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The intersection of literacy and digital literacy: incorporating writing standards with computer technology standards

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The Intersection of Literacy and Digital Literacy: Incorporating Writing Standards with Computer Technology Standards

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Abstract

This project aims to increase access to computer science/computer technology education by providing teachers resources to enable them to teach computer science/computer technology. A survey was taken to discover the interests and needs of teachers in Hamilton County, Tennessee. The project resulted in the creation of several lesson plans that integrate English and computer science through hands-on web development exercises, computational thinking opportunities, and critical thinking.

Introduction

There is a lot of pressure on schools and parents to fully prepare children for their futures. Not only does society expect students to be well grounded in foundational skills such as reading, writing, and arithmetic, but they also hope students will hone technical skills and explore career-specific knowledge before graduation. This hope for technically trained individuals is visible in the rapidly growing workforce demand for computing professionals. From 2014-2024, the Bureau of Labor Statistics predicts an increase of 12.5 percent, which is almost double the predicted growth for employment overall during that time [17].

Unfortunately, many schools do not have the capacity, the teachers, or the budget to provide any form of computer technology class. In the state of Tennessee, only half of the schools provide opportunities to learn computer skills and concepts [3]. Of the schools unable to provide computer technology classes in Tennessee, 69% of them say that most of their time is devoted to courses that are related to testing requirements [3].

Research Question

The primary question guiding our research was: "what resources could be created to help non-computer technology teachers teach computer technology?" The goal is to understand what resources teachers need to help increase access to computer technology / computer science education.

Related Work

Attempts at interdisciplinary computer science classes have been executed at schools and universities. For example, Union College added various themes to their introductory classes to illustrate the versatility of computer science [18]. Other university projects extended beyond the computer science curriculum. At the UC Berkeley School of Information, they included data

science principles in a social studies class to bolster inquiry-based learning exercises [13]. Similarly, the University of Georgia integrated technical skills and data science principles into one of their journalism classes [1]. Another project brought the technology to a senior-level literature class on Gothic Novels [6]. Research has also been conducted on the viability of introducing interdisciplinary computer science classes into K-12 schools. In 2014, a group of academics from North Carolina State University and Meredith College piloted a Big Data program for middle schoolers. During the creation of their curriculum, they found parallels between principles in computer science and common core standards in mathematics [10].

Methodology

Survey

A 19-question survey was created through a partnership with the Hamilton County Department of Education (HCDE) to explore teachers' interest in Computer Science Education. HCDE sent the survey to all K-12 teachers in Hamilton County's public-school system. The survey was answered by 578 teachers in the Hamilton County district. Teachers were surveyed from all grade levels (K-12th) and from the fundamental subjects. Those that taught multiple subjects were removed from our analysis resulting in a total of 348 unique inputs (see Table 1).

	Elementary School	Middle School	High School	Total
English	40	41	34	115
Social Sciences	2	23	20	45
Science	3	17	31	51
Mathematics	8	25	44	77
Art	5	7	5	17
STEM Technology	19	10	14	43
Total	77	123	148	348

Table 1. Respondents were filtered according to subject. Teachers who taught all the subjects were removed from the set to prevent double counting.

The survey included demographic questions, questions about teaching experience, and questions about interest in Computer Science and Computational Thinking. Teachers were also asked to rate their comfort with technology on a Likert scale from 1 being "strongly disagree" to 5 being "strongly agree". These questions were inspired from previous nationwide surveys [11] to establish our baseline of Chattanooga. On a 3-option scale (weak, adequate, strong), most teachers rated their ability to utilize technology in the classroom as adequate (average 46%) or strong (average 37%). The only aspects of technology teachers admitting having more trouble with were "Troubleshooting problems that occur when using technology" (30.9% weak) and "Integrating computer science and/or computational thinking into your curriculum" (44.14% weak).

Our survey also used some questions from a survey done by Gallup and Google, specifically questions from their Learning Computer Science section [4]. In the Gallup-Google survey teachers tended to agree with this statement: "It is a good idea to try to incorporate computer science education into other subjects at school" (35% completely agree and 31% agree); results in our Hamilton County website received slightly higher scores (46.9% completely agree and 36.6% agree). There was a surprisingly large gap in the answers of some questions. For example, when asked to rate their agreement with the statement, "Most students should be required to take a computer science course" only 56% of teachers in the Gallup-Google survey selected completely agree or agree, while 81% of Hamilton County teachers said they agreed (31%) or completely agreed (50%).

See Appendix A for the full survey.

Selection

The primary criteria for project selection was an interest in interdisciplinary curriculum. Respondents were asked to rate their agreement with this statement: "It is a good idea to try to incorporate computer science education into other subjects at school." STEM technology, which included teachers that taught computer technology, computer science, engineering labs, and career training, had the highest positive rating (*Mean: 4.44, Mdn: 5, Mode: 5*). Obviously, these classes will not be improved by incorporating computer technology standards. The group with the second highest positive ratings were English teachers (*Mean: 4.2, Mdn: 4, Mode: 5*).
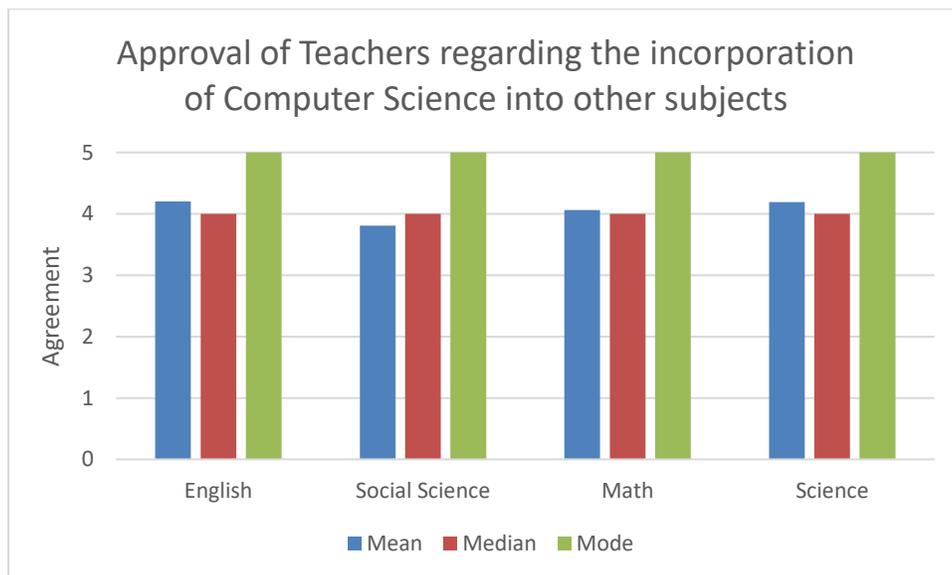

Figure 1. English teachers support the integration of computer science in general education curriculum more than any other group, except STEM Technology, where further technology integration would not have an impact.
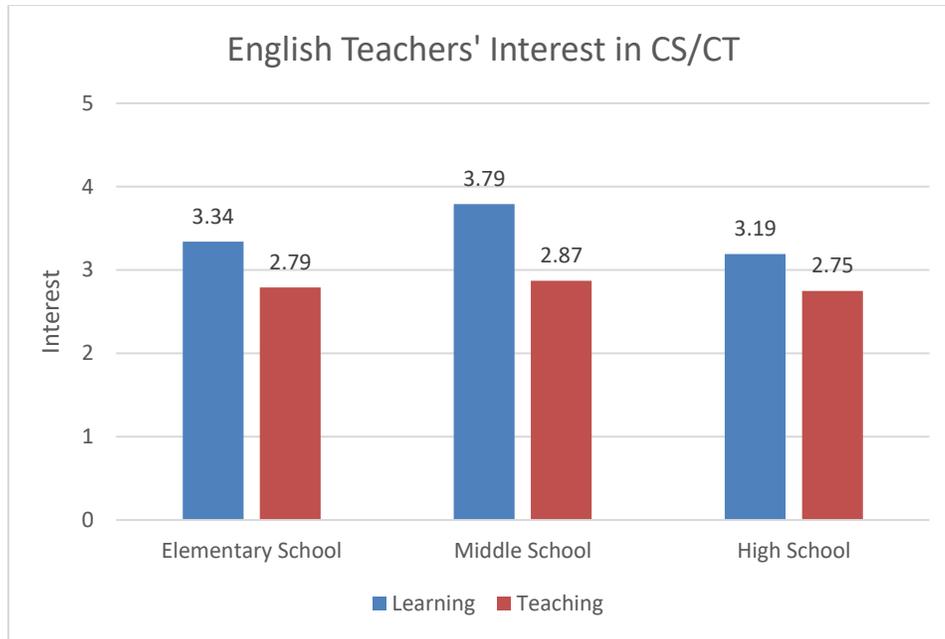
Figure 2. Middle school teachers showed a high average score for learning computer science

Among English teachers, middle school teachers had the highest interest in learning and teaching computer science. Middle school English Language Arts standards share goals and simply differ in complexity as the students progress. In the state of Tennessee, 7th graders are typically between the ages of 12-14 [9], which is when many popular websites such as Gmail, YouTube, and SnapChat allow young users to start making accounts [5, 14]. This is likely due to regulations such as the Child Online Privacy Protection Act (COPPA). When American children turn 13, they are no longer protected by the COPPA, meaning that websites no longer need to obtain consent from their guardian when collecting or using personally identifiable information [19]. From a logistics standpoint, it is much easier for websites to only allow users that are not covered in COPPA rather than create the infrastructure to ensure that the data is not collected or used by their site or any related third parties for young users. Thus, this project will be focusing on 7th grade standards, since children are starting to get more access to the Internet.

The Project

In the survey, teachers were asked to rank the resources they most needed. Middle school English teachers most frequently requested lesson ideas that support state standards (30 of 41). Other top requests from English teachers included instruction, time to prepare and computers. The scope of this project will be focused on providing lesson plan ideas that support 7th grade, English standards in the state of Tennessee. These other needs will serve as a basis for the environment these lessons will be used in. Whenever possible, these lessons will try not to be a strain in those additional three areas by providing comprehensive instructions and including activities in which students can share devices.

Development of the Curriculum

These lessons are crafted with Tennessee classrooms in mind, but the lessons will also include national standards to ensure generalizability. The computer technology standards in Tennessee have a strong focus on digital literacy and gaining confidence with common tools [16]. There is not a nationwide standard for computer technology or computer science yet, but these lessons will be using the International Society of Technology Education's (ISTE) computer science standards to help make these lessons accessible to educators outside of Tennessee. There are seven standards listed by ISTE compared to Tennessee state standards which list six computer technology standards [7, 16].

Tennessee State Standards in Computer Technology [16]	ISTE Standards in Computer Technology [7]
Students will understand basic operations and concepts of technology.	Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
Students will understand the importance of social, ethical, and human issues associated with technology.	Students recognize the rights, responsibilities, and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.
Students will use technology productivity tools	Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
Students will use technology communications tools.	Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
Students will select and use appropriate technology research tools.	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
Students will utilize technology problem-solving and decision-making tools.	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
	Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Writing standards are sorted into four primary categories: Text Types and Protocol, Production and Distribution, Research to Build and Present Knowledge, and Range of Writing [2, 15]. According to the Tennessee state standards, these four areas enhance student writing and equip them to "participate in civic life and the global economy" [15]

Common Core writing standards and Tennessee writing are sorted into the same four categories but do vary slightly; in this project, the standards achieved by each lesson includes the standard labels from both Common Core and Tennessee standards to ensure further generalizability.

Both English writing standards and computer technology standards focus on students applying specific skills to create tangible end-results which makes it an intuitive place to start an interdisciplinary pedagogy.

Lesson Plans

To pilot the idea of combining English and computer technology in classrooms, three lesson plans were created. Each lesson includes at least one standard from English Language Arts and one from computer technology. The lesson plans follow the 5E format which is a research-backed method of structuring classes that supports inquiry-based instruction [12]. Inquiry-based instruction is a technique that incorporates students' questions. Problems are set up at the beginning of a lesson and students must push through the obstacles by questioning it and their previous assumptions [8].

Each part of the 5E lesson format works towards the same learning goals but varies the type of tasks used to move the students forward. Rather than listening to a lecture the whole time, students are encouraged to challenge the information they are given or already possess in the engage phase and interact with one another as well as new techniques and ideas in the explore phase. Once students understand the value of the information, they enter the explain phase where the teacher provides instruction that supports what the students have just realized in the engage and explore phase [12]. In the elaborate phase, teachers can introduce complimentary concepts or build on the original subject. Lastly in the Evaluate phase teachers can check that students understand the how and why of the topic.

The first lesson teaches the idea of Boolean logic in conjunction with finding credible sources online. Most search engines, such as Google and Duck Duck Go, include the feature of narrowing or broadening a search using "AND" and "OR," respectively. This is an instance where English and computer technology seamlessly flow into each other. The standards supported in this lesson come from the "Research to Build and Present Knowledge" category in writing and "Select and use appropriate technology research tools" standard in computer technology.

The second lesson introduces web languages as a digital method of accomplishing the "Production and Distribution" standard in the writing standards. Within this lesson, the teacher also has an opportunity to talk about the benefits and dangers of publishing online; this accomplishes a piece of the second computer technology standard "Students will understand the importance of social, ethical, and human issues associated with technology" by discussing privacy. This lesson fulfills the writing standard expectations using technology as the medium to accomplish it.

The third lesson example looks at how technology can assist in writing projects and where it may fail. This lesson gives students the opportunity to create and use tools to help with their writing, while also learning writing principles. Students can either tinker with the raw code or use it in its present condition. In this case, technology is used in a problem-solving capacity and students can alter how this new tool functions to solve problems outside of the initial scope of the lesson. Technology is powerful, but it is much more impactful when it can be wielded by the users themselves. The current script counts the occurrence of certain words as the starting word for each sentence to help writers see where their writing is too repetitive. This lesson gives teachers the opportunity to teach about transitions and how to communicate interesting relationships between sentences which fulfills a standard in the "Text Types and Protocol" category.

The last category of writing, "Range of Writing" is about practicing writing different styles of pieces with different audiences and of different lengths. A lesson plan was not made for this category, but it could be coupled with concepts from the "Publication and Distribution" lesson in interesting ways. For example, readers could make an interactive story where each new scene is on a new page or pictures could appear only after the reader has been on the page for a certain amount of time.

Conclusion

These first lessons show the feasibility of combining English and computer technology in the classroom. There is an opportunity to expand this pedagogy into other English standards in order to further enhance critical thinking strategies. Using the skills covered in lesson 2, "Publications: Presentation and Privacy", students can investigate different aspects of the publishing standard. Similarly, the JavaScript code that is presented in lesson 3, "Transitioning: Why do we still learn English?", can be adapted as a tool for other aspects of writing.

Future Work

These lesson plans are available here or in Appendix B for teachers to implement in their classrooms. There are many opportunities to expand this idea of English plus Computer Science. For example, the snippet of JavaScript code in the 3rd lesson could be adapted to analyze student work or pieces of literature in different ways. When students are adapting it, they will be practicing computational thinking as they figure out the best way to approach their challenges. Teachers could expand on the social impacts of technology and elaborate on the various forms of

media a person can publish on and use to communicate with others. This string of lessons could examine YouTube channels, both the content creators and commenters. Alternately, the class could take a deep look at the field of Natural Language Processing and how it works. My hope is that educators and stakeholders use these lessons as inspiration and build additional lesson plans for their schools. I will be partnering with several departments at UTC and certain Hamilton County teachers to help disperse these.

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HCDE Computer Science/Computational Thinking Integration Interest Survey

We are conducting an informal study to determine the level of interest in integrating computer science and computational thinking in Hamilton County K-12 schools as well as identifying what is currently going on to support this effort. Your feedback will help us determine if there is enough interest to explore this idea further with our community stakeholders to ensure there is a strong infrastructure in place to support this effort

Sex/Gender
Female
Male
Non-binary
Prefer not to say
Other:

Race/Ethnicity
Select all that apply.
African American or Black
Asian or Pacific Islander
Caucasian
Hispanic/Latino
Native American
Other:

Age Range
18-29 years old
30-49 years old
50-64 years old
65 years and over

Please indicate your highest level of education.
Bachelor's degree (e.g. BA, BS)
Some postgraduate work
Master's degree (e.g. MA, MS, MEd)
Educational Specialist degree (e.g. EdS)
Professional degree (e.g. JD, MD, DDS, DVM)
Doctorate (e.g. Ph.D., Ed.D.)

Please indicate your bachelor's degree area.
Bachelors in Education (e.g. Early Childhood, Elementary Education, Middle Grades, Secondary, Special Education, etc.)
Bachelors in STEM Content Major (e.g. Biology, Chemistry, Physics, Geology, Engineering, Computer Science, Mathematics, etc.)
Bachelors in Social Sciences & Humanities (e.g. English, History, etc.)
Bachelors in Health-Related Field (e.g. Nursing, Physical/Occupational Therapy, etc.)
Other

How many years have you been teaching?
0-5 years
5-10 years
10-20 years
20+ years

Please indicate the grade level(s) you teach.
Select all that apply
Pre-K
Kindergarten
Elementary
Middle School
9th Grade
10th Grade
11th Grade
12th Grade

Please indicate the subject(s) you teach.
Select all that apply
Science
STEM (e.g. eLab)
English Language Arts
Art
Mathematics
Social Studies
World Languages
Physical Education
Career Technical Education
Other

CS/CT Integration Inventory & Interest

How would you rate your understanding of the following (Scale: weak, adequate, strong)? *
Learning how to use a new application (software and programs)
Acting as a guide for students when researching on the Internet
Troubleshooting problems that occur when using technology
Integrating technology into daily instruction
Using technology to differentiate instruction
Integrating computer science and/or computational thinking into your curriculum
Learning how to use a new application (software and programs)
Acting as a guide for students when researching on the Internet
Troubleshooting problems that occur when using technology
Integrating technology into daily instruction
Using technology to differentiate instruction
Integrating computer science and/or computational thinking into your curriculum

Have you ever taught Computer Science and/or Computational Thinking or a related class?
Yes
No
Not yet but plan to later this year
Other:

Rate your agreement with each statement * (Scale: 1 (Strongly disagree), 2 (Somewhat disagree), 3 (Neither agree nor disagree), 4 (Somewhat agree), 5 (Strongly agree))

Offering opportunities to learn computer science is important to a student's future success just as other elective courses like art, music, and foreign languages
It is a good idea to try to incorporate computer science education into other subjects at school
Most students should be required to take a computer science course
My community (e.g. School Board, local government and/or business stakeholders, etc.) believes computer science education is important to offer in our schools
Offering opportunities to learn computer science is important to a student's future success just as other elective courses like art, music, and foreign languages
It is a good idea to try to incorporate computer science education into other subjects at school
Most students should be required to take a computer science course
My community (e.g. School Board, local government and/or business stakeholders, etc.) believes computer science education is important to offer in our schools

Available Technology Resources

Please indicate the current status of your school's technology resources.
Inadequate
Poor
Barely adequate
Good

Excellent

Please indicate the current status of your classroom's technology resources.
Inadequate
Poor
Barely adequate
Good
Excellent

Have you ever had any type of programming or Computer Science training?
Yes
No

If yes, which type of Computer Science/Computational Thinking training have you received?
Select all that apply
Bachelors/Masters/Doctorate degree in CS/CT
Online tutorials
Workshops
Weekend training
Summer class
College class
Certification program
Other

Please indicate the type of support you need to teach Computer Science/Computational

Thinking.
Select all that apply
Support to travel for Professional Development opportunities
Instruction/professional development
Ideas for lessons that support state standards
Support from other teachers
Support from the principal
Support from the Board of Education
Time to prepare
A dedicated time to teach
Devices/computers
Proper software
Other

Please indicate your level of interest in learning more about Computer Science/Computational

Thinking. (5-point scale: Not Interested at all to Extremely Interested)

Please indicate your level of interest in teaching Computer Science/Computational Thinking. (5-point scale: Not Interested to Very Interested)

What type of professional development would you be interested in and willing to participate in to enhance your CS/CT knowledge and pedagogical integration skills? (All PD including certification and master's programs would include a stipend.)
Select all that apply
After school workshops
In-Service workshops
Summer workshop (2-6 weeks)
Saturday workshops
Certification program
Master's degree
Not interested in CS/CT professional development at this time
Other

Appendix B

Lesson One

<table>
<tr><td>

Title of lesson

Sources and Shortcuts: relevancy, credibility, and efficiency oh my!

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Concept statement: In this lesson, we will discuss how to find reliable sources and the importance of checking the sources and methodology of the source.

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Tennessee State Standards for the lesson:

7.W.RBPK.8 "*Use search terms effectively; integrate relevant and credible information from print and digital sources; quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.*"

https://www.tn.gov/content/dam/tn/education/standards/ela/stds_english_language_arts.pdf

7.W.RBPK.9 *"Support interpretations, analyses, reflections, or research with evidence found in literature or informational texts, applying grade 7 standards for reading; assess whether the evidence is relevant and sufficient to support the claims."*

https://www.tn.gov/content/dam/tn/education/standards/ela/stds_english_language_arts.pdf

Computer Technology Standard 7.5.2a:

"a. Apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies."

https://www.tn.gov/content/dam/tn/education/standards/comp-tech/std_comptech_gr_7.pdf

Generalized Standards for the lesson:

Common Core Standard(s):

CCSS.ELA-LITERACY.W.7.8
Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Technology Standard(s):

</td></tr>
</table>

ISTE Standard 3:

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

Objectives.

Students Will Be Able To (SWBAT):

Use search engines effectively using Boolean logic

Find reliable sources

Critically examine sources

Engagement

Description of activity: The students will read through the Harvard and Yale "studies" about setting goals and then discuss its validity. The teacher will then reveal that they were both made up and how it was discovered when readers wanted to see the data and how it was done. Perhaps talk about our own biases that caused us to believe it was true (ie. "I believed it due to the reputation of Harvard and Yale" or "I believed it because it supported beliefs I already had about the importance of goal setting. It was confirming my own opinions.")

What the teacher does	What the student does	Questions (to ask students)
• Share the pieces • Reveal that they weren't true • Moderate discussions	• Read the pieces • Discuss why they believe them	• What do you think of these pieces? • What do you notice is similar between these two pieces? • What do you notice is different between these two pieces? • Do you think the study is valid? Why or why not?

Resources needed:
HARVARD STUDY: There was a study done at Harvard between 1979 and 1989. Graduates of the MBA program were asked: "Have you set clear written goals for your future and made plans to accomplish them?" The results of that question were:

- *Only 3% had written goals and plans*

- *13% had goals but not in writing*
- *84% had no specific goals at all*

10 years later Harvard interviewed the members of that class again and found:

1. The 13% who had goals but not in writing were earning on average twice as much as the 84% of those who had no goals at all

2. The 3% who had clear, written goals were earning on average 10 times as much as the other 97% of graduates altogether. The only difference between the groups is the clarity of the goals they had for themselves

YALE STUDY: In 1953 a team of researchers interviewed Yale's graduating seniors, asking them whether they had written down the specific goals that they wanted to achieve in life.

Twenty years later the researchers tracked down the same cohort and found that the 3% of people who had specific goals all those years before had accumulated more personal wealth than the other 97% of their classmates combined.

Coincidence: https://media.giphy.com/media/7GcdjWkek7Apq/giphy.gif

Source: https://rapidbi.com/harvard-yale-written-goals-study-fact-or-fiction/

Exploration

Description of activity: Students will play a game that will help them explore and practice efficient search techniques. Game example: The teacher will give a scenario and ask students to craft a search query that returns an appropriate source as the top result. This can be done using the techniques given or by using precise words. Before you play this, make sure that your examples still work on the new algorithms. See example prompts below:

"Get our principal's picture as your top search result" (example solutions: cgla principal or principal site:cglaonline.com or John Doe Chattanooga)

What the teacher does	What the student does	Questions (students may ask you)

• Explain how to narrow down searches using keywords, boolean logic, quotation marks, and special words (such as ext: .gov)	• Practice using these techniques	• What type of site might have reliable information? • Would certain sites be better for different topics? Example: for a medical paper would a cigarettes company website be a good source? (Probably not due to bias)

Explanation

Description of activity: Explain how to strengthen search techniques by using language properly. Some points to hit on include:

- Using quotation marks to get precise words or strings of words. "Coconut Octopus" (will give you those words together) vs Coconut Octopus (which will give you a website that may talk about coconuts and octopuses separately)

- Narrowing your search using AND to require both topics in the resulting websites (Source: https://libguides.mit.edu/c.php?g=175963&p=1158594)

  o Note: By default, some search browsers will put an invisible AND between each word

- Broadening your search using OR so the results include pieces about both (a practical place for this would be a topic with multiple terms or related ideas: Octopus OR Octopodes)

- Explain stop words (Source: https://libguides.mit.edu/c.php?g=175963&p=1158907). Typically students should leave them out. If they are important than quotation marks should be used around the phrase: "The Republic **of** Congo"

What the teacher does	What the student does	Questions (to ask students)
• Explains how to improve search results using precise and specific words • Demonstrate the proper way to incorporate stop words • Demonstrate Boolean operation searches: Rubik's cube OR octopus Rubik's cube AND octopus	• Follow along using the new search skills	• When should we use an OR? (*to broaden a search*) • When should we use an AND? (*to narrow a search*) • What is the effect of stop words? (*it bogs down your search with unnecessary terms*)

Elaboration

Description of activity: Next students will consider the content of the sources themselves. Bring some specific or general examples of sources and discuss their credibility. Do they know what they are talking about? Were they a witness to it? Are they an expert in that field?

What the teacher does	What the student does	Questions (to ask students)
• The teacher discusses primary and secondary sources • The teacher discusses the appeal to authority fallacy in which the authority is not an expert on that topic.	• Individually, the students brainstorm examples • In groups, the students discuss and debate each of their ideas • As a class, the students share the ones they agreed on and at least one they did not.	• Would all articles in the news be a primary source? (*Nope*) • Would a YouTuber reviewing a new game be a primary or secondary source on why the creators made the game? (*Secondary*) • Give some examples of a primary source on the internet

Additional Resources:
Fallacy Robot Comic: https://external-preview.redd.it/-E8Zq91GcQnUvikuCIqPIxlVGEINeXdhtB8rAoECC3o.jpg?auto=webp&s=dd19fafc1858c168463eeaafaf815418cd1f117f

Playlist of Fallacy Videos: https://www.youtube.com/watch?v=oGBO-WMrlIQ&list=PLtHP6qx8VF7dPql3ll1To4i6vEIPt0kV5&index=2

Examples of fallacies within internet comments (would not recommend giving to children directly due to foul language…) https://www.wordstream.com/blog/ws/2013/04/04/blog-comments-logical-fallacies

Evaluations

Description of activity: Students will use devices (anything that can access the internet), to play a Kahoot game that tests their understanding of primary vs secondary sources. This Kahoot was found already made online. It may beneficial for you to make a more updated one for your classroom.

What the teacher does	What the student does	Questions (students may ask you)

• The teacher moderates this Kahoot quiz: https://create.kahoot.it/details/primary-and-secondary-sources/ea3ac0c2-7f18-4ec2-af7b-b45341f1f5f0 • The teacher explains after each answer is shown why it is a primary or secondary source	• The students participate in the Kahoot	• What if the source is a friend of the eyewitness? Would that be primary or secondary? • What if a scientist did not work on a specific project but were in the same lab as the scientist who did. Would that make them a primary or secondary source on information about the project?

14 Choose the <u>most</u> reliable resource for a reader researching how people train to climb Mount Everest.

F a newspaper article titled "Mount Everest: Hidden Gem of the Himalayas"

G an eyewitness account from a person who climbed Mount Everest

H an interview with a person writing a book about mountain climbing

J an Internet site titled How to Climb a Mountain in Ten—or a Thousand—Steps

https://middleschoolwriter.files.wordpress.com/2014/12/practice-test-1.pdf

Lesson Two

Title of lesson Publications: Presentation and Privacy
Concept statement: This lesson covers the power of digital publishing. They will learn how they can share their ideas and work (using websites), but they will also discuss what limits they should put on that.
Tennessee State Standards for the lesson: Production and Distribution of Writing Standard 6 (W.PDW.6): *"Use Technology, including the Internet, to produce and publish writing and to interact and collaborate with other"* https://www.tn.gov/content/dam/tn/education/standards/ela/stds_english_language_arts.pdf   Computer Technology Standard 2: *"Students will understand the ethical, cultural, and societal issues related to technology." (subpoint: invasion of privacy)* https://www.tn.gov/content/dam/tn/education/standards/comp-tech/std_comptech_gr_7.pdf   Computer Technology Standard 3.1: *"Students will use technology tools to enhance learning, increase productivity, and promote creativity."* https://www.tn.gov/content/dam/tn/education/standards/comp-tech/std_comptech_gr_7.pdf **Generalized Standards for the lesson:** Common Core English Standard(s): **CCSS.ELA-LITERACY.W.7.6** **Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.** Technology Standard(s): ISTE Standard 6: Students communicate clearly and express themselves creatively for a variety of

purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

ISTE Standard 2a: Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

Objectives.

Students Will Be Able To (SWBAT):

Explain why English is important on the Internet

Create a text-based website using HTML (HyperText Markup Language)

Identify personal information and decide if it is safe to share

Engagement

Description of activity: To engage students in the topic we will first initiate a discussion on how poor writing skills can hurt users' perception of an entity or person. To begin choose a website that communicates poorly, either due to content, length or layout of the page. Discuss what the factors are and how they could be resolved with better word choice and organization of content.

What the teacher does	What the student does	Questions (to ask students)
• Choose a confusing website (elements of a confusing website may be: no introduction explaining the purpose of the company, out-of-order information, strange groupings, no description for buttons or pictures, poor grammar, spelling errors, etc.) • Moderate a discussion on how we could improve the website. • May need to ask probing questions to get students engaged. (see to the right)	• Critically examine the given website • Identify its confusing pieces • Discuss how to improve it	• What impression do you get from this website? Do you think the organization is organized, efficient, or even able to do what they say? • What is annoying about this page? • What is incorrect on this page? • What seems unorganized or confusing on this page? • Can you tell what this organization even does?

Resources needed: A projector that website can be displayed on OR devices for each group

Example website for critique: http://www.roverp6cars.com/

Exploration

Description of activity: The class will learn how to create their own websites. The emphasis is on structuring it properly. Conveniently, the structure of websites is similar to research papers in terms of a hierarchy of ideas (Think like an outline with main points and subpoints).

What the teacher does	What the student does	Questions (students may ask you)
• Show the class how to make a website using HTML headers (<h#> </h#>) as well as paragraphs ( ) and links () Example:	• Follow along with the teacher's demonstration / the video • Get a website running locally on their computer	• **What do these letters stand for?** h = header p = paragraph a = anchor href = hypertext reference • **How do turn this text into a website?** Make sure their document is saved as a .html file type. Go to File → Save as →

Title goes here Main point #1 goes here Subpoint here: Creating paragraphs The actual paragraphs go here. One paragraph per tag pair If you want another paragraph, you simply use another set of p tags Another subpoint here: Using links Links are used like citations; they provide the reader with more information. The additional information can be accessed instantly and may be another type of media entirely. This is an example link Main point #2 goes here Copy all of this into a notepad++, save it as a HyperText Markup Language (HTML) document. Then right-click it and choose "open with Google Chrome/Mozilla Firefox/Opera/Internet Explorer" It should create a website for you with all of this text.	*By "locally" I just mean that they can see what it would look like on a web browser, but no one else can access it.	Save as type: {choose HyperText Markup Language} • **How do I open it in a web browser?** Go to the folder your HTML file is in. Then right-click the icon and choose "Open with". If that doesn't give you the option of a web browser (such as Mozilla Firefox, Google Chrome, Safari, etc), then check that the file type is actually HTML (and not just .txt) by right-clicking the icon and choosing "Properties" Lastly, if it is an HTML, but not opening properly, you can try dragging the icon into the web browser.

Explanation

Description of activity: Use this time to reinforce the importance of learning English and writing concepts for use in the digital world. All forms of communication are better with some form of structure and flow. Just like research papers are simpler and stronger with main points and evidence backing it up, a website makes more sense when the topics are organized under separate headings.

What the teacher does	What the student does	Questions (to ask students)
• Explain how outlines help organize a paper's argument • Explain how a website needs structure to keep users from leaving the page out of	• Take notes • Ask questions • Provide suggestions on how papers and websites are similar / different	How are research papers and websites similar? • Shared purpose of communicating / persuading an audience

frustration • Compare and contrast papers and websites *Structure is paramount for websites since as we saw earlier websites without clear structure are frustrating and unappealing *Thorough explanations help your website users navigate your page effectively *In a persuasive paper the call to action / request is at the end of the paper after you have given them all the evidence and explanation. On a website, the call to action is sometimes also placed at the top of the page since your website visitors may exit the page quickly when they get bored and miss the important request at the bottom of your long page. *Websites can be more interactive then papers by providing users with links directly to sources		• Both are based on outlines How are research papers and websites different? When would it be better to publish your work on a physical piece of paper? When would it be better to publish your work on the Internet? When would it be better to publish something using some type of Social Media? (and which one would be best for that?) Does your platform choice change based on topic or based on the people you want to reach?

Evaluations

(or you can make this a homework assignment)

Description of activity: Have students create a digital outline that serves as an "About Me" page. Don't give them too many instructions on what to write since the next section is more powerful if they write what they think is necessary. Have students swap pages for proofreading and have them provide feedback on structure and mechanics (i.e. grammar, spelling, etc).

What the teacher does	What the student does	Questions (and how to respond)

• Explain the assignment (using an "about octopus" page attached below)
 	
• Ensure students are using the HTML tags in a logical hierarchy
 	
• Help students who are struggling to understand HTML
	• Open a plain text document (like notepad++)
	
	• Create an about me page with at least a title (h1 tag), 3 main points (h2 tags) and some subpoints (h3 tags) or descriptions (p tags)
	
	• Proofread one other person's page for grammar or structural errors
		• **What should I write?**
		  Write about yourself! Your goal is to provide information about yourself, so your reader can learn who you are.
		
		• **How long does it have to be?**
		  It must have at least 3 different points. But they can be as short as a sentence each if you would like.
		
		• **Can I add colors?**
		  See the Octopus example. You can change the color on the element in the .css file

Resources needed:

SAVE THIS AS A HTML PAGE

```html
<html>

<head>

<link href="Example.css" rel="stylesheet">

</head>

<body>

<div>

 <h1>About the Coconut Octopus</h1>

  <h2>Food</h2>

   <p>The coconut octopus typically eats crabs, clams and shrimp</p>

        <a href="https://en.wikipedia.org/wiki/Amphioctopus_marginatus">(Source)</a>


  <h2>Shelter</h2>

   <p>The coconut octopus creates a shelter out of coconuts and shells it finds.</p>

        <a href="https://en.wikipedia.org/wiki/Amphioctopus_marginatus">(Source)</a>


<br><br>

</div>

</body>
```

</html>

```css
html {

        background-image: url("Octopus.jpg");


}


div {

        background-color: white;

        margin-top: 50px;

        margin-left: 75px;

        margin-right: 75px;

}


h1 {

        color: green;

        font-size: 50px;

        text-align: center;

        font-family: "Century Gothic", CenturyGothic, serif;

}


h2 {

        margin-left: 50px;

        color: purple;

        font-family: "Century Gothic", CenturyGothic, serif;

}


p {

        margin-left: 75px;

        font-size: 18px;

}
```

```css
a {

        margin-left: 75px;

        text-decoration: none;

        color: black;

        font-weight: bold;

}
```

Elaboration

Description of activity: Once students are finished adjusting their websites, begin a discussion on personal information and how much should actually be published. This can be done by asking students about the type of information they put on their website and how they think someone might perceive this information or how they may abuse it (impersonating you or worse, find where you live and kidnap you)

What the teacher does	What the student does	Questions
- Ask students what they put on their website - Keep tallies of the number of students for each type of personal data (see questions section for inspiration) - Challenge their assumptions for what is alright to publish and make available to the world	- Explain what information they put on their website - Participate in the discussion about personal data	**What sort of content does your website or your classmate's website include?** Questions for tally marks exercise: Does the website do a good job describing your partner? Does your website do a good job describing you? (Discuss this a little → [What made it a strong website?]) How many of you put down part of where you live or go to school? How many of you wrote down your extracurricular activities? (i.e. the activities and places you go after school) How many of you wrote about your interests or hobbies? How many of you wrote about your family or what your parents do for a living? How many of you wrote about your friends or pets? How many of you wrote your age or birthday? How many of you wrote your full name? (i.e. first and last name) **Do you think that any of that is wise? A website is accessible by anyone after all.**

		Do you think any of that information should be published on your social media accounts? How would you feel if someone saw the website in the future such as your boss or classmate?

Articles about posting too much:

Posting your location makes you prone to burglary:
https://www.dailymail.co.uk/travel/travel_news/article-3607012/How-posting-holiday-selfie-result-BURGLARY-Social-media-snaps-make-easier-thieves-target-homes.html

Posting information publicly about your interests, where you live, or hangout may make it easy for a stranger to target and "befriend" you https://www.kidguard.com/prevent-child-abduction-kidnapping-and-missing-children/social-media-and-kidnapping/

Safety considerations:

Be careful when discussing repercussions as some kids may react in either a counterphobic way or have a panic attack. (Just be delicate and know the kids in your class)

Lesson Three

Title of lesson
Transitioning: Why do we still learn English?

Concept statement: In this lesson, we will discuss how technology can help improve our writing sometimes but learning writing conventions and skills is important because it helps us craft powerful and persuasive pieces.

Tennessee State Standards for the lesson:

Text Types and Protocol of Writing Standard 1 (W.TTP.1):

"Write arguments to support claims with clear reasons and relevant evidence (Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts. Use varied sentence structure to enhance meaning and reader interest.)"

https://www.tn.gov/content/dam/tn/education/standards/ela/stds_english_language_arts.pdf

Computer Technology Standard 3.1:

"Students will use technology tools to enhance learning, increase productivity, and promote creativity."

https://www.tn.gov/content/dam/tn/education/standards/comp-tech/std_comptech_gr_7.pdf

Generalized Standards for the lesson:

Common Core English Standard

CCSS.ELA-LITERACY.W.7.2.C

Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.

Technology Standards

<u>ISTE Standard 4:</u> Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

Objectives.

Students Will Be Able To (SWBAT):

Write strong transitions from sentence to sentence using a variety of transition words that convey specific relationships between ideas.

Engagement

Description of activity: The class will review a "technically correct" Microsoft word document that is riddled with unrecognized errors or generally unengaging writing. Handout the example either digitally or physically whichever your preference.

What the teacher does	What the student does	Questions (to ask students)
- Disperse the technically correct piece. - Moderate discussion on how its weakness. - Talk about technology and how it helps with certain aspects (i.e. grammar, spelling, etc.) and how it is continuing to improve (i.e. Grammarly can spot passive sentence structures)	- Locate errors in the piece - Bonus: note where the piece seems dull.	- Is this piece correct? - Is this piece interesting? - What sort of errors can technology spot?

Resources needed:

Copies of the piece: "The octopus lives in oceans. The octopus is flexible. The octopus' soft body can shape itself differently to squeeze through small areas. The octopus can also change its tint to blend in with its surroundings." **VS** "Ocean creatures like the octopus must develop skills to help keep themselves alive. One technique octopodes have developed is the ability to blend in with their surroundings by changing their tint. Furthermore, octopodes can contract or spread itself out to fit through small areas."

Exploration

Description of activity: Using the created piece of JavaScript code test the variety of transition words in the given piece or the students' own work

What the teacher does	What the student does	Questions (students may ask you)
The teacher shows the class how the code script works on the Octopus examples.	The students download and play with the code script on their own pieces.	How do I make it work on my piece? *Copy your words into the p tags and then run the script. Run the script by right-clicking on the file → choose "Open With" → select a web browser (Mozilla Firefox, Google Chrome, Safari, Opera, etc)*

Resources needed:

```html
<!DOCTYPE html>

<html>

<body>


<h2>Do you overuse transition words?</h2>

<p>Let's see what words you use the most often to begin a sentence.</p>

<p id="text"></p>

<p>Press control + shift + I to open the console and see what results our script found.</p>


<script>

const paragraph = "Chattanooga has had many nicknames over the years. When the astronauts viewed the Earth from space they noticed that Chattanooga was a purple smog. The city was nicknamed 'The Dirtiest City in America' at that time. The people of Chattanooga have worked to change that. At some point, Chattanooga earned the title 'The Scenic City'. In 2010 EPB brought fiber network to Chattanooga giving us one of the world's fastest Internets at the time. The city was renicknamed 'The Gigcity'. What will the city be called in the future?";

document.getElementById("text").innerHTML = paragraph;


let countWords = {}; /*This is a map which is a type of list that can keep related pairs together. In this case, it will keep each word and the count of how many times it is used as the first word together.*/

let sentences = paragraph.split(".");


/*For each sentence pick out the first word of the sentence. The count it. If it's the first time the key is undefined, so we add the word to the map and make the count 1. Otherwise, +1 to the already existing tally*/

sentences.forEach((word, i) => {

        let firstWord = word.trim().split(" ")[0];


        if(countWords[firstWord] == undefined) {

                countWords[firstWord] = 1;

        } else {

                                                countWords[firstWord] = countWords[firstWord] + 1;

        }
```

```
                console.log(firstWord + ": " + countWords[firstWord]);

});


</script>

</body>

</html>
```

Explanation

Description of activity: The teacher will discuss transition words and give examples of when to use each type. For a concise list of transition words sorted by meaning: https://writing.wisc.edu/Handbook/Transitions.html

What the teacher does	What the student does	Questions (to ask students)
• Discuss the power of transition words and how to use each one. • Discuss the nuances of various transitions	• Takes notes and/or takes part in discussions	• Which of these words could you use in a sentence right now? • Can you think of where you might include that word in your writing?

Evaluations

Estimated time: 10 minutes (or you can make this a homework assignment)

Description of activity: Take the previous example (or start fresh) and spice it up with transitional words and varying sentence structure. A fun example is something with instructions since you can use words/phrases like "First", "Next", "Then", "Lastly"

What the teacher does	What the student does	Questions (students may ask you)

• The teacher provides a prompt or boring example for the students to adapt	• The students write/rewrite a piece with better transitions. Including at least one of the parts talked about	• What are some transitions words you would use with sequential points? • What are some transition words you could use when summing up an argument? • What are some transition words you would or would not use for the start of a paragraph (*i.e. probably wouldn't want to start a new paragraph with "This"*)

Elaboration

Description of activity: Discuss transitions between paragraphs and at the end of paragraphs

What the teacher does	What the student does	Questions (students may ask you)
• The teacher explains how paragraphs are each a separate point. They must have a logical flow, but a new paragraph should not be continuing the exact same idea as the previous paragraph. • The teacher provides examples of paragraphs that either does this well or that are split too soon.	• The student reads the examples • The students discuss whether it is right or wrong • The students write better paragraph transitions	• Does this sentence seem like a continuation of the previous sentence? • Did the previous paragraph wrap up its point with a strong and clear concluding sentence?

Example TCAP standards question:

30 Read these sentences from Paragraph 3.

> *In traditional Native American cultures, some songs are used for specific purposes, such as paying respect to another person or paying tribute to an important occasion. _____ some songs are for enjoyment, such as lullabies or games.*

Choose the word that provides the <u>best</u> transition between the sentences and should be written on the blank line.

F   Fortunately,

G   Hence,

H   However,

J   Moreover,

https://middleschoolwriter.files.wordpress.com/2014/12/practice-test-1.pdf