

### INSIDE THIS ISSUE

- 2 About Special Ed Tech
- 2 Sign up now for Hour of Code!
- 3 **MathTech:** Patch Tool & Drawing Pad
- 4 UDL STEAM for special education classes

## Leveling Up

Earn CE certificates via many of these free and low-cost webinars, courses, and seminars. See [edWeb.net](http://edWeb.net), [mits.cenmi.org](http://mits.cenmi.org), [Kent County ISDs](http://KentCountyISDs.org), [PD Hub](http://PDHub.org), [MATN Webinar Series](http://MATNWebinarSeries.com), and [ADDitudemag.com](http://ADDitudemag.com) for additional instruction.

- **Solutions for Language and Auditory Processing Problems in Children with ADHD**, Tues., Nov. 3 at 3 p.m. ET on [ADDitudemag.com](http://ADDitudemag.com).

Cont. on [page 2](#)

## UDL: What it is, why it's important, and how to use it in your class

*EDITOR'S NOTE:* The following article was inspired by an [edWeb.net](http://edWeb.net) webinar entitled [Designing Options for Every Learner: Universal Design for Learning](#), given by Chris Bugaj and Mark Nichols of Loudoun County Public Schools on Oct. 19, 2015, and sponsored by [Quill.com/education](http://Quill.com/education).



How would you like your students to pay closer attention in class? To attend more often and do homework enthusiastically? How would you like to be more excited about teaching?

If any of this appeals to you, you should incorporate UDL, or universal design for learning, into your lesson planning. It's likely that you're supposed to anyway — UDL is a Common Core initiative for special education.

You're already familiar with universal design -- it provides access for everyone. Examples include automatic doors, wheelchair ramps, auto flush toilets, and automatic hand dryers.

Please see [UDL on page 6](#)

## UDL idea: Junkyard Wars SE

Looking for an engaging way to teach about science principles? Try Junkyard Wars Student Edition! These free downloadable teacher guides which use recyclables to teach Common Core science curriculum and Next Generation Science Standards.


Based on an award-winning program designed by Kate Fanelli, JWSE is a project-based learning unit in which students build a machine or project out of "junk" while applying math concepts, working with teams, and dealing with outside constraints such as limited time and resources.

Find out more at [tinyurl.com/jwstudentedition](http://tinyurl.com/jwstudentedition).



Students test a cargo boat made of recyclables to how many Cuties it will hold.

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

- **Sexuality Education for Students with Autism, Developmental and Intellectual Disabilities**, Tues., Nov. 10 at 2 p.m. ET on [edWeb.net](#).
- **Geometric Reasoning with Shapes & Attributes Part 3: Properties of Lines and Angles**, Tues., Nov. 10 at 4 p.m. ET on [edWeb.net](#).
- **Mathematical Conversations for Next Generation STEM Students: Constructing Viable Arguments and Critiquing Other(s) Reasoning**, Wed., Nov. 11 at 3 p.m. ET on [edWeb.net](#).
- **Story S-t-r-e-t-c-h-e-r-s: Curriculum Activities to Expand Children's Favorite Books**, Thurs., Nov. 12, at 2 p.m. ET on [edWeb.net](#).
- **The World of Music Play in Your Early Learning Classroom**, Thurs., Nov. 12, at 3 p.m. ET on [edWeb.net](#).
- **Social Media for Schools: How to do it right**, Thurs., Nov. 12, at 5 p.m. ET on [edWeb.net](#).
- **Making Interactive Educational Videos with Zaption**, Tues., Nov. 17, at 5 p.m. ET on [edWeb.net](#).
- **Using Games to Assess and Personalize Your SEL (Social Emotional Learning) Instruction**, Wed., Nov. 18 at 3 p.m. ET on [edWeb.net](#).
- **Making Learning: How to Repurpose Unused Space to Benefit Learners**, Wed., Nov. 18 at 5 p.m. ET on [edWeb.net](#).
- **Student Collaboration for Literacy: What do to, what to avoid!**, Mon., Nov. 30 at 3 p.m. ET on [edWeb.net](#).
- **Geometric Reasoning with Shapes & Attributes Part 4: Classifying Plane Figures**, Tues., Dec. 1 at 4 p.m. ET on [edWeb.net](#).
- **Finding Help When You Need It**, Tues., Dec. 1 at 5 p.m. ET on [edWeb.net](#). 

## About Special Ed Tech / Subscriptions

*Special Ed Tech*, [specialedtech.net](#), is a free newsletter published monthly from September through June by the director of Aspiring Games Foundation, [aspiringgames.org](#).

To subscribe, go to [specialedtech.net](#), scroll to the subscription box on the bottom of the page, insert your e-mail address, and click the "Subscribe" button.

We welcome your questions and article suggestions. Direct all queries and subscription issues to editor Becky Palmer-Scott at [SpecialEdTechEditor@gmail.com](mailto:SpecialEdTechEditor@gmail.com).

## Sign up now for Hour of Code!

Hour of Code, sponsored by [Code.org](#), is a free one-hour self-guided tutorial on computer programming for students of all ages. Tutorials work on any modern browser, tablet, smartphone, or even with no computer at all! The tutorials feature characters from Disney's *Frozen*, *Scratch* from *Ice Age*, *Angry Birds*, and *Plants vs. Zombies*.

Hour of Code is scheduled to take place during Computer Science Education Week, December 7 to 13, 2015. Every person who organizes Hour of Code participation in his or her school will receive a gift. One lucky school in the United States will win \$10,000 worth of technology.

Sign up by November 16, 2015, at [hourofcode.com](#).

# Math Tech:

## Patch Tool & Drawing Pad

by Kate Fanelli



Kate Fanelli

### At a glance

**App:** Patch Tool

**Cost:** Free

**Platform:** Web

**Topic:** Shape patterns

**How to get:** Go to <http://www.nctm.org/Classroom-Resources/Interactives/Patch-Tool/>

**App:** Drawing Pad

**Cost:** \$1.99

**Platform:** iOS

**Topic:** Patterns, art

**How to get:** Go to <https://itunes.apple.com/us/app/drawing-pad/id358207332?mt=8>

As a teacher who spent the entirety of her 14-year classroom career with high school students, I enjoy learning about mathematics at earlier levels in my new role as a consultant. Beth Poss, at the 2015 Maryland Assistive Technology Network (MATN) Fall Institute, presented “Addressing Mathematics in Early Childhood: Apps, Tools and Strategies to Build Early Mathematics Concepts for the Youngest Learners.” The presentation was streamed nationwide and is available through the MATN website. *Editor’s Note: To see the webinar you must have a Johns Hopkins University & Medicine login, but you can download the [handouts](#).*

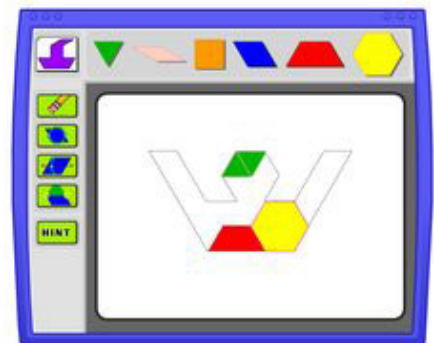
Research tells us that early childhood math understanding is not only important for skill development at early ages, but is predictive of both math and reading achievement in later grades. Providing young learners ample opportunities to play, interact, and explore via activities specifically designed to promote mathematical understanding is critical to building a strong foundation for future learning.

Ms. Poss described seven qualities of effective early childhood apps:

1. Is open-ended to support play and problem solving
2. Promotes concept development, literacy, and language through play and exploration
3. Includes rich, engaging activities that invite a high degree of interactivity and control by the user
4. Encourages movement, both fine and gross motor
5. Enhances and encourages interactions with adults or peers, rather than promoting solitary exploration
6. Is culturally diverse and free of stereotypes
7. Meets a developmental need

One app that meets these requirements

is [Patch Tool from the National Council of Teachers of Mathematics Illuminations website](#). Patch Tool allows students to explore, play, find patterns, and compose/decompose shapes using virtual pattern blocks. The app allows exploration with transformational geometry including flips and rotations. Activity instructions encourage students to notice features of their creations, and hypothesize about what would happen if they extended patterns.



Patch Tool

Another app is [Drawing Pad \(iOS\)](#). This app features stickers, stamps and a variety of drawing tools to explore shapes and figures. Teachers can import photos they have taken for students to interact with. Students can also move objects to create and recreate sets.

Whatever mathematics learning experiences you provide, be sure to align the instruction with developmentally appropriate activities, and ask students to think mathematically. This will contribute to a strong foundation of mathematics understanding from which young learners will continue to grow.

*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](http://www.facebook.com/mi2.page)) or on Twitter (@MI2\_Math). Contact Kate at [kate.fanelli@misquared.org](mailto:kate.fanelli@misquared.org).*



Drawing Pad





*Carmen Watts Clayton*

## UDL STEAM for special education classes

by *Carmen Watts Clayton*  
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[UDL \(universal design for learning\)](#) lessons in STEAM (science, technology, engineering, arts, and math) for learners with special needs and limited communication abilities can be engaging and successful as a way to build student skills in collaborative project-based learning and communication. Lessons should be project-based, be centered on students' interests, and build on collaborative activities that allow learners to engage with the materials and each other. Projects can be tailored to utilize materials on hand, common objects, physical phenomena, and natural patterns. Lessons can be theme-directed or connect to units covered on the general education campus.

Science lessons could include components of identifying, observing, and recording data. Learning the language of data, its collection, and analysis is a universal 21st century skill. Although students may learn primarily through visual or other means, materials can be adapted to assist them in noticing and recording information to share and to reflect on how the processing of using data can influence our decision making. Students with IEPs are also naturally curious. When teachers transfer ownership of the learning objectives to the students and student teams, Common Core standards are met, and higher-level thinking and learning skills are accessed.

When teachers present information, content, and directives in multiple modalities, students learn to build practical research skills. A typical science lesson might include:

- A warm up
- The hook/engagement: Presenting the mystery
- Buy-in: Involve the students in setting criteria or solving a problem
- Model the learning activity: Precise step-by-step how-to
- Role-play the sequence: "I Do, You Do with Me, We Do" (build independence)
- Set up the learning environment for success
- The lesson addresses the present levels and goals of students
- Provide support (\*Note: Adults support without doing the project)
- Team collaborations: Members choose their roles and tasks
- Supported team experiment or engaging with the materials, recording results (open ended)
- Analysis / reflection
- Assessment or portfolio

Activities that promote scientifically based observations and analysis by students lend themselves to a really broad range of tools: drawing, describing, organizing, comparing, rating, and expressing student opinions about the content are skills that students with special needs can do given the opportunity and as-

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*When teachers transfer ownership of the learning objectives to the students and student teams, Common Core standards are met, and higher-level thinking and learning skills are accessed.*

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*Please see **UDL STEAM** on next page*

*UDL STEAM, continued from previous page*

sistance. Recording, charting, graphing, and documenting evidence is a process that is also accomplished through different means. Think creatively about comparisons, assigning numerical values to collected data, and representing data in

graphs, charts, and other visual ways. Be creative to help students learn to exercise choice, voice, and the collaborative process during a structured observational process (science).

Students also like to build and create things when they see, hear, and experience new phenomena. Maker spaces are becoming popular ways to support students to learn about tools and processes in making things work (engineering). Students with special needs can engage in maker-space activities too. Sometimes educators can find materials at hand which students can use to create parts, practice using hand tools, and exercise




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*If student creations do something at the end of the day, the result could be technology! If not, perhaps it is "Art," but in either case the student learns about collaborating, building understanding, communicating needs and reflections, engaging in learning objectives, and access to math and science concepts within Common Core standards.*

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their creative abilities. Many kits and building systems are also commercially available to teachers. If student creations do something at the end of the day, the result could be technology! If not, perhaps it is "Art," but in either case the student learns about collaborating, building understanding, communicating needs and reflections, engaging in learning objectives, and access to math and science concepts within Common Core standards.

Students will build important conceptual understanding, and see ways their knowledge is not isolated to a single subject or a single classroom. Student will learn content they can transfer to the real world and career aspirations.

Collaborative learning environments for middle school students are typically difficult for students with disabilities, so preparation in the form of pre-teaching and repeating lessons with literary, visual, auditory, and hands-on components is helpful. Remember the basic steps of making materials accessible:

- Enlarge print materials font size and contrast
- Provide captions for videos with sound present
- Check for understanding; allow extra time
- Seating/positioning options for high-level access
- Provide materials ahead if possible (flipped curriculum)
- Provide materials in more than one learning or communication mode

Think flexibly when presenting science lessons to students with IEPs. Presenting Common Core curriculum adapted to students with special needs is fun and engaging, gives you a chance to use technology in the classroom, and encourages students to work collaboratively on goals and transitions. Form relationships to the constructs of scientific thinking and process, rather than an expected outcome.

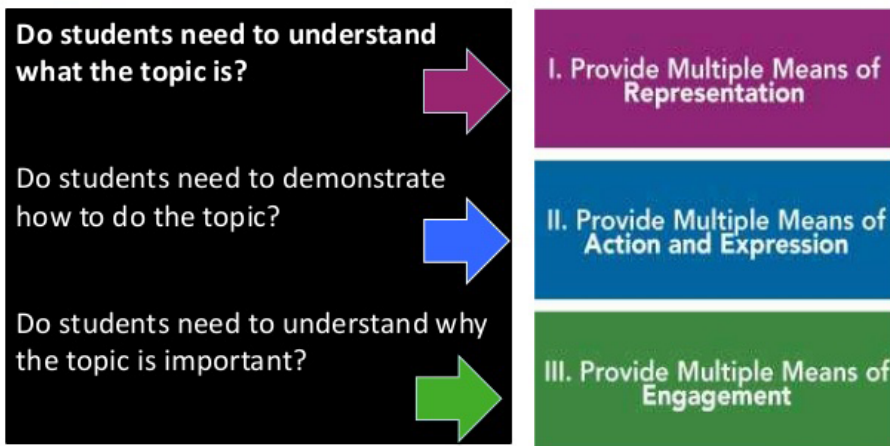
The most beautiful thing we can experience is the mysterious. It is the source of all true art and all science. – *Albert Einstein (1930)*

*Carmen Watts-Clayton is lead teacher in a moderate/severe elementary special day class. She is a vocal proponent of technology in the classroom and has experience securing donations and grants to support it. You can e-mail her at [cwattsclayton@gmail.com](mailto:cwattsclayton@gmail.com) with your experiences or questions.* ✍️

UDL, continued from [page 1](#)

So what exactly is universal design for learning? Like universal design, it's a way to ensure that what is offered is accessible to everyone. While UDL is a good idea for every student, the point is that offering only one instructional method is NOT good for every student.

You already know this. Your students have differing needs. Some enjoy listening, others like to watch or read. Some like to build things while others like to draw or write. So how do you accommodate these differences? You use the three pillars of UDL:



1. **Multiple Means of Representation** -- providing a variety of ways to present information to students.
2. **Multiple Means of Action and Expression** -- providing a variety of ways that students can share what they know.
3. **Multiple Means of Engagement** -- providing a variety of ways to interest students in the lessons.

To figure out which instructional methods to use, think about the abilities of the students in the class and how to match their learning style with the curriculum.

A practical example might help. Suppose you want to teach about the planets in the solar system. Consider the following list of learning preferences: making, reading, acting, creating, drawing, listening, doing, audio recording, manipulating, designing, producing, typing, video production, building, painting, writing, singing, game play, moving.

Does this give you some ideas? Teachers attending the webinar came up with a litany of lesson ideas, including creating a song, writing a play, using balloons to represent planets, writing a comic strip, playing Jeopardy, asking students how to make each planet liv-

able for Earthlings, and many more.

If you're looking for UDL lesson ideas, brainstorming with fellow teachers is a great way to start. You can also find UDL lesson plans at [www.cast.org](http://www.cast.org).

Tech tools can also be very helpful in helping you incorporate UDL into the classroom. See the nearby chart listing tech tools that teachers find helpful.

The best thing about UDL is that it allows you to align student abilities and preferences with learning goals, which increases accessibility for all. When you provide supports for those with disabilities, (for example, by offering read-alouds, graph paper, and oral reports), you actually increase learning for everyone.

Watch for future articles about UDL tech tools, and have fun in class!

Tools You're Not Limited To...			
Primarily Audio	Primarily Video	Primarily Pictures	Primarily Text
Voice Note in Read&Write for Google Chrome	<a href="#">Voki</a>	<a href="#">Bitstrips</a>	Paper
<a href="#">Chirbit</a>	<a href="#">Blabberize</a>	<a href="#">Pixton</a>	Google Docs
<a href="#">Vozme</a>	<a href="#">Animoto</a>	<a href="#">Toondoo</a>	<a href="#">Twiddla</a>
<a href="#">Audacity</a> (Free download)	WIndows Movie Maker	<a href="#">Flickr</a>	<a href="#">SpiderScribe</a>
Sound Recorder	<a href="#">Tellagami</a>	<a href="#">PhotoPeach</a>	<a href="#">Lucidchart</a>
Voice Memo App	<a href="#">Powtoons</a>	<a href="#">Glogster</a>	Microsoft Word