

GIFTED EDUCATION NEWS-PAGE (VOLUME 22, NUMBER 5)

*Published by GIFTED EDUCATION PRESS; 10201 YUMA COURT;
P.O. BOX 1586; MANASSAS, VA 20108; 703-369-5017 www.giftedpress.com*

Preventing Stolen Cars: An Invention Challenge for Gifted Students (Revised from author's previously published and similar subject materials)

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Introduction

Good invention sets out to solve a real problem, a situation people recognize as important; and are willing to pay money for a solution. Invention, after all, is an expression of capitalism in action. Thomas Edison said it all years ago, "I invent to make money, so I can go on inventing." In the activity described below, gifted students can attempt to solve a very real problem. . . . the stealing of cars. We all read about such behavior in our community newspapers every day. Annually, this is a significant cost to society; and a severe safety hazard as speeding stolen cars can sometimes result in deaths and injuries to innocent citizens.

Getting Started

Allocate the time for your G&T students to investigate this problem, become familiar with it, the statistics, and various characteristics:

- How many cars are stolen each year?
- How is access gained to them?
- Where are they stolen from: Homes? Parking lots? On the street? Stores? Shopping malls?
- Which model cars are stolen most often?
- Who is doing the stealing?
- What age groups are involved?
- What are the costs of stolen cars: Added insurance costs? Lost revenue and increased cost to victims? Injuries and deaths associated with the theft? Increased police and security costs? Other?

A careful study of these issues by your G&T pupils sets the stage for how important this problem is to solve; and eventually that translates into what the market is willing to pay for a solution. All inventors must understand the importance of the problem they are trying to solve; and its impact in the marketplace.

Inventors must also know what technology already exists in the market. Certainly, any inventor does not want to try and duplicate products already there; but they are absolutely free to incrementally improve them, or radically innovate upon them. So there is another important thing that must be studied by your G&T students. . . the state of the technology already out there (and being planned) to prevent car theft:

- What are the major products already on the market?
- Can these technologies be classified by type: Steering wheel locks? Fuel supply shut-offs? Ignition shut-offs? Combination systems? Other systems?
- Which anti-theft devices seem to do better than others?
- Are there other system types being developed or advertised?
- What innovations are being discussed in the technical literature and popular press?

Encourage your gifted students to read widely from available literature and use a variety of sources like the library, the Internet, and if possible, product literature, brochures, and pamphlets that may be available to discuss the topic. There may also be behaviors that can be implemented by car owners to reduce the risk of their car being stolen – like parking cars in lighted areas, not leaving valuables in parked cars, locking cars, and making sure windows are closed.

Let's talk about marketing now. What is the public willing to pay for car theft security? The best way to start this assessment is to survey what it costs and identify a wide variety of products already on the market. How much does price influence someone's decision to buy? If the price of your students' inventions were higher than those of products already on the market, how much more would be tolerable in the market? The price survey and market assessment is absolutely essential; if there is a place where inventors fail, it is misunderstanding the market(s) for their new products. If inventors do not recognize the power of the customer's wallet, it will come back to haunt them big time. Emphasize the importance inventors must place on doing their homework before they even try to create or build a prototype of anything

Invention Time

Now it's time to stir up the creative juices and get those G&T student ideas flowing. The "pump has been primed" in the previous section. Your students should be oriented for action. Generate raw ideas and capture them on paper. Students can work individually or in teams, or a combination of both; but the most important thing is to allow plenty of time to engender as many ideas as possible, so they can be

thinned down to a few really promising ones later. Out of the box thinking, a redefinition of the car theft problem, unique perspectives on the problem.....all are to be encouraged and allowed as the idea generation process proceeds.

Here is the Edison model for the invention process which you can use with your gifted students as they undertake some creative designs for preventing vehicle thefts. This will greatly help organize their approach to invention:

- 1) Identify a problem worth solving – Do the necessary background research.
- 2) Evaluate the economics of the problem – Who will want this invention and what will they pay for it?
- 3) Identify possible constraints, impacts, or challenges – How is this new invention going to impact the world?
- 4) Identify potential solutions and get busy – Conduct experiments, design the solution, test prototypes, and record progress.
- 5) Test the invention against expectations – Does it conform to what was originally envisioned? Revise if necessary.
- 6) Market your invention – Get this new product out to the marketplace.... and let the world know what you have done.
- 7) Improve your invention – Learn continuously, grow and change the product over time.

Here is another Thomas Edison inspiration....his four rules for inventive/entrepreneurial success:

- Think out of the box.
- Be entrepreneurial.....take risks.
- Fail your way to success.
- Success demands that you improve your products.

It is advisable that G&T student teams working on this challenge also keep detailed invention notebooks so they can track their ideas and how they developed, gain practice in communication skills and how to express their ideas in clear, succinct language, and practice the invention process just like real inventors.

A little organization can help out here. There are actually several classes of inventions G&T students should consider:

- Inventions that incrementally improve products already on the market;
- Inventions that propose totally new ways to protect cars; and
- Inventions that are new and built in at the automotive factory.

Gifted students should be free to decide which class they are going to innovate in, but should recognize where their inventions lie in the overall scheme of technology. Such recognition also aids the students in realizing how they would ultimately market their products.

After the idea generation phase has been completed, your gifted charges must now figure out a way to prioritize all their ideas and narrow their focus down to a single idea they can invent around. Encourage the students to develop a matrix-type evaluation chart (spreadsheet(s)) where their ideas can be ranked and prioritized, and a winner selected. This is exactly what occurs in the business world. Matrix charts are an indispensable tool for this kind of “idea winnowing process.” The real key here is to make sure the categories being used to compare the various ideas do indeed represent the broad range of the invention challenge...the technical, economic, and social aspects of the car theft problem. The more complete the matrix evaluation process, the greater the likelihood of selecting the best options for development.

Keep in mind there is also a place for deterrents that can be simple and very effective. This could include signs, tags, optical illusions, and other such things that may have a significant impact on car thefts. Solutions do not always have to be complex or expensive. They could greatly confuse would-be car thieves, thus reducing car thefts. Be on the lookout for such radically simple ideas!

This practical activity focuses on a very real problem. I have actually given this challenge before in 8th grade classes; and was amazed at the range of ideas generated. Let the ideas be presented in poster and oral form by your gifted students. This is a superb opportunity to integrate the written and communication skills into the activity.

Additional Classroom Activities to be Considered

- 1) Have your gifted students develop advertising materials for their inventions, discussing their various features, touting effectiveness and costs.
- 2) Contact manufacturers of existing anti-theft devices to obtain product literature and to learn about the technology already available.
- 3) Invite police officers into class to hear what they have to say about vehicle thefts and the current thinking from the perspective of a law enforcement agency.
- 4) Create a public information brochure about how to prevent vehicle thefts – common sense things to do to reduce the risks of theft.
- 5) Identify ways citizens can work with police departments to prevent vehicle theft and recovery of the vehicles.
- 6) Develop ideas for how stolen vehicles could be somehow tied back to a personal hand-held device like a smart-phone, iPads, Blackberries or other devices that would promote quick location and recovery of stolen vehicles.