

### Creativity Inspirations, Lessons and G&T Classroom Challenges

Harry T. Roman

Author, Technology Educator, Inventor, Retired Engineer

#### A Candle

The most important lesson I ever learned about observation was that taught to me by my inspirational high school science teacher. He walked into our classroom one morning, lit a small white candle, and said, "You have 30 minutes to write down as many observations of this candle as you can. A good observer will make about 150-160 observations. Begin now!" He then left the room.

When he returned, the class discussed what they had observed. The best we could do was 65-70 observations. We naturally complained, as he stood smiling calmly. "You all actually did a good job, but only half a job. What didn't you observe?"

The second time around we scored much closer to the 150-160 level. What you don't see is as important as what you do....and that goes for creativity too. Take care to look at both sides of the observation spectrum. Don't do half a job. Powerful clues to creative idea generation may be lurking in the shadows. The absence of a color, an odor, a certain chemical,....whatever may be an important stimulus for making, advertising, marketing the product/idea. Discipline yourself to always ask what is not observed about your new product/idea.

#### Twister

Years ago I saw that great action movie Twister and came away with an interesting idea. The weather scientists in the movie are trying to get tornadoes to suck up electronic sensors that can tell them about the inner workings of the giant storms. The ping-pong ball size sensors would transmit their information back via radio to the scientists. I completely enjoyed the special effects of the movie, but kept thinking about those flying sensors.

What if the sensors could be made really small using micro miniature construction techniques? Could I spill a can of those sensors into a large oil-filled electric utility substation transformer and have them circulate around in the oil and tell me about the health of the oil, what the temperature is, what contaminants are in the oil, and if they hear any sparking sounds? This would be very valuable to me and my company since one of those transformers costs \$2 million if it fails, and months of outage time.

If I can put them into oil, might I put them into other things like the air and water waste streams of power plants to check on pollutant dispersal? How about the human bloodstream? All sorts of ideas were spinning off that adventure movie, just like the wind from a tornado.

As it turned out, such micro miniature sensors in oil or water were a lot more complicated than I originally thought, but the brainstorm provided enough excitement at my job to get me some seed money to study how micro miniaturization technology could be applied right now. Working with a local college, we were able to identify a variety of possible near term applications for tiny sensors; and five years later, we built and tested several of them.....the first in the industry. We had turned a wild, futuristic idea into an interim and useful concept, and obtained patent protection on the devices. The industry is also waking up to the ideas we used and the concepts we conceived to make the whole utility grid much more intelligent. All this from a movie!

#### Alien

Speaking of movies,.....remember that fight scene in *Alien* where Sigourney Weaver lays a beating on the alien while she is wearing that immense, powerful supersuit? It gave me an interesting idea too. Could I combine robotic devices and humans by designing a light-weight supersuit that our workers could wear to amplify their strength? Most of the on-the-job injuries stem from lifting related accidents. Suppose our workers were equipped with such suits. Could we reduce lifting injuries and also allow them to lift even greater weights?

I had this idea many years ago while working for an electric utility company, but it was so very expensive to try and design and build a suit at that time. However, today light weight suits are being seriously considered for use by the military, and for the physically challenged. Movies are a great source of ideas and can definitely ignite creative sparks!

## The Leaking Wall

I had this real pain in the butt leaking wall in the stairs leading down into my basement. The concrete blocks making up the side walls to the stairs had cracked and during heavy rain, the water in the soil found its way into the stairs and down in the basement. The crack was thicker than my pinky finger. How was I to seal it?

For some reason, one night as it was raining heavily and I was in the basement looking forlornly at the water dripping in, my mind thought of an old wooden sailing ship hull with the mortar between the blocks being analogous to the caulking between the side boards of the ship hull. What would a sailor do with a leaking hull I thought? How would he and his mates stop the leak? Probably by using some rope hammered into the leaking space and some pitch dabbed over it, he might be able to slowly stop the leak.

Well I had some rope—the nylon kind—but no pitch or tar handy; but I did have a fresh tube of high grade silicone sealant. I got out a rubber mallet, a stick, the rope, and the sealant,..... and went to work. I cut short lengths of rope and first applied a really thick bead of sealant deep into the crack. Next I pounded a section of rope into the crack, deep and tight. Next another bead of sealant followed by more rope. I did this about six times and the water stopped dead in its tracks. That was over 25 years ago!

Why did I make that shipwright connection to the problem I had at hand? All I can reason is that by having a wealth of knowledge at your disposal, your brain has food for thought and can make associations and comparisons when faced with a problem. It looks for similar problems that it can draw assistance from and perhaps apply. Our minds are associative. Being well-read and being an across the spectrum reader is a great way to build an idea and application base that your active mind can draw upon. The mind tends to parse problems into segments it can understand. Give it lots of food and nourishment in a problem-solving bank account it can draw against.

I might add that I used the same rope and sealant technique to keep my bathroom tub from leaking, where the tub rim meets the old tile wall.

A similar technique is used by dentists when they do a root canal on a tooth. The hollowed out roots of the tooth are packed with a long recognized sealant, gutta-percha. They use a heating wire to pack the roots nice and full. It is actually quite an interesting process...if you are not scared out of your gourd while sitting in the chair.

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### For Your G&T Students to Try!

Challenge your G&T students to think creatively. Have them consider some practical problems to solve. Here is a list of things to get those young minds humming. Pair the students in 2-3 person teams so they can innovate off each other's ideas. Drawings, diagrams, sketches, schematics, and images are welcome and encouraged. Also, ask them where they get creative ideas from. What prompts their creativity?

-How can you remotely disable a stolen car so there is no dangerous high speed chase with the police involved?

-You want to trim some branches on a tree about 20 feet off the ground; but you are afraid of heights and want to do this from the ground. You cannot use a long pole with a saw attached to the end of the pole. How would you do it?

-In the backyard of your house is a series of solar panels that make electricity. The panels are located on a ground-mounted structure allowing you to walk right up to the panel array. You want to increase the output of the panels. How can you do this without radically modifying the array? Where else could the techniques you develop also be used for large arrays on flat roofs? (No use of magnification lenses!)

-Electric power outages can be disturbing and life-threatening in cold winter months. Is there a way to generate electricity in your home? Maybe you can use the natural gas that comes into your home as a source of fuel energy to make electricity? How might you envision a process for this? Natural gas outages are very rare—so this fuel input could be very helpful in reducing electricity outages. Think about this interesting problem!

-Violent storms that sweep through remote areas, island communities, and poor countries cause many victims to succumb to weather exposure afterwards. Can your gifted students design low cost, quick to erect emergency shelters? How could the structures get distributed to the afflicted areas? What special features might become designed into them?