Skill Struck ®

COMPUTER SCIENCE RESOURCES

Your Computer Science Starter Kit

This starter kit includes resources that will help educators become more confident in computer science (CS), and help students become leaders in computer science.

Inside, you'll find articles and resources that teach you the why of CS. Such as, how CS helps kids develop a growth mindset, build social skills, and allows them to stretch their creativity.

This kit also includes free resources that help you host coding workshops in your classroom, and includes lesson plans and activities that align to CSTA standards. You can also print CS-themed posters that you can hang in your classrooms to get students excited about code.

So, are you ready to take the guesswork out of getting started in CS? Start with Your Computer Science Starter Kit. If you have any questions, reach out to us at hi@skillstruck.com.

Let's empower the next generation of students together!

Computer Science Resources

Why Students Should Learn Computer Science

Computer science (CS) has been a big topic in education for the past several years. Many CEOs, state leaders, and forward-thinking educators agree that CS does more than just prepare students for jobs that are relevant today. CS also helps students develop valuable skills that will help them in other areas of their personal lives.

In this section, learn about how CS helps students develop problem-solving skills, social skills, creativity, critical thinking, and more.

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Free Coding Resources for Your Classroom

States throughout the United States are requiring computer science (CS) in the classroom. In some cases, teachers are tasked to take on this new curriculum with little to no resources to start.

In this section, you'll find helpful resources that you can start using in the classroom today.

HTML Cheat Sheet 27

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Free For Classroom access

Skill Struck's Free for Classroom accounts allows teachers and students to get a feel for how Skill Struck works, and includes some fun and free coding lessons, activities, and challenges that are all autograded, making it so teachers can teach computer science (CS) whether they are new to CS or an expert.

To make your free account, fill out the form at *skillstruck.com/classroom*.

How to Implement CS in Your K-12 Classrooms

With CS being a new curriculum to many teachers, implementing it into the classroom is a big deal. But it doesn't have to be! Many districts and schools have begun their implementation and have shared some tips and tricks to a successful implementation.

In this section, you can find some of these tips and tricks that our district partners have learned along the way.

How To Set Up Your CS Classroom for Success Blog | *Go to Blog* 75

The Scramble for CS, How to Adopt CS Despite Teacher Shortages | *Go to Blog* 79

The Importance of Engaging Kids in CTE From Kindergarten Through 12th Grade | *Go to Blog* 85

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What is Career and Technical Education? | *Go to Blog* 91

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Improving Equity + Accessibility in CS

At Skill Struck, we believe that coding is for everyone. Because of that, we believe that classrooms should emphasize implementing computer science solutions that are equitable and accessible to all.

In this section, you can learn about how to improve equity and accessibility in your CS classrooms.

How to use CS to Reinforce T.I.P.S. | *Go to Blog* 96

How to Make CTE Clusters More Equitable | *Go to Blog* 100

5 Ways to Improve Equity in Computer Science | *Go to Blog* 104

5 Service Projects for Your Class | *Go to Blog* 107

AI in K-12 Education

AI is the new frontier in education! We believe embracing this technology in a safe, secure, and informed way can help better prepare students for their futures. In this section you can view the AI in K-12 Education Panel hosted by Skill Struck CEO, Parker Gentry. In it, he led administrators from across the nation through a candid discussion on helping districts through this new transition.

Using AI In K-12 Education Panel Discussion | *Go to Blog* 110

BLOG

How Coding Helps Kids Learn How To Fail, Problem Solve, And Be Creative

June 30, 2022

According to The U.S. Bureau of Labor Statistics, the computer science (CS) field is projected to grow 13% from 2020 to 2030. That's ~667,600 new jobs that are being created right now.

Not only are a lot of jobs being created, but these jobs are on the higher end of the national average pay scale. The Median annual wage for a CS position is $97,430. Compare that to the median pay of all occupations landing at $45,760 and it's clear to see there is value in learning these skills.

But CS is so much more than a great money maker. Kids who learn how to code learn how to fail in a positive way, how to problem-solve their way through errors, and how to express themselves creatively.

Coding helps kids learn how to fail in a positive way

Not all students who learn CS will end up pursuing a CS career. We know this. However, there is still so much value to be had by studying CS. One of our favorite things about coding at Skill Struck is the growth mindset it develops. People who have growth mindsets view failure positively. Or rather, they see failure as a launching pad to better knowledge, increased ability, and eventual success.

Michael Jordan said " I've failed over and over and over again in my life. And that is why I succeed" Coding is a place where mistakes are commonly made and students have to study out, discover the error, and fix it.

Learning to code is a safe place to try and try again. We recently asked a 5th grader, who is using our Skill Struck platform in her afterschool program, if coding has ever made her laugh. She responded with a big smile on her face, "Ya! Because when you mess up in the game, it falls down, and sometimes you can make it spin, it's kinda funny."

That is what a growth mindset looks like. She confidently told us that she messes up, and because of the way these coding platforms are designed she gets to chuckle at her mistake and learn how to fix it. She told us she likes art and if she is an artist in the future there is no doubt that this growth mindset she has developed will be a great asset in her creation process.

Coding helps kids develop problem-solving skills

When learning how to code, it is common to find issues and errors in your code that prevent it from working the way you wanted it to. Even if you've been coding for years, this statement holds true.

As a student in CS, you quickly learn how to problem-solve these bugs or errors–you have to! Some problem-solving skills that students develop as they are learning how to code include how to google answers, how to ask a friend for help, and how to take out the error you're experiencing until it starts to make sense.

All these problem-solving skills can be translated into non-coding-related jobs and industries. That's why coding can help students improve in other subjects. The skills they develop in the world of coding will easily aid them as they grow and become positive members of society.

Coding sparks creativity and is a space for kids to express themselves

We've heard a lot of people speak of coding as if it's boring and only for people who don't appreciate the sunlight or human interaction. This is untrue. Coding is for everyone and sparks creativity and human expression.

We live in an era where kids and adults spend a lot of time on their devices consuming content. Coding is the avenue in which people can create the content that we consume. Using code, kids have the potential to develop video games, websites, or any other form of gamification that others can consume.

With coding, kids have the ability to create worlds that come from their minds. So as a parent or educator, if you're concerned about how much time kids spend consuming content, imagine a world where they are creating it instead. Coding is the pathway for them to express themselves in this way.

If you're still unsure about why learning how to code matters for your kids, know that learning CS will help your kiddos learn skills such as how to fail positively, how to problem-solve, and how to express themselves creatively. All of these characteristics will surely be a positive influence on a young person's life and continue to serve them into adulthood and beyond.

To learn more about how Skill Struck is helping kiddos learn how to code, schedule a demo at *www.skillstruck.com/get-demo*.

BLOG

5 Ways Coding Helps Build Social Skills

April 13, 2022

Many people have a misconception of what computer programming looks like. Images of a dark room lit by the blue eerie glow of computer screens still come to mind. Some think that programmers work alone and only come out to talk to people when they need to come up for air.

This couldn't be further from the truth. In reality, programmers are in constant communication and collaboration with others. From coworkers to clients to interested mothers-in-law, programmers communicate about their projects a lot. In fact, communicating is the only way to get their code to work. Collaboration can happen more often between teams of programmers than co-workers found in other careers.

The ability to work well with others is a prized and important aspect in pretty much every career field and in general life success. Learning to code is an effective way to help kids build those social skills. Let's explore 5 ways we do that through our coding curriculum.

1. Help and be helped
2. Collaboration on projects
3. Community of Creativity
4. Common across languages
5. Coding in many different fields

Help and Be Helped

Students learning to code have many questions as they are building a new skill. Naturally, they will ask their peers for help which opens the door for building relationships. Students who know those answers are often eager to share their knowledge. In doing so their confidence grows and the information is solidified. Being helped and helping builds strong social ties among students.

Collaboration on Projects

Students learning to code will often work together on teams to create large projects. Each student develops a specific part of the program and their code needs to work with the other code created by their peers. There are hundreds of ways to write a correct code for each piece of the project. Therefore, the students end up in constant communication to make sure their particular approach is going to work for the project as a whole. Students work on their code, check-in with each other, ask for pointers or suggestions, go back and rework their code, and come back together to see if it works. This process is repeated until the project comes together. Communication is a huge part of programming.

Community of Creativity

Coding is a highly creative medium. Students can create anything they can imagine. This element of creativity generates a kind of community where students anxiously share their ideas and get inspiration from others. Students will find others who share their enthusiasm and often explore in person and online groups of peers who love to create with code. Coding provides a medium for students to connect with others in a healthy, constructive way.

Common Across Spoken Languages

Coding is a tool that works across spoken language barriers. All students, who have learned to code, will have something in common no matter what language they speak. Understanding code allows them to communicate and relate with people from all over the world. Learning to code helps students become more comfortable with others, no matter what their spoken language might be. The skill of coding is relevant no matter where in the world you are from.

Coding in many different fields

Students of code have a skill set that is common across many different career fields. While some skills or trades are highly specific, coding is used in virtually every career field. Students of code will be able to communicate and relate with a wide variety of people who work in many different professions. Everyone works with computers and therefore most every company has some form of programmer. Students of code will be relevant everywhere and have a place in every social circle.

As you can see, programming is not a solitary exercise. People who code work with others often and find themselves in highly social environments. Coding helps students build social skills as they help each other learn. They collaborate with peers to create projects that work well together. Students of code become involved in a highly creative community that thrives on sharing their cutting-edge ideas. Students discover that learning a programming language transcends spoken languages as they relate with people from all over the world. And lastly, they are building a skill that is highly relevant across career fields. Learning to code builds many social skills for students now, and in the future.

If you'd like to learn more about customizing a computer science pathway for your classrooms, schedule a consultation with Skill Struck today.

BLOG

How Coding Helps Kids Develop A Growth Mindset

March 4, 2022

What is a Growth Mindset?

People with a growth mindset look for ways to learn, grow, and improve themselves. They thrive on challenges and feedback. They base their sense of value and worth in the learning process and are thrilled when they can feel themselves changing.

People with a fixed mindset look for ways to defend their value and worth. Challenges and feedback are threats to their worth. They are happy when nothing questions their abilities, which ends up stunting their growth.

In her book, Mindset, Carol Dweck describes how people with a growth mindset find much more success and peace of mind in their lives Life is full of challenges and everyone will run into problems. Those with a fixed mindset tend wrestle emotionally with life challenges than those with a growth mindset. One person sees a bad review on their brownies as a personal insult, while the other sees it as a chance to tweak the recipe for the better.

Let's examine a few more ways that a fixed mindset is different from a growth mindset.

Fixed Mindset

People with a fixed mindset believe their intelligence is fixed and static.

Growth Mindset

People with a growth mindset believe their intelligence and talents can be improved through effort and learning.

What happens when they run into a challenge or receive feedback?

Fixed Mindset

Get upset if they have a hard time with the challenge because that means they are not smart/ good enough. Feedback is a threat to their value.

Growth Mindset

See the challenge as an opportunity to learn. They take feedback and use it to improve. They see challenges and feedback as steps in the process of becoming better.

Where do they base their sense of value?

Fixed Mindset

Base their value in accomplishments or their current abilities. When these fall short, their value is threatened.

Growth Mindset

Base their value in growing their abilities and reaching for a better way. When their current abilities or performances fall short, their value is strengthened.

Kids from an early age can start to develop a growth mindset. Learning to code in particular helps students practice a healthy growth mindset.

How does coding help students build a growth mindset?

The process of coding is a particularly effective way to help develop a growth mindset. Coding naturally involves trying something out, seeing what it does, tweaking what you did, and trying again. For each step of the code, we try it again and again until it looks just right. Entering a piece of code and seeing a response you weren't expecting is very much a part of the every day process.

Because coding involves so much trial and error, students quickly become used to feedback. They become well practiced at quickly applying the feedback, improving their project, and moving on. Feedback, change, and growth are all naturally part of the everyday process of getting a piece of code to work.

Often, students naturally become curious about code. They start to question, "Well, what happens if I do this?" Or they think, "If this works, what happens if I add this?" They will naturally try out new things just to see what happens. They become more interested in possibilities and push their own possibilities. The fear of failure is often simply forgotten in their excitement.

Teachers can Demonstrate a Growth Mindset

The entire field of computer science is young. We are all learning new things about computers every day and computer languages update constantly. Often, in a computer science classroom, the teacher has opportunities to demonstrate a growth mindset as they run into new ways of coding right in the middle of their teaching. Often students know or discover a different way to get to the same answer and a teacher can also learn on the spot. A coding classroom is full of opportunities for change, growth, and learning.

Learning to Code Helps Kids in Many Ways

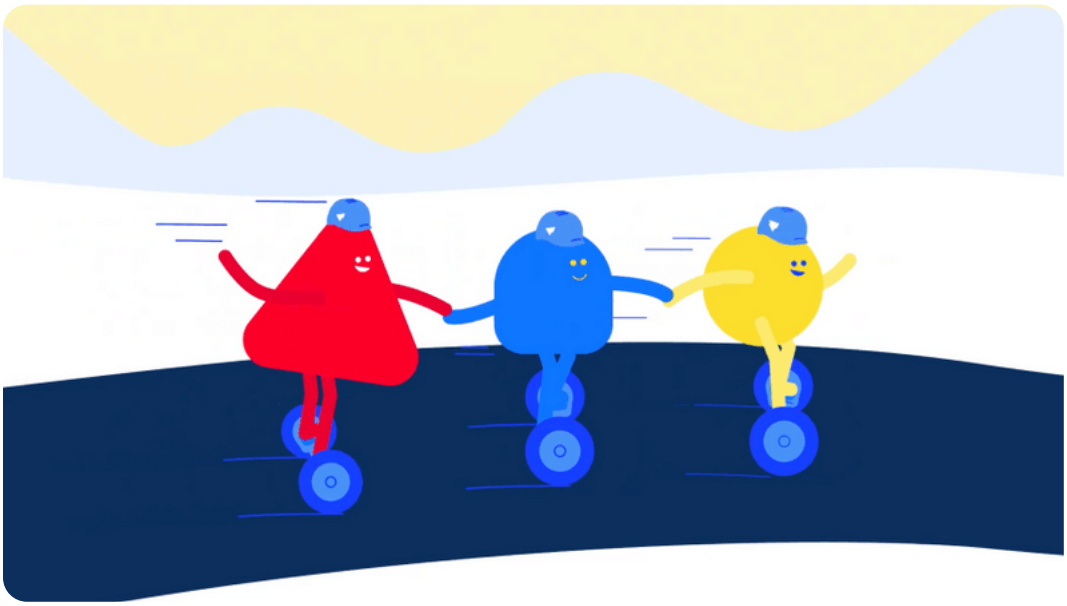
We commonly recognize the more obvious benefits for learning to code. It builds a marketable skill that looks good on a resume, it helps kids learn critical problem solving, it verses them in a machine they use every day. Learning to code also helps kids emotionally as they exercise their ability to make mistakes, learn from them, and grow. Developing a growth mindset is important to build resilient and adaptable kids. One of the most effective routes to a growth mindset is to practice coding.

If you'd like to learn more about customizing a computer science pathway for your classrooms, schedule a consultation with Skill Struck today.

BLOG

10 Reasons Why Schools Should Teach Coding

February 11, 2022



Every couple of months we meet with leaders in education across the nation to talk about computer science in K-12 schools and districts. We talk through barriers schools experience when trying to adopt new computer science pathways, things that have helped engage students in computer science, and ways to increase equity in computer science.

After some of our conversations, it's becoming clear that coding and computer science need to be rebranded.

A big barrier that educators have faced when implementing computer science pathways has stemmed from some not seeing the need to have computer science in the classroom, some thinking computer science is too challenging for their students, and others thinking that to be a software engineer you have to fit a specific mold. We'd like to challenge all of these statements.

Coding is for everyone! Anyone can code and should learn how to code. This blog explores 10 reasons why schools should teach coding.

10 Reasons Schools Should Teach Coding

1. Coding allows students to create content, not just consume it.

In a world where there's a lot of content and games to consume, it's important to have creators of good, engaging, and quality content. By learning how to code students have an opportunity to be the creator, not just the consumer.

2. Coding empowers students and gives them tools to express themselves in really cool ways.

Students need more creative outlets to express themselves. Coding allows students to tap into their creative side and express what interests them.

3. Coding teaches storytelling with games and animations.

Kids can easily spend a lot of time on all the different content platforms that are available today. Coding allows them to be the creator of their own stories and stretches them to be able to make it fun for others to consume.

4. Coding is a safe place for students to take risks and fail.

It's inevitable: every person will experience failure. It's so important that students learn in their youth what it's like to fail and work through it. This skill will be so useful as they learn and grow in other areas of their life.

5. Coding is inclusive and builds self-confidence.

Through their risk and failure, students have the opportunity to learn what they did wrong in their code and fix it. Any student, no matter their background, can use coding as a vehicle to learn that they can create and do amazing things.

6. Coding supports many principles of mathematics.

Math is a core curriculum and can be a challenge for some students to grasp. Coding helps kids learn principles of mathematics which ultimately helps them improve their knowledge and abilities all around.

7. Coding teaches problem-solving and critical thinking skills.

Problem-solving is needed in any industry, and in any career. By teaching kids problem-solving skills early on through coding, they are better prepared for the world that follows after high school and beyond.

8. Coding is a new type of literacy and will be a large part of future jobs.

Coding is in almost every job. Whether you are a software developer, a customer success manager, a designer, a marketer, all these careers require technical skills. So while not all students will become coders, the majority of them will use these skills in whatever career path they choose.

Fun fact: the department of labor statistics says that 65% of today's students will work in STEM jobs that don't currently exist.

9. Coding develops teamwork and collaborative skills.

It's so important that kids learn how to be team players in school, in their jobs, and in their life. Collaboration is used in every career and results in incredible software, products, and experiences that influence people's lives for the better.

10. Coding can help humanity.

Technology has not only improved people's lives but it's also saved people's lives. By introducing students to coding and computer science in their youth, you are exposing them to skills that will help current and future generations for the better. Think about technology like FaceTime. FaceTime has allowed us to connect with loved ones no matter where they are. That, in a real sense, saved many people through the pandemic.

Coding is for everyone. It's for you, for your students, for everyone. Learn more about how you can implement an equity computer science pathway in your classrooms by checking out our course catalog.

BLOG

Using CS To Remediate Struggling Math Students Increases MAP Scores By 17.7%

July 21, 2023

Mike Afdahl is an educator full of curiosity and passion who has created lifelong learning experiences for his students. He currently is the Coordinator of Technology Services at Northwest Georgia RESA where he supports the instructional and technology goals of 17 districts in Northwest Georgia. He has served as a math teacher, academic coach, and director of technology, but "Dad" is his favorite title and responsibility. We thought you might feel the same way, so we've compiled some ideas for service projects you can do with your class to end this year on a positive note.

Mike Afdahl

Mike joined us at our Skill Summit in June 2022, a three-day event focused on computer science professional development for administrators representing districts throughout the nation.

At Skill Summit, Mike heard one sentence that stuck with him: If a student takes computer science (CS) it increases their test scores by 10%. That thought gnawed at him, and here is why. When Mike was a math coach he was in charge of creating extended learning time in the school day which was an additional 30-minute block set aside for students who needed math remediation. Halfway through the year, he said he felt like he was "watching paint dry." Why is that? Because he was taking a subject these students really struggle in and likely don't enjoy and giving them more of it.

He kept thinking, "Is this the answer? Is the answer to a struggling math student more math?" He always felt that there might be a different way. So when he heard, "If a student takes computer science it increases their test scores by 10%," he knew he needed to act on that information and see for himself.

The Computer Science Experiment Begins

Mike's experiment began. He approached a math teacher and asked to work with a handful of kids struggling with math. He wanted to see if he could, through computer science (CS), retrain their brains to be more receptive to mathematical concepts. His hypothesis: **computer science and computational thinking will unlock the brain to better understand mathematical concepts.**

His friend agreed and he was granted 30 minutes on Fridays before the school bell rang to meet

with 8 third-grade students teaching them CS concepts.

Who were these 8 students?

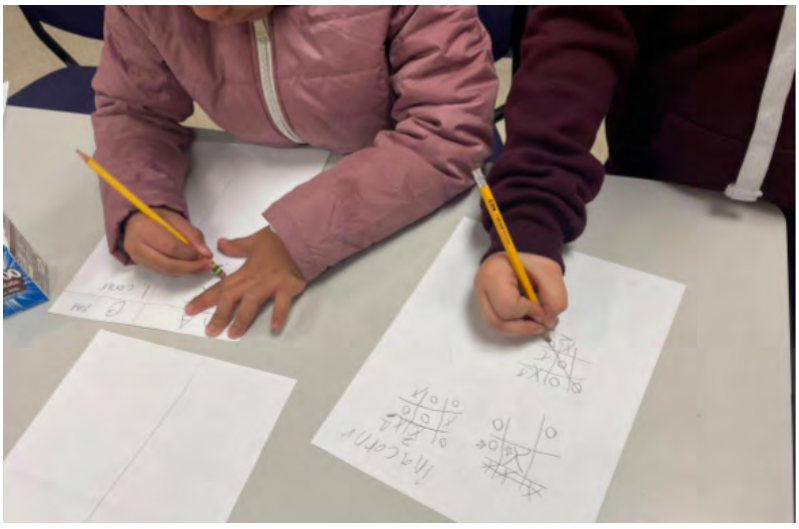
- Targeted for math remediation.
- From 7 different math teachers. **Important, because he wanted to see if learning CS made an impact rather than a specific teacher.*
- From 4 different countries.
- 5 different states.
- 5 females and 4 males.

To track growth he analyzed their MAP and State Assessments. With this group of students, their fall Math MAP normed average achievement percentile was **34.1%**.

The main CS concepts of computational thinking he wanted to teach were:

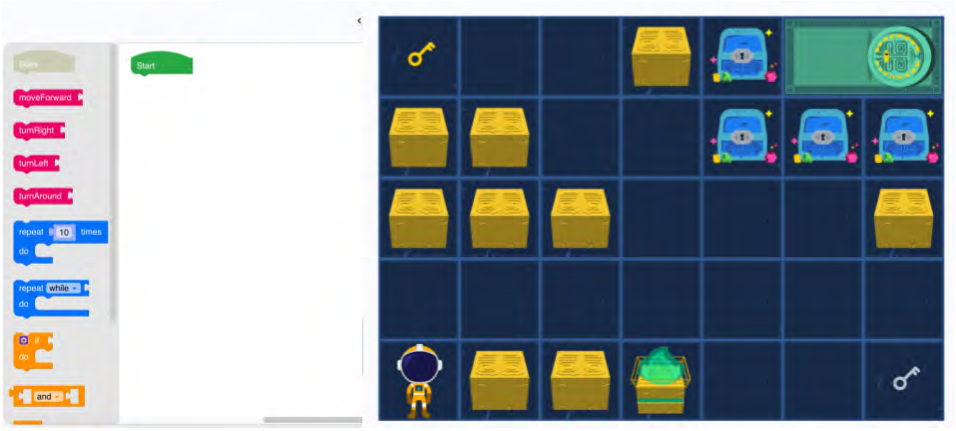
1. **Decomposition:** taking a big problem and breaking it down into smaller parts.
2. **Pattern recognition:** observing and analyzing data to spot recurring patterns or trends.
3. **Abstraction:** looking at a problem and removing unnecessary information (very applicable in math).
4. **Algorithm design:** learning step-by-step processes like baking a cake or long division.

The Process



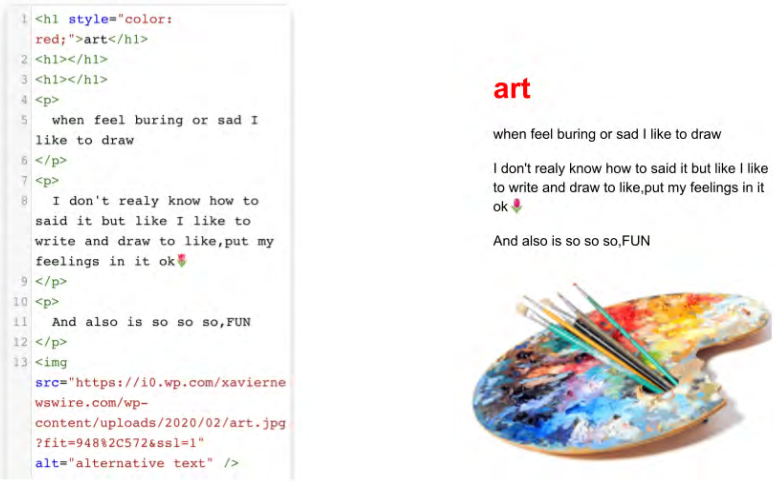
Students discovering the algorithm to never lose a game of Tic-Tac-Toe.

From magic tricks to Tic Tac Toe to puzzles to building HTML websites on Skill Struck and even to drones he engaged these children in CS the entire year. There were times they struggled. There were concepts that would take longer to grasp than expected and he would remind himself that they are struggling math students, they are going to struggle with the math.



A puzzle one student built on Skill Struck's Platform when they were learning Sequencing.

He chose to **chase progression, not perfection**. "As long as they were moving forward, it didn't have to be perfect," Mike said.



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An especially tender and personal website built by another student who came to the US when she was 4.

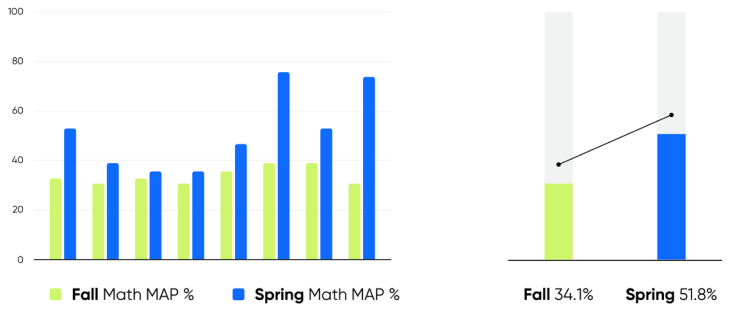
With computer science, students have the opportunity to bring their interests into their projects. Mike found that the students really engaged in building their HTML websites and could see their

unique personalities and backgrounds shine through.

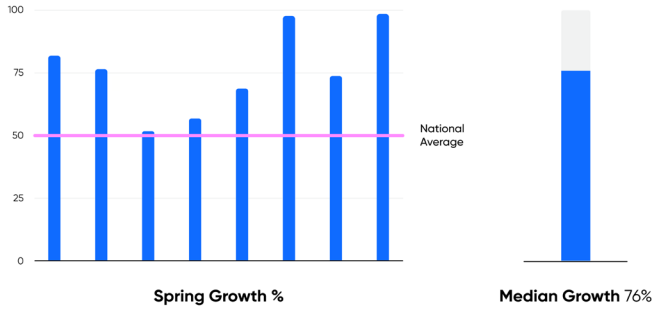
If you would like an in-depth look at his process and how he taught these concepts you can watch the seminar he gave at ISTE in 2023. He goes into greater detail about the learning approach and explains the activities he did with these students.

The MAP Results

Remember in the fall these students averaged 34.1% for math, in the spring they averaged 51.8% meaning during the school year these students jumped up a remarkable 17.7%.



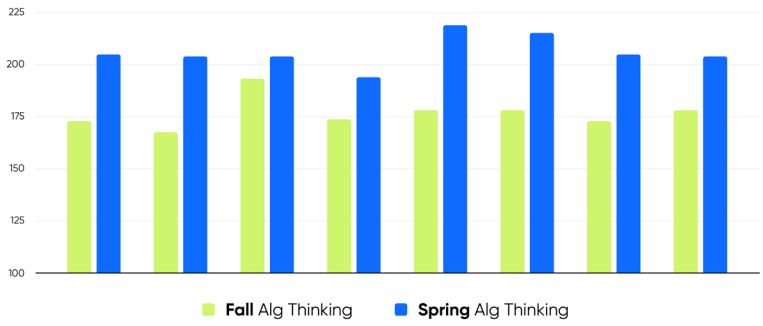
"They also do math as a median growth percentile, so they are measuring their growth with their peers who also scored ~34% in the fall, and how well did they score in comparison to them in the spring. If they were normal average kids they would have been in the 50th percentile but they hit an average of 76%! Some were higher or lower but every one of the kids was above average and we were excited about that," Mike said.



He was mostly interested in looking at his student's Algebraic Thinking because it most correlated with computational thinking. Here are some interesting findings from the study:

- The national average for third graders in the fall was 188.
- This group's average in the fall was **175**. (This is about one grade level below. Students grow about 13 points in a typical year)
- The national average in the spring was 201.

This group's average in the spring was 206. **(31-point growth in one year!)**



These students in one year experienced over two years of growth in algebraic thinking. Remember, Mike wanted to see if computational thinking could change their brain and unlock something within them to be able to receive math instruction. These results show that his hypothesis was correct.

Mike said, "Now as they go into 4th grade they are equipped in their math classrooms not just with better math knowledge but they have better math computational skills and better able to receive instruction. Which results in lifelong progress."

State Assessment Results

These students' average Fall Predicted Score was 494 but their actual State Performance score in the spring averaged 525. Georgia breaks scores into different levels:

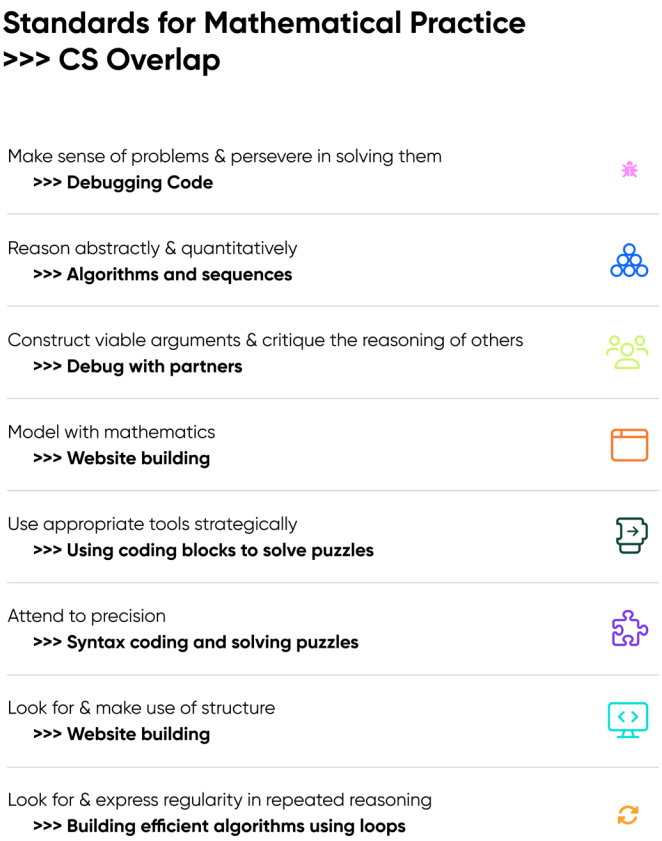
Level 2: 475-524 is qualified as Developing

Level 3: 525-574 is qualified as Proficient or on grade level.

In the spring these students were developing in Level 2 and by the fall were in Level 3 and back on track with their grade level.

Why does this work?

Mike believes this works because when you compare the Standards for Mathematical Practice with Computational Thinking you can find a lot of overlap.



Skill Struck® with Michael Afdahl

Beyond the Data Results

We recognize that this is a small sample size but find a lot of inspiration from Mike and his students. One of the golden moments of the whole experience for Mike was at the end-of-year showcase where they invited the teachers of these special students to come and see what they have been learning and working on.

He shared with us a particularly inspiring interaction between a student and her teacher, he said: "[A student] showed her teacher how she was able to build her puzzles and there was this moment of just, I don't know how to describe it, just **beauty**. Because here I have a student targeted for math remediation and what is she doing right now with her teacher? She is a teacher! **She is teaching her teacher how to code!** Her teacher said, 'I have no idea how to do any of this. This is amazing!' The confidence this moment can give her is just immeasurable."

At the end of the year, Mike asked this same student how she felt about her CS class and she responded, "I'm really excited, I want to do computer science!"

This is a moment worth celebrating because here is a girl who wouldn't have been shown a CS class opportunity until 9th grade and she now sees it in her trajectory. All of these students, because they have learned basic CS skills at a younger age, have a higher likelihood of enrolling in those CS classes when they are offered. We believe offering computer science education to younger students is integral in boosting high school CS enrollment in the future and diversifying the student population in terms of ethnicities, genders, and backgrounds in those classes and careers.

Experiment Takeaways

Traditionally, these struggling math students would have spent the year doing more math. Mike's conclusion from this year of CS is that introducing computational thinking to struggling math students **is more beneficial** than traditional math remediation.

We understand that teachers are overwhelmed with the many demands they are required to meet and have built our platforms with teachers in mind. Mike shared, "There are amazing partners, and I'll speak to Skill Struck that have things in a box that you can just show your teacher and put it out there and they can do it. I met four times a month and they had lesson plans for four times a month."

We are thrilled to be partners with Mike and honored to be a part of this CS journey. We are amazed by the students involved and the hard work they put in this year. We believe **coding is for everyone** and know our dream is realized through passionate educators like Mike Afdahl.

If you would like to learn more about Skill Struck, schedule a call with us here.

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Your HTML Cheat Sheet

8 examples of HTML code to build a basic website

HEADER CODE:

```
<h1></h1>
<h2></h2>
<h3></h3>
<h4></h4>
<h5></h5>
<h6></h6>
```

TEXT COLOR CODE:

```
<h1 style="color:blue;">This is my heading</h1>
```

FONT CODE:

```
<h1 style="font-family:courier;">This is my heading</h1>
```

BACKGROUND COLOR CODE:

```
<h1 style="background-color:red;">This is my heading</h1>
```

TEXT ALIGN CODE:

```
<h1 style="text-align:center;">This is my heading</h1>
```

PARAGRAPH CODE:

```
<p>This is a paragraph</p>
```

IMAGES CODE:

```
<img src="insert image url here">
<img src="insert image url here" width="300px">
```

VIDEO CODE:

*If choosing your video from YouTube, click the "Share" button, choose "Embed" and copy and paste the code into the code editor.

```
<iframe width="560" height="315" src="insert video link here" title="YouTube video player" frameborder="0" allow="accelerometer; autoplay; clipboard-write; encrypted-media;
```

See how Skill Struck can help you teach HTML in your classrooms.
Get a free consultation at skillstruck.com/get-demo.

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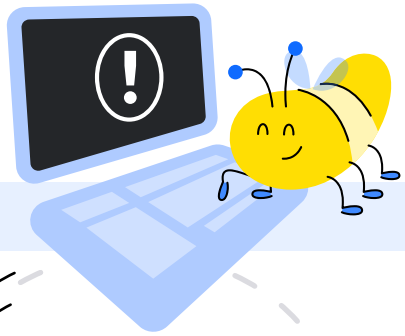
5 Tips for Debugging Code

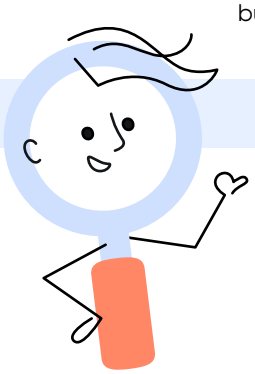


1 Learn error messages.

In many code environments, if your code is invalid or has a bug, it will spout out an error message.

3 common error messages you might see include:

1. Syntax error: this means that the **characters** were typed incorrectly (for example, a missing semicolon or misusing the assignment operator (=)).
   + Semantic error: this means a **word or variable** was used in the wrong place.
   + Logic error: this means the code is technically written without error, but the logic doesn't accomplish the goal.



2 Search it.

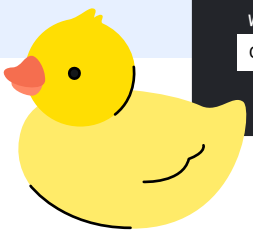
Open a search engine (like Google Search™) and in great detail type your problem into the search bar. Developers are always helping each other out!

`Did you know?` Real bugs used to get stuck in computers causing them to crash. Computer scientists named the process of removing the bug "debugging."

Today this term is used when `an error breaks the code.`

3 Use the Rubber Duck Method.

Explain, out loud, line by line your code and what outcomes you're aiming to accomplish. This approach is likely to expose the bug.



4 Take a break and think about something else.

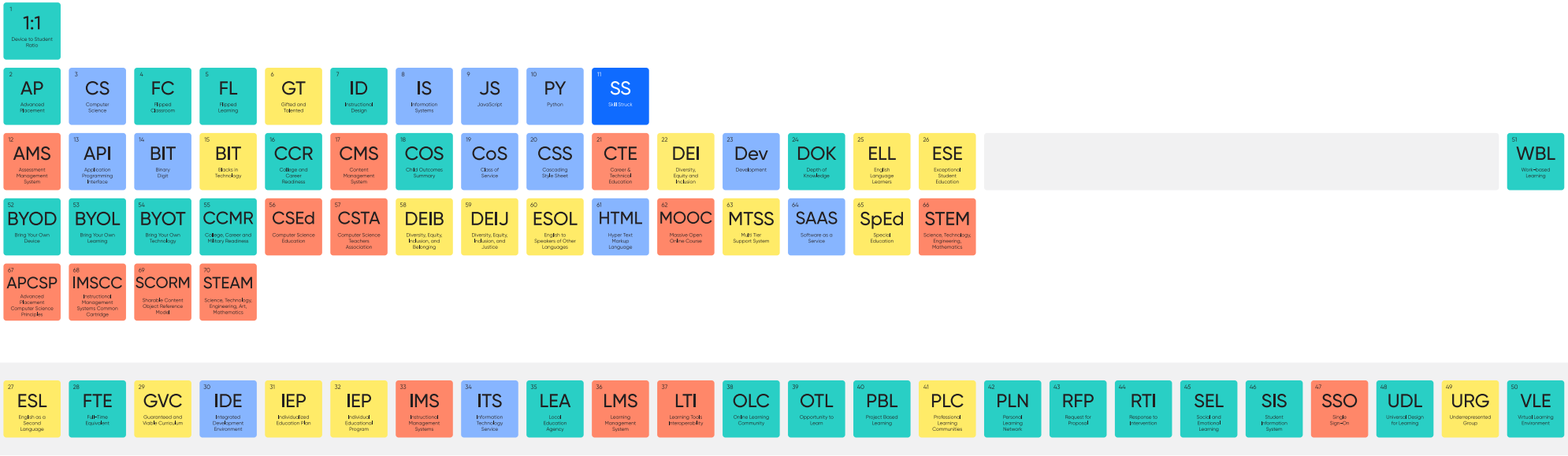
When debugging is taking a long time, it is important to give your mind a break and focus on something else. The answer may come while taking that break!

5 Search the Answer Keys (Teachers Only)

A Skill Struck teacher can access answer keys for any challenge or activity within Skill Struck. As a teacher, searching the answer key is an efficient way to find the solution you're looking for.

To learn more about Skill Struck visit us at ***skillstruck.com***

Skill Struck Periodic Table of Acronyms



Education Technology Education Technology Equity

Acronyms arranged alpha-numerically from fewest letters to most.

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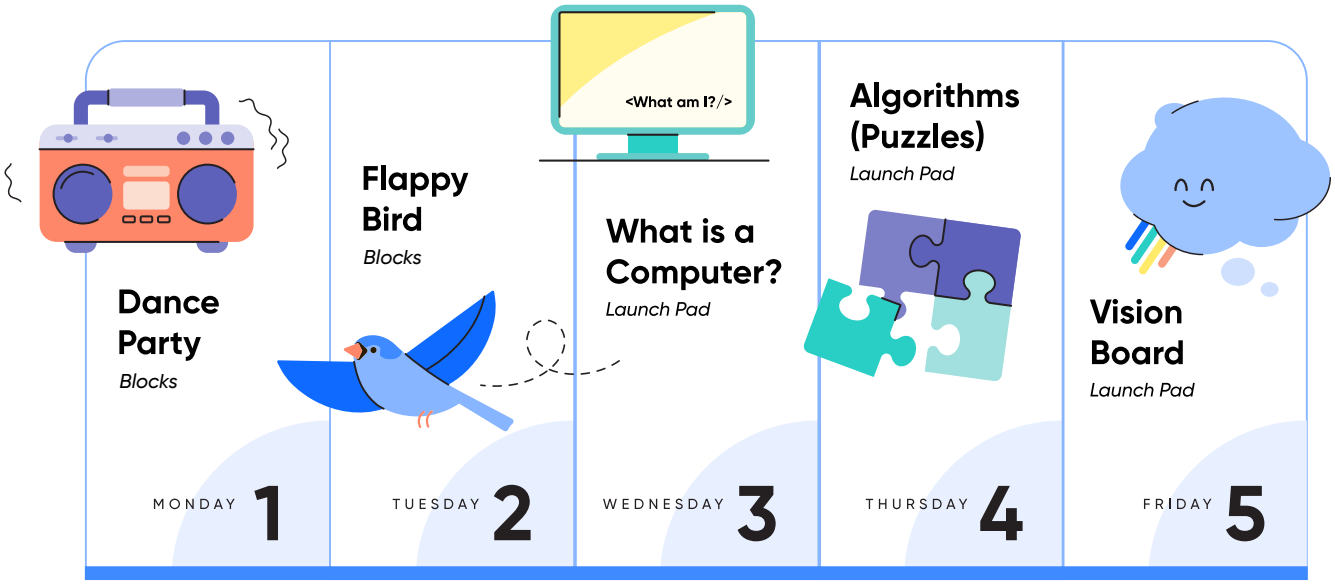
Your K-5 Computer Science Education Week Calendar

We're thrilled you've chosen to use Skill Struck's ready-to-use lesson plans and activities for CS Education Week! **Click on the days of the calendar below to see what's included in each day of the week:**



What's included in each day of the week:

- A 1-hour themed lesson plan and activities.
- A Free for Classroom Skill Struck account for teachers and students. **We recommend you set up your Free for Classroom accounts at least one week before CS Ed Week.*

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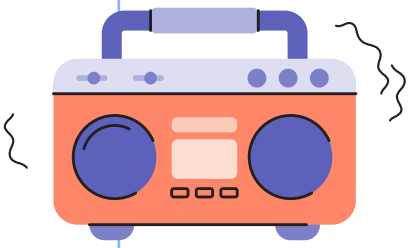
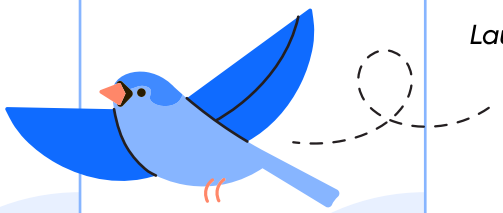
CS Ed Week is for Everyone

Join us for a week of computer science activities.



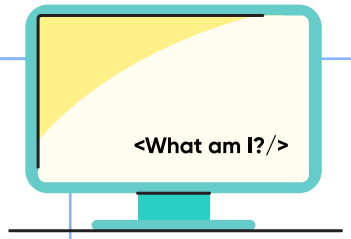
Dance Party
Blocks

MONDAY 1



Flappy Bird
Blocks

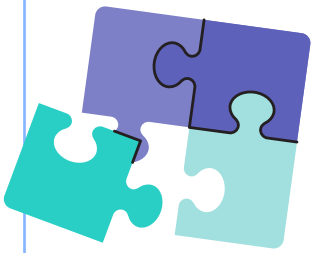
TUESDAY 2



What is a Computer?
Launch Pad

WEDNESDAY 3

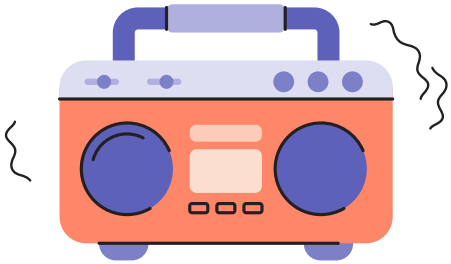
Algorithms (Puzzles)
Launch Pad



THURSDAY 4

Vision Board
Launch Pad

FRIDAY 5



CS Calendar Day 1:
Dance Party

Welcome to Day 1 of a CS week with Skill Struck! We're kicking off this special week with easy and fun coding activities that involve dancing and block coding. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **Dance Party**.

Materials Needed:

- Skill Struck's Blocks Playground. Here is a link that you and your students will need access to: *https://tinyurl.com/Blocks-Playground*. **Students will need to enter this URL in their browser to participate.*
- Supplemental materials. **See below.*
- Student computing devices. **Chromebooks work!*

Supplemental Materials:

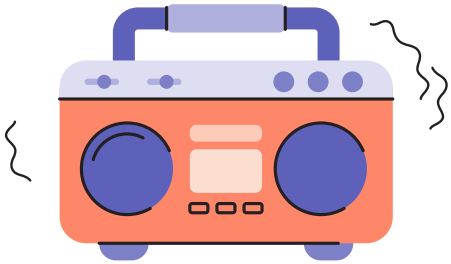
- CS Calendar Dance Party Slide Deck. **A powerpoint to guide you and your class through this interactive lesson.*
- Blocks Printable Blocks

Your Dance Party Lesson Plan:

Estimated Prep: 20 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Ask students to raise their hands if they've ever had a dance party before. In this lesson, students will build an algorithm that makes it look like their sprite character is having a dance party on the Blocks platform. Inform students that they will be creating a computer programming algorithm today. Computer programs and algorithms are sets of instructions created by people that tell the computer to do something.	5 min
Teacher Demonstration	We recommend first building the algorithm using our hands-on coding cards as a class. These resources can be found in the supplemental materials above. Print one set of these coding cards for your class to work together and build their algorithm for this activity. You can use any blocks you wish, but try to have at least this many of the following cards: + 1 green play button trigger block + 2 purple right arrow movement blocks + 2 purple hop movement blocks + 1 purple rotate left movement block + 1 purple rotate right movement block + 1 purple left arrow movement block + 1 red blank end block You must start your algorithm with a green trigger block and end your algorithm with a red end block. The movement blocks can be in any order you and your students wish! Work with your students to build the algorithm using the coding cards either using a classroom pocket chart or perhaps taping them on the whiteboard in the desired order. Invite a student(s) to act out the algorithm along the way so you can more easily decide what should come next in the algorithm. When finished building the dance party algorithm, consider having all your students act it out!	15 min

NAME	DESCRIPTION	DURATION (ESTIMATED)
Playground	When students are ready, invite them to build their code on the Blocks playground following the algorithm you all built together. **Teachers:** Here's a tutorial on how to use the Skill Struck's Blocks Playground link. Click here to visit the Blocks playground. *All students need access to this URL to participate. Have your student build the algorithm they put together as a class. Then invite them to create a new dance party with a Space theme. Then invite them to create a new dance party with a beach theme. When finished, remind students how to click Save. Explain that the Save button is a helpful tool, because it will save the work they did. Meaning, if they walk away from their project and come back to it later, it will still be there without needing to start over.	20 min
Wrap Up	Invite students to share their coded projects with a neighbor or with the class.	10 min



Blocks Printouts: Dance Party

Cut out the images below for the unplugged activity.

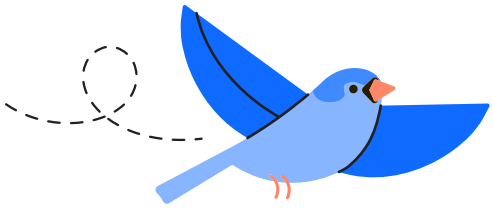
Trigger on Play

Trigger on Tap

Trigger on Touch

Trigger on Message

Trigger Send Message



CS Calendar Day 2: Flappy Bird

Welcome to Day 2 of your CS week with Skill Struck! Now that your classroom has some experience with block coding, we're going to continue the fun by making mazes and puzzles. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **Flappy Bird**.

Materials Needed:

- Skill Struck's Blocks Playground. Here is a link that you and your students will need access to: *https://tinyurl.com/Blocks-Playground*. **Students will need to enter this URL in their browser to participate.*
- Supplemental materials. **See below.*
- Student computing devices. **Chromebooks work!*

Supplemental Materials:

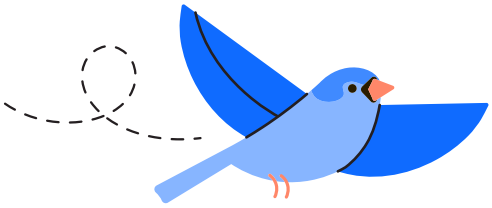
- Flappy Bird Map Materials
- Flappy Bird Lesson Slide Deck. **A powerpoint to guide you and your class through this interactive lesson.*

Your Flappy Bird Lesson Plan:

Estimated Prep: 20 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Pick a spot in the classroom to stand far from your main door. Ask students to instruct you on how to walk to the classroom door. As they explain, follow their instructions exactly as they say. If they say, "walk left," don't stop walking, even if it means bumping up against a wall. It's silly, but will challenge students to make their instructions simple and clear. For example, instead of students saying "walk left" they should say "take 3 steps left." Once the students have successfully given you step-by-step instructions to walk to the door, say: "Nice work! You just gave me the steps to reach our classroom door. In computer science, we call this group of steps an algorithm. Algorithms are like the rules of a game. We need rules to tell us how we reach the goal. I needed the right instructions to reach the door, which you gave me. Rules help us understand what we need to do to get the result we want. In every game you play, there are rules. Same thing in computer science. In every computer program, website, app, or online game you play, there are rules that tell the program (or website) what to do. This group of rules is called an algorithm. Today, we are going to learn about algorithms."	5 min
Teacher Demonstration	Read this story to your class: "I'm going to tell you a quick story about Mama Bird. Mama Bird was flying through the forest to get some food for her Baby Bird back at the nest. As she was getting food, she could hear Baby Bird crying because it was hungry. So, now Mama Bird is trying to get back as fast as she can to give Baby Bird some food. We need to help the Mama Bird get there! Here's a map to help us. We need to be thinking: What rules do we need to make to help Mama Bird get back to Baby Bird?" Display Map 1 on the board. Model that Mama Bird needs to move 1 space up and 1 space left to reach the Baby Bird. As you state this, draw arrows to match. 1 space up (^) and 1 space left (<). Circle the ^ and < symbols and explain "This is an algorithm. These rules show me what I need to do to get Mama Bird to Baby Bird. What is this called? *An algorithm!* Remember, algorithms are the group of rules."	15 min

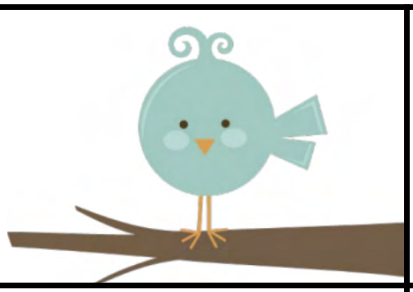
NAME	DESCRIPTION	DURATION (ESTIMATED)
Teacher Demonstration	Now Display Map 2 on the board and have students state the directions Mama Bird must travel while drawing the matching arrows to symbolize the directions (i.e. ^, <, >, v). Encourage students to turn and talk with a neighbor/group to share their ideas. Repeat with Maps 3 and 4.	15 min
Teacher Demonstration	Show students how to play Flappy Bird. Show them where to access backgrounds, shapes, etc. and tell them the rules of Flappy Bird: Create your own flappy bird game. Build a maze using the rectangles and program your bird sprite to move through the maze. **Teachers:** Watch a tutorial on how to play Flappy Bird.	5 min
Playground	Allow students to log into their Blocks playground link and have them create their Flappy Bird maze. **Teachers:** Here's a tutorial on how to use the Skill Struck's Blocks Playground link.	10 min
Wrap Up	Have students share what they made with their neighbor.	5 min



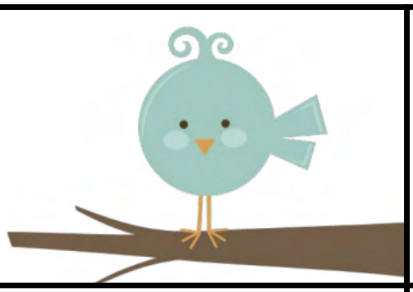
Blocks Map Materials Printouts: Flappy Bird

Display the images below for the classroom activity.

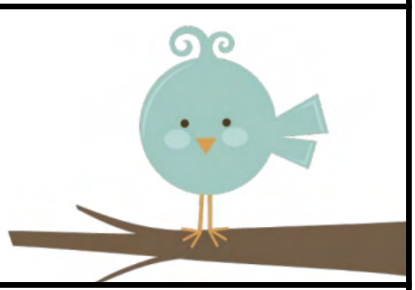
1

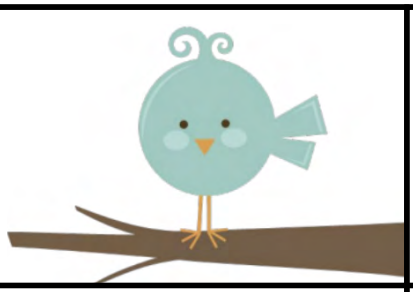
2

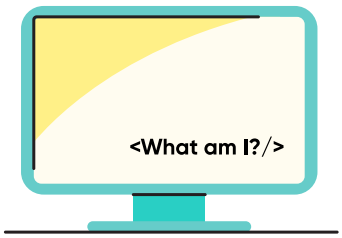
		

3

4



CS Calendar Day 3:
What is a Computer?

Welcome to Day 3 of a CS week with Skill Struck! We're going to switch gears a bit and introduce computers and how to use them safely. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **What is a Computer?**

Materials Needed:

- Skill Struck Free for Classroom account. **Fill out the form on www.skillstruck.com/classroom and set up your account. Here is a tutorial on how to set up your account. We recommend you set up your Free for Classroom account a week before using the CS Calendar.*
- Supplemental materials. **See below.*
- Coloring Utensils.
- Student computing devices. **Chromebooks work!*

Supplemental Materials:

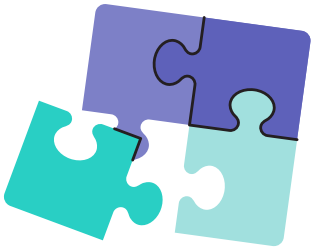
- *What is a Computer Slide Deck*
- *What is a Computer Coloring Sheet*

Your What is a Computer? Lesson Plan:

Estimated Prep: 20 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Ask the class what a computer is. Invite students to turn to a neighbor and take turns describing what a computer is. Write their responses on the board.	5 min
Teacher Demonstration	After doing this, ask students: "Is a cell phone a computer?" "Is an iPad a computer?" "How about a smart watch, a Nintendo Switch, etc?" Explain that a computer is a machine that works with information. Define a machine as technology that does things. Go back through the above questions with this new definition. For example, "Is a cell phone a machine that works with information?" Explain that each of these devices are forms of computers.	15 min
Class Activity	Open the "What is a Computer?" slide deck and play the slideshow game with your students. Then print out the computer coloring sheet in the supplemental materials. With your students, have them follow your directions in coloring what IS a computer. For example, ask the class "Is a smartphone a computer?" The answer is yes. If yes, color the phone blue. Go through each device. If you prefer, you can have students also color devices that are NOT a computer red, or you can choose to leave them uncolored.	10 min

NAME	DESCRIPTION	DURATION (ESTIMATED)
Teacher Lesson	Now that students know what a computer is, teachers will teach them a few ways students can use them safely when on the internet. Describe to the students what a digital footprint is: A digital footprint is all your information you ever posted online. Videos, pictures, statuses, assignments... all of these things stay with you forever. Describe to students the 5 things we can follow when we're online to make sure our digital footprint is small and positive. **Positive** - Make sure the things you say and share are positive and uplifting. Practice digital etiquette online. Digital Etiquette is the way you should act when you are using computer devices. Follow the golden rule: Do unto others as you would have them do unto you. **Permission** - Remember to only share information online that you are allowed to share. If you share a picture, video, or other information that you don't have the rights to, you'll be breaking copyright laws. **Profile** - Only use your first name if you need to. Avoid using your last name. **Private** - Keep your passwords and personal information private. Don't tell anyone else. **Protect** - If you see cyberbullying happening online, tell an adult immediately.	10 min
Launch Pad	Whole Class Activity: Play the "Computer Safety Typer Race" game with your class. Skill Struck Free for Classroom Users: You can find this activity in Launch Pad>All Lessons>Grade 3>Computer Safety>Games>Computer Safety Typer Race Have the students compete by seeing who can do the fastest typing with the least amount of mistakes. Students can play the typing game an unlimited amount of times.	5 min
Wrap Up	Ask students to remember that digital footprints follow you and are always growing with the things you share and interact with online. Think twice before	2 min



CS Calendar Day 4:
Algorithms + Sequencing

Welcome to Day 4 of a CS week with Skill Struck! Now that you've completed the first three days of CS Ed Week, your students are ready to build their own puzzles using algorithms. Below, you'll find links and a step-by-step guide on how to participate in Skill Struck's **Algorithms + Sequencing**.

Materials Needed:

- Skill Struck Free for Classroom account. **Fill out the form on www.skillstruck.com/classroom and set up your account. Here is a tutorial on how to set up your account. We recommend you set up your Free for Classroom account a week before using the CS Calendar.*
- Supplemental materials. **See below.*
- Student computing devices. **Chromebooks work!*

Supplemental Materials:

- *Debugging Slideshow*

Your Algorithms + Sequencing Lesson Plan:

Estimated Prep: 20 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Think of a classroom procedure that involves sequencing. This could be something that is organized alphabetically. Maybe it's a daily schedule of things that you do in order. It could also be a certain way that homework is completed and turned in. Point out this example to your students and discuss what would happen if a student did one of those things out of order.	5 min
Class Activity	Create a simple "maze" out of the desks or chairs available in the classroom. As a class, come up with a series of instructions that must be followed in order to get through the "maze." Explain that you as the teacher will follow the instructions exactly in order to complete the maze. This activity is highly entertaining for the kids if you follow their instructions literally. If it says go forward, walk forward and bump into the desk in front of you and say, "You didn't say to stop before I hit the desk." Kids will think it's very funny until they can get the sequence down to follow just right. You might consider having some students do the maze as well, but this can quickly turn chaotic if not carefully regulated.	10 min
Teacher Demonstration	Show students how to log in to their Skill Struck account. Demonstrate the concepts within the Sequencing lesson. Students will be solving puzzles in this lesson to practice their sequencing skills. After modeling one puzzle for students, Open the PowerPoint and show different knight puzzle algorithms. Challenge students to spot the bug in each knight puzzle algorithm. After students find the bug, show the correct solution. **Teachers:** Here is a tutorial on how to access and play with Skill Struck puzzles.	10 min

NAME	DESCRIPTION	DURATION (ESTIMATED)
Platform	Whole Class Activity: Complete as many puzzles as possible with your class. Let each student do puzzles on their own. **Skill Struck Free for Classroom Users**: You can find this activity in Launch Pad>All Lessons>Grade 3>Algorithms>Puzzles There are 10 puzzles total. Each puzzle gets more challenging.	20 min
Wrap Up	Assess students' understanding of algorithms but asking them what an algorithm is.	2 min

CS Calendar Day 5:
Vision Board

Welcome to Day 5 of your CS week with Skill Struck! This is our most challenging activity of the week. Students will have the opportunity to share a little bit about themselves while coding. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **Vision Board**.

Materials Needed:

- Skill Struck Free for Classroom account. **Fill out the form on www.skillstruck.com/classroom and set up your account. Here is a tutorial on how to set up your account. We recommend you set up your Free for Classroom account a week before using the CS Calendar.*
- Student computing devices. **Chromebooks work!*

Your Vision Board Lesson Plan:

Estimated Prep: 15 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Explain that today students will be learning to add images to their websites. Explain that students can't just pick any image they want that they find online. These images may belong to somebody and students would be using them without permission. This is technically a form of stealing. To avoid taking anything that we aren't supposed to, there are websites that offer	5 min
Teacher Demonstration	Show students where to access the Vision Board challenge and how to add images and titles. Where to find the Vision Board challenge: Launch Pad>5th Grade>Images>Challenges>Vision Board Teachers: Watch this tutorial on how to access, add images, and add titles. Share with students what a Vision Board is and what they will be doing during the activity: A vision board is a place where you can put all your dreams in one place with lots of pictures so you can visualize your goals easily. A vision board has all kinds of things you want to do, places you want to go, talents you want to develop, and anything you want to have in your life.	10 min
Platform	Allow students to get into Launch Pad and create their vision boards using: Unsplash.com Pexels.com Pixabay.com	25 min
Wrap Up	Give students time to share with the class their Vision Boards.	10 min

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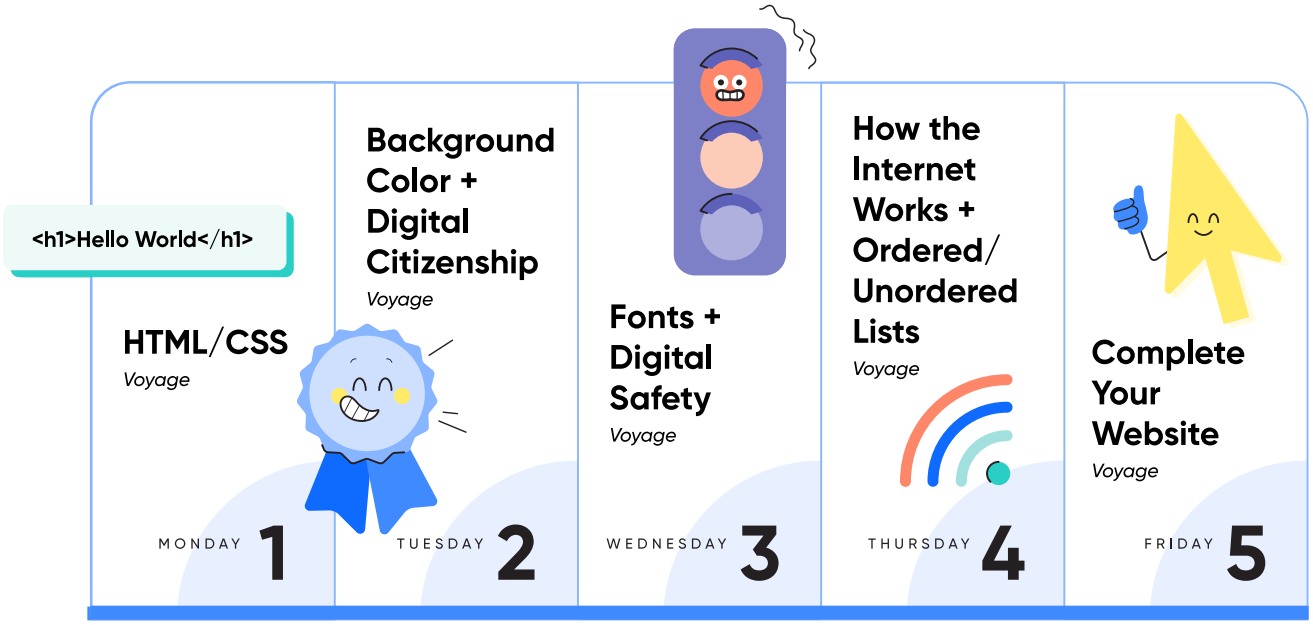
Your 6-12 Computer Science Education Week Calendar

We're thrilled you've chosen to use Skill Struck's ready-to-use lesson plans and activities for CS Education Week! **Click on the days of the calendar below to access your teaching materials.**



What's included in each day of the week:

- A 1-hour themed lesson plan and activities.
- A Free for Classroom Skill Struck account for teachers and students. **We recommend you set up your Free for Classroom accounts at least one week before CS Ed Week.*

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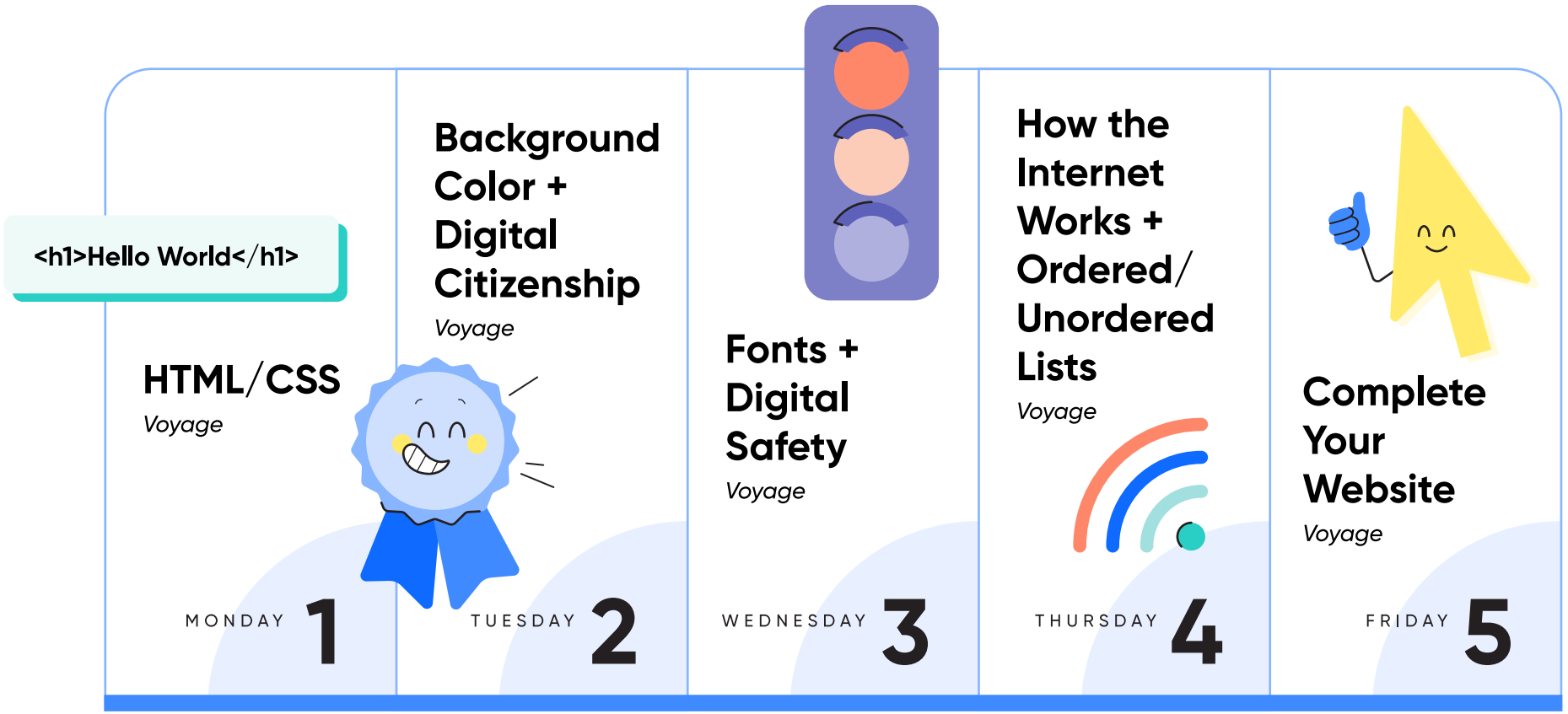
CS Ed Week is for Everyone

Join us for a week of computer science activities.



<h1>Hello World</h1>

CS Calendar Day 1:
HTML + CSS

Welcome to Day 1 of your CS week with Skill Struck! We're kicking off this special week with a lesson on HTML and CSS, two coding front-end coding languages that every coder should know. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **HTML + CSS**.

Materials Needed:

- Skill Struck Free for Classroom account. **Fill out the form on www.skillstruck.com/classroom and set up your account. Here is a tutorial on how to set up your account. We recommend you set up your Free for Classroom account a week before using this calendar.*
- Student computing devices. **Chromebooks work!*

Your HTML + CSS Lesson Plan:

Estimated Prep: 20 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up/Class Discussion	Invite students to share what languages they speak. Invite them to share personal experiences with foreign languages and say a few words in that language. Write on the board some different ways to say "Thank You" in other languages: gracias (Spanish), xie xie (Chinese), merci (French), danke (German), asante (Swahili), mahalo (Hawaiian), uatsaug (Hmong). Ask them what the process was for them to learn these languages. Explain that learning to program is a similar process--you can't just learn something and know it forever. You have to practice with the principles. The more interaction someone has with a programming language, the more fluent they will become. So if students finish an assignment, challenge them to find more ways to practice or do extra challenges. On the board write the following language names: HTML CSS Explain how HTML puts things on the web page and CSS styles. For example, HTML will create a button, and CSS will make it blue.	10 min
Teacher Demonstration	Show the class how to get logged on to their Skill Struck account. Show the students the basics for how the platform works, including how to save, how to run their code, and how to create different files. **Teachers**: Here is the tutorial on how to use the Free for Classroom accounts.	5 min
Class Activity	Students will log into their account and explore the site. Invite them to become familiar with the text editor and file system. Allow students enough time to get comfortable with the new platform.	5 min

NAME	DESCRIPTION	DURATION (ESTIMATED)
Teacher Demonstration:	Demonstrate the concepts in the HTML Basics lesson. Show students how to create a Header tag and how to style it. Things to cover: Headers: Style: style="" Hello World! Hello World! **Teachers**: Here is a tutorial on how to teach these concepts.	10 min
Platform	Allow your students to create a new file and play with Headers and styling them. Invite them to make patterns. Try to have them use all six header tags and at least six different colors.	15 min
Wrap Up	Sometimes it's easy for students to confuse what HTML does and what CSS does. This activity will help review the difference. Assign an action such as standing up to the value of "HTML" and another action such as sitting down to the value of "CSS". When you say an example of what a code does to a page, invite students to decide if it is done with HTML or CSS by doing the action. Examples: Changing a button background to blue -- CSS Creating a paragraph of information -- HTML Creating a link to another site -- HTML Making the font of a header a specific font-family -- CSS Changing the background color on the site -- CSS Including an image -- HTML Changing the font color of a header -- CSS Changing the font of a link -- CSS Creating a header for an image -- HTML	5 min

CS Calendar Day 2: Background Color + Digital Citizenship

Welcome to Day 2 of your CS week with Skill Struck! Now that your classroom has some experience with HTML and CSS, we're going to show them how to play with text colors and teach them about being a good citizen on the internet. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **Background Color + Digital Citizenship**.

Materials Needed:

- Skill Struck Free for Classroom account. **Fill out the form on www.skillstruck.com/classroom and set up your account. Here is a tutorial on how to set up your account. We recommend you set up your Free for Classroom account a week before using this calendar.*
- Supplemental materials. **See below.*
- Student computing devices. **Chromebooks work!*

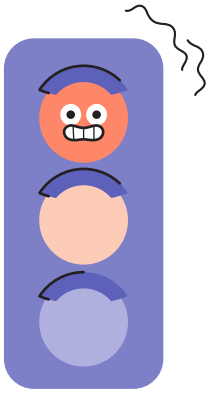
Supplemental Materials:

- Coloring supplies
- Large sheets of paper

Your Background Color + Digital Citizenship Lesson Plan:

Estimated Prep:

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Review header and style tags you learned the day before. Pull up a code editor on Voyage so you can visually show the class.	5 min
Class Activity	Divide the class into groups. Give each group a large sheet of paper and some coloring supplies. Invite the students to write/draw on their paper what it means to be a good citizen of a community. Give them 5-10 minutes for the groups to finish their poster. Make sure they don't use the backside, as that will be used later in the lesson. Invite each group to share about their poster with the class.	10 min
Class Activity	Invite the groups to turn their paper over and do the citizenship activity again (drawing on a poster what it means to be a good citizen in a community) but this time to focus on Digital Citizenship. What stays the same? What changes? What should be added? What does that term digital citizenship mean? Allow 5-10 minutes for the groups to finish their poster. Invite each group to share about their poster with the class. **Teachers**: Here is a Digital Citizenship powerpoint you can use for reference.	10 min
Teacher Demonstration	Walk through how to change the background color. Code you need: <body style="background-color: blue"> this would change the background to blue. **Teachers**: Here's a tutorial on how to change the background color.	15 min
Platform	Allow your students some time to try it on their own. They can work off the file that they started yesterday.	15 min



CS Calendar Day 3: Fonts + Digital Safety

Welcome to Day 3 of your CS week with Skill Struck! We're going to continue our HTML basics and learn more about how students can be safe on the internet. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **Fonts + Digital Safety**.

Materials Needed:

- Skill Struck Free for Classroom account. **Fill out the form on www.skillstruck.com/classroom and set up your account. Here is a tutorial on how to set up your account. We recommend you set up your Free for Classroom account a week before using the calendar.*
- Supplemental materials. **See below.*
- Student computing devices. **Chromebooks work!*

Supplemental Materials:

- Digital Citizenship Powerpoint
- Digital Safety Powerpoint

Your Fonts + Digital Safety Lesson Plan:

Estimated Prep: 10 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Pull up the Digital Citizenship powerpoint and review what it means to be a good digital citizen.	5 min
Class Activity	Select three students to be on the "judge panel." Assign the rest of the students into two groups. Explain the activity: the two groups have been nominated to be in charge of secret services for a celebrity (or the judge panel). The celebrity has not decided which company to go with, so they staged this contest to help them determine which team will get the job. Both teams are to demonstrate (without talking: charades style) what they would do to protect that celebrity's home. Give each group 5 minutes to plan their act. Instruct the panel of judges to watch carefully as each group performs. After the demonstrations, the panel of judges will decide which team will be the security officers. Relate the demonstrations to digital security. For example: Strong Locks on the Doors: Password Strength Use Different Locks on each Door: Use Different Passwords Make sure all guests are confirmed: Be Careful what you Click on Build a strong fence or perimeter system: Antivirus or Firewall Programs Make sure security cameras are up to date: Software Updates Keeping the location secret: Caution with posting personal information	10 min
Teacher Demonstration	Walk through the concepts in the Font section in Voyage. **Teachers**: Here is a tutorial on how to teach about Fonts.	5 min
Platform	Allow the students to open the file they've been working with and play with fonts.	15 min
Wrap Up	Remind students all the different ways they can be safe on the internet.	2 min

CS Calendar Day 4: How the Internet Works + Ordered/ Unordered Lists

Welcome to Day 4 of your CS week with Skill Struck! We're going to explore how the internet works and continue learning about the basics of HTML. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **How the Internet Works + Ordered/Unordered Lists**.

Materials Needed:

- Skill Struck Free for Classroom account. **Fill out the form on www.skillstruck.com/classroom and set up your account. Here is a tutorial on how to set up your account. We recommend you set up your Free for Classroom account a week before using the calendar.*
- Supplemental materials. **See below.*
- Student computing devices. **Chromebooks work!*

Supplemental Materials:

- Castle Problem Powerpoint

Your Internet Works + Ordered/Unordered Lists Lesson Plan:

Estimated Prep: 10 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Write a few fun prompts for lists up on the board. Some options might be: Favorite vacation spots. Worst smells Famous people it would be cool to meet Things to do in the summer Invite students to share or come up to the board to write down their additions to these lists. After the lists have some content, talk about whether they should be ordered lists or not. What kinds of information should be listed in order? What kinds of lists don't need to be numbered? Explain that today we will be adding both kinds of lists to our webpages.	10 min
Teacher Demonstration	Pull out the Castle Problem Powerpoint. Invite students to get into groups to address the problem or discuss it as a class. Explain how the internet breaks down information into chunks called packets in order to transport information across the optic fiber cables that spread all over the globe. Consider showing the following videos to emphasize your point: *https://www.youtube.com/watch?v=x3c1ih2NJEg* *https://www.youtube.com/watch?v=82m2du-zgmY* Discuss with your students the implications of a global internet. What opportunities does it provide? What issues might it cause? What happens when people don't have access to the internet? How might this affect cultural practices?	5 min

NAME	DESCRIPTION	DURATION (ESTIMATED)
Teacher Demonstration	Show students how to add ordered and unordered lists to their websites. Code you need: - This is the first item in my list - This is the second item in my list - This is the first item in my list - This is the second item in my list **Teachers**: Here is a tutorial on how to demonstrate lists.	5 min
Platform	Allow the students some time to add an ordered and unordered list to the website they've been working on.	15 min
Wrap Up	Remind students why it's a blessing to have the internet.	2 min

CS Calendar Day 5:
Complete Your Website

Welcome to Day 5 of your CS week with Skill Struck! This is our most challenging activity of the week. Students will have the opportunity to share a little bit about themselves while coding. Below you'll find links and a step-by-step guide on how to participate in Skill Struck's **Complete Your Website.**

Materials Needed:

- Skill Struck Free for Classroom account. **Fill out the form on www.skillstruck.com/classroom and set up your account. Here is a tutorial on how to set up your account. We recommend you set up your Free for Classroom account a week before using the calendar.*
- Supplemental materials. **See below.*
- Student computing devices. **Chromebooks work!*

Supplemental Materials:

- HTML Cheat Sheet **We recommend printing this for each of your students.*

Your Complete Your Website Lesson Plan:

Estimated Prep: 15 minutes

NAME	DESCRIPTION	DURATION (ESTIMATED)
Warm Up	Review all the HTML and CSS code you've learned up to this point. Headers Paragraphs Style, including fonts and colors Background color Lists and Unordered Lists	5 min
Teacher Demonstration	Show your students how to add images to their websites Images *make sure students access pixabay.com or the other ones in order to access an image. <img src="insert image url here"> <img src="insert image url here" width="300px"> **Teachers**: Here's a tutorial on how to add images.	10 min
Platform	Allow your students a large amount of time to tweak their websites using the code they've learned throughout the week. Invite them to pick a theme. For example, Marvel or Sports. Have their website be about something they love.	25 min
Wrap Up	Allow students to show off their work. Have the class vote their favorite website.	10 min

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Holiday Coding Lesson Ideas

Materials Needed:

- Devices with an internet browser and keyboard for each student
- Skill Struck platform
- Step-by-step guides for creating new projects on each platform can be found beneath the table

Description Overview:

- Each holiday has one Blocks and one HTML activity idea. We recommend the Blocks activities for students in grades K-2 and the HTML activities for students in grades 3-5. However, feel free to choose whatever is best for your students.

HOLIDAY	ACTIVITY DESCRIPTION
New Years	+ Blocks: Select 3 sprites that represent a goal you have this year. Then, code each sprite to say what your goal is using the pink text block. For example, I might select the sun sprite and code a text block to say that one goal is to play outside at least 30 minutes every day. + HTML: Discuss the importance of setting goals and how that can help us be successful. Then, Invite students to create a basic website outlining 3 New Year's Resolutions they want to work on this year.
Martin Luther King Jr Day	+ Blocks: Dr. King once said, "Everybody can be great because everybody can serve." Ask students to share ideas for ways they can serve the people around them. Then, invite students to code a scene showing one of the service ideas discussed. + HTML: Research Martin Luther King Jr and design a basic website sharing about his childhood, dreams, and accomplishments.
Black History Month	A lesson plan detailing coding activities to celebrate Black History Month can be found here.
Valentines Day	+ Blocks: Design a scene where one sprite gives a Valentine to another sprite. + HTML: Design a fun Valentine's card.

HOLIDAY	ACTIVITY DESCRIPTION
Presidents' Day	+ Blocks: Invite students to imagine they were president! Encourage them to code a scene showing 2 things they would do if they were president. + HTML: Research a former US president. Then, design a basic website sharing about this president's childhood, education, and some of the things they accomplished while in office.
Women's History Month	A lesson plan detailing coding activities to celebrate Women's History Month can be found here. The Women's History Month Graphic Organizer referenced in the lesson can be found here.
St Patrick's Day	+ Blocks: Code a scene where 2 sprites are on the hunt for a leprechaun. Students can be creative with the background and sprites they choose. + HTML: • Consider discussing how the holiday of St Patrick's came to be: St Patrick was kidnapped from Britain at the age of 16 and taken to Ireland. He was able to escape, but later went back to Ireland to teach the Irish people Christianity. Legend says he used a shamrock to teach some of these teachings which is why it is a symbol of the holiday today. When he died he'd established lots of churches and schools in Ireland which he was admired for. Irish emigrants brought the St Patrick's holiday to the US where it is now widely celebrated with symbols like the color green and shamrocks, which are seen as lucky. Yummy food like corn beef and cabbage is also eaten as a traditional meal. Fun fact, Chicago dyes its river green every year to celebrate the holiday!
Earth Day	A lesson plan detailing coding activities to celebrate Earth Day can be found here.
Mother's Day	+ Blocks: Invite students to code a scene of them doing something that would make their mom/motherly figure happy! Examples may include cleaning their room, playing nice with their siblings, walking the dog, etc. + HTML: Design a website to take the form of an interview. Challenge students to imagine they are interviewing their mom or another motherly figure in their life. Encourage them to think of 4-5 questions with the answers they think their mother figure would respond with. They will need to use header tags and text color to identify who is speaking with each question and answer.

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HOLIDAY	ACTIVITY DESCRIPTION
Father's Day	+ Blocks: Invite students to code a scene of them doing something that would make their dad/fatherly figure happy! Examples may include cleaning their room, playing nice with their siblings, walking the dog, etc. + HTML: Create a basic website listing a few things you love about your dad, or another fatherly figure in your life.
Juneteenth	+ Blocks: Discuss Juneteenth and its history with your students. Then, invite students to code a sprite telling another sprite about the holiday. + HTML: Research Juneteenth and its history. Then, design a website sharing about this celebrated holiday.
Independence Day	+ Blocks: Invite students to code a scene representing something they might do to celebrate the 4th of July. Do they drive somewhere to watch a firework show? Do they gather with community members or family for a BBQ? Invite them to get creative! + HTML: Design a website sharing 3-4 traditions celebrated on Independence Day, or design an invitation to an Independence day party.
Halloween	+ Blocks: Invite students to code a scene of 3 friends walking down the street trick-or-treating. Each sprite should at least go to 2 doors, say "Trick or Treat" at each, and walk away. + HTML: Design a basic website to look like a wanted poster for a monster. Include sections that explain what the monster looks like, what the monster did, and what the reward is.
Thanksgiving	+ Blocks: Select 5 sprites to represent things they are grateful for. Then, code each sprite to say what it represents. For example, I might select the dog sprite and code it using a pink text block saying I'm grateful for my dog, Buddy. + HTML: Design a website to share 5 things you are thankful for.
Christmas	+ Blocks: Code a group of sprites moving around a scene to pose for a Christmas photo. Consider having them code each sprite to share something they love about the Christmas holiday. + HTML: Christmas is celebrated differently all around the world. Invite students to research how Christmas is celebrated in other countries through different traditions. Then, invite students to design a website sharing 3 countries other than the country where they live and a tradition they do differently to celebrate this holiday. An example website for research can be found here: ***https://www.whychristmas.com/cultures/***

HOLIDAY	ACTIVITY DESCRIPTION
Kwanzaa	+ Blocks: Discuss Kwanzaa and some of the traditions practiced during this holiday. Then select 2-3 sprites that represent a different tradition. Code each sprite with the pink text block to share what each tradition being represented is. Examples of traditions may include lighting the candles (or Kinara), honoring ancestors, feasting on food, and more. + HTML: Kwanzaa is a cultural holiday where families and communities gather to remember the past and to celebrate African American culture. Invite students to research different traditions practiced during this holiday and to design a website sharing 2-4 of the traditions they found.

Additional Things to Keep in Mind:

+ Growth Mindset and Iteration: As you model and try coding as a group, explain the importance of trying new things. Explain that we don't always get things on the first try, and that's okay. In programming, we call that "iteration." We iterate, or go over something multiple times to keep learning and improving.
+ Testing: Only add 1-2 pieces of code at a time. It's important to test things as we go. Otherwise, if we get to the end and have a bug, it's much harder to find it and takes a lot more time.
+ Debugging/Critical Thinking/Problem Solving: When code doesn't work, we say that it "has a bug." Figuring out where that bug is, and how to fix it is called "debugging." Use the opportunity to debug code in front of the class, model your thinking processes by speaking out loud, and engage everyone in problem solving to figure it out.

Navigating Platforms

Blocks - used for Blocks activities

+ Open the Blocks platform
+ Click "Saved Projects"
+ Click the plus sign to add a new project
+ Title your new project and select "Save Project"
+ Begin coding!

Launch Pad - used for HTML activities

+ Open the Launch Pad platform
+ Click the desktop icon at the top and select "Code Playground"
+ Select the drop down and click " + New File"
+ Type a file name (i.e. Halloween, Valentine's Card, PSA) and make sure the file type listed is .html. Click "Create File"
+ Begin coding!

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MONTH	HOLIDAY	MONTH	HOLIDAY
January	New Years Martin Luther King Jr. Day	July	Independence Day
February	Black History Month Valentines Day President' Day	August	
March	Women's History Month St. Patrick's Day First Day of Ramadan	September	Labor Day Grandparents Day
April	Easter	October	Columbus Day
May	Mother's Day	November	Veterans Day
June	Father's Day	December	Christmas Eve Christmas Kwanzaa New Year's Eve

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Graphic Organizer

WOMEN'S HISTORY MONTH

INFLUENTIAL WOMAN

REASON #1

REASON #2

REASON #3

IMAGE IDEA

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Website Brainstorm

WEBSITE THEME

TOPIC #1

TOPIC #2

TOPIC #3

IMAGE IDEA

IMAGE IDEA

IMAGE IDEA

How To Set Up Your Computer Science Classroom For Success

Bree Yocum
November 3, 2022

Are you new to teaching computer science? Are you new to teaching in general? No need to fear! We have compiled a list of helpful tips and ideas to support our computer science educators in preparing for a successful year.

Constructing Your Classroom

The first key to creating a smooth-running classroom is to be intentional in your setup. Here are three suggestions to support you in accomplishing this:

1. **Spend time getting to know your classroom technology** - understanding your technology will give you peace of mind knowing everything works prior to being in front of students. Use this time to learn how everything connects. This prevents day 1 fumbling to connect cords. In the case where you discover technology is not functioning, this gives you time to submit a work order to ensure it is working properly when you need it.

When troubleshooting bugs that may arise during a lesson, reach out to the Skill Struck support team. Letting them know what types of devices your students are using, as well as the browser offers helpful information towards fixing the issue. Skill Struck works best on Google Chrome and is also supported on Safari and Firefox.

2. **Designate a teaching station** - A teaching station is a place where you organize and arrange your teaching materials for the day or week. This may include copies, lesson plans, pencils, and more. Your teaching space should be somewhere easily accessible by you to ensure optimal use of instructional time and limited opportunities for students to misbehave.

3. **Clear your entry and exit way** - Students are entering and exiting your classroom multiple times each day. Minimize the clutter in this space to limit student distractions and foster a seamless transition.

Setting Expectations

Expectations are explanations of how students should behave and perform in your classroom. Expectations should be individualized for your classroom, but general enough to apply to all students. Research tells us that over the past 60 years, "researchers have consistently found that teachers who explicitly teach expectations have students who are: on-task at higher rates, have more prosocial behaviors with peers, and overall are more academically successful than children who have not been systematically taught classroom expectations" (Croce & Salter, 2022).

Several experts recommend outlining expectations as positive statements. Such expectations should be clear standards that motivate students as they thrive knowing what is expected of them. Here are a few expectations for students working with technology:

1. Only visit websites the teacher has given permission to visit
2. Keep passwords private
3. Respect the computer (i.e. Hold it with two hands, walk if transporting your computer, no food or drink around the computer, only use it on a flat surface)
4. Keep your personal coding files private (i.e. No cheating)

5. If you finish early, help those around you who might need some extra support

Creating Procedures

"A routine is a process or action that is done automatically without prompting" (Wong & Wong, 2014). Imagine your students walking into class. They put away their bags, pull out their chairs, and get right to work on the morning task. This is an example of a start-of-class routine or procedure. A procedure is a step-by-step list of instructions that students are to follow at a given time. Think of these as your very own algorithms! It is important to be specific when writing procedures. Think about how you want a procedure to look, sound, and feel when in action. Setting classroom procedures not only make the flow of a daily classroom routine smoother, but they save you valuable instructional time. Here are a few common tasks that typically require a procedure:

1. Entering the classroom
2. Getting or returning a computer to the computer cart
3. Submitting work
4. Working in groups
5. Lining up

Preparing For Lessons

At least one day before a lesson, read over your lesson plans so that you are familiar with the content you will be teaching. Print and prepare any resources you will need, and check that digital resources, such as slideshows, work. Reviewing the content and materials before the lesson will help you feel prepared and one step ahead. You may find it useful to bookmark websites on your computer that you will refer to often during lessons, so that you can easily pull them up when needed. In addition, consider having a hard or digital copy of student passwords and usernames handy. This way you can help them when they forget!

Functioning in a Limited Space

Do you feel there is limited space in your classroom? If this is the case, it is crucial to utilize the space you do have in creative and effective ways. Here are some suggestions for doing this:

1. **Vertical wall space** - Add a hanging shoe organizer to give yourself 24 pockets of storage on your wall. These organizers can often be found at your local stores. Store anything from a class set of headphones to water bottles, or even your various school supplies.

2. **File crates** - If you use file crates to store things in your classroom, add a cushioned seat or pillow to the top to create an extra seating space that doubles as storage.

3. **Need more wall space?** - Consider hanging poster boards in front of shelving units used for storage. Not only does this limit the visual clutter that can be distracting to both you and your students, but it allows you the space to hang more intentional visuals to help your kids. Pro tip: Tape the boards in a way that they can be flipped up to still access the shelved items easily.

4. **Use small space storage** - Rolling carts, boxes, bins, storage cubes, shoe shelving, and more. There are loads of small space storage options out there. Consider using these to help consolidate the supplies you are looking to keep in the classroom.

5. **Turning Desks into Tables** - You can flip student desks around and into tables, allowing you to store your items in their desks. You may be asking, where do student supplies go? Consider attaching a command hook to the back of their chair with a hanging pencil bag to store the small items they might need (i.e. pencil, scissors, erasers).

Being new to the field of teaching computer science doesn't have to be scary and overwhelming. Take things one step at a time and you'll soon be feeling the successes of your efforts.

Croce, K. M. & Salter, J. S. (2022, May 6). Beyond the Walls: Establishing Classroom Expectations in a Virtual Classroom. Frontiers in Education. https://doi.org/10.3389/feduc.2022.816007

Wong, H. K. & Wong, R. T. (2014). THE Classroom Management Book. Harry K. Wong Publications, Inc.

BLOG

The Scramble For Computer Science: How To Adopt CS Despite Teacher Shortages

August 12, 2022

Back to school has arrived and administrators are facing the same problem they have been for the past few years: teacher shortages and added computer science mandates.

We've seen district leaders across the nation scramble to meet their state computer science (CS) requirements while also dealing with a loss of teachers in the classroom.

We've heard stories about non-CS teachers taking on the responsibility to meet these requirements, and have seen these same teachers shed tears over the imposter syndrome–or the feeling of inexperience. We've heard other stories about schools adding CS classes but not being able to create enough buzz to get students to enroll.

So how can we fix these issues?

Understanding the Scramble for Computer Science

Why is there a massive push for computer science education? Because computational thinking takes our lives to the next level. Creating a successful sourdough starter takes the same computational thinking skills as an algorithm. Biologists today are visualizing their sample data using Python. Computer Scientists are changing the world fundamentally, including how we communicate. Computer Science Education and computational literacies are fundamental skills for our generation and the future.

In Career and Technical Education we talk about the different CTE clusters ranging from agriculture and food to science and technology. While historically computer science fits in the "Science, Technology, Engineering & Mathematics" cluster, it's true that CS skills can actually fit into every CTE cluster–including agriculture and food.

For example, technology has driven technological advances in how farmers improve efficiencies in their farming operations, helping produce food in a way that's more efficient and helps reduce climate change. Technology will continue to advance in every industry–it's happening right now.

It's true that not all students will be coding in their chosen career path. However, computer science education and coding have proven to help students gain applicable skills in any industry such as problem-solving and collaboration.

CEOs all over the nation are calling on state and district leaders to add computer science as a requirement to K-12 education because there is a huge gap in tech career opportunities and those with the skills to fill those roles.

> "Software touches all of these different things you use, and tech companies are revolutionizing all different areas of the world...from how we shop to how farming works, all these things that aren't technical are being turned upside down by software. So being able to play in that universe really makes a difference." - Drew Houston, Founder & CEO, Dropbox

> "Computing lets people express their creativity and unlock solutions, and code is computing's universal language. All young people, including girls, deserve to be fluent in the language of the future." - Lucy Sanders, CEO & Co-Founder, National Center for Women & Information Technology

State and district leaders have been having these discussions for years, and now we're starting to see more funding available to help students get the skills needed to join the tech workforce.

The Challenges of Adopting Computer Science Pathways

Now that funding and state support are becoming more available, district leaders have started adopting computer science pathways. But there have been some challenges along the way.

One is the teacher shortage.

States have provided a lot of time and money behind professional development in hopes to bring teachers up to speed with the complexities of teaching computer science. This has resulted in some teachers becoming coders themselves and leaving their district for tech jobs.

This isn't the only reason teachers are fleeing the classroom. Teachers are feeling more burned out than ever. And with so many leaving the classroom, the teachers that are staying have little to no CS experience and struggle to take on one more thing, resulting in even more teacher shortages.

Some states and districts have required computer science professional development (PD) to train these new-to-CS teachers. These added hours and big PD budgets have only added to the problem–more work required of teachers that are already taking on additional work.

Because of the teacher shortage and burnout, some districts have pushed pause on fulfilling these state CS mandates and requirements–making it so their students can't get the CS education needed in today's workforce.

Another challenge in adopting CS is the lack of CS enrollment.

According to the most recent State of Computer Science report, 51% of schools in the United States now offer computer science classes. While the amount of CS courses offered throughout the United States increases, many schools struggle to hit their target student enrollment. This is because of the common misconception that CS is too hard or too boring–or from the difficulty of creating buzz around CS in the classroom.

How District Leaders Can Solve the Problem

1. Introduce Earlier Exposure to Computer Science

We've heard it over and over again, "we've added computer science to our CTE pathways but we aren't hitting the enrollment numbers we're hoping for." Giving your high school students exposure to CS in high school is essential–starting them earlier is equally essential in your pursuit of fostering computational thinkers that buck traditional stereotypes.

Starting your students' CS journey as early as Kindergarten will help them experience how easy and creative coding really is–before those misconceptions that coding is too hard or too boring set in.

Districts can start laying the foundation of CS in elementary schools by implementing a K-5 pathway that includes unplugged activities and cross-curricular. You don't have to have CS teachers in your elementary schools to start laying this foundation. The unplugged activities and cross-curriculum can be used by any teacher and can be woven into everything that's already being taught, including Math, Science, and ELA.

While any teacher can easily add CS into their classroom using unplugged activities and cross-curriculum, schools can also utilize paraeducators–also referred to as computer lab aids–to introduce K-5 students to computer science.

Weber School District recently implemented a K-5 pathway to start earlier exposure to computer science through the use of paraeducators. They did this to alleviate home room teachers' added responsibilities, while also being able to fulfill Utah's CS mandates. As a result, they've been able to help their youngest students learn the basics of computational thinking, helping prepare students for a stronger computer science CTE pathway.

2. Implement an Easy-to-Use, Autograded, and Accessible Computer Science Solution

There are several free computer science lessons, curriculum, and services available to you and your teachers on the internet. The problem with using these free resources is that **it still puts the burden on your teachers**, resulting in added burnout.

By implementing an easy-to-use, autograded and accessible computer science solution, your teachers, subs, and paraeducators will be able to easily hop into the platform and rely on carefully scaffolded, curated, and auto-graded K-12 curriculum that an expert created for them–giving your teachers more time to focus on their students and less time to burn out.

A computer science solution makes it easy for any teacher to teach CS in the classroom. Teachers don't have to know how to code to teach code.

This solution should empower students to learn at their own pace–making them more independent in their learning. Look for CS solutions that include:

- Curriculum written by dedicated curriculum experts that aligns with your state and CSTA standards
- A code environment that helps your students apply the curriculum they're learning
- A built-in autograder that checks your students' progress and code
- Pre-made lesson plans for teachers–including unplugged activities
- Accessibility features that make it so all your students can participate in computer science

- Curriculum in multiple languages–for your English Language Learners (ELL)
- An easy-to-use interface for teachers and students
- Live support that can be easily accessed during school hours

In 2019, Landmark Middle School of Moreno Valley Unified School District added a computer science course to their school. Instead of hiring a CS teacher, they asked Mrs. Becky Baez–an English and history teacher–to take on the responsibility of teaching the course. Without hesitation, Mrs. Baez took on the challenge and her school supported her with a computer science solution that has a built-in autograder and curriculum. One year after implementing CS into their school, their computer science enrollment increased 43%.

3. Adopt a Guaranteed and Viable Computer Science Curriculum

Part of the issue of curating your own curriculum, or adopting free CS curriculum on the internet, is that teachers still need to have some understanding of code in order to create a rigorous pathway that engages students.

By adopting a guaranteed and viable curriculum and strong instructional strategies, your teachers can teach CS without prior experience–making it so they can focus on their students' learning and practice differentiation and personalization in the classroom.

A guaranteed and viable curriculum includes a comprehensive K-12 computer science pathway that engages students in rigorous coding experience at every grade level.

An example of this comprehensive K-12 computer science pathway could include:

- **Grades K-5:** Start your youngest learners' computer science journey using block-based code environments that help them create content, not just consume it. In addition to block-based coding, students should participate in unplugged activities that help them apply complex coding concepts–preparing them for more rigorous concepts in later grades. While your students are still in these younger grades, transition their block-based code to text-based code and begin teaching them HTML.
- **Grades 6-8:** Prepare your middle schoolers for a more rigorous curriculum by introducing them to introductory text-based coding in languages such as HTML, CSS, JavaScript, and Python–languages required to be web and software developers.
- **Grades 9-12:** Introduce more advanced-level courses–such as AP Computer Science Principles, Python ITS Cert, and more–and simulate real-world work environments that web and software developers face on a day-to-day basis. This includes self-paced learning practices, group projects, and a rigorous curriculum that helps students advance in computer science skills and languages.

When you partner with a computer science solution that prioritizes a guaranteed and viable curriculum, you can rely on them to customize a CS pathway that makes sense for your district instead of placing the burden on your teachers and curriculum staff.

4. Provide Appropriate Professional Development and Support for Your Teachers

Your teachers are incredible. They are willing to take on new challenges and curriculum for the good of their students' future. It's disheartening to see them struggle to implement CS education that they've never had previous experience with.

Instead of requiring teachers to take hours upon hours of CS professional development (PD), invest in a computer science solution that has PD and live support built into the platform–and requires little to no technical knowledge to dive in. The PD you're looking for should support your teachers in the classroom–not require extra time or work outside of the classroom.

The built-in live support feature means your teachers can ask technical and curriculum questions to an expert during class hours, making sure they are never on their own.

LaShon from Rialto Unified School District started her first year teaching computer science with a computer science solution that has live support built-in. She had no previous CS experience, but was able to ask this live support channel for help on technical and curriculum questions during class hours. The live support responded in seconds, making her first year teaching CS a positive experience. Now LaShon is in her second year teaching and has more confidence in her CS classroom.

> "My confidence in teaching coding [curriculum] has soared knowing that the solutions team is just moments away from assisting me at just about a moment's notice. I feel like they are there just waiting to assist me personally whenever a need arises within the entire school day." - LaShon, CS Teacher at Rialto Unified School District

What is Skill Struck?

Skill Struck offers a comprehensive K-12 computer science solution and curriculum for schools and districts. To learn more about how Skill Struck can help your district adopt a computer science pathway that any teacher can easily teach, schedule a demo at ***www.skillstruck.com/get-demo***.

BLOG

The Importance Of Engaging Kids In CTE From Kindergarten Through 12th Grade

Bree Yocum

February 23, 2022

It's challenging to understand the vast array of careers available in the world when you are a kid. Most students are familiar with the jobs that are local and familiar to their community. However, exposing students to possibilities beyond the neighborhood is an important role in education. That is where career and technical education (CTE) programs come in.

What is CTE?

CTE programs teach students technical skills that will support them in future careers. Most programs offer a wide scope of learning experiences that extend across several career fields and industries. Some of these learned skills may be in areas such as auto, business, IT, agriculture, STEM, healthcare, and more. The form that CTE classes take in schools varies depending on the district and local opportunities. However, the advantage to incorporating CTE programs in any form is widely beneficial for students.

CTE in Upper Grades

Currently there are more than 12 million high school and college students in CTE courses across the country. These courses are preparing our students with hands-on, applicable skills that prepare them for the workforce. According to the Applied Education Systems CTE statistics, 95% of students enrolled in CTE courses graduate high school. This is 10 percent higher than the overall national high school graduation average as of 2021.

CTE programs offer students learning opportunities in technical fields that are not typically learned in the classroom and support them in setting goals for their future. This results in students graduating high school with relevant and marketable skills that make them competitive candidates in the job market. Even if they choose to not pursue the career they've gained experience in through the CTE program, they are equipped with skills that are transferable across various positions.

The Benefits of CTE for Elementary

While CTE is typically taught in middle, high school, and post-secondary, adapting and implementing these career readiness programs in the younger grades is equally beneficial.

However two questions stand. First, how do we engage elementary students in CTE? And second, how young should we start?

It is essential that we expose our students to career options as early as possible. This introduces them to several professions they may not have opportunities to experience in their typical everyday lives. Most youth are unaware of just how many options are available to them. Broadening their understanding to these possibilities will kickstart their thinking about the future and will support them in goal-setting.

It's important to note that the goal of CTE in upper and lower grades does differ. Secondary and higher education programs aim to set students on a path specified to their interests and skills. The purpose of elementary CTE is to simply expose students to their wide expanse of opportunities.

Here are 3 CTE activities you can utilize in your elementary classroom:

1. **Invite guest speakers** - Guest speakers can present their jobs along with what they do. Knowing how inquisitive our young students naturally are, their questions will flow as they learn from and interact with the guest speaker.

2. **Incorporate dramatic play areas** - Children are drawn to dramatic play, especially our Kindergarten and 1st grade students. They gravitate to dramatic play areas in the classroom, like a make-shift rocket ship, hospital, or restaurant when given the chance for free play. These play areas are both entertaining and interesting to young children and familiarize students with various careers based on the toys and scenarios teachers make available.

3. **Plan field trips** - Going on CTE related field trips provides students with first-hand experience in other career fields. It builds their knowledge base and gives them an introductory idea of what it takes to enter that field. This can be achieved through an in-person workplace tour where students meet the employees, ask questions, and see the behind-the-scenes. An alternative can also be a virtual field trip where students can go essentially anywhere ranging from a contractor's construction site to outer space. The internet is chalk full of videos that feature business owners and field specialists talking about their profession.

All in All

Higher percentages of students will form interest in career and technical fields when we expose them to CTE-based curriculum beginning from a young age, even Kindergarten. Students will explore different opportunities before they form preconceived notions of the types of individuals that are typically in those fields based on the stereotypes often cemented in society. This will lead to a wider variety of people from all types of backgrounds entering these technical fields.

CTE will empower all K-12 students with feelings of self-control over their goals and life direction as they learn new skills and master these areas of interest.

To learn more about computer science curriculum Skill Struck offers grades K-12, take a look at our course catalog here.

BLOG

Why We Need To Engage K-2 Students In Computer Science

Bree Yocum

February 3, 2022

Why early access to computer science matters

Samaira Mehta, the 12-year-old CEO of CoderBunnyz and CoderMindz, began coding at six years old. With a love for coding, Samaira fostered the idea for these two code-based games shortly after her 6th birthday. With a goal to close the gender gap in coding, she later began the initiative "Girls who Code." This organization helps women develop computer science (CS) skills and gain equal opportunities in the CS field. Samaira Mehta has made an incredible difference in the world of computer science, and it all started at six years old.

What a force one child can be when equipped with the skills and tools at an early age. Typically, CS is thought to be a subject for the secondary space, grades 6th-12th. However, if this snap thought crossed your mind, I urge you to reevaluate.

Several states are currently creating, or have created, Career and Technical Education (CTE) standards for K-12. CTE is "the practice of teaching specific career skills to students." Among several topics that these standards include, STEM and computer science are often included. There are thousands of careers in STEM and CS fields. Unfortunately, there are few people to fill these available roles. By introducing CS to students beginning in K-2, we strengthen their critical thinking and problem solving skills and equip them with the tools for a CS related career in the future.

Starting kids in CS as early as Kindergarten

It is crucial that we introduce students to CS beginning as early as Kindergarten. Typically as students grow older, they form preconceived ideas on the type of person who they believe is good at CS based on stereotypes. It is the responsibility of educators and companies, like Skill Struck, to provide CS opportunities to all students to discover their talent and passion in coding starting from an early age. Lee and Junoh's conclusion in their study, "The concern is not [only] whether we are exposing children to coding, but how to expose them to coding in a developmentally appropriate manner and in a way that will get them to playfully engage in coding."

So the question stands, how do you engage young learners in K-2 with a subject like computer science? The answer lies in unplugged activities.

Engaging young students in unplugged activities

An unplugged activity is a hands-on activity that takes place away from a computer, contrary to plugged activities which are done using technology.

In the upper grades, computer science in CTE is primarily taught through the use of technology and platform activities. However, early elementary students are unfamiliar with computers and technology. This is why the need for unplugged activities is present.

Unplugged activities include movement, drawings, and/or manipulating objects, like blocks, to teach CS concepts. Unplugged activities help young learners make a tangible connection with an abstract concept. For example, by providing arrows for students to code directions on a classroom grid, it offers a more kinesthetic and visual form of learning to teach the concept of algorithms. Another example could be teaching how the internet works through the creative use of a puzzle. Or, teaching sequencing through well-practiced classroom procedures, like lining up for lunch or turning in homework. Connecting code with daily routines that children are familiar with offers meaning to the CS concepts they learn.

Not only are unplugged activities developmentally appropriate for our students in grades K-2, but the hands-on approach engages students with the abstract concepts of CS. Incorporating these activities, tailored to the interests of your students, will engage them in learning and will support them in being prepared for the STEM and CS opportunities that come their way.

If you'd like to learn more about unplugged activities, and other way to engage K-2 students in computer science, reach out to the Skill Struck team here.

BLOG

What Is Career And Technical Education (CTE)?

Aimee Alsop

January 24, 2022

Students have more potential career possibilities today than ever before in history. The internet has introduced a global community that has dramatically expanded the resources and options available to today's students. This widespread possibility has also made the process of career selection and preparation more complex Schools and districts today have the unique challenge of directing and preparing students for the busy modern world. This is where career and technical education (CTE) courses are so valuable.

The Role of a CTE Educator

A CTE leader in education has the task of teaching specific career skills to help prepare students for future jobs. CTE courses are proving to be a valuable asset to schools all over the country. These types of courses give students early exposure to career options, boost their possibilities for the future, and help students to be eligible for better jobs.

CTE courses help expose students to career options early in their education. Starting as early as middle school, students can experience activities and tasks related to topics such as health science, STEM, manufacturing, or business. Many students don't know the varied career fields available to them. Experiences in CTE courses help expose them to options they may have never considered before.

Preparing Student For the Future with CTE

Students enrolled in CTE courses are better prepared for the future. According to the Applied Education Systems CTE statistics, 95% of students enrolled in CTE courses graduate high school. With the high school diploma in hand, students are better equipped to secure high paying jobs, attend college, and provide for themselves in the future. Seventy percent of CTE students say entering a CTE program of study helped them get better grades. Higher grades tend to open doors as students look for scholarships and apply for further schooling. With these statistics, it's clear to see that CTE courses give students a boost as they face the busy world.

The skills students learn in CTE courses are highly desirable by future employers. Topics such as business, engineering, programming, or law are highly relevant across disciplines. Employers are highly interested in hiring people who have an understanding of practices learned in CTE courses. Students who leave high school with marketable skills on their resumes have an advantage in highly competitive job markets. Even if students pursue a career field different from their CTE courses, the skills they learned still prove valuable across disciplines. It's clear that students can learn valuable information in CTE courses.

With the whole wide world of careers, jobs, and life paths available to students, it can be difficult to know where to start. Students who participate in CTE courses have a leg up as they step into the busy modern world. Career and technical education courses help give students access to different career fields early on, so they can start navigating their preferences and organizing opportunities.

Learning from CTE Educators Across the Globe

The world is getting increasingly more complicated and students are presented with more technical opportunities than ever. We have the opportunity to learn from several career and technical educators all over the world. It's important for us to recognize the work they are doing and help give them the tools they need to give students access to these career-ready valuable skills.

If you'd like to learn more about CTE, visit our blog here and get involved in helping your local school districts get their students and teachers the access and curriculum they need to prepare every student, no matter their background, for current and future careers.

BLOG

6 Ways To Engage Young Learners In Computer Science

Bree Yocum

September 2, 2021

Imagine you're sitting at a table in the middle of a long meeting. You can hear the presenter in the front of the room droning on, but there's nothing to keep you engaged other than the presenter's voice. Your mind begins to wander and you miss what the presenter just explained. Even as you try to pay attention, you start to feel bored, tired, and eager to move.

We've all been in a similar situation—one where we know important information is being presented to us, but we still struggle to pay attention. Students are no different, especially young learners. If we want elementary school students to focus, and ultimately learn computer science, we need to make sure that the lessons we teach are interesting to them.

We've compiled six helpful tips for engaging elementary students in computer science.

1. Encourage discovery learning.

"Why do I need to learn this?" "How will I use this in real life?" These questions, or some version of them, can be heard in every classroom. Kids are naturally curious. They search for meaning and reason as they learn new things. As educators, it's important to recognize the benefits of this desire to explore.

Because of their curiosity, they are natural problem solvers. If students are shown a tower made of blocks, they will likely try to use blocks to emulate the tower before them, creating a structure that is similar in appearance or complexity to the first tower.

Computer science education works the same way. By showing students the possibilities of what they can make with code, and providing them with resources to support them, we enable students to use their problem-solving skills.

2. Get excited.

Students look to their teachers for cues when learning new topics. If a teacher is apprehensive about a topic, students will notice. Likewise, when a teacher is excited, students will recognize and often mirror that enthusiasm.

Having a positive attitude towards computer science will foster a positive energy in your classroom that will allow students to open themselves up to learning new things!

3. Show that coding is creative.

Many students are hesitant about learning computer science because they associate it with math or science, subjects that they may struggle with. So, rather than first introducing computer science as fitting into the same category as those STEM subjects, start by introducing it as a creative outlet.

Students are constantly looking for opportunities to express their creativity and individuality. Computer science allows them to create algorithms, animations, websites, and more. These projects can be centered around whatever topics interest them most.

As a teacher, you can foster excitement around computer science by emphasizing how it enables students to be creative.

4. Incorporate students' interests.

Music, sports, video games, reading, art, and any other hobby you can think of. Our classrooms are filled with students whose interests are diverse and wide-ranging. Computer science can be used as a tool to celebrate those interests.

Educators can encourage students to build a website about their cultural traditions, favorite hobbies, future goals, and more. You can also incorporate these interests in your lesson plans. Offering students opportunities to represent their individuality will motivate and engage them in computer science learning.

5. Use hands-on learning.

Imagine sitting at a desk, taking notes for thirty minutes on how to cook your favorite dessert. Now, imagine learning by actually making the dessert by following the recipe. Which one seems more exciting?

Students learn best through hands-on experience. Computer science principles don't have to be taught in a lecture. For example, you could teach students what an algorithm is by asking them to guide you through an obstacle with directions. Students may make mistakes or give incorrect directions, but they will exercise their problem-solving skills and learn to give clearer instructions along the way.

Hands-on learning, like the example shared above, allows students to engage more with the content. Students not only enjoy learning this way, but it also helps them to better understand and retain the information they're being taught.

6. Invite students to share.

Inviting your students to share their work is a great way to keep them engaged and excited. Presenting also fosters innovation and builds confidence.

Whether they choose to share their work or choose not to and instead celebrate their peers' accomplishments, students get excited about coding when they know they can showcase their hard work.

Conclusion

By engaging early learners in computer science, we are setting them up for success throughout their education and beyond. Creating a fun space to learn about coding allows students to feel comfortable with this subject early on and gives them a head start as they continue in their computer science education journey.

BLOG

How To Use Computer Science To Reinforce Trauma-Informed Practices (T.I.P.S.)

September 9, 2022

Did you know that computer science and coding education can reinforce T.I.P.S. (Trauma Informed Practices) in the classroom? Things like creating websites, solving puzzles, and problem-solving through challenges can teach students self-regulation, collaboration, and empower students to share their voice.

About 70% of adults say they have experienced trauma in their lives. Untreated childhood trauma can lead to anxiety, depression, addiction, and other health issues. By introducing T.I.P.S. through computer science (CS) education, students will be better equipped to deal with the trauma they have faced.

The 6 Guiding Principles of T.I.P.S.

T.I.P.S can be broken down into 6 guiding principles:

1. **Safety**
2. **Trustworthiness & Transparency**
3. **Peer Support**
4. **Collaboration & Mutuality**
5. **Empowerment Voice & Choice**
6. **Cultural, History, Gender Issues**

CS can be a great tool for students who have experienced trauma, as it reinforces these 6 guiding principles.

Here's a deeper look at each of the principles and how CS can help reinforce them.

1. Safety

It goes without saying that safety is the most essential principle in T.I.P.S. For students, it's important to ensure that they feel physically, emotionally, and psychologically safe amongst their peers, leaders, and environment.

Whether it's safety in the playground, walking down the hallway, or interaction on the internet, safety is something that every classroom should put first.

Part of your students' computer science education can include topics such as digital safety. Digital safety includes training on the importance of click restraint, how to be a responsible participant of online activities, how to avoid and look out for hackers and scammers, and more. By educating students in this way, you are helping create a safer space for them on the internet.

Another computer science concept that can help your students learn how to create a safe environment is algorithms. Algorithms are step-by-step instructions that result in a desired outcome or function. Teaching students who have experienced trauma about clear routines and expectations can help them decrease anxiety.

2. Trustworthiness and Transparency

In many cases, students who have faced trauma are hesitant to reach out for help because they lack a sense of trust. When schools instill a sense of trust through transparency in the classroom, it allows students to feel trust with their peers and leaders.

Coding is a great way to help students and teachers learn how to trust each other in a learning environment. Coding is a collaborative experience, especially for beginners. As a coder, it's common to run into bugs and errors, and a lot of the time it takes collaboration and teamwork to be able to work out those errors.

This type of collaboration found in CS classrooms opens the door for building relationships of trust and transparency. Trust that the student's peer will work with them to solve the errors, and transparency that the peer can share their knowledge and skill in a helpful way.

In addition to these types of plugged coding activities, teachers can also lead their classroom in unplugged activities that promote trust and transparency. These unplugged activities include solving a puzzle as a class or group, and other group activities that include a challenge and team effort to solve.

3. Peer Support

Experiencing trauma can be isolating. Using T.I.P.S., professionals try to utilize caregivers who have experienced similar trauma to create a safe space for them to share their experiences. This is called peer support.

Learning code in the classroom can be a great way for students to practice supporting each other with similar challenges they are facing in their code journey. Teachers can create a healthy dynamic of peer support by pairing students together to solve a problem.

Some students pick up coding more quickly than others. By pairing these more experienced students in coding with students who are having a difficult time grasping a concept, you can create a healthy peer support dynamic in the classroom that can be translated in and out of the classroom.

4. Collaboration and Mutuality

This guiding principle of T.I.P.S. helps people who have experienced trauma feel like they are a part of their treatment plan. For example, instead of being told how to fix the problem they are facing, the person who has been affected by the trauma works alongside professionals and peers to determine the best course to healing.

For students who have experienced trauma, they can start to learn the importance of collaboration and mutuality through the use of group coding projects.

In group coding projects, students can collaborate and lean on each other to accomplish a goal. Providing students an opportunity to practice this type of peer support in the classroom, opens the door for them to be able to lean on each other through difficult out-of-classroom experiences as well.

5. Empowerment Voice & Choice

Trauma is personal. This important T.I.P.S. principle allows people who have experienced trauma to voice their thoughts, experiences, and decisions in a safe environment.

Computer science lends itself to provide many opportunities for students to express themselves, share their beliefs, and promote choice. When creating a website, students can choose any topic that interests them.

Students can create their own website about a historical figure, a website that describes their favorite pet, a website about holidays around the world, and so many more topics. Teachers can assign projects on any topic and students can work collaboratively to design a group website.

Through computer science, students can practice expressing themselves creatively and effectively, and learn the importance of expressing themselves authentically.

6. Cultural, History, Gender Issues

In T.I.P.S. it's important to recognize that each survivor is an individual and their background matters. One size does not fit all. It's vital for people healing from trauma to feel seen as it relates to their cultural, historical, and gender background.

Coding is for everyone. Seriously, anyone can code. It's not for just your uncle who lives in the basement. It's for teachers, educators, parents, and students from any and all backgrounds. We know this because everyone consumes technology. And as consumers of technology, we can see the importance of having all races, genders, and perspectives being the creators of the content we rely on on a day-to-day basis.

Coding in the classroom is also for everyone. By using an inclusive and accessible computer science solution, students can feel supported in their diversity and learn to love coding, and incorporate their background into what they create.

Any student would benefit from computer science education. When we consider those students who have experienced trauma, we can see how computer science would support them because it reinforces the 6 Guiding Principles to a Trauma-Informed Approach.

If you want to learn more about how Skill Struck can help your district adopt a computer science pathway that supports all types of learners, request a demo at *www.skillstruck.com/get-demo*.

BLOG

How To Make Your CTE Clusters More Equitable

Rylee Goodman

April 20, 2022

A long time ago, the classroom was occupied by white males only. It was a bland world of black and white, and sadly, the untapped potential of women and all other ethnicities fell through the cracks.

But times have changed. Culture, perception, and experience have transformed the curriculum into a vibrant burst of colorful courses to match the equally vibrant variety of students.

Today anyone can hold positions of power or influence within career fields, from politics to medicine. While times have changed, this does not necessarily mean mindsets have. Students (especially those in the minority or marginalized groups) can still feel limited to the paths of those who have gone before. This results in students avoiding certain classes because they do not feel they belong. Those classes, more often than not, are Career and Technical Education (CTE) courses.

Overview

According to the Association of Career and Technological Education, the goal of CTE is to prepare students for the workforce through an applicable curriculum and hands-on experience. CTE courses encompass various clusters that branch into different job markets. These classes provide wonderful opportunities for students to gauge their interests and find their passions for future careers. Each student should be provided with activities that explore their interests as well as opportunities that permit them to utilize skills needed for their desired profession.

Since pupils vary in gender, race, health, and intrigue, it may seem difficult, if not impossible, to meet the needs of every student and ensure a welcoming environment for all. Don't stress. This task is easier than you'd think. Here are some ideas to explore.

Gender Roles and Race

One way to combat the intimidation of CTE programs is to first tear down antiquated gender roles and racial stereotypes. Now, we're not asking you to abolish all the prejudice and hardship these parties have endured since the beginning of time. That is unreasonable and frankly impossible. Rather, we encourage you to reinforce the truth of equality in society, particularly in the many career fields that CTE courses target, such as agriculture or law.

Try highlighting well-known male and female executives of various races who have succeeded in their professions. This can be introduced as a weekly study or an assigned research project as part of the class. Seeing role models in fields that students are studying allows them to envision the reality of their dreams.

Similarly, you could contact school alumni of different genders and races who have paved their way into CTE career fields. Invite them to come to speak in your class about their experience, education, and achievements. These visits can be drop-in greets or a question-and-answer seminar. Remember, it's helpful for classes to meet previous students who are succeeding in their CTE field. It helps them visualize the possibilities attainable if they work hard, regardless of race or gender. Seeing that their peers are succeeding will help students stay or get motivated to pursue their own interests and dreams.

Don't be afraid to address race and gender as their own lesson. Students may be more open in your class if you are willing to discuss the opportunities available to all as well as how to battle discrimination in old-fashioned workplaces.

Disability Inclusion

Disability is a state of being, not a roadblock. Remember that people impacted by disabilities are not defined by them, just like gender or race. In fact, mentally or physically disabled individuals are capable of accomplishing just as much as able-bodied individuals, if not more. As such, they should be permitted various opportunities to apply themselves.

Unfortunately, futures in CTE careers can seem daunting to those who don't feel they fit the common image of a successful professional. With few publicized role models to follow, it can be easy for feelings of interest to diminish, and in turn, people will avoid these careers altogether.

It's your job as an educator to disbar doubts of belonging and provide activities that any student can complete. If they are unable to follow along with the curriculum based on their situation, offer the necessary accommodations for them to not only pass the course but ones that encourage them to utilize their learning in the real world.

You can do this by ensuring the school system's standards for CTE enrollment oblige to the needs of the disabled population and review your curriculum. An article called "Four Strategies to Address Equity in CTE" revealed that CTE program administrators in Maryland held their enrollment based on excelling grades, performance reviews, recommendations, essays, interviews, and more. These lengthy requirements prove tedious and unjust toward those who cannot meet the same standards as students with more opportunities.

Assess your class requirements and evaluate the students registering for your course. If a majority of registrars have outstanding GPAs and high achievement levels, there may need to be an adjustment in enrollment requisites. No student should be withheld from a chance to participate in a class that will benefit them in their future careers.

For the Common Man

We are now clear that gender, race, and health should not play a factor in enrollment or involvement in CTE. As such, it's vital the curriculum used keeps the learning accessible to all. This could be completed through assignments that incorporate the student's hobbies, pastimes, and interests.

For instance, if you are teaching a web design and development course, you could assign the project of developing a website about the students' favorite movie. Or, suppose you are an educator for a health science class, you can propose classwork that delves into the nutrition of their favorite food. Activities of this kind provide an umbrella that excludes no one. Each student has an opinion and a preference.

While crafting your class curriculum, avoid activities that require extensive financial investments. Whether it be field trips, projects needing materials, or professional competitions related to the

course, the cost of learning should not overshadow the lessons. Evaluate initial and future costs in your class to cut the chances of isolation among less wealthy pupils.

Remember, keeping education inclusive and affordable is a massive keystone in making CTE clusters more equitable.

Advertising

The main target of CTE is to invite all. There is no one-shape-fits-all for students in CTE programs. Whether they be white, black, male, female, disabled, or otherwise, it is the prerogative of teachers to ensure all feel welcome. In order to do this, there must be an enthusiastic buzz of CTE throughout the school.

The best way to tap into the diverse spectrum that makes up the school's population is to advertise the advantages of CTE to social or academic groups. Pictures, posters, awards, and socials could be used to make the students aware of CTE's success and inclusion. It could also introduce participants to contacts for future networking.

Dip your resources into contacting societies, clubs, and movements to boost support of CTE as a whole. Reaching the vast groups of a campus is a great way to increase diversity and show that CTE is accommodating, rewarding, and welcoming to all. Make sure you tailor each invitation to the group you are focusing on. For example, if you are targeting a Spanish club for recruitment, emphasize the positions available in career fields that utilize multilingual employees.

By doing this, an educator increases the diversity within their own classroom as well as open experiences to any student desiring to enter a CTE profession, using the skills they already hold.

Conclusion

Career and Technical Education should incorporate a diverse curriculum that involves all types of learners and their needs. Regardless of physical characteristics or monetary capability, one thought-provoking school lesson with hands-on experience can help the students feel accepted and welcome. This will not only bode well for your future CTE registration due to recommendation, but progressing students who are looking to acquire jobs in CTE fields will be more prepared from your course load and inspired by your class's atmosphere.

At the end of the day, keep in touch with your class. Post surveys for a class evaluation to see how you can adjust your course. Do your best to keep everyone involved and ensure all participants can complete the work you assign. With these extra steps, you will create the ideal equitable environment for learning in CTE.

BLOG

5 Ways To Improve Equity In Computer Science

November 5, 2020

Did you know that only 24% of the computers science (CS) workforce is female, 8% is African-American, and 7% is Latinx? Every student should have the opportunity to learn how to code. Unfortunately, not all students are given equal access to a quality computer science education.

Barriers like lack of funding or teachers being unfamiliar with teaching computer science are contributing factors to the lack of diversity in CS. Minority and marginalized groups need more exposure to STEM education, and we need more of their unique perspectives in the STEM industry.

So, what can you do to make computer science education more equitable in your school or district?

1. Give students access to computer science education early.

The sooner students are exposed to a subject, the less imposing it seems. Computer science is no different. When students don't have any interaction with coding until middle or high school, it feels less familiar and for many students, scarier. They've been exposed to subjects like math and reading since they were young, but all of a sudden they're faced with the prospect of a new subject to learn. This can be daunting and discouraging for students.

By introducing computer science to elementary students, you are setting them up for success down the road. They will feel more confident and prepared throughout their computer science journey.

2. Provide instruction that meets each student where they are.

It's important that computer science instruction feels accessible and engaging to students. If instruction is too easy or too advanced, students may lose interest in coding. Ensure that your students are being taught at the appropriate level that is challenging, but not discouraging.

Elementary school computer science should cater to the needs of younger students with engaging games and block coding to teach them the foundations of computer science. Middle and high school students may not be playing games, but it's important that they are still engaged in interesting coding activities. And most importantly, each individual student should be encouraged and able to progress at their own pace.

3. Make sure all students in your school or district have equal access to CS education.

Logically, one of the best ways to improve equity in computer science education is to increase the availability of computer science education. Unfortunately, not every school has the funding necessary to implement CS education for all students.

The Equity in Computer Science Matching Grant is a great opportunity to obtain funds for implementing computer science platforms in schools. When a school or district is awarded the grant, Skill Struck will match, dollar-for-dollar, the annual licensing, implementation, professional development, and support for Skill Struck's platforms. You can apply for the grant here.

4. Introduce students to diverse role models in STEM.

It's important that students can see themselves working in computer science. One way to help students do this is to introduce them to diverse role models in STEM—both real and fictional. Use this list as a jumping off point and invite your students to discover role models for themselves as well.

- **Raquel Romano** is a software developer and advocate for members of underrepresented groups in math, science, and technology.
- The character **Shuri** from The Black Panther is an icon for both female and Black coders and makes working in STEM seem like a superpower.
- The **Girls Who Code** books have great examples of diversity. The books are written for kids in grades 3–6.
- **Gordon Bellamy** is a video game executive who has worked on games like Madden and pushed for more accurate and diverse representation in video games.

5. Allow students to express individuality through coding.

Students will feel more interested in computer science when they realize that it can be a vehicle for them to express their individuality. Computer science courses that teach web development allow students to showcase their unique interests.

By committing to making computer science education more equitable, we are investing in the future, not only of our students, but also of the computer science industry. With a quality CS education students will have better job opportunities, more self-confidence in their abilities, and they will become the role models of the future for underrepresented groups in tech.

BLOG

5 Service Projects For Your Class (Remote Friendly)

December 9, 2020

This year is almost at an end, even though some days it still feels like we're stuck in the chaos of March and the beginning of a worldwide pandemic. It's been a challenging year, especially for educators who have continued to support and teach students in spite of the difficulties of remote or hybrid learning.

Teachers—we recognize all that you've done for your students and we thank you!

And that's how we want to end this year, showing gratitude for the people who got us through it. We thought you might feel the same way, so we've compiled some ideas for service projects you can do with your class to end this year on a positive note.

Of course, service projects will look different this year than they have in the past. It's likely that your class isn't together in person. The following five ideas can be done remotely and safely

social distanced, but also work if your school has in-person classes.

1. Write thank you letters to other teachers.

Have your students write letters (digital or otherwise) to a teacher that made a difference for them this year. Consider collecting the notes (through email, a drop box, etc.) and delivering them to your fellow educators.

You know exactly how hard all educators around you have worked this year (because you've been working hard too). This act of service will let them know that all their effort was worth it and appreciated by the students they teach.

In writing the letters, your students will recognize how much they have to be grateful for, especially from educators. And, as a teacher, is there anything better than receiving a confirmation that you're truly helping students?

2. Support healthcare workers.

Hold a drive collecting donations to support healthcare workers to thank them for all their sacrifices this year.

You could donate to local healthcare heroes that you know—giving them letters, necessities, but also thoughtful gifts to show them that they're appreciated.

You could also donate supplies to a healthcare organization or to a hospital in your area. There are plenty of options for what your class can contribute. Students can donate surgical masks , bleach, sanitizing wipes, gloves, and hand sanitizer. Consider calling your local hospital to see what supplies they need.

3. Collect presents for a children's hospital.

Consider donating to a children's hospital to bring joy to kids who will be in the hospital for the holidays, especially because many may not be able to have visitors.

Most hospitals have a wish list that you can share with your students. This service project is great for kids because they can buy games, toys, and books for kids close in age to them. They're able to pick something out that they would love to receive themselves, but instead experience the joy of giving to someone in need.

You can find children's hospitals near you using this tool from the Children's Hospital Association.

4. Make cards for the elderly.

The holidays can be lonely for elderly people in retirement homes and assisted living, and the pandemic is making it even harder since visitors are restricted at most of these locations.

Students can write letters or draw pictures depending on their age. Collect the letters in a drop box if students are remote or in your classroom if you're teaching in person. Then drop the cards off and spread some holiday cheer!

5. Play video games for good.

If you're looking for a service project that's more specific to computer science, students can sign up on Extra Life.

According to their website, "Extra Life unites thousands of gamers around the world to play games in support of their local Children's Miracle Network Hospital."

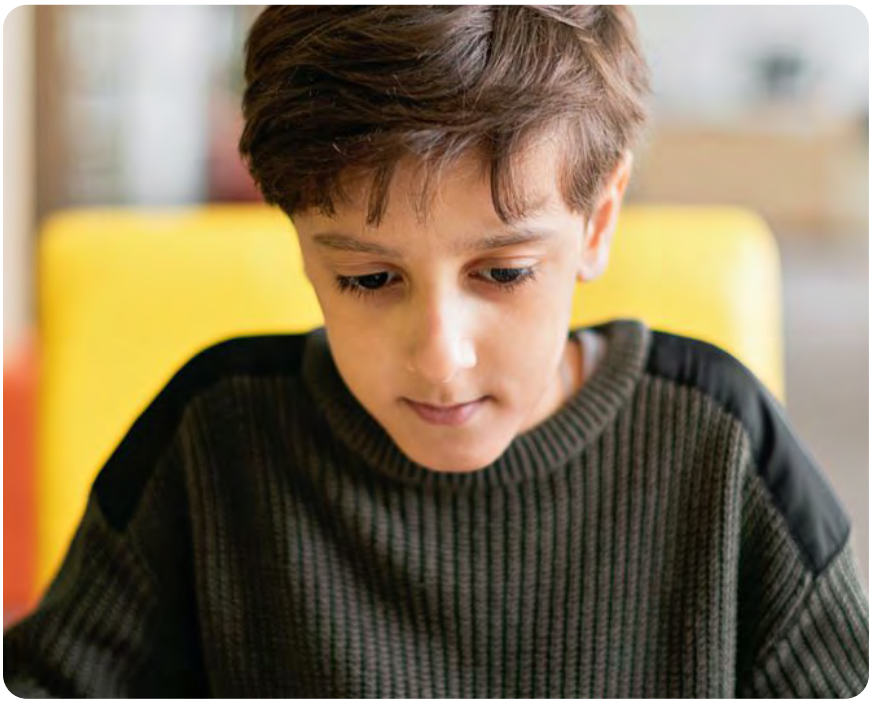
They have raised over $70 million for sick and injured kids. Your students can sign up to play video games and raise funds for Children's Hospitals COVID - 19 Impact Fund.

No how matter how you decide to serve with your classroom, a service project is a great way to finish out a difficult year on a positive note. Or, you could wait to do one of these projects until January and help your students start 2021 with gratitude and service.

BLOG

Using AI In K-12 Education Panel Discussion

July 12, 2023



With the 2023 school year wrapping up, we felt it was important to host a discussion regarding AI and its impact on education. Parker Gentry, CEO of Skill Struck, led this conversation and was joined by a panel of educators from across the country involved in computer science and helping their districts through this AI transition.

The panel included:

Donna Woods: CTE Cyber Pathway Instructor, Moreno Valley Unified School District, California

Justine Chavez-Crespin: Digital Learning Innovation Coordinator Santa Fe Public Schools, New Mexico

Stacie Gomm: IT Information Systems Manager, Cache County School District, Utah

It was an enlightening hour where we heard the different perspectives, feelings, and approaches these educators and their districts are taking in regard to AI's use in the classroom. It was also a good reminder that we are not alone in figuring this out and that we can lean on and learn from one another. Watch the entire discussion below.

Click here to view the discussion in full

Or, if you are interested in hearing short insights shared by our panel and CEO Parker Gentry, check out the panel highlights below.

Panel Highlights

Parker's Question: What is the general emotion around AI in your schools and districts? How about with your students?

Donna talked about the in-depth conversations happening district-wide. They understand it is an inevitable transition but they do want to make sure they incorporate ethical standards. Some students have been very concerned as they are applying for higher education and taking AP exams and worry about the level-ness of the playing field with these tools in play.

Stacie talked about how it's unknown. The adults in her schools are apprehensive but the students are excited and think it's the coolest thing ever. It has been misused to cut corners which has furthered the apprehension in the adults.

Justine's district is asking a lot of important questions. What does this look like? How is it being utilized? What can we expect? What policies? The results of these conversations are drafts within policy, reviewing policy, and a big reminder of the importance of taking a look at technology policies often since tech is constantly evolving. She said, "We cannot just check the box and move on, we have to come back to those concepts and reassess."

Across the country, the feelings around AI are a balance of fear and excitement

Parker's Question: Does your district or school have any policies on AI or Chat GPT currently?

Stacie explained that Chat GPT is an unknown and her district is wondering how to even write policy about something constantly changing. Policy has to go through the board which takes about a month to become official. With that timeline, the policy would be outdated by the time it was approved.

Justine's district has not made any formal policies around AI but is developing and opening up the conversation. Step one of their policy process is to gain experience and knowledge.

Her district has partnered with MIT for an NGSS grant and they are working with a small group of teachers to look at AI curriculum and resources specifically at the middle school level. The purpose of this partnership is to educate this group of educators so that when it is time to create policy the conversation is educated, productive, and well-rounded.

Donna's school is in a similar position. Her IT team and academic officers are forward-thinking and want the student's voices to be heard as policies are created. Industry partner advisors have shared how AI has impacted their job roles so they know it needs to be involved in their curriculum to prepare students for their future careers. In writing and revising the curriculum they contemplated where to put AI, and they chose to add it alongside ethics. And they are paying close attention to the global discussion and decisions being made by the leading AI companies.

Stacie talked about how she has witnessed other transition moments in her years of teaching and seen how we've gotten through them. She saw the same exact questions being asked when the internet and computers became accessible. "I think we are going to ask these same questions and then we are going to figure it out. AI will change learning. Students have to still know what questions to ask, they have to be able to look at what is output to analyze it and figure out what is good, correct, incorrect, or outdated. There is still a lot of thinking that has to be involved. It's a different type of thinking."

Justine wonders about the what if. What if we say no to AI? What does that do for us and our students? AI is different from a calculator because it is an input and you get an output. AI is a data-collecting resource, it is collecting data as we use it. What will happen if some areas have access to it while others are cut off? What does that mean for those people, students, or communities? Where will that voice shine through or limitations come through? AI is only as good as the data it has, it functions off of what we feed it.

4 recommendations for conversations about AI in education

To support discussions around creating policies and determining the role of AI in schools or classrooms, Parker presented four recommendations to guide and support those involved. These four recommendations include:

1. Meet with teachers, principals, and district officials to be on the same page with chat GPT in the learning process. We don't view this as an "all or nothing" decision.
2. Set very clear expectations with students on when it should be used, and when it should not.
1. Example: When you are working on a large or group project, and are trying to understand a difficult concept, use GPT to learn! However, it is not allowed during an assessment.
2. How is this similar to other tools (i.e. calculator, tablets, computers).

1. Trust your teacher instincts. If something feels off, it might be smart to dig deeper. Utilize cheating-detection tools.
2. Cut yourself some slack. If students want to skip steps in the learning process, they can usually find a way. This is a new way to do it.

Ways AI can help the student learning process

Because we interact with the computer science (CS) side of education we have learned that one of the biggest headaches for teachers of CS is the debugging process.

Parker shared: "We have launched, using an AI plug-in, a customized hint process. With this new tool, Skill Struck students can receive three customized hints during every lesson. This is only possible because of AI. If a student has a typo, doesn't have the right coding algorithm, or they have quality code that still is not meeting the auto-grader requirements then they can receive a customized hint to help them debug and solve their problem. This is an example of how AI can become a custom and personal tutor that can assess gaps and provide feedback. This accelerates the feedback loop dramatically so students don't have to raise their hands and wait for the teacher to come over. Teachers can spend more time one on one with other students as well as be strategic about custom ways to help students."

Using AI we have also been able to create a free teacher resource to support educators with their content creation. Our Lesson Activity Generator can be found on our website and is there for any and all teachers to utilize.

With this tool, educators can create lessons and learning activities in a matter of minutes. By automating this process, teachers can focus on more important tasks, such as interacting with students and providing personalized instruction. It's important to remember that AI is not perfect. Using an AI tool like our Lesson Activity Generator is great for going from 0% to 50-80% in an instant. This sparks ideas, gets the ball rolling and then the teacher can tweak it to work for their students, classroom set up, and add their own personal teacher magic.

Parker's Question: What use cases for AI are you most excited about (at or away from school)?

Donna is excited about using our Lesson Activity Generator to draft new content for lessons, and using it for expanding and reviving courses. Excited about how it can help create rubrics, and is excited to see how it could be helpful to process and clean up collaborative work projects.

Stacie looks at this moment as fluid and unknown. She views it all as a rollercoaster ride, there will be fun times and scary times. But no matter what, it is going to be a thrill! That is the important

part to keep in mind. Hold on during the scary time but also go hoorah for those great times. The world of technology is exciting but it is still unknown.

Justine is most excited about being in the role that she is in and where she is in her career to be able to work with students to bring them along in the journey, to open up the conversation in a space that is safe and meaningful. She is excited thinking about the industries AI will benefit, specifically thinking about job shortages and if Ail could fill those jobs. She's also excited about what AI will offer in the future in the right hands. She loves data and is excited to see how AI can support her with the data she collects as an educator. With a brainstorming partner like Chat GPT, she can uncover themes and things she needs to know about her student's progress.

Parker answered this question by sharing how he has been inspired to learn how AI models can look at DNA genomes to identify cancer 10-20 years earlier. "The really powerful thing to me is that this is happening now. Think about what our students will be able to do with this 20 years from now! We are teaching them critical thinking skills now, and the prompt engineering preparation. Imagine what they will be capable of in changing the world."

We want to recognize and thank our panelists for joining and sharing with us their perspectives. We have the great privilege of partnering with phenomenal people who embody our mission to Grow Problem solvers, Inspire Creators, and Strengthen Communities.

Gentry finished the webinar perfectly by saying, "We can't share any of this without recognizing all the things AI can not replace. It can not replace the human connection a teacher develops with a student over a school year, can't replace empathy, the motivation a teacher relationship can have on a student, or replace an educator's creativity. I'm just so excited to see how individuals can be celebrated better and do more through this technology."

Learn more about Skill Struck at skillstruck.com

Skill Struck's mission is to create opportunities for all students to learn how to code and equip them to have a positive impact on the world.

Our computer science education platforms provide easy-to-use resources for teachers, and fun and engaging coding activities and challenges for students.

Skill Struck is helping schools:

- Create a K-12 aligned and equitable CS Plan.
- Integrate CS into English Language Arts, Math, and Science.
- Create CS pathway progressions.
- Empower all teachers, both new and experienced, with tools and professional development to teach CS.
- Block to text-based coding transition for elementary students.
- Teach students industry skills like Python, JavaScript, HTML & CSS.
- Provide students with career-ready digital portfolios
- Improve students' type accuracy and productivity.

Features students and teachers love:

- Spanish + English curriculum
- K-12 pre-made lesson plans
- Autograder
- 1,500+ activities
- Track student data
- Live support
- Group projects
- Accessible platforms
- Assessments to track student progress
- AP Computer Science Principles Course
- Cross-Curricular Content

> "For the teachers it's great, they can go back and see how students are progressing and it has auto-grading built in, so that is really effective because going back to read and grade multiple lines of code can take an extensive amount of time. It is helpful for the students as well to be able to auto-grade their own code because we want them to be self-guided learners."
>
> **Donna Woods** *Teacher at Moreno Valley USD*

Want to see our platform? Request a demo at ***skillstruck.com/get-demo***