STEMTLnet
@STEMTLnet

Welcome everyone! Please introduce yourselves – tell us who you are, where you're from and your current role. We'll put up the first question in just a few minutes. #STEMTLdiscuss

STEM TEACHER LEADERSHIP NETWORK

STEM FOR ALL MULTIPLEX

• Use the reply icon to answer 💬

• Answer our questions (Q1, Q2, Q3, Q4) by using A1, A2, A3, A4 anywhere in your tweet

• Tag all tweets with **#STEMTLdiscuss**

• Add hashtags for your role (ex. #ElementaryScienceTeacher #STEMEDResearcher)

• Don't forget -to see new posts, you may have to **refresh often** as the conversation continues!

Welcome!
Thank you for joining tonight's chat.

Please tell us who you are, where you're from, and what your current role is.

Live Twitter Chat 6/17 at 4pm -5pm EDT Integrating CS & CT in the Pre K-8 Grades
🐦 **#STEMTLdiscuss**

TeRC 🌐

3:58 PM · Jun 17, 2020 · Twitter Web App

2 Retweets   **1** Like

Bobby Oommen @bobby_oommen · Jun 17
Replying to @STEMTLnet
Hey there – Middle School CS Tchr @Latin_School #STEMTLdiscuss.

💬   ⟲   ♡ 2   ⬆

Melissa Rasberry @MelRasberry · Jun 17
Replying to @STEMTLnet
Hello all! I'm the PI for the @NSF @CSforAllTchrs virtual community. Happy to join the conversation today.

💬   ⟲   ♡   ⬆

Jennifer Tsan @JennTsan · Jun 17
Replying to @STEMTLnet
Hi everyone! I'm a #graduatestudent in #k12csed from NC State. #STEMTLdiscuss

💬 1   ⟲   ♡ 3   ⬆

Melissa Rasberry @MelRasberry · Jun 17

Nice to "connect!" I work for @AIRInforms but work remotely from home in Durham and serve as the PI for @CSforAllTchrs!

💬 1   🔁   ♡ 1   ⬆️

Jennifer Tsan @JennTsan · Jun 17

Nice to virtually meet you! Do you offer PD @CSforAllTchrs?

💬 1   🔁   ♡   ⬆️

CS for All Teachers @CSforAllTchrs · Jun 17

Yes! We are a FREE virtual community with over 7K educators who teach #CS. The PD comes through participation in discussion groups, webinars, Twitter chats (like this!) and much more. #STEMTLdiscuss

💬 1   🔁 1   ♡ 3   ⬆️

Jennifer Tsan @JennTsan · Jun 17

I will have to check this out! I know teachers who are interested but may not feel quite confident enough to start teaching CS yet

💬   🔁   ♡ 2   ⬆️

n☐el kuriakos @nkuriakos · Jun 17

Replying to @STEMTLnet

Noel UMD PhD student, focus on CT and data science for the middle school, for Non–STEM content domains.

💬 1   🔁   ♡ 1   ⬆️

n☐el kuriakos @nkuriakos · Jun 17

#STEMTLdiscuss

💬   🔁   ♡ 2   ⬆️

Lisa Rode @roderunners · Jun 17

Replying to @STEMTLnet

Hello! I am a 6th grade teacher at @KingsGlenES in Virginia.

💬   🔁   ♡ 1   ⬆️

Joni Falk @Joni_Falk · Jun 17

Replying to @STEMTLnet

Not sure everyone got to introduce our self. Please join in and use **#STEMTLdiscuss**. Looking forward to hearing from you!

💬   🔁   ♡   ⬆️

Melissa Rasberry @MelRasberry · Jun 17

Replying to @STEMTLnet

I am not in the classroom but from most PreK-8 teachers I know, **#CS** and **#CT** are integrated within the curriculum—if they are even offered. Still much to do to ensure **#CSforAll** in these grades. **#STEMTLdiscuss**

💬   🔁   ♡ 1   ⬆️

Mrs.Geeky @Themrsgeeky · Jun 17

Mrs.Geeky here, Anthem AZ, currently a PD Facilitator with @BootUpPD **#STEMTLdiscuss**

💬   🔁   ♡ 5   ⬆️

STEMTLnet
@STEMTLnet

How is CS and CT being taught in grades PreK-8 in your district – as a standalone course or integrated within the curriculum? #STEMTLdiscuss

STEM TEACHER LEADERSHIP NETWORK — STEM FOR ALL MULTIPLEX

Q1

• Use the reply icon to answer
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Live Twitter Chat 6/17 at 4pm -5pm EDT Integrating CS & CT in the Pre K-8 Grades

🐦 **#STEMTLdiscuss**

TERC

4:10 PM · Jun 17, 2020 · Twitter Web App

Naᴏmí Hᴀʀм @naomiharm · Jun 17

A1 I'm currently not in the classroom yet I support edu's w/ STEM, CT & CS professional learning exp's to model the importance & why hands-on learning experiences can build lifelong learning confidenee within computer science. A lot of #compsci rotation stations **#STEMTLdiscuss**

Bobby Oommen @bobby_oommen · Jun 17

Replying to @STEMTLnet

A1: I'm at an independent school. Our LS (PreK-4th) offers CS as standalone course. The MS (5th-8th) offers CS as standalone class for 5th & 8th, BUT we integrate CS/CT through collaborative projects in all four grades. #STEMTLdiscuss

💬 1   🔁 2   ♡ 2   ⬆️

Melissa Rasberry @MelRasberry · Jun 17

Wow, @bobby_oommen! Standalone course for PreK-4? What does that look like? How often do kids go? #STEMTLdiscuss

💬 1   🔁   ♡ 2   ⬆️

Bobby Oommen @bobby_oommen · Jun 17

Great question - @fadd is our LS CS Teacher. I believe Ss cycle through courses on a 6 day cycle. LS Ss attend their CS class 1x/cycle. @fadd , can you confirm?

💬   🔁   ♡ 3   ⬆️

Jennifer Tsan @JennTsan · Jun 17

Replying to @STEMTLnet

A1: In my district, most CS and CT instruction seems to be limited to media center time and electives. However, in charter schools in the area, it seems more common for more students to have access to CS and CT instruction #STEMTLdiscuss

💬   🔁 1   ♡ 1   ⬆️

Mrs.Geeky
@Themrsgeeky

Q #STEMTLdiscuss Q1 I am fortunate that I work with a variety of schools. I have seen both ways- with purpse across the K-5 and also teachers integrating in isolation

nancymclaughs @nancymclaughs · Jun 17

Replying to @Themrsgeeky

What are some methods of integration that you like as well as some you can suggest? #STEMTLnetdiscuss

💬 1   🔁   ♡   ⬆️

Mrs.Geeky @Themrsgeeky · Jun 17

I love it when you ask a teacher if they teach CS -they say no, then ask their students to use LOGO to draw a triangle ,Scratch to illustrate a verb, EarSketch 2 create a song The "method" have teachers forget the word coding, CT and show them hands on kinestheticTeaching Tools

💬   🔁 1   ♡ 1   ⬆️

Joni Falk @Joni_Falk · Jun 17

Replying to @Themrsgeeky

#STEMTLdiscuss Q1 Mrs. Geeky, So do you have an opinion as to what is more effective and sustainable?

💬 2   ♻️   ♡   ⬆️

Mrs.Geeky @Themrsgeeky · Jun 17

Honestly it depends on so many variables. Ideally integration that scaffolds K-12 is ideal. But greatest success is to factor in what is most reasonable for your school environment, infrastructure, school day, consituency. Would rather have one or the other than not at all

💬   ♻️   ♡   ⬆️

Mrs.Geeky @Themrsgeeky · Jun 17

Replying to @Joni_Falk

Also if the integration path reflects what will work beat for that districts environment you will have better district wide buy in and success

💬   ♻️   ♡   ⬆️

Joni Falk
@Joni_Falk

Replying to @Themrsgeeky

Q #STEMTLdiscuss Q1 Bobby-Oommen and @Themrsgeeky, which do you think is easier to implement, scale and sustain? Do teachers have the allocated time to do it as a standalone?

4:17 PM · Jun 17, 2020 · Twitter Web App

1 Like

💬   ♻️   ♡   ⬆️

Mrs.Geeky @Themrsgeeky · Jun 17

Replying to @Joni_Falk

Stand alone is easier in the beginng if this is new to district and there is pushback. Gives teachers to see success, how it works and makes it easier- more comfortable to take the next step and integrate in classroom

💬   ♻️   ♡   ⬆️

STEMTLnet
@STEMTLnet

Q2 - From an #equity lens, why is it critical to expose PreK-8 students to CS and CT? Don't forget to tag your responses with #STEMTLdiscuss! If you're just joining, feel free to introduce yourself and answer Q1

STEM TEACHER LEADERSHIP NETWORK · STEM FOR ALL · STEM FOR ALL MULTIPLEX

Q2

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From an equity lens, why is it critical to expose PreK-8 students to CS and CT?

Live Twitter Chat 6/17 at 4pm -5pm EDT Integrating CS & CT in the Pre K-8 Grades

#STEMTLdiscuss

TeRC

4:17 PM · Jun 17, 2020 · Twitter Web App

3 Retweets

Bobby Oommen @bobby_oommen · Jun 17
Replying to @STEMTLnet
A2: SO many ways to answer this! My school has taken the approach that CS is the "new" liberal art. As is the case w/ all other liberal arts, understanding CS is fundamental to understanding and functioning the world around us. #STEMTLdiscuss

⟲ 2   ♡ 1

Melissa Rasberry @MelRasberry · Jun 17
Replying to @STEMTLnet
Q1 #STEMTLdiscuss: To me, #CSforAll is a moral and economic imperative. If we want to continue to be a global leader, we need everyone -- but especially underrepresented students -- to have access to #CS and #CT. It can no longer be just for the elite few.

⟲ 1   ♡ 3

CS for All Teachers @CSforAllTchrs · Jun 17
Replying to @JennTsan @MelRasberry and 2 others
Yes! We are a FREE virtual community with over 7K educators who teach #CS. The PD comes through participation in discussion groups, webinars, Twitter chats (like this!) and much more. #STEMTLdiscuss

💬 1   ⟲ 1   ♡ 3

Jennifer Tsan @JennTsan · Jun 17

Replying to @CSforAllTchrs @MelRasberry and 2 others

I will have to check this out! I know teachers who are interested but may not feel quite confident enough to start teaching CS yet

💬　　　⟲　　　♡ 2　　　⤴

nancymclaughs @nancymclaughs · Jun 17

Replying to @STEMTLnet

A2: The critical aspect of #CS and #CT in PreK-8 comes in the ability to solve problems using logical reasoning. This can be integrated into any subject. :) #STEMTLnetdiscuss

💬 1　　　⟲ 1　　　♡ 2　　　⤴

Jennifer Tsan @JennTsan · Jun 17

And it is especially important to teach #CS #CT in the context of solving real world problems

💬　　　⟲ 1　　　♡ 2　　　⤴

Lisa Rode @roderunners · Jun 17

Replying to @STEMTLnet

A2: Providing opportunities for CS and CT in elementary supports development of problem solving strategies & creative solutions. It also provides time for a wider range of students to learn about CS without having to be during an elective or specials block. #STEMTLdiscuss

💬 1　　　⟲ 2　　　♡ 5　　　⤴

Melissa Rasberry @MelRasberry · Jun 17

I'm curious, @roderunners. Have you seen students who may not excel in other areas do well in #CS/#CT? I can imagine that it may help some kids learn where their strengths lie. #STEMTLdiscuss

💬 2　　　⟲　　　♡　　　⤴

Lisa Rode @roderunners · Jun 17

Replying to @MelRasberry and @STEMTLnet

💯 There have been so many times where students have been empowered by the use of coding/robotics.

💬　　　⟲ 1　　　♡ 1　　　⤴

Mrs.Geeky @Themrsgeeky · Jun 17

Replying to @MelRasberry @roderunners and @STEMTLnet

absolutely!!!! That is why robotics, programming etc. should never be for the gifted or after school programs. I can not begin to tell you how many kids we discovered through these experiences. And provides insight into learning styles. #STEMTLnet

💬 1　　　⟲ 3　　　♡ 7　　　⤴

Cleo QC 🇨🇦🪴🐛🐤🌻☕ @Cleo_Qc · Jun 17

ITA, @Themrsgeeky ! Kids with a low school-related self-esteem discover they're good at something! And the opposite happens too! Some straight A students may suddenly not be at the top of their class.

💬　　　⟲　　　♡ 1　　　⤴

Jennifer Tsan @JennTsan · Jun 17

Replying to @STEMTLnet

A2: There are many resources online for PreK-8 students to learn programming. However, for students that do not have technology at home will be unlikely to learn from those resources #STEMTLdiscuss

💬 2   🔁 2   ♡ 2   ⬆️

nancymclaughs @nancymclaughs · Jun 17

Replying to @JennTsan and @STEMTLnet

@JennTsan @STEMLnet
CSFirst has many unplugged lessons that fit into lessons for core classes.
CSunlugged is also a wonderful resource for computational thinking:
classic.csunplugged.org/activities/

💬   🔁 1   ♡ 1   ⬆️

nancymclaughs @nancymclaughs · Jun 17

Replying to @JennTsan and @STEMTLnet

@JennTsan CSFirst is very user friendly for elementary.
csfirst.withgoogle.com/s/en/home
#STEMTLdiscuss

💬 1   🔁 1   ♡ 2   ⬆️

Jennifer Tsan @JennTsan · Jun 17

Oh yes! I have helped out with a CSFirst initiative but I have also found that students struggle with focusing on video tutorials and instructions. Do you have any advice on that?

💬 1   🔁   ♡   ⬆️

nancymclaughs @nancymclaughs · Jun 17

Be aware of the level of specific activities. The videos are very good, but if you have beginners I find it most helpful to work through the project using a team approach.

💬   🔁   ♡ 1   ⬆️

Naᴏmí Hαrм @naomiharm · Jun 17

A2 from an equity lens - the research has proven that CS is the greatest learning opp to meet the diversified learn needs of each & every one of our Ss & w/ differing abilities. It also provides the necessary access and equity to necessary resources and exp's.#stemTLdiscuss

Mrs.Geeky @Themrsgeeky · Jun 17

A2 #STEMTLdiscuss evens the playing field. All students learn logic, problem solving... skills that transfer to all subject matters, helping them to be more successful learners overall
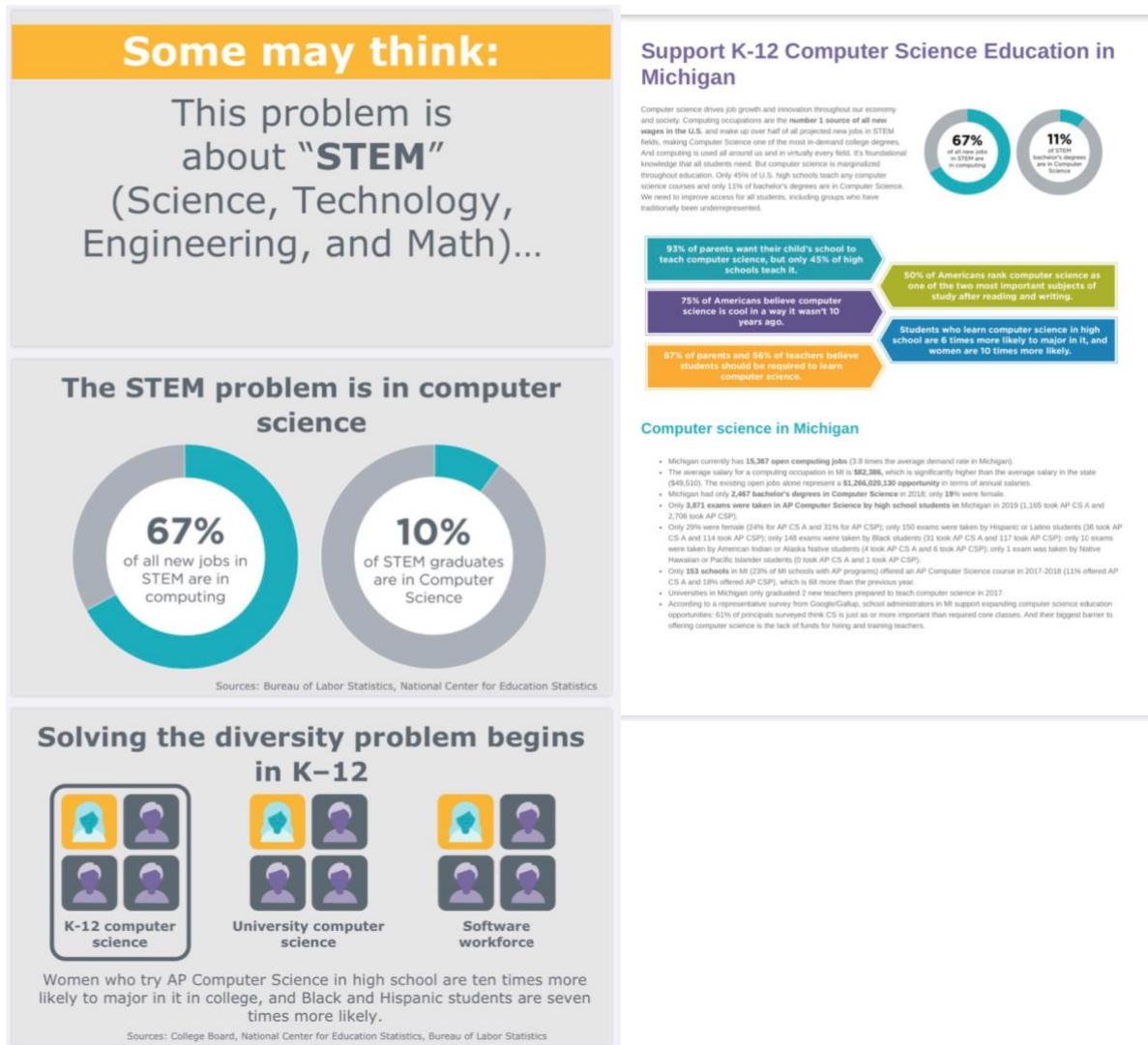
💬   🔁 2   ♡ 2   ⬆️

Wanda Faye Bryant @wandabryant · Jun 17

A1 Wanda Bryant, @Detroitk12 middle school teacher. I'd start here: #STEMTLdiscuss

Some may think:

This problem is about "**STEM**" (Science, Technology, Engineering, and Math)...

The STEM problem is in computer science

67% of all new jobs in STEM are in computing

10% of STEM graduates are in Computer Science

Sources: Bureau of Labor Statistics, National Center for Education Statistics

Solving the diversity problem begins in K–12

K-12 computer science

University computer science

Software workforce

Women who try AP Computer Science in high school are ten times more likely to major in it in college, and Black and Hispanic students are seven times more likely.

Sources: College Board, National Center for Education Statistics, Bureau of Labor Statistics

Support K-12 Computer Science Education in Michigan

Computer science drives job growth and innovation throughout our economy and society. Computing occupations are the **number 1 source of all new wages in the U.S.** and make up over half of all projected new jobs in STEM fields, making Computer Science one of the most in-demand college degrees. And computing is used all around us and in virtually every field. It's foundational knowledge that all students need. But computer science is marginalized throughout education. Only 45% of U.S. high schools teach any computer science courses and only 11% of bachelor's degrees are in Computer Science. We need to improve access for all students, including groups who have traditionally been underrepresented.

67% of all new jobs in STEM are in computing

11% of STEM bachelor's degrees are in Computer Science

93% of parents want their child's school to teach computer science, but only 45% of high schools teach it.

75% of Americans believe computer science is cool in a way it wasn't 10 years ago.

67% of parents and 56% of teachers believe students should be required to learn computer science.

50% of Americans rank computer science as one of the two most important subjects of study after reading and writing.

Students who learn computer science in high school are 6 times more likely to major in it, and women are 10 times more likely.

Computer science in Michigan

- Michigan currently has **15,367 open computing jobs** (3.8 times the average demand rate in Michigan).
- The average salary for a computing occupation in MI is **$82,386**, which is significantly higher than the average salary in the state ($49,510). The existing open jobs alone represent a **$1,266,020,130 opportunity** in terms of annual salaries.
- Michigan had only **2,467 bachelor's degrees in Computer Science** in 2018; only **19%** were female.
- Only **3,871 exams were taken in AP Computer Science by high school students** in Michigan in 2019 (1,165 took AP CS A and 2,706 took AP CSP).
- Only 29% were female (24% for AP CS A and 31% for AP CSP); only 150 exams were taken by Hispanic or Latino students (36 took AP CS A and 114 took AP CSP); only 148 exams were taken by Black students (31 took AP CS A and 117 took AP CSP); only 10 exams were taken by American Indian or Alaska Native students (4 took AP CS A and 6 took AP CSP); only 1 exam was taken by Native Hawaiian or Pacific Islander students (0 took AP CS A and 1 took AP CSP).
- Only **153 schools** in MI (23% of MI schools with AP programs) offered an AP Computer Science course in 2017-2018 (11% offered AP CS A and 18% offered AP CSP), which is 68 more than the previous year.
- Universities in Michigan only graduated 2 new teachers prepared to teach computer science in 2017.
- According to a representative survey from Google/Gallup, school administrators in MI support expanding computer science education opportunities: 61% of principals surveyed think CS is just as or more important than required core classes. And their biggest barrier to offering computer science is the lack of funds for hiring and training teachers.

Naɒmí Ħaʀм @naomiharm · Jun 17

A2. CS also is the number one indicator to empower /motivate more girl students to pursue a passion-driven career in STEM/CS as long as they have a supportive role model women mentor starting at elem, especially in MS & continued on w/ a strong women mentors in HS #STEMTLdiscuss

Wanda Faye Bryant @wandabryant · Jun 17

A2 #STEMTLdiscuss.

How Diversity Can Drive Innovation
Most managers accept that employers benefit from a diverse workforce, but the notion can be hard t...
🔗 hbr.org

💬   🔁 1   ♡ 2   ⬆️

Mr. Scott 🤖 @mrscottbot · Jun 17

A2: Critical before students step up to HS to not only expose them to CS/CT/STEM but to empower them...to have them get excited about it and verbally declare that they are strong at it. Otherwise we continue to lose kids as they come up. Big drop off from 8-9 #stemtldiscuss

💬   🔁 3   ♡ 6   ⬆️

STEMTLnet @STEMTLnet · Jun 17

Q3- What professional development (if any) has your district provided to help PreK-8 teachers in learning how to teach #CS and #CT? Don't forget to tag your responses w/ #STEMTLdiscuss!

STEM TEACHER LEADERSHIP NETWORK | STEM FOR ALL MULTIPLEX | **Q3**

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What professional development (if any) has your district provided to help PreK-8 teachers in learning how to teach CS and CT?

Live Twitter Chat 6/17 at 4pm -5pm EDT
Integrating CS & CT in the Pre K-8 Grades

🐦 **#STEMTLdiscuss**

TERC

💬 1   🔁 5   ♡ 3   ⬆️

Bobby Oommen @bobby_oommen · Jun 17

Replying to @STEMTLnet

A3: 2 yrs ago, @Latin_School held our own 1 day CS conf for our entire school - all Ts were in attendance. We discussed equity, increasing diversity in CS, and integrating CS in all courses. Had internal & external spkrs It was awesome! #STEMTLdiscuss!
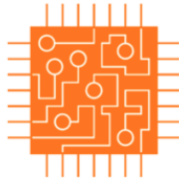
Computer Science @ Latin Schedule & Directory

Latin School of Chicago, 45 W North Blvd, Chicago, IL 60610 – See the full schedule of even...

🔗 latincs.sched.com

💬   ⟲ 2   ♡ 4   ⬆️

CS for All Teachers @CSforAllTchrs · Jun 17

Bravo! That's wonderful, @bobby_oommen. I bet you had something to do with that :) #STEMTLdiscuss

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Naᴑmí Ħarм @naomiharm · Jun 17

A3. For some schools it's optional for some edu's to find their own CS PD, where other districts have a dedicated strategic plan to incorporate CS as a thematic unit approach throughout a k12 focus and every student is provided differentiated learning experiences. #STEMTLdiscuss

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Mrs.Geeky @Themrsgeeky · Jun 17

A3 #STEMTLdiscuss   as a tech coordinator I found that letting teachers have hands on time learning the resources combined with modeling works well. Also allowing teachers to take baby steps and provide support. Un realistic for those who are tentative to jump in with both fee.

Baby Steps

CS for All Teachers @CSforAllTchrs · Jun 17

Meet them where they are! So important! **#STEMTLdiscuss**

> **Mrs.Geeky** @Themrsgeeky · Jun 17
>
> A3 #STEMTLdiscuss   as a tech coordinator I found that letting teachers have hands on time learning the resources combined with modeling works well. Also allowing teachers to take baby steps and provide support. Un realistic for those who are tentative to jump in with both fee.

Wanda Faye Bryant @wandabryant · Jun 17

A3 I found a suite of AMAZING, FREE Artificial Intelligence classes on Twitter **#STEMTLdiscuss**

	IBM AI Education — mindSpark Learning	Custo...
✺ **m**	A graduate-level STEM teaching certification program designed to support educators with ...
indSpar	🔗 mymindsparklearning.org
LEARNING	
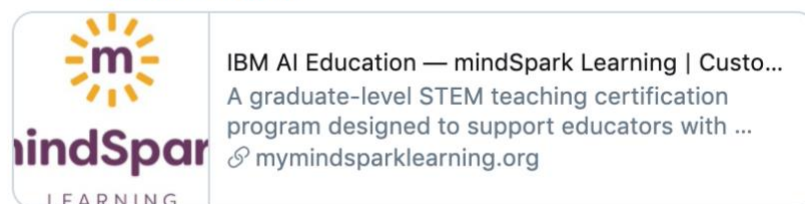
💬 2   ⟲ 4   ♡ 8   ↥

Mrs.Geeky @Themrsgeeky · Jun 17
Replying to @wandabryant

awesome! Thank you!

💬   ⟲   ♡ 1   ↥

Jennifer Tsan @JennTsan · Jun 17
Replying to @wandabryant

@ai4k12 also has resources that might be helpful for anyone interested in teaching AI at this level

💬   ⟲   ♡ 1   ↥

STEMTLnet @STEMTLnet · Jun 17

Last question! Q4 - What resources have you found helpful for PreK-8 teachers in integrating CS and CT?**#STEMTLdiscuss**

💬 2   ⟲ 3   ♡ 2   ⬆

nancymclaughs @nancymclaughs · Jun 17

Replying to @STEMTLnet

A4: A great starting point is to look at your state DLCS standards or ISTE standards to see how #CS and #CT are already implemented in core classes. @STEMTLnet #STEMTLdiscuss

💬   ⟲ 2   ♡ 3   ⬆

Bobby Oommen @bobby_oommen · Jun 17

Replying to @STEMTLnet

A4: So many great, free resources, but IMHO, the best resources combine: free/low cost PD + high quality curriculum + community of fellow Ts. I've found this combo through @codeorg. In addition, local @csteachersorg chapters are invaluable! #STEMTLdiscuss

💬 1   ⟲ 2   ♡ 4   ⬆

Mrs.Geeky @Themrsgeeky · Jun 17

So true!

💬   ⟲   ♡   ⬆

Nα◻mí Ħαʀм @naomiharm · Jun 17

A4 I have personally found exemplar resources of CS/CT resources through @CSforAllTchrs virtual community of practice, here is ex of how to start a girl's cloding club csforallteachers.org/blog/how-engag... Twitter hashtags #compsci & #csk8 Collaborating alongside w/other #CS edu #STEMTLdiscuss

BLOG POST **HOW TO ENGAGE MORE K-8 GIRLS IN COMPUTER SCIENCE**

Mrs.Geeky @Themrsgeeky · Jun 17

A4 #STEMTLdiscuss @TuftsUniversity legoengineering.com MIT Media Lab www.media/mit.edu @ucdcstem c-stem.ucdavis.edu have more on my@website.

Inspiration and support for teachers
Inspiration and support for LEGO-based engineering in the classroom
🔗 legoengineering.com

💬 1   ⟲ 3   ♡ 4   ⬆

Mr. Scott 🤖 @mrscottbot · Jun 17 ⌄

A4: We have utilized @VEXRobotics VR during #remotelearning and will utilize moving forward in any setting **#stemtldiscuss**

> **VEXcode VR**
> The VEX Robotics Design System offers students an exciting platform for learning about areas rich ...
> 🔗 vexrobotics.com

💬   🔁 1   ♡ 2   ⬆️

Wanda Faye Bryant @wandabryant · Jun 17 ⌄

A4 @mieducation offered this course for free: michiganvirtual.org/professionals/... **#STEMTLdiscuss**

> **Computer Science Standards Course | Michigan ...**
> In partnership with the Michigan Department of Education, we have developed a course that ...
> 🔗 michiganvirtual.org

💬 1   🔁 1   ♡ 4   ⬆️