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- 4 MathTech: Teacher Tools

Leveling Up

Earn CE certificates via many of these free and low-cost webinars and seminars. Register for these and others on edWeb.net and MITS.cenmi.org.

- **Practical Application for Using Video Models with Students with Autism**, Wed., Dec. 3. [See recording.](#)
- **History Goes to the Movies: Historical Fiction's Place in the Classroom**, Thurs., Dec. 5. [See recording.](#)

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Using STEM games from MIT for middle and high school

EDITOR'S NOTE: The following article is based on an [edWeb.net webinar](#) entitled "Game-Based Learning Initiatives for Secondary STEM: Four Implementation Models" given by Carole Urbano and Susannah Gordon-Messer of The Education Arcade/Scheller Teacher Education Program at MIT.

"Knowledge is built by the learner, not supplied by the teacher." This constructivist tenet by Jean Piaget in his book [The Psychology of the Child](#) was taken one step further by Seymour Papert in [The Children's Machine](#), when he asserted that people learn by constructing something external and



Please see [MIT](#) on page 5

Using Flipagram for visual lessons



Shannon Holden

EDITOR'S NOTE: The following article is based on an [edWeb.net webinar](#) entitled "Using Flipagram to Help Students Categorize Knowledge" given by Shannon Holden, assistant principal at Republic Middle School in Missouri. His website is newteacherhelp.com.

A former teacher, Shannon Holden knows that teachers will only use technology if it's free, easy to use, and saves time or effort. [Flipagram](#) meets all these criteria and is perfect for creating short, visual lessons. Available on all platforms, Flipagram is an app that enables users to make 15- to 30-second videos using pictures. It's also easy to add music.

Because the videos are short, they are easy to make and easy to view repeatedly. Holden recommends using it for lists or sequences of 10 items or less.

To get ideas flowing, Holden and webinar attendees suggested a wide variety of things which could be taught in 30 seconds with a Flipagram video:

Please see [Flipagram](#) on page 3

Leveling Up, continued from [page 1](#)

- **Accessibility in a Bring Your Own Device Environment**, Mon., Dec. 8 at 3:30 p.m.ET on mits.cenmi.org.
- **Planning Lessons for a Range of Cognition**, Mon., Dec. 8 at 3 p.m. ET on edweb.net.
- **Teaching Digital Photography: Seven Elements for Success**, Tues., Dec. 9 on edWeb.net.
- **How a Well-Designed Website Can Increase K-12 Community Engagement**, Wed., Dec. 10 at 4 p.m.ET on edWeb.net.
- **H.O.T. (Higher Order Thinking) Web Tools to Ignite Your Classroom**, Wed., Dec. 10 at 5 p.m. ET on edWeb.net.
- **Top 5 Digital Tools of 2014**, Mon., Dec. 15 at 4 p.m. ET on edWeb.net.
- **Journeys in Blended Learning: Key Landmarks for Your School's Progress**, Tues., Dec. 16 at 3 p.m. ET on edweb.net.
- **Character Education in a Digital World**, Tues., Dec. 16 at 4 p.m. ET on edWeb.net.
- **Encouraging Student Collaboration Using Today'sMeet and Lino**, Tues., Dec. 16 at 5 p.m. ET on edWeb.net.
- **Going Digital: Do's, Dont's, and Pro-Tips**, Wed., Dec. 17 at 4 p.m. ET on edWeb.net.
- **Hands on Learning: The Power of Interactive Learning in the Library**, Wed., Dec. 17 at 5 p.m.ET on edWeb.net.
- **Bringing the Classroom to Life with Green Screen Technology**, Thurs., Dec. 18 at 4 p.m.ET on edWeb.net.

See also

- **Flipping the Classroom by Using Educational Websites**, on newteacherhelp.com by Shannon Holden.
- **Teaching Character and Creating Positive Classrooms**, 5 weeks of study, 1-3 hours/week, Dec. 11, 2014 - January 24, 2015 on coursera.org.
- **Hour of Code**, interactive tutorials on block-style programming for all ages at code.org/learn.

About Special Ed Tech / Subscriptions

Special Ed Tech is a free newsletter published monthly from September through June by the director of Aspiring Games Foundation.

We welcome your questions and article suggestions. Direct all queries and subscription requests to editor Becky Palmer-Scott at SpecialEdTechEditor@gmail.com.

About Aspiring Games Foundation

www.aspiringgames.org

Aspiring Games Foundation supports the creation and use of learning games and educational technology for individuals, groups, and classrooms.

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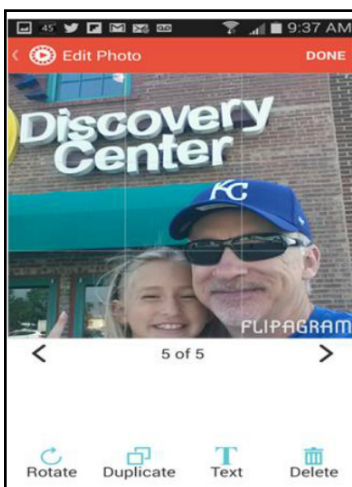
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A great source for pictures is [Google Images](#). If you need to give photo credits, use the last Flipagram frame to create a "Credits" page.

[BlueStacks](#) allows you to use Flipagram on your desktop computer -- otherwise Flipagram will only work on a mobile device. But after using BlueStacks for three days you will be asked to pay for it or download another app each week.



Editing a Flipagram

Flipagram, continued from [page 1](#)

- Visual directions to a new location
- Steps in a procedure
- Behavior modeling
- Life cycle of butterfly
- Parts of speech/grammar
- Our solar system
- Order of operations (PEMDAS)
- Sine - Cosine - Tangent
- The water cycle
- Types of clouds
- Events leading to Civil War
- Steps in The Scientific Method
- New England Colonies - Southern Colonies - Middle Colonies
- Different names for a number
- Types of pronouns
- The Bill of Rights
- Types of bears
- Three branches of government
- Figurative language in a poem
- The writing process
- Vowels and the souces they make
- The FOIL Method (First-Outside-Inside-Last) (multiplying expressions within parentheses)
- Types of energy
- Kingdom - Phylum - Class -Order - Family - Genus - Species
- Phases of the moon
- Continents of the earth
- Great Lakes
- Constellations
- Stars within a constellation
- Book Trailers - 30 seconds to promote a book
- Character sketches of characters
- Compare/contrast Medieval knights vs. Jedi knights
- Essentials of copyright
- Elements of foreign language

Making a Flipagram video is easy. Just download it to your mobile device for free, open it, and follow the instructions. You can also use Flipagram on your desktop if you use [BlueStacks](#) (see sidebar). You can import photos from Instagram, Facebook, your photo gallery, Twitter, Flickr, Dropbox, or anywhere you have a stash of photos on the Internet. For best results, limit the number of photos to 10, with a transition speed of 3 seconds/slide.

Once the photos are selected, you can put them in a specific order or select random order, rotate them, add text, delete them, control speed of transitions, add audio, and filters. You can duplicate pictures to reinforce a point.

Flipagram has music to use, or you can add your own. This adds a lot of interest and production value. There is no way to fade out, though.

The Flipagram video can be up to 30 seconds long. But if you post the video to Instagram it can only be 15 seconds long so you would have to reduce the transition speed. Holden recommends not posting on Instagram for this reason.

You can share the Flipagram videos in many ways. The most common is to create a URL link or send via e-mail. You can also post on Twitter, Instagram, or even [create a QR code for scanning](#). Here are some examples of videos:

- Moon Phases: <http://flipagram.com/f/Jv7r0A0VwJ>
- 7 Geographic Regions of Texas: <http://flipagram.com/f/JhAbjdUwuK>
- Life Cycle of Butterfly: <http://flipagram.com/f/Jv7pvcUVSV>

To use in class, consider these ideas:

- Make Flipagrams and send students the link.
- Assign students a topic and have THEM make Flipagrams.
- Have students present their Flipagrams to the class.
- Save all your class's Flipagrams in one place, such as a blog, Wiki, or website, for students to access whenever they need 30 seconds of knowledge. Put a title above each link.

Math Tech:

Teacher Tools

by Kate Fanelli



Kate Fanelli

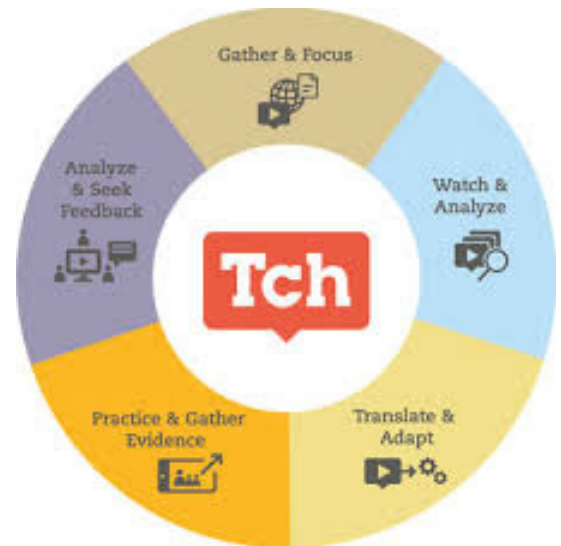
Research shows that the use of manipulatives, used as concrete representations of math concepts, is an important first step for understanding among students with special needs.

Technology can enhance learning and teaching for students, but it can also be leveraged for the learning and teaching of teachers. The web is full of online resources for teachers looking to learn something new, relearn some content, or connect with other teachers. The amount of information can be overwhelming. This month, I am highlighting two of those resources.

The Teaching Channel

[The Teaching Channel](#) offers free professional learning through searchable video covering multiple age levels and subject areas. The Teaching Channel supports its Theory of Professional Learning by offering tools that assist teachers at each phase of the learning cycle (see graphic).

Looking for a place to start? Try Mingle and Count, an elementary number sense lesson, or Algebra Mixture Problems, a way to teach the classic word problem using conceptual understanding and mathematical structures. Both videos show how teachers can engage learners in understanding the mathematics of a lesson, can support new learning through experience, and can scaffold future learning through accurate use of language and models.



Annenberg Interactives

Research shows that the use of manipulatives in the mathematics classroom, used as concrete representations of mathematics concepts, is an important first step for understanding among students with special needs. Research also shows that the use of virtual manipulatives is also effective with this population. That same research has found that using concrete and virtual manipulatives together has maximum benefit for students with special needs.

[Annenberg Interactives](#) is a searchable collection of virtual manipulatives and applets that teachers may use to teach mathematics at all age and ability levels. When users select an interactive, they will find a variety of support materials including step-by-step directions on how to use the interactive to teach, sample problems, problems to give to students for independent practice, videos demonstrating the use of the interactive in classrooms or professional learning settings and opportunities for reflection.



Kate Fanelli is the math accessibility specialist for Michigan's Integrated Mathematics Initiative (Mi)2, a state of Michigan initiative that promotes and supports high quality mathematics education for ALL students. Follow (Mi)2 on Facebook (www.facebook.com/mi2.page) or on Twitter (MI2_Math). Contact Kate at kate.fanelli@misquared.org.

MIT offers a [teacher licensure program in secondary math and science](#). Professional development tools include the [Imagination Toolbox](#) and [Biograph](#).

MIT also offers Massively Online Open Courses (MOOCs) on [edX](#). These include [11.132x Design and Development of Educational Technology](#) and [11.126x Introduction to Game Design](#).

MIT, continued from [page 1](#)

sharable, such as books, computer programs, sand castles, and even [Flipagram videos](#). The act of creating something sharable is the power of quality game-based learning.






So what is quality game-based learning and how can it fit into the classroom? A good game doesn't just shovel in nonrelevant math equations here and there. And it doesn't make play the reward for correctly solving a problem. A good game inspires players to progress for the sake of achievement. When implementing a new game or learning resource, consider these questions:

- **Why are you using it?** Reasons include pre-instruction learning context, post-instruction application, post-instruction practice, formative assessment, and engagement.
- **What type of game is it?** Examples include short-play games, immersive role-playing games, puzzle-based games, and board games.
- **Where will it be played?** At home, in class, in the library, or computer lab?
- **How will it be used?** One way is to assign the game as homework. Or it can be part of a formal lesson plan, as part of free exploration, for enrichment/extra credit, or as competition.

MIT's Education Arcade/Scheller Teacher Education Center offers several free games designed to inspire and challenge students.

Programming games

A family of blocks-based programming tools, [Scratch Jr.](#), [Scratch](#), [MIT App Inventor](#), [TaleBlazer](#) and [StarLogo Nova](#), provide creation tools for all ages. There are easy-to-follow tutorials and teacher supports for these products, such as the [Scratch Curriculum Guide](#), [App Inventor 2 tutorials](#), [TaleBlazer tutorials](#), and [StarLogo Nova tutorials](#).

|  |  |  |  |  |
|---|---|--|---|---|
| Ages 5-7 | Ages 7-13 | Ages 11+ | Ages 11+ | Ages 11+ |
| New | 3.8M Users 6.2M Projects | 2M Users 5M Apps | 2 K Users 200 Projects | 200K Users 1M Projects |
| Interactive storytelling | Interactive storytelling & Games | Mobile Apps for Android | Location-based games & experiences | 3D Games & Simulations |
| Online ipad | Online ipad | Online + Android device | Online + Mobile Device | Online |

Please see MIT on next page

MIT, continued from previous page

Radix Endeavor

[Radix Endeavor](#) teaches STEM skills to middle- and high-schoolers. It looks like the MMOG *World of Warcraft*. Players are dumped on a fictional island and must solve the inhabitants' problems using math and science skills. They investigate, collect evidence, and analyze things. It includes data analysis tools such as a stool collector, critter catcher, ruler, trait decoder, food web kit, population survey, and timeline to measure how traits change. The game includes a teacher mode to track student progress.



Radix Endeavor

Teachers often use Radix Endeavor as a skill-building exercise. Figuring out which tool to use to answer a specific question is a 21st century learning objective. The game's Genetics Quest includes a breeding station and Punnett square, and this is popular with teachers – one teacher uses it during her class to for concept reinforcement.

Radix Endeavor includes guiding questions for players to link the game to the actual classroom. One teacher uses the questions as journal entries for her students, posting them on Google docs where she can see what the students write as they progress.

The Food Web Kit Tool is being used by a middle school science teacher as homework. He uses this as a shared experience for discussion.

The Geometry stations are being used by a middle school math teacher as general enrichment and skill building for 7th graders; it provides a shared experience for students.

The data analysis tools are used in the math and biology quests. They are popular with after-school programs for enrichment and skill building.

Lure of the Labyrinth

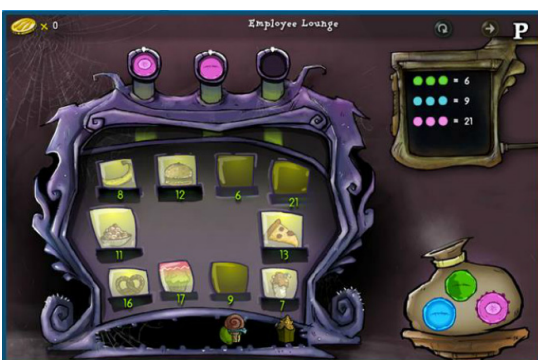
[Lure of the Labyrinth](#) is a puzzle-based game which teaches middle-school math. It includes a narrative involving solving puzzles to free pets.

For the puzzle there are no directions - the player must discover what problem needs to be solved. This supports playful exploration. There are coins but the values aren't clear -- the player must figure them out to buy a snack from a vending machine. Replay of the game allows players to become more efficient in problem solving.

Similar concepts are presented when players buy items from a cafeteria or prepare a recipe. For example, one challenge is to build a fence to protect plants on a grid, so the player must map out fence panels efficiently, building upon concepts of area and perimeter.

Another challenge is to collaborate and work in teams. In that case, the teacher assigned the game as homework. One of the students was struggling so he asked for help. No one was online at the time, so he filled out a "think aloud" log exercise which helped him get closer to the answer.

Some teachers use group game play as part of instruction. Others use the game as homework for practice, or pre-instructional context setting. Some geometry teachers use these to create a shared enrichment experience for their kids. Other teachers use them to teach statistics.



Lure of the Labyrinth