Understanding and Addressing the Needs of Hispanic and ELL Students in High School Computer Science Courses

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Abstract

As schools returned to in-person classes in SY21-22 in the Chicago Public Schools (CPS), the Exploring Connections to Computer Science (EC2CS) program was implemented for the first time as a strategy to help students make personal connections to computer science (CS) content in their introductory CS classes. Research shows that these connections are particularly important for Hispanic students, a student group that showed inequitable outcomes in previous research on introductory CS. With still some pandemic-related restrictions in place and limited access to the classroom, data collection during the pilot year consisted of student surveys and coursework, in addition to interviews with the teachers. Using findings from the analysis of student work, this paper explores how Hispanic students engaged in EC2CS activities and the types of personal connections they were making between CS topics and their lives. Findings suggest that themes of family and community are important aspects in Hispanic students' lives. However, there is little evidence on whether using aspects of their lives increased students' understandings of CS topics. Thus, further research is needed to better understand the impact of EC2CS on Hispanic students' overall CS learning experience. Additional research is also needed to explore the role of students' linguistic backgrounds in their CS learning experiences. This is particularly relevant in the context of this study, as many of the Hispanic students in CPS are bilingual and/or classified as ELL.

Introduction

In 2016, the Chicago Public Schools (CPS), where the majority of students are Hispanic or African American, enacted a high school computer science (CS) graduation requirement as a key strategy for broadening CS participation (Dettori et al., 2018). The primary introductory CS course that students take to fulfill the requirement is *Exploring Computer Science* (ECS). The pedagogy of ECS is structured around three interwoven strands: equity, inquiry, and CS concepts. To prepare teachers to implement these inquiry-based activities, ECS includes a professional development program that emphasizes building a classroom culture that is

culturally responsive and adapting lessons to the backgrounds and interests of the students (Goode et al., 2014). However, the ECS coaches observed that many teachers were not creating the type of culturally responsive lesson adaptations that ECS promotes. Additionally, the results of our previous research by the Chicago Alliance for Equity in Computer Science (CAFÉCS) Research-Practice Partnership (RPP) highlight a gap in the equitable implementation of ECS, showing inequities among Hispanic and ELL students (McGee et al., 2018). To address the need for increasing teacher preparedness to teach ECS in culturally responsive ways and to better understand and address inequities found among Hispanic and ELL students, the Exploring Connections to CS (EC2CS) project provides teachers with resources and support to teach CS in culturally responsive ways.

The EC2CS program is rooted in Culturally Responsive Pedagogy (CRP) (Gay, 2018; Ladson-Billings, 1995). Designed to address the five essential elements of CRP (Gay, 2002), the EC2CS program major components are: 1) an identity survey to help teachers build a knowledge base about the diversity of backgrounds in their classes; 2) unit activities that encourage students to use their own identities as part of their learning and make personal connections to CS topics; 3) professional development. Table 1 below shows how each of the CRP elements is addressed by the EC2CS components.

Table 1

CRP and EC2CS

CRP Element	**EC2CS Component**
1. Developing a knowledge base about cultural diversity	Student Identity Survey
2. Including ethnic and cultural diversity content in the curriculum	Unit Activities
3. Demonstrating caring and building learning communities	Professional Development
4. Communicating with ethnically diverse students	Professional Development
5. Responding to ethnic diversity in the delivery of instruction	Professional Development

As part of a larger study with a mix of qualitative and quantitative approaches, this paper is focused on the analysis of Hispanic students' EC2CS activities (component #2).

Research Design and Context

The data analyzed for this study were collected in **19 ECS classes distributed among 7 teachers** while EC2CS was being piloted during the 2021-22 school year. It must be noted that during that time CPS was transitioning back to in-person classes, following a year of COVID-19 pandemic-driven remote instruction. The project was constantly adapted around the constraints of the second year of the pandemic, as CPS navigated changes in policies and modes of instruction brought by new COVID-19 strands. While the original design of the program was comprised of in-person activities, we adapted some of the program components to be done online, like the professional development workshops or making electronic versions of the activities. Because these activities were supported by the CPS Department of Computer Science, we were able to continue to collaborate with teachers to adapt the lessons in spite of the uncertainty created by the COVID-19 pandemic conditions. We want to acknowledge the impact of these circumstances on the research while presenting the findings of the student work that we were able to collect and discuss its implications in the continued implementation of EC2CS.

The **main research question** that guides this study is: What is the perceived impact of EC2CS on Hispanic students' engagement and interest in computer science learning? Seeking to better understand how Hispanic students learn CS topics, we wanted to explore the ways in which they engage with EC2CS activities. For that, the analysis of the student work focused on looking for Hispanic students' identities and cultures (as self-reported in their identity surveys) that showed up in their completed EC2CS activities. In other words, we wanted to know:
What types of personal connections are students making to the CS topics of each lesson?

Among the students who completed all the EC2CS activities implemented by their teachers, we selected those who self-identified as Hispanic in the identity survey and who had agreed to participate in this study. As a result, **83 Hispanic students** are represented in the data sample. As depicted on table 2 below, the sample represents around one third of the population of Hispanic students in the program. While all Hispanic students were considered for the sample, the final number of participants relies mostly on consent status, with a few exceptions from students who consented but did not submit any activities. Despite the relationships with teachers developed over time and offering incentives for participation, having a research sample that closely represents the population of program participants continues to be a challenge in large urban districts like CPS CS (McGee et al., 2019). Researchers that work in partnership with school district administrators and teachers can mitigate these challenges.

With some delays in launching the program, the implementation of EC2CS unit activities started with unit 2 and continued until unit 4. Implementation plans and pacing varied by teacher,

making it hard to generalize. The following table indicates what unit activities were implemented and collected from each teacher, therefore used as data, as well as the number of Hispanic students who agreed to participate in the study and were included in the analysis.

Table 2

Data Sample: Implementation Context

Teacher Pseudonym	**Unit activities implemented and collected**	**ECS Classes**	**Students enrolled**	**# of Hispanic students** (self-reported in the identity survey)	**# of Hispanic students included in the sample** (based on consent status and on activity completion)
Chris	U2, U3, U4	3	62	27	**6**
Caroline	U2, U3, U4	1	28	28	**12**
Mary	U2, U3, U4	3	91	48	**7**
Michelle	U3, U4	1	28	20	**14**
Tessa	U2, U3	3	77	41	**22**
Martha	U2, U4	3	91	29	**3**
Wyatt	U3	5	144	73	**19**
	3	**19**	**521**	**266**	**83**

Data Sources

As explained above, the activities used in this analysis were EC2CS activities designed around specific lessons in the ECS curriculum for units 2, 3, and 4 (see Appendices). Below is information related to each unit activity. It must be noted that the activities analyzed in this paper are the original versions, as used by the students in SY21-22. We have since made changes to each activity, informed by this analysis as well as by feedback received from teachers, coaches, and advisors. One more thing to highlight is that these activities are designed to be printed and folded as each column is completed, thus they should not be read left-to-right, but following the order of the circled numbers at the bottom of each column.

Table 3

Data Sample: Unit Activities

ECS Unit title	EC2CS activity title	EC2CS theme	Represented in the data sample
U2: Problem Solving	The Problem-Solving process	A problem in my community	*5 teachers* *13 classes* *50 students*
U3: Web Design	Building my own website!	Resources for my community	*6 teachers* *15 classes* *80 students*
U4: Introduction to Programming	Conditionals	Culture & Tradition	*5 teachers* *11 classes* *42 students*

Methods

The data analysis of student work was qualitative and consisted of two cycles of coding (Saldaña, 2021):

1. **Structural coding.** The first reading and coding of the data involved a broad lens directly tied to the research question (what types of personal connections are students making to the CS topics of each lesson?). Given the nature of the data (i.e., student work; fill-in-the-blank questions), this phase primarily included word-by-word coding. Following this method, the large set of data was organized into individual tables by unit activity and CS topic. Structuring the data into smaller pieces of data (i.e., the individual tables) was helpful to prepare the data for further analysis.
2. **Focused coding.** The second phase of coding took a more focused approach. Once the data had been structured into tables for each EC2CS unit activity, each subset of data was analyzed individually. During this second round of coding, the first author read through each table and identified emerging codes and themes from the data excerpts. In this second phase, the findings of each activity or topic were synthesized, paying attention to the themes that were more salient and comparing the results of each dataset.

Two sequential phases of analyses, including memo-writing, allowed for a richer perspective on the data set. Using table of codes, subcodes, and data excerpts was useful to display graphically which were the most repeated and dominant themes, which are presented in the next section.

Findings

As shown in the pictures above, the EC2CS unit activities all have the same ending step. With some writing guidance and blanks to fill, step 5 was designed to help students reflect on how the CS topic they learned in that lesson might be connected to their lives. This part of the

activity underwent some changes throughout the SY21-22 to address challenges identified by teachers among their students by trying to provide more clarity on what they needed to write in. As a result, the data from each unit reflects students' answers to the format used at the time. While the fill-in-the-blank format was initially thought as a design that would better guide students, it turned out to be more restrictive than the open-ended questions that they were later used as a replacement. In addition, some students felt like the blanks indicated that there was one correct answer, which generated confusion and uncertainty.

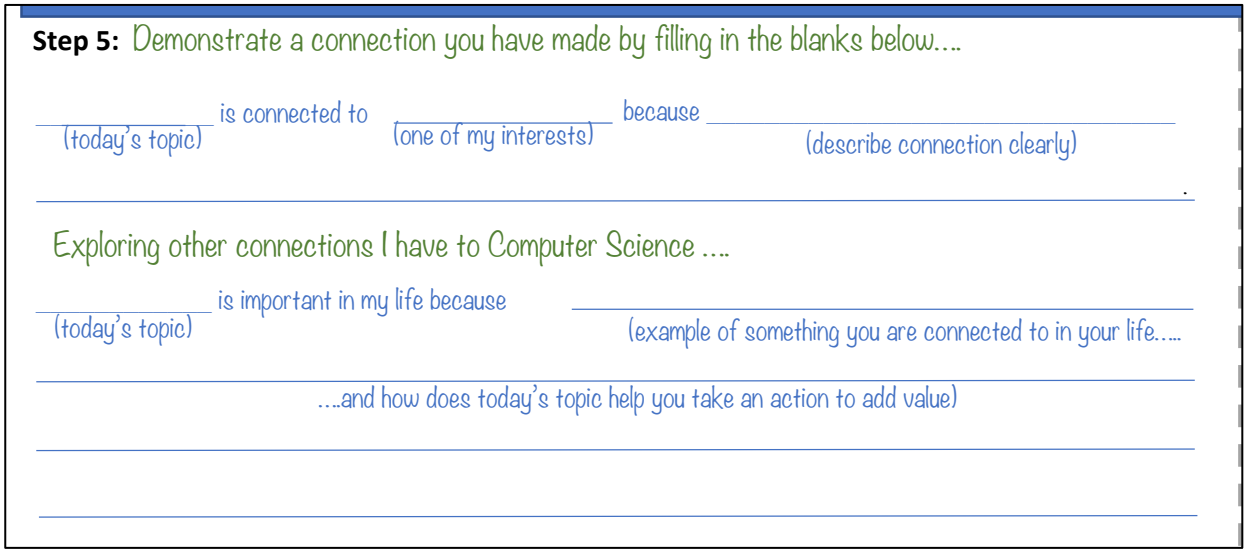
This section includes the step 5 used for each set of data (by activity), as well as findings from the student data that highlight the connections that Hispanic students made at the end of the EC2CS activities:

Unit 2: Problem Solving

As depicted below, step 5 of the EC2CS activity for Unit 2 was composed of fill-in-the-blanks:

Figure 1

EC2CS Unit 2 Step 5



Among students' answers in Step 5, most of them identified "today's topic" (first fill-in-the-blank) as either "community," "problem solving," or "community problem solving." Some students wrote in the specific problem that they identified and used to complete the steps in the activity, such as gun/gang violence, littering, or cyber bulling.

The table below shows what connections students made with the lesson's topic, as of their answers to the second fill-in-the-blank, from most to least common (top to bottom):

Table 4

Unit 2 Themes

Theme	Codes
Interests	Sports; Theater; Cars; Video games
Family	Family values; My family; Spending time with family
Culture & Identity	*Navidad*; Hispanic culture; My culture
Social responsibility	Protecting others; The environment; Responsibility
Community	My community; The neighborhood
Education	My learning; Going to college
Other disciplines	Financial; Medicine

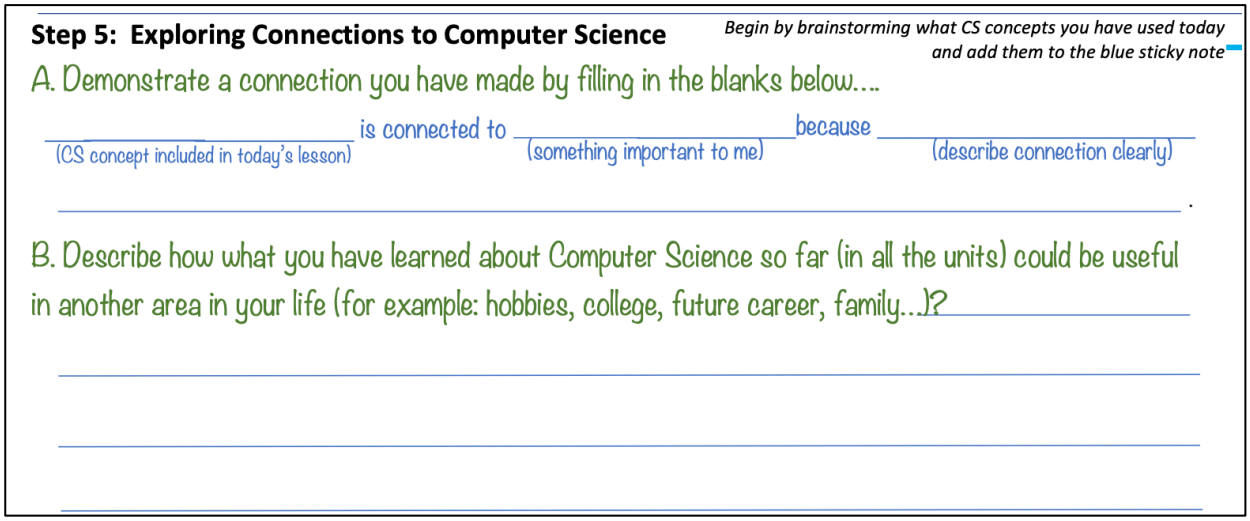
When describing how the topic of the day is connected to something in their lives and how it helps them take an action to add value, student's answers were not always related to the connection they made in the first part of Step 5—the first fill-in-the-blank. Nevertheless, the findings show that students used this space as an opportunity to reflect on how they could act on the problems they identified during the activity, and why doing that would be important for their community. We received feedback that the multiple blanks to fill in this latter part of step 5 (and the wording itself) caused some confusion among students, which caused us to replace it by an open-ended question, as seen in the findings for units 3 and 4 below.

Unit 3: Web Design

In preliminary analyses of the data from Unit 2, the second fill-in-the-blank was proving to cause confusion among students. As a result, step 5 in the EC2CS activity for Unit 3 was redesigned to include an open-ended question to guide students in making personal connections to CS. Another change was the addition of a brainstorming step to help students reflect on the CS concepts that were explained during the lesson and select one for their connections, responding to previous uncertainty among students while filling in the first blank (as reported by the teachers).

Figure 2

EC2CS Unit 3 Step 5



Following their teacher's guidance in the brainstorming step, most students filled in the "CS concept included in today's lesson" blank with "Web design," "CSS," "HTML," "coding," or similar. Some less common, more specific CS topics written by students included "algorithm," "binary numbers," or "data." Like in the previous activity, some students used this space to write something related to their personal interests, such as "careers," "climate change," "diversity," or "community help."

The table below shows what connections students made with the CS topic, based on their answers to the second fill-in-the-blank, from most to least common (top to bottom):

Table 5

Unit 3 Themes

Theme	Codes
Interests	Cooking; art; gaming; sports; hobbies; languages;
Future/Career	Teaching; marketing; movies; math; my future; future studies;
Community	Informing the community; safe community; improving the community
Education	School, learning; math; education; computer skills; homework
New skills	Communication; writing; research; accuracy; organization
Healthy life	Health; sports mentality
Culture	Learning about one's culture
Social responsibility	Giving to others
Family	Help my family

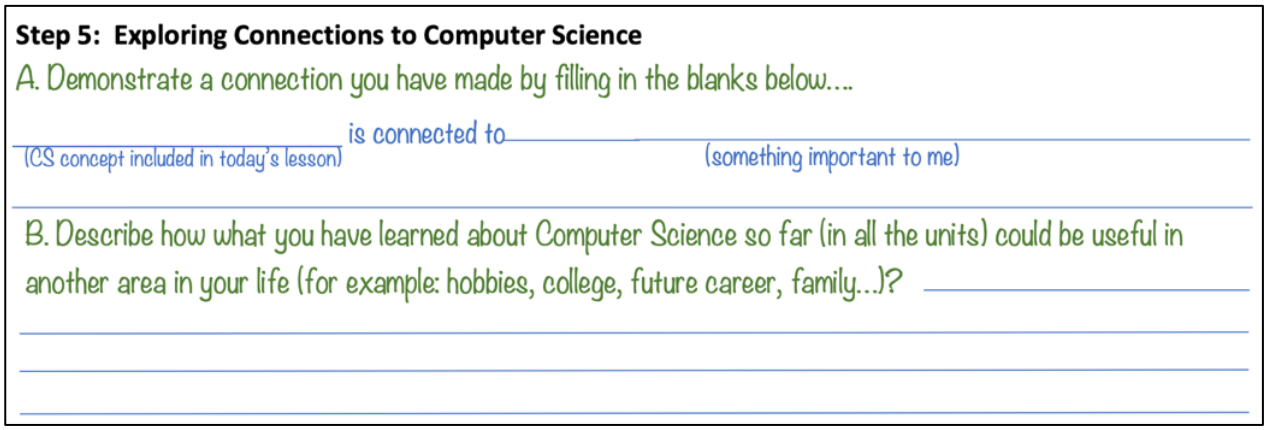
When describing how what they have learned about CS so far could be useful in other areas of their lives, most students used this space as an opportunity to reflect on how they newly acquired CS skills could be helpful in their future careers, regardless of the field. Some students, on the other hand, described how what they learned could help them more generally, mentioning the importance of following directions correctly, analyzing problems and coming up with solutions, asking questions, collaborating, research, etc.

Unit 4: Introduction to Programming

Following the design of EC2CS for unit 3, step 5 of the activity in unit 4 consisted of a fill-in-the-blanks followed by an open-ended question. Responding to teachers' feedback and to preliminary findings, the third fill-in-the-blank ("describe connection clearly") at the end of the first sentence was removed with the intent of providing a less structured space for students to write about their connections. As previous activities showed, the structuredness of the multiple fill-in-the-blanks were causing confusion among students, who often left the third blank unfilled or simply repeated information added to other parts of step 5.

Figure 3

EC2CS Unit 4 Step 5



The teachers' guidance to brainstorm for the "CS concept included in today's lesson" resulted in a higher repetition of topics, with "programming," and "conditionals" as the top choices. Students who deviated from the norm wrote CS topics like "coding," "scratch," or "variables." As in previous activities, a few students filled the first blank with something related to the theme of the activity or to their personal lives, such as "community," "tradition," or "pollution."

The table below shows what personal connections students made with the CS topic, as written in the "something important to me" blank —from most to least common (top to bottom):

Table 6

Unit 4 Themes

Theme	Codes
Daily life	My life; plans of the day; daily choices; planning
Community	Community values; my community; respect
Culture & Identity	Generations; traditions; my identity; culture;
Interests	Social media; shopping
Future/Career	My future; a future job; life decisions
New skills	Problem solving; decision making;
Education	School
Family	My family

On the last question (B), students described how what they have learned about CS so far could be useful in other areas of their lives. Most students' answers made an association with what they are learning and their future careers/jobs or described the benefits of learning to create websites for aspects of their daily lives. In a few occasions, students made mention of how what they are learning about CS could result in opportunities to pursue CS in the future, whether it was a pre-existing or a new interest.

Conclusion

In its first year of implementation, the EC2CS program focused on supporting teachers in the collection and use of students' background information to increase culturally responsive teaching in ECS high school classes. With ongoing development and adaptations, the EC2CS activities encouraged the use of students' backgrounds in their learning and the sharing and validation of diverse backgrounds in the CS class. In addition, the final step of the activities guided students in making connections between CS topics learned and their lives. This study shows that the EC2CS activities provided a space for students to reflect on their identities and of things that are important to them (e.g., family, community). The data is helpful to understand the types of themes and topics that are important for Hispanic students—information that teachers can use to adapt lessons to be more culturally responsive and improve the learning experiences of Hispanic students.

Interpreting the data within the context of each activity was helpful to hypothesize about the types of connections that were more salient in each case. In activities driven solely by a community theme, like unit 2 and the problem-solving cycle, family and community were among the most popular choices in students' connections. While the theme of community prevailed during unit 3, the most salient connections while developing web design skills slightly shifted to more individual aspects in students' lives, like hobbies or careers. Lastly, in learning

programming skills and the use of conditionals within a given theme of culture and traditions, community and identity became more salient again among students' connections, following aspects of students' daily lives.

It is important to acknowledge that the data by teacher might impact these results, as students' connections might also reflect their teachers' guidance and suggestions during the completion of the activity. Thus, teacher representation in the data set could skew the data findings and our hypothesis about why certain types of connections were more salient across the different unit activities. With the data available for this study, we hypothesize that the level of engagement with CS concepts and opportunities for students to bring in their creativity might impact what personal connections they make during each activity. Future directions will allow us to pay closer attention to the implementation context and teacher guidance during each activity and the impact on students' connections between their lives and CS.

Data on the students' descriptions of their "connections to CS" lacks evidence of a deep personal connection that might result in an increase of students' interest and motivation to pursue CS. Aligned with the teachers' perceptions, this finding may indicate that the final step of the EC2CS activities did not successfully guide students in making personal connections to CS. We plan to use these findings to revise the EC2CS activities (specifically step 5) to find ways in which students can more organically explore connections between CS and their lives.

In addition to continuing to improve EC2CS to ensure that students are learning CS in meaningful ways, this study highlighted areas for further exploration. First, considering the linguistic background of many of the Hispanic students in this study (and more generally in CPS), further attention needs to be paid to the role that Hispanic students' linguistic and cultural identities play in their engagement in computer science learning. Second, acknowledging the limitations that relying mostly on student work bring to our study, the larger study recently incorporated student interviews as a method for data collection as a strategy to elevate student voices during the data analysis process and beyond. Data from teacher interviews and/or classroom observation will also allow us to use implementation information in these analyses.

In sum, the data collected and analyzed in this pilot study was helpful to identify the affordances and limitations of the EC2CS program. These data were particularly helpful to assess the extent to which EC2CS activities were addressing the goal of increasing culturally responsive CS teaching, and to inform adaptations that will improve the experiences of both teachers and students in the program.

Acknowledgments

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References

Dettori, L., Greenberg, R. I., McGee, S., Reed, D., Wilkerson, B., & Yanek, D. (2018, February). CS as a graduation requirement: Catalyst for systemic change. Proceedings of SIGCSE '18, Baltimore, MD, USA, 406-407. doi:10.1145/3159450.3159646

Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice*. Teachers college press.

Goode, J., Margolis, J., & Chapman, G. (2014, March). Curriculum is not enough: The educational theory and research foundation of the exploring computer science professional development model. In *Proceedings of the 45th ACM technical symposium on Computer science education* (pp. 493-498).

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American educational research journal, 32*(3), 465-491.

McGee, S., Greenberg, R. I., Dettori, L., Rasmussen, A. M., McGee-Tekula, R., & Duck, J. (2018). An examination of the factors correlating with course failure in a high school computer science course. Western Springs, IL: The Learning Partnership. (Technical Report 5)

McGee, S., McGee-Tekula, R., Dettori, L., Rasmussen, A. M., & Greenberg, R. I. (2019). Research Methods for Reaching Urban Students from Groups Underrepresented in STEM Disciplines. In T. Rueker & V. Svihla (Eds.), *Navigating Challenges in Qualitative Educational Research: Research, Interrupted*. London: Routledge (pp 26-38).

Saldaña, J. (2021). *The coding manual for qualitative researchers* (4th ed.). London: Sage.

Appendix A (Unit 2 activity)

Preparing ourselves to communicate

EMPOWERMENT THROUGH WORDS

Community (noun)

1) a social group whose members have something in common, such as a shared government, geographic location, **culture**, or heritage.

2) the physical location where such a group lives. It can refer to a town, city, village, or other area with a formal government whose residents share a nationality or culture.

3) the people who live in this area.

Problem solving

the act of defining a problem; determining the cause of the problem; identifying, prioritizing, and selecting alternatives for a solution; and implementing a solution.

Words and synonyms

Words: **Problem** | **solving**

synonyms	Problem Need Necessity	Solution Plan Action / Act Collaboration / Collaborate

(add your own synonyms to the box!

2

Reflection

Use your bookmark and answer the following questions:

How would you define your community?

Who do you consider to be part of your community?

How does your community go about solving a problem? What does that look like? Use words from the left boxes:

3

Write your name and then place Bookmark here:

Name:

My interests

Sports/Wellness:

Arts/Entertainment:

Leisure:

Culture/Traditions:

Other:

My future me

After graduating:

Plans/Dreams:

My Values: What qualities do I consider important in my...

Family:

Community:

School:

Friends:

1

ECS Unit 2: **The Problem-Solving Process**

Step 1: Understand the problem

Describe a problem or need related to your community:

What **data** (information) is known?

What is unknown?

What are the conditions?

4

Step 3: Carry out the plan

To carry out the plan in your community…

1. *What* do you need to follow your plan?

2. *Who* might you need to get involved?

3. How will you communicate the need for their help and what data would you share?

Step 4: Reflect on your solution

4. Why is this problem important to solve for members of your community (teachers, business owners, etc.) and/or as a whole?

Step 5: Demonstrate a connection you have made by filling in the blanks below….

_____ (today's topic) is connected to _____ (one of my interests) because _____ (describe connection clearly).

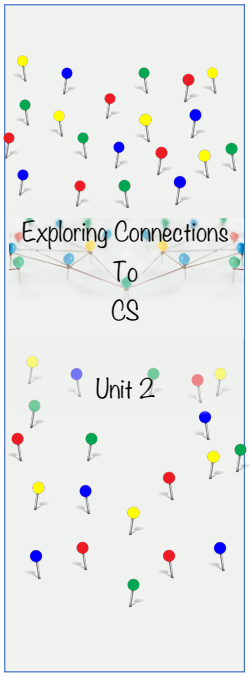
Exploring other connections I have to Computer Science ….

_____ (today's topic) is important in my life because _____ (example of something you are connected to in your life….

…and how does today's topic help you take an action to add value)

6

7



Step 2: Make a plan to solve the problem

1. Describe a plan to solve the problem. Use words, pictures, charts, graphs, systematic lists…

In Computer Science, we call this plan an algorithm — a sequence of steps designed for programming a computer to solve a specific problem

5

Appendix B (Unit 3 activity)

Preparing ourselves to communicate

EMPOWERMENT THROUGH WORDS

Resource (noun)

1) a source of supply, support, or aid, especially one that can be used when needed.

2) [pl.] the materials, money, and other things that a person or organization has and can use in order to function properly.

Support (noun, verb)

1) [n.] aid or assistance, emotional or practical help, or the person giving it.

2) [v.] to help someone, or offer help with something, when this is needed.

3) [v.] to give aid or courage; to agree with and give encouragement to someone or something because you want them to succeed

Access (noun, verb)

1) [n.] the right or privilege to approach, reach, enter, or make use of something.

2) [v.] to gain access to; make accessible or available.

Guidance (noun)

1) help and advice about how to do something or about how to deal with problems.

2) leadership, instruction, or direction.

2

Reflection

Thinking about a resource you could provide for your community in your website, answer the following questions:

A: What is a resource that you value, or a skill that you have, that you could share with people in your community?

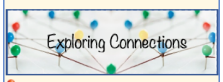
B: What could be a challenge that some people in your community currently experience to access that resource?

C: What are ways in which people in your community might use the internet to access resources? What guidance might some need?

3

Write your name and then place Bookmark here:

Name:



My interests

Sports/Wellness:

Arts/Entertainment:

Leisure:

Culture/Traditions:

Other:

My future me

After graduating:

Plans/Dreams:

My Values: What qualities do I consider important in my...

Family:

Community:

School:

Friends:

1

ECS Unit 3: **Web Design**

Step 1: Thinking together

A: Brainstorm ideas for a website where you could share a resource, skill, knowledge...

B: Find a partner with one common/related idea (you will build a website together). Write down the idea:

C: What is the **purpose** of your website?

D: Who is the intended **audience/user**?

4

Step 3: Title, Body & Headings

Keeping in mind the feedback you received and what you wrote in Step 1, decide...

A. The title of your homepage:

B. The body, including two paragraphs and headings (summarize here):

C. Access the LINK to start creating your web

Step 4: Create an html page

D. Using that link, create an html page with at least a title and body; paragraphs and headings. Here are some useful tags you will need:

<html>, </html>	Tells a browser the page will be written in HTML
<head>, </head>	Information for the browser that won't be displayed on the web page
<title>, </title>	The title is what shows up on the tab in a web browser- Goes in <head>
<body>, </body>	Information for the browser that will be displayed on the web page
** , **	Defines the start and end of a paragraph
** , to , **	Creates subheadings (Bigger numbers mean bigger text)

Step 5: Exploring Connections to Computer Science

Begin by brainstorming what CS concepts you have used today and add them to the blue sticky note

A. Demonstrate a connection you have made by filling in the blanks below....

_____ is connected to _____ because _____

(CS concept included in today's lesson) (something important to me) (describe connection clearly)

.

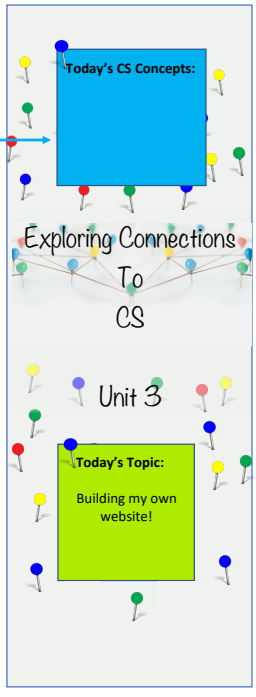
B. Describe how what you have learned about Computer Science so far (in all the units) could be useful in another area in your life (for example: hobbies, college, future career, family...)?

C. Please complete the end of activity survey and then **check the box** below.

☐ I have completed the end of activity survey.

6

7



Step 2: Creating a storyboard

A storyboard is a visual plan for a website

It usually consists of a series of pages: a rough sketch outlining the content, navigation, and design elements of the website.

A. What are important considerations for your intended user when designing the content, navigation, and design of your website?

B. Follow you teacher's instructions to create a storyboard for the homepage of your website to share with the class.

C. Check out other storyboards from your classmates and provide feedback.

D. Review the feedback you received. List the feedback that was helpful to you.

5

Appendix C (Unit 4 activity)

Preparing ourselves to communicate

EMPOWERMENT THROUGH WORDS

Culture (noun)

1) the ways of living of a group of human beings and transmitted from one generation to another.

2) the social behavior and norms found in human societies, as well as the knowledge, beliefs, arts, laws, customs, capabilities, and habits of the individuals in these groups.

3) the values, traditions, worldview, and social and political relationships created, shared, and transformed by a group of people bound together by a common history, geographic location, language, social class, religion, or other shared identity.

Tradition (noun)

1) the handing down of statements, beliefs, legends, customs, information, etc., from generation to generation, especially by word of mouth or by practice.

Custom (noun)

1) a habitual practice; the usual way of acting in given circumstances.

Cultural Identity (noun)

1) Cultural identity refers to identification with, or sense of belonging to, a particular group based on various cultural categories, including nationality, ethnicity, race, gender, and religion.

2

Using your bookmark and the definitions on the left, answer the following questions:

A: What culture(s) do you feel a connection with? Who are the people and/or places in your life that make you feel that connection?

B: What are some examples of cultural traditions and/or customs that are important in your life?

C: How would you define *your* cultural identity?

3

Write your name and then place Bookmark here:

Name:

My interests

Hobbies:

Skills:

Leisure:

Culture/Traditions:

Other:

My future me

This summer:

After graduating:

Plans/Dreams:

My Values: Describing what I value, what I respect, what's important to me and what I appreciate in my...

Family:

Community:

School:

Friends:

1

ECS Unit 4: **Programming (Conditionals)**

Step 1: *If* we work together, we learn better

In English, **if** is used to state a condition where something might happen if the condition is true.

If [condition] → then [result] — *like in this sentence*

Conditionals in Computer Science

A conditional is a common computer science construct.

An example from computing is when a program like Microsoft Word asks if you want to save your work when you hit close.

If you click yes, it saves your changes

If you click no, it discards your changes

A: Discuss your reflection (←) with a partner and write a condition about something relevant to your cultural identities.

If _____

_____ ,

(then) _____

B: Write a condition about something you might be able to do in the future (near or far) related to computer science.

If _____

_____ ,

(then) _____

4

Step 3: Create a story

Build on what you did in Step 2 to tell a story. Use the conditionals you worked with and add other elements (pictures, text, music,... even new content!) in Scratch to tell the story of your person of choice. Get creative!

Write the main elements of the story below:

Step 4: Share your story

Review some of your classmates' work and provide constructive feedback. This is also your chance to show off the story you created! Write down feedback from classmates below:

Step 5: Exploring Connections to Computer Science

Begin by brainstorming what CS concepts you have used today and add them to the blue sticky note

A. Demonstrate a connection you have made by filling in the blanks below....

_____ is connected to _____ because _____

(CS concept included in today's lesson) (something important to me) (describe connection clearly)

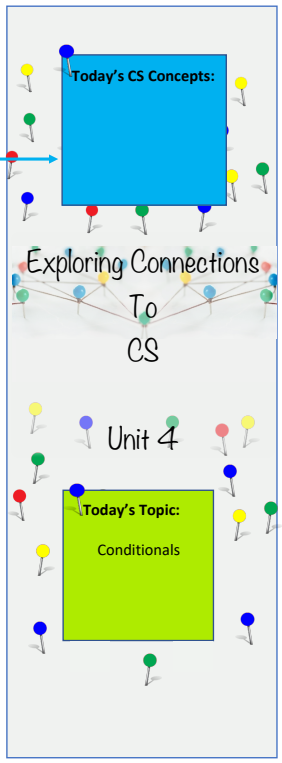
B. Describe how what you have learned about Computer Science so far (in all the units) could be useful in another area in your life (for example: hobbies, college, future career, family...)? _____

C. Please complete the end of activity survey and then **check the box** below.

☐ I have completed the end of activity survey.

6

7



Step 2: "if" blocks in Scratch

Life is different for every generation, especially with the fast development of technology and computers. Traditions and customs are also lived differently at different ages or in different times...

A. Think about 2 people that you know from different generations. They can be family, community members, someone that you admire, etc. Write their names and ages:

1) _____

2) _____

B. How would each person experience the following scenarios at a certain age and the specific time and place based on their lives?

Get in touch with a friend

1) _____

2) _____

Find the recipe to cook a traditional meal

1) _____

2) _____

Listen to their favorite song

1) _____

2) _____

C. Write your own scenario and how you think each person would experience it:

[_____]

1) _____

2) _____

5