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**2019-2020**

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**Merge Cube:  
The Future of  
Education is Now!**

# Merge Cube: The Future of Education is Now!



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Image Credit: Merge VR

## Goals and Objectives

My objective was to help my students (especially my ESOL students) advance academically by implementing a STEM-based Augmented Reality (AR) experience using the Merge Cube within the classroom. Students would be able to learn by taking part in an interactive experience with the Merge Cube that reaches all types of learners (tactile, kinesthetic, visual, and auditory). As a STEAM (Science, Technology, Engineering, Arts, and Math) Designation School, we are driven to motivate and engage our students to think strategically and problem solve. Using the Merge Cube has not only accomplished my objective but has also helped my ESOL (English Speakers of Other Languages) students acquire necessary vocabulary in an interactive way.

As an educator, I'm always looking for new and innovative ways to engage my students and get them excited about learning. As a parent, I also know how frustrating it is to get kids interested in learning something new which they believe is not necessary for them in life - especially if it is not going to help them in what they already do with most of their free time, such as Fortnite, Roblox, or Minecraft. That is why using the Merge Cube is so captivating and engaging for students. It is one of the most easily accessible devices to use when teaching hands-on science with augmented reality.



Image Credit: Merge VR

## Common Core Science Standards

According to the Florida Department of Education, the NGSSS (Next Generation Sunshine State Standards) for science are organized by grade level for grades K–8. Although 18 Big Ideas are present throughout all grade levels and build in rigor and depth as students advance, not all grades have benchmarks for each Big Idea. The benchmarks for grades K–2 serve as a foundation for grades 3–5 benchmarks. For that reason, science teachers in K–2 must ensure a good, solid foundation so that students can succeed later on in school and when they take the Science FSA in 5th grade.

These are some of those foundational standards in the elementary grades which can be mastered using Merge Cube applications:

**SC.2.E.6.1** Recognize that Earth is made up of rocks. Rocks come in many sizes and shapes.

**SC.2.E.7.2** Investigate by observing and measuring, that the Sun's energy directly and indirectly warms the water, land, and air.

**SC.2.L.17.2** Recognize and explain that living things are found all over Earth, but each is only able to live in habitats that meet its basic needs.

**SC.2.L.14.1** Distinguish human body parts (brain, heart, lungs, stomach, muscles, and skeleton) and their basic functions.

**HE.2.C.1.6** Recognize the locations and functions of major human organs.

**SC.3.E.5.3** Recognize that the Sun appears large and bright because it is the closest star to Earth.

### Middle School Standards:

**SC.6.E.6.2** Recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas, and lakes and relate these landforms as they apply to Florida.

**SC.7.E.6.2** Identify the patterns within the rock cycle and relate them to surface events (weathering and erosion) and sub-surface events (plate tectonics and mountain building).

**SC.7.E.6.5** Explore the scientific theory of plate tectonics by describing how the movement of Earth's crustal plates causes both slow and rapid changes in Earth's surface, including volcanic eruptions, earthquakes, and mountain building.

**SC.8.E.5.8** Compare various historical models of the Solar System, including geocentric and heliocentric.



Image Credit: Merge VR

## Introduction

It may be hard to believe but by 2025, two billion of the world's population is going to be made up by the youngest generation: Generation Alpha. Generation Alpha is made up of children born between 2010 and 2025 (Vargason, 2017). This generation of students is considered to be the most technologically infused generation to date. They have no problem using technology, smartphones, tablets, and computers. These students have never known a world without Internet, or video games.

Infusing the classroom with modern technology is essential in addressing today's student needs (Wichlinski, 2017). Wichlinski (2017) goes on to say that "by integrating these methods into our current system (of instruction), we can better prepare students for the real world." Therefore, today's educator must captivate the student's attention with game-based learning, virtual reality and augmented reality devices in order to engage the Generation Alpha students to learn. Being an educator in this technological era means staying up to date with engaging programs that will help students not only understand complex and abstract concepts but allow them to see how those concepts are useful in preparing them for their possible future careers all while keeping in mind that many of these careers do not even exist at the present moment.

## Course Outline and Overview

Being a parent of a child that constantly needs motivation to succeed in school has given me a different perspective and approach to engage students within my own classroom. Every student wants to succeed but getting them motivated in education is key to achieving that academic success. Ask a student to study for a science test and I'm sure her or his motivation to pick up a book or an outline defining scientific concepts and vocabulary is less than positively taken into consideration. Yet, ask a student to take out a cell phone or tablet and use a hand-held cube to learn about the human body with a 3D holographic image and their curiosity, engagement, and motivation has suddenly reached new heights. This type of learning is the future of education.

Through the use of digital technology, virtual realities can create experiences for students which would otherwise be very difficult or even impossible for them. Since today's students are very tech savvy, why not take advantage of their technological skills and infuse their education with 21<sup>st</sup> century learning?

As an educator, I not only want my students to succeed academically, but also to positively impact their future success, college plans and careers. The future of education is technology. According to April Chamberlain (2014) the District Technology Integration Specialist at Trussville City Schools, "Education is evolving due to the impact of the Internet. We cannot teach our students in the same manner in which we were taught. Change is necessary to engage students not in the curriculum we are responsible for teaching, but in school. Period." If we are to truly prepare our students for their future, we must grasp the idea that technology is and will surround every aspect of our lives.

Given what we know from this new generation of student learners, as educators we can't teach them the way we were taught; no more "old school" techniques and strategies. We must find new means of engagement with our Generation Alpha students; yet at the same time, as teachers, our means of funding new technological devices must be



cost effective. Let's face it, although we are a technological society, schools can't afford to provide teachers with new digital devices for each student; it's just not possible. We must be creative, tech savvy, and resourceful in order to provide our students with that high level of digital technology engagement given our monetary constraints. This is where the Merge Cube comes to save the day.

The Merge Cube costs only \$20, yet its capabilities and applications are immeasurable in terms of student engagement and cost effectiveness. You will also need a smartphone or tablet and to download the free applications called *Mr. Body* and *Galactic Explorer* from your App Store. The Merge Cube acts like a QR code, giving the apps the ability to appear holographic and in 3D. If you don't feel safe handing over your smartphone to your students to use with the Merge Cube, you can buy the Merge AR/VR Headset - Augmented and Virtual Reality Goggles (\$30) and securely put your phone in the protected goggles.

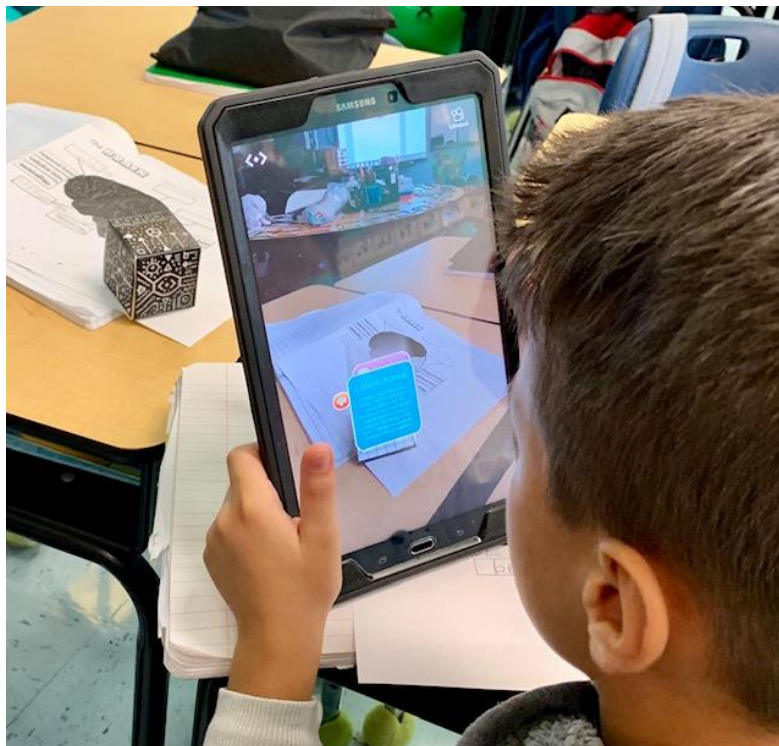


Image Credit: Merge VR

My entire 2nd grade class of 19 students participated in using the Merge Cube during Science. We met a total of 150 minutes every week (two days for one hour and one day for half an hour). The beauty of the Merge Cube is that this one product can be used from K-12th grade, yet

in my opinion, given the apps I utilized, it would be better suited for elementary and middle school students serving as a solid foundation in Science skills for high school students.

I began using the Merge Cube with my Science class for the second half the 2018-2019 school year and witnessed how it helped not only my struggling students succeed academically, but my ESOL (English to Speakers of Other Languages) students, who lack the vocabulary and English language, as well. Since some of my students are ESOL Level 1, I found that when they brought their own devices (configured in their language) to use with the Merge Cube, all the text for the desired information was in their home language. Students got to see what each piece of information said in their language, while learning the vocabulary terms and meaning in English. This was an even greater feature I didn't even know was available until I started using it with my ESOL students.



ESOL student viewing text information in his own language.

Sample Lesson  
The Human Body Part: Brain



**Standard**

**SC.2.L.14.1** Distinguish human body parts (brain, heart, lungs, stomach, muscles, and skeleton) and their basic functions.

**Body of Knowledge:** Life Science

**Big Idea:** Organization and Development of Living Organisms

**Learning Objective:** Understand how structures and systems of organisms in the human body perform functions necessary for life. In this lesson students will gain the skills to identify and explain the characteristics and functions of the brain and the different sections of the brain.

**Vocabulary:**

Frontal Lobe

Occipital Lobe

Cerebellum

Temporal Lobe

Parietal Lobe

**Materials Needed**

- 1 Merge Cube for every 3 or 4 students

- Science Journal
- 1 Student tablet, iPad, or smartphone for every 3 or 4 students
- *Mr. Body* App downloaded from App Store on student devices
- Brain Game Worksheet from:  
<https://thecraftyclassroom.com/crafts/anatomy-crafts-for-kids/brain-crafts-activities/>

### **Prior Knowledge**

Students should know that the human body has different body parts and they all have distinct functions. Students should know that each body part has a similar function (example: skeleton - supports the body, muscles - movement of the body, etc.)

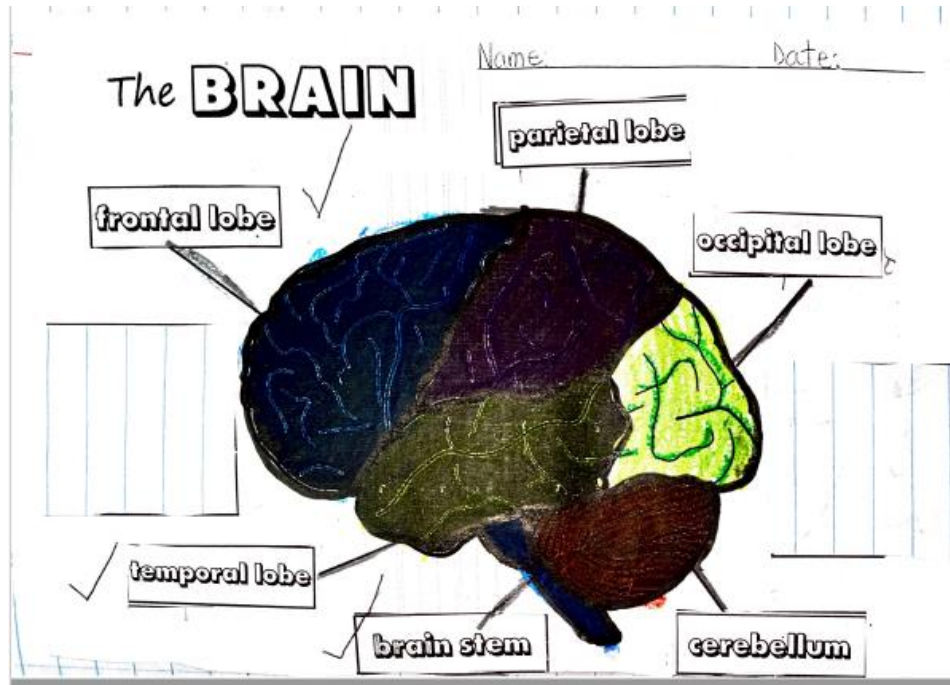
### **Activities**

1. Students will go to <https://safeshare.tv/x/qZUaQqyJsa> to view an introductory video on the brain.
2. Students will then be placed in groups of 3 or 4 and be given a Merge Cube to use with their own devices with the *Mr. Body* App.
3. Students will be given 5 minutes with the Merge Cube to explore the major human parts inside the body.
4. Distribute Brain Game Handout depicting the brain so that they can label each part of the brain with their Merge Cube
5. Students will then take out their Science Journals and write the informational text within each of the lobes of the brain from the Merge Cube.
6. Students will glue the Brain Game worksheet in their Science Journals along with each piece of information text from the 5 sections of the brain (see Sample Student Work below),

### **Evaluation**

Brain Worksheet and Student Science Journal

## Sample Student Work



Worksheet from: <https://thecraftyclassroom.com/crafts/anatomy-crafts-for-kids/brain-crafts-activities/>

**BRAIN**

**1. FRONTAL LOBE**

We use this lobe for speaking, thinking, planning, and making decisions. It's also used for a lot of deciding what to wear and planning your next move in chess. It all thanks to your frontal lobe.

**2. TEMPORAL LOBE**

The temporal lobe is in charge of processing the huge range of sounds, pitches and speech we hear in the world around us, and turns the sounds into something meaningful we can understand.

**5. CEREBELLUM**

This area of the brain is responsible for balance and muscle coordination. It controls things like walking, dancing and even writing.

**3. OCCIPITAL LOBE**

The occipital lobe is our brain's visual processing center. It not only gives us accurate information about what our eyes are seeing, but it also plays an important role in reading, too!

**4. PARIETAL LOBE**

This part of the brain processes sensory information in seconds, like touch, taste, and even temperature. If we touch something too hot or cold, our parietal lobe lets us know!

## Resource List and Internet Sites

The resources needed to use the Merge Cube are easily accessible through Apple App Store or Microsoft Store depending on your device and operating system. Here is a list from [www.MINIVERSE.io](http://www.MINIVERSE.io) giving a brief description of the app, QR code, available languages, operating system, and cost.

### MERGE CUBE APP LIST



**CUBE PAINTAR** FREE

English

Choose your favorite 3D animal with MERGE Cube, rotate your animal in the palm of your hand to view it from every angle, then paint it whatever colors you choose!



**DEFUSED!** FREE

Deutsch, English, Español, Français, 中文

Race against the clock and defuse a 3D bomb! Twist and turn the cube to find the correct panel as you follow the instructions to deactivate the bomb for each level.



**DIG!** FREE

Deutsch, English, Español, Français, 中文

Mine and build to create 3D worlds you can hold in the palm of your hand! Choose from unlimited resources like stone, sand, grass, brick, and lava to make anything you can imagine.



**GALACTIC EXPLORER** FREE

Deutsch, English, Español, Français, 中文

Hold the solar system in the palm of your hand with Galactic Explorer! Watch as the planets revolve around the Sun in their orbits, explore the texture and color of each planet's surface, and discover interesting facts as you navigate through space.



**HOLOGLOBE** FREE

English

HoloGLOBE brings NOAA's Science on the Sphere (SOS) programs to MERGE Cube, using satellite imagery and data simulations for stunning views of Earth and its many systems.



**MR. BODY** FREE

Deutsch, English, Español, Français, 中文

Get ready for a hands-on, holographic anatomy lesson! Select each of Mr. Body's parts to get a close-up view of each vital organ and its function like the heart, brain, lungs, and more.



**MUSEUM VIEWER** FREE

English

3D Museum viewer lets you place each of the life-size artifacts into the real world, with the ability to physically walk around each statue in full 360°.



**MYARQUARIUM** FREE

English

myARquarium uses the MERGE Cube to give you a palm sized aquarium you can hold in your hand! Choose from over 55 different exotic fish species like the lionfish, mandarin fish, or moorish idol.



**MOMENT** FREE

English

Moment helps children with mental health needs to identify feelings and emotions with professional mental health support providers, teachers, and parents.



**OBJECT VIEWER** FREE

English

Upload, view, and share 3D objects on MERGE Cube! Whether it's a sculpture of Michelangelo's David or an original work of 3D art that you created, MERGE makes it easy turn your models into 3D objects!



**PARTY GAMES** FREE

Deutsch, English, Español, Français, 中文

Use the MERGE Cube and play along with your friends! Spin, rotate and tap to win games like Crystal Crush, Starfighter, Tap-N-Toss and more. Use one cube or multiple cubes to compete with your friends.



**SNAKE ATTACK** FREE

Deutsch, English, Español, Français, 中文

Maneuver your snake around the MERGE Cube in this retro, holographic snake game! Maneuver your snake around all six sides of the Merge Cube to find food and watch it grow longer with each bite!

**THINGS** FREE  

Deutsch, English, Español, Français, 中文

Experience a fresh collection of holographic mini-games with Things for MERGE Cube! Navigate treacherous valleys as you battle alien forces and hold a campfire in the palm of your hand!

**TILT BALL** FREE  

Deutsch, English, Español, Français, 中文

It's a race against the clock! Guide the boulder through a medieval obstacle course before time runs out. Don't let your ball fall in the water or run off course as you roll your way to victory!

**57° NORTH** USD \$2.99  

English

Two cousins are shipwrecked on a remote island in Alaska, and it's up to you to help them survive, escape, and maybe even discover why there are so many security cameras out in the middle of nowhere.

**ANATOMYAR+** USD \$0.99  

English

Hold the brain, heart, and lungs in the palm of your hands and view them in striking detail using the MERGE Cube!

**AR KITTEN** USD \$4.99  

English

Chose your adorable virtual kitten in this app for the MERGE Cube. Name, feed, and play with your kitten to earn coins and unlock custom outfits so that you can have the cutest kitten around. Bring your virtual pet to life.

**ASK KRANKY** USD \$1.99  

English

KNOW the Future! DARE to tell the Truth or face Danger! DISCOVER how your days are numbered! SEEK your Fortune! SOLVE the mysteries of Love! ALL things are possible if you possess the ancient-modern marvel, Kranky!

**BLOCKAR** USD \$2.99  

Deutsch, English, Español, Français, 中文

Build, solve and win! Use your MERGE Cube to rotate, move and align three or more cubes of the same shape and color. Collect special powers, solve increasingly challenging levels and outwit a diabolical robot!

**CELLULAR** USD \$2.99  

English

Prepare for a new twist on educational cell visualization! Use your Merge Cube to spin, rotate, and view a variety of different cells. Explore the microscopic world like never before.

**CUBE CONQUEST** USD \$1.99  

Deutsch, English, Español, Français, 中文

Alien bugs are invading the planet, and your mission is to stop them before they eat the planet's core! Set up defenses on all sides to defeat them at every turn. Balance strategy and lead your way to victory!

**CYBER CUBE** USD \$0.99  

English

The glitch is coming, and you're the only one who can stop it! Hack into the cyber zone using your Cyber Cube. Match patterns on the cube with the sequence presented on your HUD.

**DINO DIGGER** USD \$1.99  



English

Dig for dinosaurs in this educational game for MERGE Cube! Go back in time to when dinosaurs roamed the land with legendary dinosaur hunter and paleontologist, Jack Horner.

**ELEMENTAL ORDER** USD \$1.99  

English

Can you unlock the Elemental Order? Challenge and be challenged with brilliant, holographic, shapes and colors. Repeat the pattern to test your skills against the MERGE Cube. Unlock the pattern and victory is yours!

**HANGRY HERB** USD \$0.99  

English

Hangry Herb is an AR (Augmented Reality) pet experience for the MERGE Cube. This particular pet plant is pretty persnickety. He doesn't rely on you to live or grow, because you're not really that important to Herb.

**INVASION** USD \$1.99  

English

Overlord Ut has chosen YOU to lead a mission to a distant planet in a desperate attempt to borrow their mighty items. Grab as many as you can and hurry back! There is no time to waste.

**MUNCH** USD \$4.99 

English


Move Munch, the lovable fish, around with your MERGE Cube to eat as many smaller fish as you can find, but make sure not to get eaten by other, bigger creatures.

**NEXUS BOX** USD \$8.99  

English

The Nexus Box is a multiplayer puzzle game where two or more players must work together to unlock the secrets of the mysterious, ancient cube.



**RUBIK'S CUBE:  
AUGMENTED** USD \$1.99  

Deutsch, English, Español, Français, 中文

Challenge yourself to solve the classic puzzle game with a futuristic twist! Rotate the MERGE Cube in your hand while you turn and rotate the rows and columns of colored squares to put them all back in order.



**SHAPES 3D  
GEOMETRY DRAWING** USD \$4.99 

English

Explore and understand 3D shapes in a whole new way with your MERGE Cube! Draw and rotate line-segments, shapes, and cross sections while discovering the inner workings of 3D Geometry.



**SUPER SUGAR CRASH** USD \$1.99  

English

Beat the clock and collect as many sweet treats as you can in this arcade style game for MERGE Cube! Your cube becomes a cloud, and you move to catch falling the candy and bounce the unicorns.



**TRICKY TEMPLE** USD \$2.49  

English

Professor Ignatius Crumble and The Evil Adventurers Society have broken into your temple! Build totem towers to protect your precious relics in this tower defense game for MERGE Cube.

## MERGE CUBE APPS FOR EDU



APP NAME	GRADE LEVEL	SUBJECT	CURRICULUM AREA	ISTE STANDARD
SUPER Sugar Crash: MERGE Cube	1st - 3rd	Math	Time Counting	1 Empowered Learner Indicators: 1a
Galactic Explorer	1st - 6th	Science, Earth Science, Astronomy	Space Earth's Place in the Universe, Particles in Matter, Gravity, Life beyond Earth, Motion and Stability: Forces and Interactions	3 Knowledge Constructor Indicators: 3a
THINGS	1st - 12th	Math, Science, Art Technology, Engineering	Problem Solving	1 Empowered Learner Indicators: 1d
Tiltball	1st - 4th	Math	Spatial Awareness, Problem-Solving, Time, Time Management	1 Empowered Learner Indicators: 1a
CubePaintAR	1st - 4th	Art, Technology	Color, Design	4 Innovative Designer Indicators: 4a
Party Games for MERGE Cube	1st - 12th	Technology, Math	Problem-solving, Time Management, Group Collaboration	7 Global Collaborator Indicators: 7b
Snake Attack for MERGE Cube	2nd - 4th	Science	Problem-Solving, Energy	1 Empowered Learner Indicators: 1d
CyberCube	2nd - 3rd	Math	Patterns, Sequencing, Coding	5 Computational Thinker Indicators: 5d
Ask Kranky	3rd - 9th	Emerging Technology	N/A	1 Empowered Learner Indicators: 1d
DinoDigger	3rd - 6th	Science, Natural History, ELA, Geology Paleontology	Biological Unity and Diversity, Inheritance and Variation of Traits, Fossils, Natural Selection, Fluency, Listening and Responding, Multimodal Literacy: Digital	3 Knowledge Constructor Indicators: 3a



# MERGE CUBE APPS FOR EDU



APP NAME	GRADE LEVEL	SUBJECT	CURRICULUM AREA	ISTE STANDARD
Elemental Order	3rd - 6th	Math, Technology	Patterns, Problem Solving	5 Computational Thinker Indicators: 5d
Mr. Body	3rd - 5th	Science	Organisms: Structure and Processes	3 Knowledge Constructor Indicators: 3a
Invasion for MERGE Cube	3rd - 5th	Math, Technology	Time, Time Management	1 Empowered Learner Indicators: 1d
Munch	3rd - 6th	Science, Biology	Food Chains, Ecosystems: Social Interactions and Group Behavior, Adaptation	3 Knowledge Constructor Indicators: 3c and 3d
Cube Conquest	3rd - 8th	Science, Earth Science, Zoology, Math	Problem Solving, Adding/Subtracting, Money Sense	1 Empowered Learner Indicators: 1a
Rubik's Cube Augmented!	3rd - 12th	Math	Spatial Awareness, Cognitive Ability, Problem-Solving, Identifying Patterns	5 Computational Thinker Indicators: 5d
AR Kitten for MERGE Cube	4th - 6th	Science, Math	Animals, Energy flow in organisms, Multiplication	1 Empowered Learner Indicators: 1a
BlockAR	4th - 6th	Math	Patterns, Identifying Common Shapes, Spatial Awareness, Problem-Solving, Higher Order Thinking	1 Empowered Learner Indicators: 1d
Defused!	4th - 6th	ELA	Time, Time Management, Multimodal Literacies	1 Empowered Learner Indicators: 1d
Hangry Herb	4th - 6th	Science, Botany	Plants, Energy flow in organisms	1 Empowered Learner Indicators: 1a
Wobble Wobble for MERGE Cube	4th - 6th	Science Physics	Newton's Law	5 Computational Thinker Indicators: 5c

[edu.MERGEVR.com](http://edu.MERGEVR.com)

Find these apps at [MINIVERSE.io/Cube](http://MINIVERSE.io/Cube)

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Here are more useful sites where you can obtain more information on how to utilize the Merge Cube in your classroom:

<https://www.teacherspayteachers.com/> Teachers Pay Teachers TpT

<https://mergevr.com/cube>

<https://mergevr.com/edu-resources/activity-plans>

<https://drive.google.com/file/d/1y6a3NzcnBoOSky1zrsnHZP-cuwIBodAY/view>

<http://www.janusgroup.us/merge/>

<https://www.virtualiteach.com/single-post/2019/01/29/Top-5-Apps-for-the-Merge-Cube>

<https://thecraftyclassroom.com/crafts/anatomy-crafts-for-kids/brain-crafts-activities/>

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