

# Letter to a Young Scientist

## *Science Pays in Many Ways*

By JAMES B. SHORT<sup>1</sup>

**James Short** attended the Bryan (Ohio) City School District, where he had his first experience in science fairs. Following his formal education at The Ohio State University and Defiance College, he taught science at Gorham Fayette Local Schools for a quarter century. Understanding the transformative effect of science fair projects in his own life, during his teaching career he emphasized the importance of independent science projects for all students. The result was a legacy of high school students excelling in local, state, and national-level science fairs and science days—including the International Science and Engineering Fair. After retirement from teaching he has continued his involvement in science fair activities, and is currently the Director of the Northwest Ohio Science and Engineering Fair. During his long career he has come to understand the many ways that science education can benefit everyone in society. Mr. Short is a Fellow of The Ohio Academy of Science.

**T**HIS MESSAGE WILL ENCOURAGE YOU TO investigate science. If you are from my area of the state—northwest Ohio—you will probably have heard my standard statement: “**Science pays in many ways!**” If you have not heard this, let me explain.

### **A Long Look Back**

I am a very “seasoned” citizen. I participated in my Local and District Science Days back in the 1960s. After graduating from The Ohio State University with a fisheries management major, and no employment possibilities, I attended Defiance College to obtain my teaching credentials. I was hired as half of the science teaching faculty at Gorham Fayette Local Schools (GFHS) and completed my employment in the same building and room(s) 25-years later.

### **Science Pays in Many Ways**

My statement—*science pays in many ways*—has developed over these 60-plus years. My early 7th

grade science project started the process by helping me become interested in all areas of science. (Before that time, all I wanted to do with science was to go fishing!) Now I was able to see all the necessary research, planning, writing, building, and practice needed. I was also forced to speak to my adult judges.

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Each year my projects became more involved and detailed, yet I was intrigued by the questions and situations that kept occurring. I was pushed to learn new mathematical, mechanical, and social skills. I met other students, teachers, and specialists. Each of these occurrences I see as a *payment* from science, since I was gaining information, knowledge, and social interaction.

Teaching not only furthered my opportunities to payback my love for science but also to keep receiving these payments. Yes, the salary of a teacher was much appreciated and needed; however, the payments have arrived by many different methods. I re-started, and further developed, a local science fair in my school district. Grades 7 to 11 in science classes were required to have projects. The first year was so successful that one of the students was selected as a finalist at the International Science and Engineering Fair (ISEF) held in Minneapolis-St. Paul, Minnesota. What a payment, not only

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for me, but also for the student! There were several other payments that I observed. Not only was I invigorated by the success of my students but also the students were excited that they were able to finish a project of this magnitude—and achieve recognition for their academic efforts. Even many educationally challenged students, who had never had success in their educational activities, were recognized with Superior and Excellent ratings.



The local science fair participation was followed by district, regional, state, and international levels of presentation, display, and competition by my students. These students continued to prove that science pays in many ways: trips and major cash awards were won; they earned top placements in multiple categories of the middle and high school divisions of competition; plus they received many employment opportunities, lab experiences, book awards, and equipment awards.

For several years, students from our school won the highest or most Superiors at District Science Day at Defiance College. We usually had over 24 participants from our small school (about 600 students, K-12). After 25 years of teaching, the school had many ISEF finalists and student observers. The trophy case also displayed 4 prestigious Shaw Awards from the State Science Day. All of the advanced science day participants are considered *champions*; the payment they received was the knowledge gained in planning, making improvements to their projects, and the experience of the competition—as well as any added monetary awards.

How many students in a small school can be called state champions or even state qualifiers? At one time GFHS was in the top 10 schools sending students to the State Science Day, averaging about 6 students per year.

### **The Payments from Science... For the Teachers**

During my teaching years, I became involved with the District Science Day, State Science Day, and Regional Science Fair. I have been a district councilperson and a State Junior Academy council member. Currently I am the Director of the Northwest Ohio Science and Engineering Fair, which sends students to ISEF.

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Payments I have received from working with students include:

1. Being invited by a regional student to attend, as their guest, a weeklong expenses-paid workshop at the Department of Energy's Oak Ridge National Laboratory, Oak Ridge, Tennessee
2. Being selected as one of the two Ohioans to be part of the 8-week Department of Energy Research Program at the Pacific Northwest National Laboratory in Pasco, Washington
3. Being able to attend over 20 International Science and Engineering Fairs along with the top student-scientists in the world
4. Being provided the opportunity to meet and talk with outstanding science educators from around the world
5. Being privileged to meet Nobel laureates
6. Being fortunate to witness my students' successes and achievements associated with their projects

### **The Payments from Science... Even More for the Students**

More specifically, here are some benefits that I have witnessed students achieving:

1. Receiving a \$50,000 college scholarship (many)
2. Employment opportunities during the summer after they graduate high school
3. Receiving \$1,000 cash awards
4. Receiving \$500 cash awards
5. Receiving a 4-year, \$18,000 scholarship
6. Introduction to a university with a subsequent enrollment into that university (scholarship)
7. One-week expenses-paid US Navy experience
8. Full college tuition and research space
9. Full college expenses from associated scholarships through PhD
10. Early placement into advanced medical field education
11. National recognition via television or radio broadcast
12. Meeting famous people, such as Nobel laureates and a legendary football coach
13. Meeting a future spouse
14. Discovering unknown interests
15. Improved self confidence

### **Science Builds Many Key Life Skills**

Science pays beyond the possible *glory* awards. Science fulfills the need for many skills including: organization, time management, materials procurement, planning, reading, writing, research, exploring new technologies, mathematics, verbal and visual presentation, data analysis, display planning and preparation, following rules, public speaking, analyzing media validity, patience, practice, and social interaction.

Here is a final story for you. I had a student who was very diligent and completed her science fair projects as instructed, although I knew she did not like the assignments. She went to college and as a senior was told that she had to have a senior project. I am guessing that she grumbled, but went ahead and prepared for the assignment as she had

been taught back in middle and high school. After completion she wanted to get it out of the way, so she volunteered to go first. Her classmates were not happy with her; she set the expectations so high they had to scramble to even come close to her presentation. A display board, reports, pictures, and models were used—just like she had learned. She passed!

Yes, I have received many payments from science. But I am most happy for the payments that I see coming to young student scientists who put in the work, avoid the hazards that appear, and successfully complete and present their projects at a science day or science fair.

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