ISTE Essential Conditions and ISTE Standards

ISTE is the International Society for Technology in Education. Their standards for teachers and students are commonly accepted as the go-to standards for integrating technology in education. The ISTE Essential Conditions are the 14 critical elements necessary to effectively leverage technology for learning. They offer educators and school leaders a research-backed framework to guide implementation of the ISTE Standards, tech planning and systemwide change. The College of Education and Human Services at Utah State University has developed a new course for educators - ITLS 5500 and TEAL 5500 - Innovative Integration of Technology for Teaching. The course is focused on achieving the ISTE standards for students and teachers. The course content is publicly accessible under a Creative Commons license, and would serve as a great starting point for school and community discussions about what schools can do to make learning fun and engaging for students (and for teachers). What follows is a portion of one of the course experiences.

<table>
<thead>
<tr>
<th>THE 2016 ISTE STANDARDS FOR STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Empowered Learner</strong></td>
</tr>
<tr>
<td>Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.</td>
</tr>
<tr>
<td><a href="#">VIEW EDUCATOR</a></td>
</tr>
<tr>
<td><strong>Digital Citizen</strong></td>
</tr>
<tr>
<td>Students recognize the rights, responsibilities and opportunities of being, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.</td>
</tr>
<tr>
<td><a href="#">VIEW EDUCATOR</a></td>
</tr>
<tr>
<td><strong>Knowledge Constructor</strong></td>
</tr>
<tr>
<td>Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.</td>
</tr>
<tr>
<td><a href="#">VIEW EDUCATOR</a></td>
</tr>
<tr>
<td><strong>Innovative Designer</strong></td>
</tr>
<tr>
<td>Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or innovative solutions.</td>
</tr>
<tr>
<td><a href="#">VIEW EDUCATOR</a></td>
</tr>
<tr>
<td><strong>Computational Thinker</strong></td>
</tr>
<tr>
<td>Students develop and apply strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.</td>
</tr>
<tr>
<td><a href="#">VIEW EDUCATOR</a></td>
</tr>
<tr>
<td><strong>Creative Communicator</strong></td>
</tr>
<tr>
<td>Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.</td>
</tr>
<tr>
<td><a href="#">VIEW EDUCATOR</a></td>
</tr>
<tr>
<td><strong>Global Collaborator</strong></td>
</tr>
<tr>
<td>Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.</td>
</tr>
<tr>
<td><a href="#">VIEW EDUCATOR</a></td>
</tr>
</tbody>
</table>
ISTE Standard 2-2 for Teachers: Design and develop digital age learning experiences and assessments: Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.

We’ve already witnessed several technology-enriched learning environments in earlier videos - such as in sections 2A, 3B, 3D, 3E, 3F, 3G, and 4A. A technology-enriched learning environment simply means that the right tools and spaces are available for students to become active participants in the learning experience. There are several tools available that also allow students to set goals, manage learning, and assess their progress. Let’s explore some possibilities for this standard. Carefully consider the following...

Read:

- 5 Ways to Give Your Students More Voice and Choice
- “I Wonder” Questions: Harnessing the Power of Inquiry
- Research Says… / Choice Is a Matter of Degree

Knewton: is an adaptive instructional site that simplifies lessons, and tracks progress for each student. “Teachers can use this site to incorporate adaptive lessons into their curriculum. They can set up courses for specific students or for the whole class, choosing which lessons to include. Teachers can search for content by grade level or topic. They can also create their own instructional or assessment content. By setting specific due dates and being able to monitor students’ progress in the teacher dashboard area, teachers can help their students stay on track. Students 13 and over can register on their own (though anyone under 18 needs a parent’s permission), but for students under 13, teachers can make child accounts for them, under their own accounts, to assign courses and lessons for their class. The site currently offers math lessons for grades 6-12, English language arts lessons for grades 4-6, and biology lessons for grades 9-11. The site’s goal is to eventually have lessons that span K-12 content in several areas, but they aren’t there yet. The information they have so far, though, is high-quality and helpful.” (Source)
KHAN Academy: "Missions boost math learning with balance of focus, freedom to explore. "For classroom teachers, Khan Academy is probably best used to teach, practice, and review Common Core-focused math skills. The site’s other videos can also serve as great supplemental resources in a variety of subjects. The missions are organized by grade level, and an interactive knowledge map has direct links to standards-focused exercises; it’s easy to target students’ instruction for a particular grade level and skill. If you’re new to the site, a great place to start is the Coach and Classroom Resources section under the Learn menu. Here, you’ll find great information about how to blend the missions into your classroom instruction.

Once you’ve got your classroom and student accounts set up, simply find the content that’s relevant to an upcoming unit. From there, assign your students recommended skills so they can review and practice the material. Using the site’s powerful analytical and adaptive program, you can track students’ progress and identify those who may be struggling in certain areas. Use the reports to view the skills your students need to practice more; you could even find and recommend a peer tutor for someone. Challenge your students to complete lessons within a given time frame, or even to complete their grade-level mission by the end of the school year." (Source)

AlienRescue - From their website: “Alien Rescue is an online problem-based 3D immersive learning environment for sixth grade science. It combines best practices from educational research with innovative technologies to deliver an engaging learning experience. The design of Alien Rescue is based on current research in teaching and learning and is continually developed and improved by researchers from The University of Texas at Austin. Alien Rescue was developed to meet the curriculum requirements for sixth grade science.” Read a research study on the use of AlienRescue in the classroom.

The Google Art Project - The Google Art Project is a unique collaboration with some of the world’s most acclaimed art institutions to enable people to discover and view artworks online in extraordinary detail. Working with over 250 institutions, we have put tens of thousands of works of art from more than 6,000 artists online. This involved taking a selection of super high resolution images of famous artworks, as well as collating more than thirty thousand other images into one place. It also included building 360 degree tours of individual galleries using Street View ‘indoor’ technology. The project has expanded dramatically since it first launched.
To conclude this section, its purpose is to spark some ideas how you can develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress. What technology software or hardware can you find that would provide or add to a meaningful, engaging experience? How can you arrange your learning space so give students more choice to pick their environment? Think about this - it can reap great benefits in learning!

CK-12 Open Education Resources can now be used offline!

https://www.ck12info.org/about/whatsnew/#Online_Offline_Access

What is it?
With the free CK-12 FlexBook® app for smartphones and tablets, users have the power to read the entire collection of CK-12 FlexBook® textbooks anytime, anywhere, even without connectivity.

Why should I use it?
- Your customized FlexBooks®, along with the full collection of CK-12 books, are available on this app.
- See the latest content from CK-12 here, including all updates and new books not available on iBooks and Kindle.
- Download individual chapters or entire FlexBooks® at any time on your phones and tablets to access them offline.

Where do I get it?

Video: STEM-Focused Classroom | Mount Pleasant Middle School (3:19)

Article: Inside ‘Room 21C’: This Iowa Classroom’s Redesign Inspired Seven Other Districts

Website: 4.0 Schools: 4.0 Schools finds, trains, and invests in passionate people solving the most important challenges in education. We build communities around entrepreneurs and their ventures to help them grow their ideas into successful, sustainable organizations.
Bring NASA’s Summer Discoveries Into the Classroom With Free Education Resources

This summer, while many of us were sleeping in and avoiding school work, lots of exciting things were happening in and around our solar system!

Check out resources from NASA’s Jet Propulsion Laboratory that will help you kick off the 2016 school year right by turning those stellar events into educational connections with NASA.

Summer in the Northern Hemisphere is fire season. See how NASA satellites and airborne instruments are helping scientists better understand wildfires and their impact on our changing climate. Bring the story into the classroom with JPL’s latest Teachable Moment featuring lesson plans that use real NASA data. Or spruce up your classroom with a NASA Earth Science bulletin board kit.

On July 4, the Juno spacecraft entered orbit around Jupiter! Explore the mission with your students with free classroom activities, videos and an easy-to-build Juno model.

To learn more and download education materials to kick off your school year, visit http://www.jpl.nasa.gov/edu/news/2016/8/23/what-nasa-did-over-your-summer-vacation/.

This false-color image of the Soberanes fire in Northern California, near Big Sur, was captured by the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) instrument on NASA’s Terra spacecraft on July 28, 2016.

Albert Einstein Distinguished Educator Fellowship Program Accepting Applications for 2017-2018 Fellowship Year

The Albert Einstein Distinguished Educator Fellowship Program provides a unique opportunity for accomplished K-12 educators in the fields of science, technology, engineering and mathematics to serve in the national education arena. Fellows spend 11 months working in a federal agency or U.S. congressional office to bring their extensive classroom knowledge and experience to efforts related to STEM education programs and policy.

To be eligible, applicants must be U.S. citizens who are currently employed full time in a U.S. public or private elementary or secondary school or school district. Applicants must have been teaching full time in a public or private elementary or secondary school for at least five of the last seven years in a STEM discipline.

Current sponsoring agencies included NASA, the U.S. Department of Energy and the National Science Foundation. The DOE sponsors up to four placements in U.S. congressional offices.

The Albert Einstein Distinguished Educator Fellowship Program is managed by the DOE Office of Science through its Office of Workforce Development for Teachers and Scientists, in collaboration with the Oak Ridge Institute for Science and Education and partnering federal agencies.

Program applications are due Nov. 17, 2016, at 8 p.m. EST and must be submitted through an online application system. Additional information about the program, including eligibility requirements, program benefits, application requirements and access to the online application system, may be found at http://science.energy.gov/wdts/einstein/.

Please direct inquiries about the Albert Einstein Distinguished Educator Fellowship Program to sc.einstein@science.doe.gov.
What’s New at NASA’s Space Place Website?

Space Place is a NASA website for elementary students, their teachers, and their parents. Check it out at www.spaceplace.nasa.gov.

New Resources:

**Galactic Explorer** -- A galaxy is a huge collection of gas, dust and billions of stars held together by gravity. Visit as many galaxies as possible in Galactic Explorer, our new NASA Space Place game! - [http://spaceplace.nasa.gov/galactic-explorer](http://spaceplace.nasa.gov/galactic-explorer)

**Sun Comparison** -- Our sun is a bright, hot ball of hydrogen and helium at the center of our solar system. So hot, that it’s actually 10,000 degrees Fahrenheit at the surface and 27 million degrees Fahrenheit in the core! But how does our sun compare to other stars? - [http://spaceplace.nasa.gov/sun-compare](http://spaceplace.nasa.gov/sun-compare)

**Sunscreen Activity** -- The sun sends energy toward Earth in the form of ultraviolet, or UV, light. We can’t see UV light with our eyes, but we are affected by it. Make handprint art using UV light. - [http://spaceplace.nasa.gov/sunscreen-activity](http://spaceplace.nasa.gov/sunscreen-activity)

**NASA Space Place Calendar** – Looking for some hands-on activities and fun facts to use in the classroom? Check out our 2016-2017 NASA Space Place Calendar! This calendar includes many noteworthy space dates and links to related content on our website. - [http://spaceplace.nasa.gov/calendar](http://spaceplace.nasa.gov/calendar)

**Rovers on Mars** -- Over the years, we’ve sent four rovers to study the cold, red planet we call Mars. We even plan to send another one in just a few years. Meet the team of rovers and discover what we’ve learned from each one.

- **Sojourner** - [http://spaceplace.nasa.gov/mars-sojourner](http://spaceplace.nasa.gov/mars-sojourner)
- **Spirit and Opportunity** - [http://spaceplace.nasa.gov/mars-spirit-opportunity](http://spaceplace.nasa.gov/mars-spirit-opportunity)
- **Curiosity** - [http://spaceplace.nasa.gov/mars-curiosity](http://spaceplace.nasa.gov/mars-curiosity)

**Back to School** - Summer is almost over, and that means it’s time to head back to the classroom! Here are some helpful resources:

- **Math Activities** - [http://spaceplace.nasa.gov/math-activities](http://spaceplace.nasa.gov/math-activities)
- **Social Media** - To keep up with the latest, follow us on Facebook and Twitter @nasaspacesplace.

**Special Days to Celebrate** - Find out about noteworthy days in NASA and space history that you can observe in your classroom.

- **Sept. 1** -- Pioneer 11 made the first flyby of Saturn on this day in 1979. Five spacecraft, including this one, have been to Saturn. Learn more about this beautiful planet. - [http://spaceplace.nasa.gov/all-about-saturn](http://spaceplace.nasa.gov/all-about-saturn)
- **Sept. 18** -- Voyager 1 took the first photo of Earth and the moon together in 1977. Find out what this spacecraft is doing now. - [http://spaceplace.nasa.gov/voyager-to-planets](http://spaceplace.nasa.gov/voyager-to-planets)
- **Sept. 23** -- Neptune was discovered on this day in 1846. Neptune is dark, cold and very windy. What else do we know about this planet? - [http://spaceplace.nasa.gov/all-about-neptune](http://spaceplace.nasa.gov/all-about-neptune)
- **Oct. 1** -- Happy Birthday, NASA! Today, NASA opened its doors for the first time. But did you know there are also other agencies in space? - [http://spaceplace.nasa.gov/other-agencies](http://spaceplace.nasa.gov/other-agencies)
- **Oct. 15** -- Today, Uranus will be at its closest approach to Earth. Fun Fact: Uranus actually has faint rings. - [http://spaceplace.nasa.gov/all-about-uranus](http://spaceplace.nasa.gov/all-about-uranus)

**Share** - Do you want some help spreading the word about NASA’s Space Place? We have a page with ready-to-use website descriptions, logos and links to all our social media. Check out [http://spaceplace.nasa.gov/share](http://spaceplace.nasa.gov/share).

**Subscribe to Our Monthly E-newsletter!** - Interested in keeping up with the latest and greatest news from NASA Space Place? Subscribe to the NASA Space Place Gazette. The NASA Space Place Gazette is for educators, parents and space enthusiasts of all ages. It includes special bulletins for noteworthy days and NASA events, such as a lunar eclipse, planet flyby or rover landing. It’s easy to subscribe – just click here. [http://spaceplace.nasa.gov/subscribe](http://spaceplace.nasa.gov/subscribe)

**Send Feedback** - Please let us know your ideas about ways to use The Space Place in your teaching. Send them to info@spaceplace.nasa.gov.
Take ‘STEM on Station’ Back to School With You

Looking for ways to bring the space station into your classroom? Visit NASA’s STEM on Station website to learn about the station, the research currently taking place there, and exciting ways to get your students involved. Take a look at the themed “Teacher Toolkits” to find lesson plans and other resources related to a monthly topic. STEM on Station has everything you need, all in one place!

More opportunities and resources await you at this education website focused on the space station. http://www.nasa.gov/education/STEMstation

Free Education Webinars From NASA Educator Professional Development

The NASA STEM Educator Professional Development Collaborative at Texas State University is presenting a series of free webinars open to all educators. Join NASA education specialists to learn about activities, lesson plans, educator guides and resources that bring NASA into your classroom. Registration is required to participate. To register, simply click on the link provided beneath the webinar description.

Seeing Your Students at NASA: So You Want to Be an Astronaut and Other NASA Careers

Event Date: Sept. 12, 2016, at 6 p.m. EDT
The Climate Kids website features sections through which participants gain a deeper understanding of climate change issues. The section titles are Learn the Basics, See the Impacts, Think Like a Scientist, Be Part of the Solution and Dream of a Green Career. This NASA education resource includes articles, videos, images and games focused on the science of climate change. Register online to participate. https://www.etouches.com/196236

Seeing Your Students at NASA: Engineering for Mars -- Part 1

Event Date: Sept. 15, 2016, at 4 p.m. EDT
In Part 1 of this series, educators will review two classroom activities in which students work in engineering design teams to test various components of a Mars exploration vehicle. This ready-to-go facilitation guide, Gaining Traction, is aligned to the Next Generation Science Standards and includes a pre-assessment, handouts, rubrics and a post-assessment. In the first two activities of the project, students build batteries and test wheel friction while focusing on the subject areas of engineering, motion and interaction. Register online to participate. https://www.etouches.com/198527

For a full schedule of upcoming webinars, visit http://www.txstate-epdc.net/events/.

Please direct questions about this series of webinars to Steve Culivan at stephen.p.culivan@nasa.gov.
Be a Citizen Earth Scientist
With New ‘GLOBE Observer’ App

Want to be a citizen Earth scientist? To contribute to NASA's studies of our home planet, all you need is a smartphone, access to the outdoors, and the new “GLOBE Observer” app.

Now available for Apple and Android phones, the app is an initiative of the Global Learning and Observations to Benefit the Environment program. For over two decades, GLOBE has enabled schools and students in over 110 countries to investigate their local environment and put their observations in a global context.

The initial release of the app allows users to collect observations of clouds, which are a critical part of the global climate system. From Aug. 31 - Sept.14, the GLOBE Observer team challenges citizen scientists to collect cloud observations that coincide with the overpass of cloud-observing satellites over their location. Through the GLOBE Observer app, users will be informed about the timing of the satellite overpass at their respective locations. Users can also view daily maps of the satellite’s path by following GLOBE Observer on Facebook or Twitter.


NASA’s Digital Learning Network Seeking High School Classes for Interactive Event About Game-Changing Technology

In 2013, life changed drastically for the families of 19 firefighters trapped in an Arizona wildfire. The fire shelters the firefighters were carrying were unable to protect them. That tragedy inspired scientists and engineers at NASA's Langley Research Center in Virginia to look at how technology developed for inflatable heat shields for spacecraft could be used to prevent this kind of tragedy from happening to others.

Join NASA's Digital Learning Network for a special web conference on Oct. 19, 2016 at Noon EDT. During this event, students can learn personally from the scientists, engineers and representatives of the National Forestry Service about how they will use this technology to save lives. The DLN is currently accepting requests for high school classes to participate live during the webcast.

To be considered for this opportunity, please send an email to dlinfochannel@gmail.com. Use “CHIEFS Webcast” in the message's Subject line and include the following information in the email message:

- Point of Contact (POC) Name
- School Name
- POC Email
- POC Phone Number
- Grade Level of Students Who Will Participate
- Approximate Number of Students Who Will Participate

To be considered, requests to participate must be received by Sept. 16, 2016.

Please direct questions about this event to DLiNfochannel@gmail.com.

For more information about other DLN events, visit http://www.nasa.gov/dln.
Host a Real-Time Conversation With Astronauts Aboard the International Space Station

ARISS-US is now accepting proposals from U.S. schools, museums, science centers and community youth organizations (working individually or together) to host an Amateur Radio on the International Space Station, or ARISS, radio contact with an orbiting space station crew member between July 1 - Dec. 31, 2017. Proposals are due Nov. 1, 2016.

ARISS is looking for organizations that will draw large numbers of participants and integrate the contact into a well-developed education plan. Students can learn about satellite communications, wireless technology, science research conducted on the space station, what it is like to work in space, radio science, and any related STEM subject. Students learn to use amateur radio to talk directly to an astronaut and ask their STEM-related questions. ARISS will help educational organizations locate amateur radio groups who can assist with equipment for this once-in-a-lifetime opportunity for students. Exact dates for the 10-minute radio contact are determined by crew scheduling and space station orbits.

Informational Sessions

To help organizations learn about ARISS radio contacts and the proposal process, ARISS offers one-hour online information sessions; all questions are welcomed. Attending an online session is not required but strongly encouraged.

Informational sessions will be offered Sept. 20, 2016, at 4 p.m. EDT and Sept. 28, 2016, at 7 p.m. EDT.

Advance registration is necessary. Email ARISS (aris@arrl.org) to sign up for an information session.

For proposal information and more details such as expectations, proposal guidelines and proposal form, visit http://www.arrl.org/hosting-an-ariss-contact.

ARISS-US is offered through a partnership between NASA; the American Radio Relay League, or ARRL; and the Radio Amateur Satellite Corporation, or AMSAT. ARISS was created and is managed by an international working group.

Please email questions about this opportunity to ariss@arrl.org.

NASA Unveils New Public Web Portal for Research Results

With the launch of a new agency public access portal, public access to NASA-funded research data now is just a click away. PubSpace is a repository of original science journal articles produced by NASA-funded research and available online without a fee.

While the agency always has made access to its research a high priority, the focus now is to make NASA science data more easily obtainable via “one-stop shopping.” This increased public access is intended to accelerate the dissemination of fundamental research results to advance scientific knowledge and help ensure the nation’s future prosperity.

The NASA-Funded Research Results portal was created in response to a 2013 request from the White House Office of Science and Technology Policy, which directed science-funding agencies to develop plans to increase access to the results of federally funded research. NASA’s public access plan was developed in coordination with the science and technology research community across the agency. NASA will continue to consult with the scientific community, academic institutions, publishers and other federal agencies to implement this plan and increase access to research results.

For more information, visit http://www.nasa.gov/open/researchaccess.
Open Textbook Hub

http://goo.gl/1QWl8S

The rising cost of higher education textbooks are a concern for students and their families. Their newest Hub on OER Commons supports the discovery and use of open textbooks, from Economics to Psychology. These newly curated collections of open textbooks provide access to open textbooks by topic, as well as by provider. In addition, we’ve curated OER to supplement these free and open textbooks. Explore the Open Textbook Hub.

Dissecting Eyeballs And T-Rex’s

Is virtual reality all hype? Not according to Montour School District administrator Justin Aglio. In the fall 2015, Montour opened a new “Virtual Immersion Lab,” where the district has been experimenting with augmented and virtual reality technology. Aglio offers EdSurge a peek into the lab—as well as VR and AR tips for educators.

Take the Preamble Challenge!

Celebrate Constitution Day with the Civics Renewal Network (CRN)! Sign up to take the Preamble Challenge along with hundreds of schools across the nation on Friday, September 16. Annenberg’s free online Teacher Toolkit gives you everything you need for your classroom activity. Annenberg Learner is a proud partner in the CRN, a consortium of nonpartisan, nonprofit organizations that support high quality civics education by providing free teaching materials.

Weather Interactive

Hurricane season is in full spin. Students learn about how hurricanes and tornadoes form with the Weather interactive. They can also see if they have what it takes to be a virtual storm-chaser.

http://annenberglearner.cmail20.com/t/i-l-kiljydt-kutltukjh-m/
Flipped Classrooms and Blended Learning

In this free five week course, learn how to use Adobe tools, including Photoshop, InDesign, Captivate and others, to create digital content to support your teaching and learning in the physical classroom and online. Course starts September 19.

Enroll Now

Animation for the Classroom

This free five week course empowers educators to create and manipulate animations in a hands-on, collaborative experience. Learn how different types of animations are made and explore best practices for integrating animation into your classroom. Starts September 26.

Enroll Now

Participate Learning

https://www.participate.com

From their website: “We believe that education has the ability to change the world. This is why our goal is to create learning opportunities that empower teachers and inspire students.

As a part of the VIF family, Participate Learning helps teachers connect and collaborate with educators around the world to discover new resources and ideas they can incorporate into their instruction. Our collaborative professional development tools provide growth opportunities for educators that are rooted in discussion and creative, critical thinking.” Click the video (below-right) to learn more about Participate.com

“What’s Next?” Student Film Challenge

Deadline: September 27

Sundance Institute and Adobe Project 1324 announce the 2016 Sundance Ignite “What’s Next?” short film challenge for students. Winners will become Sundance Ignite fellows and receive a trip to the 2017 Sundance Film Festival, a year-long mentorship with a Sundance Mentor and more!

Enter Now

Track Migration and the Seasons with Journey North

goo.gl/ebH9Nn

Join classrooms across North America in tracking fall wildlife migrations and signs of the seasons. Report your sightings from the field, view maps, take pictures, and leave comments. Journey North is one of the nation’s premier online science projects for children and the general public, providing an easy entry point to citizen science. Discover what’s happening “right now” across our continent.

New Teaching Arabic Resource Coming This Fall!

goo.gl/es1jsg

Annenberg Learner and Qatar Foundation International (QFI) are partnering to bring a robust professional development Open Education Resource (OER) to U.S. Arabic language educators. The project, Teaching Arabic, is produced by WGBH Boston with guidance from leading advisors on the teaching of Arabic and world languages.

“Participate Learning” Dashboard

Create a new collection

Upload files and organize your digital resources. You can also invite colleagues to discuss and collaborate on your collection.

Check in on #globaled16

Global Leadership Week (GLW) is a weeklong convening of virtual and face-to-face events designed to celebrate leadership through global action in K-12.

Complete your user profile

Personalize your Participate experience and tell everyone a little about yourself.
Photomath Camera Calculator

by Jordan Haws

There is an app called Photomath Camera Calculator, and just as the name implies, you can take a picture of a math problem and this app will give you the solution! Not only that, but it gives a step by step process of how to solve the problem.

The program is able to cover arithmetic, fractions, decimals, linear equations, and systems of equations. More complex subjects like trigonometry or basic calculus are available, but not to the same extent yet.

This app is free for both Apple and Android, but does have some in app purchases. It might not be ideal for young students, but can be a great help for parents helping students with math. When used right by students, though, it can be a great help to see example problems worked out in a step by step fashion, and teach the principles of math solutions.

Physics in Action

by Jordan Haws

Trains insulate their windows in order to keep heating and AC energy requirements down. As a side effect trains tend to have horrible cell phone reception through. A train line in Switzerland (Bern–Lötschberg–Simplon railway) developed a very interesting solution that is based on basic physics principles.

More specifically, many train windows use a double layer of glass with an ultra-thin sheet of metal between the sheets in the layers of glass. This thin sheet of metal helps to reflect out heat (like a tin foil food cooker might), but is also transparent to allow regular light through. This concept works wonderfully, but has an adverse effect on cell phone reception. And here is where physics comes in.

If you’ve ever seen a giant tesla coil in a movie or in real life that shoots electricity like lightning through the air, then you’ve probably seen a cage of metal nearby. That cage of metal creates a Faraday cage. The basic concept is that if you surround something in metal, electromagnetically everything inside is disregarded. This is the same reason people are safe inside a car, even if the car gets struck by lightning. It’s not that the lightning doesn’t want to flow through the people inside or the rubber tires, but that the electric charge is all concentrated on the outside of the car, and doesn’t see any point in going through the car.

So this concept is important because with train windows utilizing metal in them, each train car is turned into a Faraday cage. This is good for lightning strikes, but bad for phone signals, which operate on the spectrum that is Faraday cages negate. To fix this problem, the metal plates were laser treated to allow some wavelengths through the windows while stopping others. Because cell signals have relatively long wavelengths, heat can be transferred though a medium wavelength, and light is a relatively short wavelength, the laser designs acted to keep out the medium waves without stopping the other two.

So with a little science and a lot of precise engineering, this new train technology in Switzerland has allowed trains to be insulated from heat, but still allow light and phone signals through it’s windows.