

Carrots and Sticks: A parent asked me a good question recently. We were discussing my Bonus Assignments, and how the number of attempts were far lower than I believe they should be. “If you think they are so important,” she asked, “why don’t you require them?” I’ve been asked similar questions about Bonus Assignments and about Family Science projects in the past, and I imagine other parents (and students) have wondered about this without verbalizing it to me.

Daniel Pink, Alfie Kohn, and others researchers have studied motivation. The findings show rewards (carrot for doing your job, stick for not) have seven deadly flaws:

- They can extinguish intrinsic motivation
- They can diminish performance
- They can crush creativity
- They can crowd out good behavior
- They can encourage cheating, shortcuts, and unethical behavior
- They can become addictive
- They can foster short-term thinking

Short term, requiring Bonus Assignments would ensure more students attempts. Long term, we risk diminishing intrinsic motivation in students. “I chose to complete this project to improve my problem solving abilities” is a comment made by an empowered student. **Note:** Carrots and sticks work best for routine tasks, which require little creative thinking.

The One-Minute Timer was the most recent Bonus Assignment. I asked students if their final product was their first idea. In many cases it was not. “I started out

with a marble run toy, but it took way less than a minute so I scrapped that idea,” stated one student. In one class three students all made hourglasses in which sand flowed from one container to another. Although all worked at home, two of the three clogged in class. Students explained that they had made the holes in the hourglass bigger to prevent clogging, but this necessitated more sand since it flowed faster. The third student explained that her family had dried the sand in the oven to prevent clogging from moist sand sticking together!

After sharing these observations with my classes I was pleased to hear students tell me that, even though I had been explaining the importance of trying extra challenges all year, they now better understood the learning opportunities they missed by electing to bypass the projects. One doesn't have to become a scientist or an engineer to benefit from being able to look at a problem, design solutions, and evaluate them.

Bonus Assignments are offered **twice per trimester**. Although some students spend a lot of time revising their work, basic projects can generally be completed in 15-30 minutes. (Remember, all projects are acknowledged whether they work or not.) I offer Family Science projects **once per trimester**. (Slow Down! is the current Family Science project—due May 11. The explanation video is on the Family Science page of my website.)

Choice: According to Pink in his book ***Drive: The Surprising Truth About What Motivates Us***, research shows that three elements motivate people.

- Autonomy
- Mastery
- Purpose

For the past two years I've run a learner-paced science class. Students work at their own pace and choose the type of product to create to show evidence of their learning. Until our current unit, Forces & Motion, students had no choice on the unit activities. During this unit, I experimented with a Phenomena-Based approach. I selected 23 responsible students who wanted to try this approach. The Phenomena-Based students focused on explaining either how cephalopods (squid, octopi) can move by jetting out water or why a steel sphere falls faster through water than a glass marble (this doesn't happen in air).

Although all 23 students have shown great responsibility with phenomena-based work, it's been a challenge for me to manage so many different things happening in my room at one time. I had all but decided not to try it again, but when I interviewed the 23 students, most felt they learned more than in the standard approach. **Choice (autonomy)** matters! Not only did allowing students to try the phenomena-based approach give students more autonomy, it also gave the unit a clearer **purpose** (explain the phenomena). Daniel Pink would not be surprised by positive student feedback!

Empower: I recently read *Empower* by John Spencer and A.J. Juliani. The subtitle is What Happens When Students Own Their Learning. I highly recommend this book to all educators and parents. (It's a quick read, yet thought-provoking.) In describing the creative process, the authors list **copying** as a common stage. Someone learning guitar may begin by playing a Beatles song over and over. Once mastered, she may make changes (new arrangement, different instrument). These changes make the product her own. Often I see something intriguing on YouTube and I begin by copying it. Assuming I get it to work, I then often ask "what if?" questions, and make it more my own. I tend to learn a lot while trying out variations on the original.

Sound & Light: This will be our final content unit of the year. For the final product, each student will make their own solar cooker. Most all work will be **done at home**. (More information coming later in May.)

Instead of trying phenomena-based the way I did in Forces & Motion, I am going to trying something new. This new approach will give students autonomy and a sense of purpose. I've made a playlist on my YouTube channel. Students may watch these videos, and if interested, can select one to copy. After copying it, the expectation is they will change a variable. Students will predict what they think will happen and analyze what does happen. I will send home more information for parents shortly. In order to try this out, parents will need to let me know that they are available to provide materials, tools, and possible support at home. (Few of these projects can be completed exclusively in class). **No student is obligated** to try this—the standard approach is still an excellent option.

Hope your family had a pleasant April Break. It looks like winter has finally been vanquished! Should you have any questions, or would like to observe a class, please contact me at dstith@londonderry.org