more subject matter choices. Chapter 5 addresses more extensive classroom changes such as compacting, tiered activities, learning centers, and creativity/arts integration. Chapters 6 and 7 carry forward the information presented in the previous sections by showing how it applies to teaching the four subject areas to advanced students. Chapter 8 offers some creative ideas for inspiring teachers to become better educators of the gifted, and is followed by a Resource Section of useful books, web sites and publishers. I recently received an inquiry from a parent regarding useful resources for teaching the gifted. Smutny's and von Fremd's book was my first choice, and I also recommended that it be used by her child's classroom teachers. **Maurice D. Fisher**