# Keheley Needs the Cube!

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**Project Overview**

With the introduction of common core mathematics several years ago, teachers have grappled with how to teach their students perseverance in the face of problem solving. Many innovative ideas and classroom activities have been created to address real world problem solving skills. However, the challenge still remains to refrain from "teaching the students" how to solve versus allowing them to struggle to solve.

Last year I introduced the Rubik cube to my 4th and 5th grade Gifted students during their one day a week with me. I immediately noticed the perseverance road block. Students who are normally able to push their way through problem solving due to a unique skill set were suddenly in tears and in udder frustration. At first, I panicked. What had I done to my students? Then I realized this was a good thing. I began to refer to it as "brain burn". They weren't able to find a way around it, there was no "quick trick" to complete it. I stuck with it and fought my way through the process of facilitating true perseverance.

The students began to talk and soon began bringing their own cubes to school. Excitement and collaboration began to overtake frustration and desperation. Self-confidence began to blossom and student leaders began to emerge. Teachers began to notice and they began supplying cubes in their brain centers in the classroom. All this excitement over the cube was great, but I hadn't seen the true impact until a fifth grade boy, who visited the special education classroom next door to my room, approached me one day carrying his own cube. My heart sank a little as in my incorrect thinking, I thought it might be too much for this boy, who I knew was already struggling academically. As we talked on our way down the hall, I realized: He's engaged! He's motivated! He wants to persevere! After a few hallway sessions, he brought me a solved cube one day and a sense of accomplishment that melted my heart. At that moment a light went on and I realized I needed to get a cube in as many hands in our small school as possible to foster perseverance and problem solving, while teaching students the process of solving the cube. I immediately reached out to our media specialist who has created an amazing makerspace for our students and we began plotting on how we were going to get cubes out to our third through

fifth graders. We've borrowed from the lending closet at the YOUCANDOTHECUBE website but they only loan them for 6 weeks and it just wasn't long enough. We need our own cubes!

In my own experience of introducing the cube in my gifted classes I've noticed the following:

Students collaborate and model for each other
Students must follow directions!
Increasing perseverance/problem solving
Managing frustration
Building confidence/self-esteem
Spatial reasoning
Critical thinking growth
Increase in their visual and tactile learning
Independent learning
Developing leadership roles

This is how our project was born and our plan began to develop. We want to have enough cubes for teachers to check out for the classrooms and we want to have enough cubes for students to use in makerspace and then phase in checking out cubes to take home. Next, we will host a competition and use any money raised to go back into purchasing more cubes and resources. Our goal is to have a Rubik cube available for everyone in the school and for our community to be actively involved.

**Project Objective**

As stated in the paragraphs before, our goal is to provide a motivating and engaging activity for students to develop their perseverance and problem solving skills. It fits nicely into the established curriculum with ties to standards using algorithms and geometry. The Rubik cube also lends itself to STEM/STEAM standards that can be introduced in the classroom as well. We want this project to stretch from every classroom and even into our ASP program. Our project will consist of three phases.

Phase I:

- Introduce the staff to the Rubik program
- Provide resources each teacher in grades three through five (we may need to do Pilot Teachers First)
- Allow teachers to get more comfortable with introducing the cube to their students
- Become familiar with the free resources on the Rubik website.
- Teachers will receive their cubes and begin phasing them into instruction
- Introduce cubes into the Makerspace in our Learning Commons

Phase II:

- Allow cubes to be checked out of the media center
- Pilot Teachers will model and support the rest of the teachers in grades three through five to implement

- Every student in grades three through five should be touching a cube
- Begin implementing the idea of a sponsored competition

*By this time every student should be learning to solve the cube and the glorious aroma of brain burn will waft through our building.*

Phase III:

- Expand to mosaics
- Introduce our first competition
    - Charge a small fee and all funds will go back into purchasing more resources (2X2 and other cubes)
    - Offer reasonable prizes

**Target Population**

Our target population is grades three through five at all academic levels. We will also include a mini program in ASP and coordinate training of some of the staff to facilitate this during after school sessions.

**Collaboration**

The collaboration portion will include all classroom teachers in grades three through five including special education teachers as well as ASP teachers. Our media specialist will control the inventory of cubes and collaborate with teachers for students to participate in makerspace and having a tub in their classroom. We'd like to see this grow to include our Art teacher who is amazingly talented and would help us facilitate the mosaic portion once we get there. We will also reach out to our foundation, partners in ed, and other local businesses to help sponsor our program and the competition. Collaboration on many level will be necessary to allow our program to gain sustainability and grow.

**Budget**

Cubes ordered directly from the company come with a colorful booklet with directions on how to solve the cube and we'd like to order from them to receive that booklet. Cubes cost an average of $10 per cube. However, if we order directly from the company, each cube costs approximately $7.60. Each kit ordered comes with a flashdrive of resources, resource books for teachers, cubes, and the colorful how to booklet for each cube. All the videos, links, and online resources are free and easily accessible form a laptop, desktop, or iPad. We'd like to begin our program with 200 cubes.

Ordering directly from the website we can order 6 X 36 cube education kit @ $274.99 per kit. That would be approximately $1,644.00 to get our program off the ground.

https://www.youcandothecube.com/educators/shop

| Item Description | Amount | Price per unit | Total price |
|---|---|---|---|
| 36 Cube Education Kit | 6 | $274.99 | $1,649.99 |
| Learn to Solve Curriculum | 1 | $94.95 | $94.95 |
| Elementary STEM Unit Bundle | 1 | $30.00 | $30.00 |
| Shipping | | | $60.00 |
| Total | | | $1834.94 |

**Communication**

Once we are awarded the grant, we will immediately reach out to our PTA, Foundation, and our Partners in Education to begin the process of planning a community event for sharing and possibly our first friendly competition and/or exhibition. We want our community to embrace the cube! At this point, it will be necessary for us to form a committee to plan and facilitate community events starring the students! We will definitely be inviting the Cobb Schools Foundation to see the amazing impact this project will have on our students and our community. We will share our success via social media, including the Keheley Facebook page, Keheley Twitter, Keheley website, and PTA events. The cube has been around since its introduction in the late 70's. I'm sure many parents and grandparents will enjoy seeing their children and grandchildren solving the cube as they once did and giving it a try themselves and maybe get to solve it this time!