

Mobile CSP Sample Lesson Adjustment Recommendations

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Guide Overview: This resource guide **provides teachers** with research-derived recommendations they can use in their CSP class to improve accessibility of the lesson for students with learning and attention disorders. The recommendations stem from what is known about the range of learning and attention disorders typical in classrooms (e.g., reading, written expression, language, math, attention) and the types of adjustments commonly made to support students who learn differently because of these disorders in any discipline.

Adjustment Terminology: This guide includes two types of adjustment recommendations: **adaptations** and **accommodations**. The term **“adaptation”** refers to instructional practices that can be used whole-class (to benefit students with learning and attention disorders, and potentially all learners in the classroom). The term **“accommodation”** refers to differentiation for individual students based on their unique learning needs beyond what the whole-class practices provide. Many of the “adaptations” are akin to [Universal Design for Learning \(UDL\) strategies](#) that emphasize how information is presented, how students demonstrate understanding, and how students interact and engage with materials. However, these recommendations were specifically designed to address the needs of students with diagnosed learning and attention disorders.

Learning and Attention Disorders: The guide identifies the learning and attention disorders that each recommendation addresses. The list of broad disorders and sub-disorders listed on page 3 in **Table 1** are representative of the range of disorders in the general population as identified by the research team learning specialists. The adaptations and accommodations commonly made for these learning differences in any discipline inform the recommendations below.

Learn More about Instruction for Students with Learning & Attention Disorders

Find ways to collaborate with your school’s Special Education personnel (Department Heads, paraprofessionals, school psychologists, etc.) to generally benefit from their expertise and perspective. These specialists may also be able to help you navigate any unfamiliar or unclear information contained in a student’s [Individualized Education Program \(IEP\)](#) or a [504 plan](#) (legal documents that outline supports that schools and teachers must provide for students with disorders that impact their learning, beyond the recommendations here).

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Table 1. **Broad Learning and Attention Disorders**

Specific Learning Disabilities and Attention Deficit Disorders	Sub-Disorders
Reading Disorders – All <i>(Adjustment applies to all types of reading disorders)</i>	<ul style="list-style-type: none"> • Reading decoding • Reading fluency • Reading comprehension
Written Expression Disorders – All <i>(Adjustment applies to all types of written expression disorders)</i>	<ul style="list-style-type: none"> • Spelling accuracy • Grammar and punctuation accuracy • Clarity or organization of written expression
Math Disorders – All <i>(Adjustment applies to all types of math disorders)</i>	<ul style="list-style-type: none"> • Number sense • Memorization of arithmetic facts • Accurate or fluent calculation • Accurate math reasoning
Attention Disorders - All <i>(Adjustment applies to all types of attention disorders)</i>	<ul style="list-style-type: none"> • Combined presentation (inattentive & hyperactive/impulsive) • Predominantly inattentive • Predominantly hyperactive/impulsive
Language Disorders – All <i>(Adjustment applies to all types of language disorders)</i>	<ul style="list-style-type: none"> • Reduced vocabulary • Limited sentence structure • Impairments in discourse • Social pragmatic communication

Underlying Processes: In our work, we address not only the broader diagnostic information in Table 1, but also the basic, [psychological processes underlying the disorders](#) that can make certain activities common in CS and non-CS classes challenging (Table 2). This is because two students may both have a disorder in reading that, due to the different underlying processes that contribute to the disorder, call for different kinds of actions to address the disorder. A student with a learning disorder may also have an interference with more than one of the processes listed in Table 2. Therefore, it is important to remember that, like students as a whole, those with diagnosed disorders are also very heterogeneous.

The recommendations for teachers in this document identifies both, the **broader disorders** (Table 1, first column) and in some lessons, the **underlying psychological processes** (Table 2, column 2). Each disorder category is named (e.g., “Reading”); in some lessons, underlying processes are denoted with a number (e.g., “listening comprehension” is “6”). These processes were sorted into groupings (“Clusters”) by the research team learning specialists that roughly represent similar types of processing issues.

Table 2. Underlying Process Clusters

Processes related to...	Underlying Psychological Processes
Aspects of reasoning	<ul style="list-style-type: none"> • Verbal reasoning (1) • Visual-perceptual reasoning (2) • Higher-order reasoning (3) • Cognitive flexibility (4) • Cognitive reasoning (29)
Areas of language	<ul style="list-style-type: none"> • Vocabulary/semantics (5) • Listening comprehension (6) • Following oral directions (7) • Oral formulation (8) • Retrieval fluency (9) • Phonological awareness (10) • Language processing (11)
Different types of memory	<ul style="list-style-type: none"> • Verbal memory (12) • Visual memory (13) • Working memory (14) • Procedural memory (15) • Sequential memory (16)
Fine motor	<ul style="list-style-type: none"> • Fine motor (17)
Processing, timing and pacing	<ul style="list-style-type: none"> • Processing speed (18) • Sustained tempo (19)
Aspects of visual processing	<ul style="list-style-type: none"> • Visual pattern recognition (20) • Visual-auditory learning¹ (21) • Visual discrimination (22)
Executive functioning,² attention and social skills	<ul style="list-style-type: none"> • Sustained focus & alertness (23) • Self-monitoring (24) • Planning (25) • Activation initiation (26) • Metacognition (27) • Social skills (28)

¹ Also linked to the “language” cluster

² A weakness in some mental skills related to planning, organizing, and prioritizing. Challenges in these areas are often associated with learning and attention disorders.

Mobile CSP: 2.5 Hardware & Software

Adjustment Suggestions

Suggestion 1

Lesson section: Teacher Materials – Hook/Motivation

Task description: Students engage in a whole class discussion to address “what is a computer?”

Some students may have difficulty:

- comprehending discussion prompts (Language)
- putting their thoughts into words (Language)
- expressing thoughts with the correct words and phrases to articulate them (Language)
- using socially appropriate language in communication and collaboration (Language)
- sustaining attention while classmates explain their thoughts (Attention)

Teacher adjustment recommendations - adaptations:

- Project the prompt so information is presented visually as well as verbally.
- Rephrase and recap student responses to emphasize essential points and to clarify information shared by students that may not be clear to their peers.
- Allow enough wait time before calling on any student. Give students adequate time to think about their responses so that those with oral formulation or retrieval issues have time to process and come up with responses.
- Throughout the discussion help students by modeling phrasing for both content and social appropriateness.

Teacher adjustment recommendations - accommodations: None

Suggestion 2

Lesson section: Teacher Materials – Hook/Motivation

Task description: Students learn a new concept (definition of “computer”) from information presented verbally (through discussion).

Some students may have difficulty:

- understanding concepts/vocabulary conveyed with words (Language)
- comprehending information and gaining knowledge from the teacher and classmates through discussion (without visuals) (Language, Attention)
- sustaining attention during discussion in order to learn the meaning of new words and phrases (Language, Attention)
- processing and retaining information presented verbally without any visual supports (Attention)

Teacher adjustment recommendations - adaptations:

- As students discuss key points, provide a visual with a summary of the key points (e.g., on a white board).
- Place key terms and definitions (“computer”) on a presentation slide or white board so that information is presented visually.

Teacher adjustment recommendations - accommodations: None

Suggestion 3

Lesson section: Teacher Materials – Experiences and Explorations: Videos & Discussion

Task description: Students view and discuss one or more videos that introduce basic concepts (e.g., computers, operating systems, applications)

Some students may have difficulty:

- understanding concepts in the videos conveyed only through words (Language)
- maintaining focus & attention; comprehending new information presented quickly in a video (Attention, Language)
- recalling or retrieving information (Language)
- expressing thoughts with the correct words and phrases to articulate them (Language)
- sustaining attention while classmates explain their thoughts (Attention)

Teacher adjustment recommendations - adaptations:

- Watch the video two times with the closed captioning enabled.
- Create a handout that identifies the key concepts from the video to use while watching (can pull from the main topics list in the lesson).
- Use demonstration (refer to the computer parts) to support information presented.
- Allow enough wait time before calling on any students to give them adequate time to process information and come up with their responses.
- Explicitly summarize the main points.

Teacher adjustment recommendations - accommodations: None

Suggestion 4

Lesson section: Teacher Materials – Experiences and Explorations: Lecture with PowerPoint slides

Task description: Students learn new concepts presented via a pre-recorded video or teacher-advanced PowerPoint slides (definition of computer, software, operating system, applications, motherboard, CPU, RAM, persistent data, etc.).

Some students may have difficulty:

- reading and understanding new vocabulary (Language)
- maintaining focus & attention; comprehending new information presented quickly in a video (Attention)
- identifying key take-aways (Attention, Language)

Teacher adjustment recommendations - adaptations:

- Provide PDF handout of slide show for students to reference as you run through the slides (or watch the video version).
- (If watch the video version) watch the video two times – the first time, pause to review each new term/concept, then watch once more.
- Provide students with concrete examples of new vocabulary words by showing examples using model computer parts.
- Explicitly summarize the main points.

Teacher adjustment recommendations – accommodations: None

Suggestion 5

Lesson section: Student Materials – Matching Activity

Task description: Students work in pairs to complete a matching activity (students match technical terms with their definitions).

Some students may have difficulty:

- working effectively and efficiently in pairs (Attention/Social Skills)
- working collaboratively on an abstract task (Attention)
- sustaining attention while classmates explain their thoughts (Attention)
- finding the correct words and phrases to express their own thoughts; comprehending the language used by their peers (Language)
- concentrating, particularly if they need additional time to process information and complete work (Attention)
- recalling basic information and vocabulary (Language)

Teacher adjustment recommendations – adaptations:

- Place students in partnerships or groups that will be supportive of learning differences and minimize difficulties that could arise because of social skills or other factors (these partnerships may remain for an extended period of time, or need to be changed regularly to maintain effective working groups).
- Explicitly state that students will work or problem-solve together (not just work in parallel). Review and model guidelines for students on how to work together (e.g., only one person talks at a time; everyone accepts feedback; listen actively; people can share differences of opinion) and provide feedback.

Teacher adjustment recommendations – accommodations:

- Work directly with pairs who need extra support to make progress with the task.

Suggestion 6

Lesson section: Student Materials – Self Check and Reflection

Task description: Students read and respond to multiple-choice questions that assess their understanding of the technical terms introduced in the lesson. Students are then asked to respond to reflection questions, where they must solve a computation problem.

Some students may have difficulty:

- reading and comprehending the multiple-choice questions and the explanations of correct or incorrect responses (Reading, Language, Attention)
- recalling newly introduced vocabulary and concepts (Language)
- concentrating, particularly if they need additional time to process information and complete work (Attention)
- putting their thoughts into words (Written Expression)
- typing or hand-writing responses (Written Expression)
- converting numbers to the same unit of measurement (e.g., bytes to gigabytes) (Math)

Teacher adjustment recommendations – adaptations:

- Remind students that some questions are “Select all that apply” while others are “Select only one.”

Teacher adjustment recommendations – accommodations:

- Offer students the use of text-to-speech software to read and reread questions and explanations, and to listen to and edit their own written responses.
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, clarify when needed.
- Assist students who are having difficulty putting their thoughts into words. Use cueing or modeling to assist students in making their written work clear.
- Provide opportunities for students to use dictation software to write their responses. Set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general classroom for students to use dictation software if needed.
- Assist students who are having difficulty with the mathematical concepts associated with units of measurement.
- Allow students to use calculators.

Mobile CSP: 2.11 Digital Explosion

Adjustment Suggestions

Suggestion 1

Lesson section: Day 1, Teacher Materials – Hook/Motivation

Task description: Students engage in a discussion about digital data, or bits, in everyday life.

Some students may have difficulty:

- comprehending discussion prompts (Language)
- putting their thoughts into words (Language)
- expressing thoughts with the correct words and phrases to articulate them (Language)
- using socially appropriate language in communication and collaboration (Language, Attention/Social skills)
- sustaining attention while classmates explain their thoughts and comprehending the information (Attention, Language)

Teacher adjustment recommendations - adaptations:

- Project the prompt so information is presented visually as well as verbally.
- Check for understanding of discussion prompts; clarify and rephrase when needed, and define terminology.
- Rephrase and recap student responses to emphasize essential points and to clarify information shared by students that may not be clear to their peers.
- Allow enough wait time before calling on any student. Give students adequate time to think about their responses so that those with oral formulation or retrieval issues have time to process and come up with responses.
- Throughout the discussion, help students by modeling phrasing for both content and social appropriateness.

Teacher adjustment recommendations - accommodations: None

Suggestion 2

Lesson section: Day 1, Teacher Materials – Experiences and Explorations, and Student Materials – Part 1

Task description: Students read *Blown to Bits*, Chapter 1, pages 1-4 and page 8 (Koan 4), as well as view a graph in the student materials that visualizes the progression of Moore’s Law on a logarithmic scale. While reading, students record their thoughts and quotes from the chapter in the Double Entry Journal template, and then provide their own opinion about the idea. Next, students share their responses in small groups, and as a group, pick one idea to share, whole-class.

Some students may have difficulty:

- interpreting and understanding data represented in different graphs and charts (Math)
- reading and comprehending CS content/information and vocabulary (Reading, Language)
- using socially appropriate language in communication and collaboration (Language, Attention/Social skills)
- sustaining attention while classmates explain their thoughts and comprehending the information shared (Attention, Language)
- writing down ideas quickly and accurately (Written Expression, Language)
- typing or hand-writing responses (Written Expression)
- finding the correct words and phrases to articulate thoughts (Language)

Teacher adjustment recommendations - adaptations:

- Refer students to the *Blown to Bits* Chapter 1 Vocabulary list for definitions of new vocabulary.
- When student groups share ideas with the class, rephrase and recap student responses to emphasize essential points and to clarify information shared by students that may not be clear to their peers.

Teacher adjustment recommendations - accommodations:

- Offer students the use of text-to-speech software to read excerpts from the book.
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, and clarify when needed.
- Provide opportunities for students to use dictation software to write their responses. Set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general room for students to use.
- Assist students who are having difficulty putting their thoughts into words. Use cueing or modeling to assist students in making their written work clear.
- Circulate and assist students in interpreting charts and graphs; provide guidance and instruction when needed.

Suggestion 3

Lesson section: Day 1, Teacher Materials – Rethink, Reflect, and Revise

Task description: The teacher introduces the journal assignment/tracking template and asks students to predict how many objects they interact with that process digital data. Then, students complete the tracking sheet over the next 24 hours.

Some students may have difficulty:

- typing or hand-writing responses (Written Expression)
- writing down ideas quickly and accurately (Written Expression, Language)
- initiating the work, and maintaining focus/concentrating to complete it (Attention)

Teacher adjustment recommendations - adaptations:

- Create a tracker template for students to use to record data about their digital technology use [if this doesn't already exist] and model how to use it.

Teacher adjustment recommendations - accommodations:

- Provide opportunities for students to use dictation software to write any responses completed at school. Provide an alternate method to record use for students who do not have access to dictation software at home.

Suggestion 4

Lesson section: Day 2, Teacher Materials – Hook/Motivation and Experiences and Explorations

Task description: Students share their technology data tracking results with the whole class, discuss ways to organize the information, compare actual usage to their predictions, and discuss the positive and negative impacts of the technology used.

Some students may have difficulty:

- comprehending discussion prompts (Language)
- putting their thoughts into words, and expressing them in a way others can understand (Language)
- using socially appropriate language in communication and collaboration (Language, Attention/Social skills)
- sustaining attention while classmates explain their thoughts and comprehending the information shared (Attention, Language)

Teacher adjustment recommendations - adaptations:

- Project the prompt so information is presented visually as well as verbally.
- Check for understanding of discussion prompts; clarify and rephrase when needed; and define terminology.
- Rephrase and recap student responses to emphasize essential points and to clarify information shared by students that may not be clear to their peers.
- Allow enough wait time before calling on any student. Give students adequate time to think about their responses so that those with oral formulation or retrieval issues have time to process and come up with responses.
- Throughout the discussion, help students by modeling phrasing for both content and social appropriateness.

Teacher adjustment recommendations - accommodations: None

Suggestion 5

Lesson section: Day 2, Teacher Materials – Experiences and Explorations and Rethink, Reflect, and Revise, and Student Materials – Debate Team Carousel

Task description: Students read *Blown to Bits* pages 13-16, and then get in to groups to debate a topic, using the Debate Team Carousel handout. Finally, the teacher selects real-world examples of technology use, and leads students in a discussion about the product/initiative, as well as the positive and negative implications on life.

Some students may have difficulty:

- interpreting and understanding data represented in different graphs and charts (Math)
- reading and comprehending CS content/information and vocabulary (Reading, Language)
- using socially appropriate language in communication and collaboration (Language, Attention/Social skills)
- sustaining attention while classmates explain their thoughts and comprehending the information (Attention, Language)
- reflecting and identifying the reasoning behind their arguments (Language)
- gaining knowledge from the teacher and classmates through discussion (Language, Attention)
- writing down ideas quickly and accurately (Written Expression, Language)
- typing or hand-writing responses (Written Expression)
- finding the correct words and phrases to articulate thoughts (Language)

Teacher adjustment recommendations - adaptations: None

- Project the prompt so information is presented visually as well as verbally.
- Check for understanding of discussion prompts; clarify and rephrase when needed, and define terminology.

Teacher adjustment recommendations - accommodations:

- Offer students the use of text-to-speech software to read excerpts from the book.
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, and clarify when needed.
- Provide opportunities for students to use dictation software to write their responses. Set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general room.
- Assist students who are having difficulty interpreting the debate prompts or putting their thoughts into words. Provide example responses, and use cueing or modeling to assist students in making their written work clear.

Suggestion 6

Lesson section: Day 2, Student Materials – Homework: For Your Portfolio

Task description: Students read and respond to questions in their portfolio. Students are also asked to find, read and summarize a news article about computing innovation impacts.

Some students may have difficulty:

- recalling newly introduced vocabulary and concepts (Language)
- putting their thoughts into words (Written Expression)
- typing or hand-writing responses (Written Expression)
- reading and comprehending CS content/information (particularly dense and complex text in articles) (Reading, Language)
- selecting a news article at an appropriate background knowledge and reading level (Reading, Language) recalling newly introduced vocabulary and concepts (Language)
- concentrating (especially at home), particularly if they need additional time to process information and complete work (Attention)

Teacher adjustment recommendations – adaptations:

- Prior to class, identify and prepare a list of 10-15 current events articles that are at an appropriate level for the varying student abilities in your class. If students are experiencing difficulty selecting, guide them to the list that you pre-selected.

Teacher adjustment recommendations – accommodations:

- Offer students the use of text-to-speech software to read and reread the questions and the article they select, and to listen to and edit their own written responses.
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, and clarify when needed.
- Assist students who are having difficulty putting their thoughts into words. Use cueing or modeling to assist students in making their written work clear.
- Provide opportunities for students to use dictation software to write their responses. Set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general classroom for students to use dictation software if needed.

Mobile CSP: 3.2 Paint Pot Tutorial

Adjustment Suggestions

Suggestion 1

Lesson section: Teacher Materials - Hook/Motivation

Task description: The teacher leads students in a discussion on the Snapchat app. Students are asked to brainstorm user interface components and the functionality needed to draw on the picture.

Some students may have difficulty:

- understanding the teacher’s discussion prompts because of phrasing and terminology (Language, Attention, 5, 6, 11, 23)
- recalling or retrieving information (Language, 9, 12, 15, 18)
- expressing and articulating thoughts with the correct words and phrases (Language, 5, 8, 9, 11)
- sustaining attention while classmates explain their thoughts, and comprehending the information shared (Language, Attention, 6, 11, 13, 14)
- using socially appropriate language in communication (Language, Attention, 5, 8, 24, 28)

Teacher adjustment recommendations - adaptations:

- Check for understanding of discussion prompts; clarify and rephrase when needed, and define terminology such as “interface components” and “functionality.” (helpful for student challenges related to: Language, Attention, 5, 6, 11, 23)
- Allow enough wait time before calling on students to give them adequate time to think about their responses. (helpful for student challenges related to: Language, 5, 8, 9, 11, 12, 15, 18)
- Rephrase and recap student responses to emphasize essential points and to clarify information shared by students that may not be clear to their peers. (helpful for student challenges related to: Language, Attention, 6, 11, 13, 14)
- Throughout the discussion help students by modeling phrasing for both content and social appropriateness. (helpful for student challenges related to: Language, Attention, 5, 8, 24, 28)

Teacher adjustment recommendations - accommodations: None

Suggestion 2

Lesson section: Student Materials - Paint Pot Tutorial Part 1 & 2

Task description: Students view two videos. The first introduces the painting and drawing Canvas and its related event handlers. The second video introduces the concepts of a dot size, a variable for incrementing and decrementing dot size, and data abstraction. Students are asked to open the App Inventor environment in a different window and move between the video and instructional materials to the App Inventor.

Some students may have difficulty:

- understanding the instructions and terminology used in the instructional video, and following the complex instructions (Language, Attention, 5, 6, 7, 11, 23)
- moving between two windows on computer: one with the instructional video and the other with the App Inventor, which is where the instructions need to be executed (Language, Attention, 7, 11, 13, 14, 15, 16, 20, 23, 24, 25)
- recalling, understanding, and applying mathematical concepts such as the coordinates (x, y) and radius (Math, 2)
- identifying and using the block commands and variables, particularly in the second video because the block commands, their features, their names, and how they relate to one another are presented quickly and in a visually dense environment (Related to challenges in visual processing that are often associated with Reading and Math, 16, 20, 22)

Teacher adjustment recommendations - adaptations:

- Project the instructional video on a screen so it can be viewed by the whole class and have students open up the App Inventor on their own computers. Watch the instructional video as a class; pause frequently; replay instructions; and provide guidance and clarify instructions. (helpful for student challenges related to: Language, Attention, 5, 6, 7, 11, 13, 14, 15, 16, 20, 23, 24, 25)
- Point out the differences between the blocks and why some fit well with each other and others do not; help students interpret what they are seeing in the Blocks View because the commands are laid out in a manner that is difficult to follow visually in the video. (helpful for student challenges related to: visual processing often associated with Reading and Math, 16, 20, 22)

Teacher adjustment recommendations - accommodations:

- Review the mathematical concepts of coordinates (x, y) and radius and how this applies to the app being built. (helpful for student challenges related to: Math, 2)
- Provide students with the electronic document that has the verbal instructions from the videos written out, and allow those who need text-to-speech software to read the document to do so. (helpful for student challenges related to: Language, Attention, 5, 6, 7, 11, 13, 14, 15, 16, 20, 23, 24, 25)

Suggestion 3

Lesson section: Student Materials - AP Pseudocode: Variable and Assignment States

Task description: Students read how the App Inventor block codes such as the *initialize global variable* block, the *set* block, and the *get* block translate to the AP Pseudocode.

Some students may have difficulty:

- reading and comprehending the terminology and symbols related to the newly introduced code in this lesson and how those would translate to the AP Pseudocode (Reading, Language, Attention, 1, 2, 4, 5, 10, 14, 15, 20, 21, 23)
- recalling, understanding, and applying mathematical concepts that relate to incrementing and decrementing radii/dots (Math, 2)

Teacher adjustment recommendations - adaptations:

- Provide a list of all the newly learned block codes, their labels and their associated variables, and within the list, detail how the AP Pseudocode is used to represent the same commands with examples and explanations. Spend time reading through the list with students, provide additional explanations, and check for understanding. (helpful for student challenges related to: Reading, Language, Attention, 1, 2, 4, 5, 14, 15, 20, 21, 23)

Teacher adjustment recommendations - accommodations:

- Provide individual guidance to students who have difficulty working through the code examples that involve mathematical concepts and help them work through the steps of how the variables/values affect the dot sizes. (helpful for student challenges related to: Math, 2)
- Read parts of the written explanation of how App Inventor block codes translate to AP Pseudocode aloud to students who are having difficulty and allow those who need text-to-speech software to read the explanation to use it. (helpful for student challenges related to: Reading, 10)

Suggestion 4

Lesson section: Student Materials - Self-Check and Reflection

Task description: Students read and respond to multiple-choice questions following the two parts of the video and reading the AP Pseudocode description. Students receive immediate feedback for their responses to the multiple-choice questions through written explanations regarding the correct and incorrect responses. Students are then asked to respond to two reflection questions.

Some students may have difficulty:

- reading and comprehending the questions and the explanations of correct or incorrect responses (Reading, Language, Attention, 1, 2, 4, 5, 10, 14, 15, 20, 21, 23)
- recalling newly-learned terminology and procedures to respond to the questions and understand the explanations of responses (Reading, Language, Math, Attention, 1, 2, 4, 5, 10, 14, 15, 20, 21, 23)
- recalling, understanding, and applying mathematical concepts that relate to the placement of the dots and the incrementing and decrementing radii/dots (Math, 2)
- putting thoughts into words to respond to the reflections (Written Expression, Language, Math, Attention, 1, 2, 4, 5, 8, 10, 14, 15, 20, 21, 23)
- typing or hand-writing responses (Written Expression, 8, 17)

Teacher adjustment recommendations - adaptations: None

Teacher adjustment recommendations - accommodations:

- Offer students the use of text-to-speech software to read and reread questions and explanations. (helpful for student challenges related to: Reading, 10)
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, clarify when needed. (helpful for student challenges related to: Reading, Language, Attention, 1, 2, 4, 5, 10, 14, 15, 20, 21, 23)
- Assist students who are having difficulty with the mathematical concepts associated with the commands and block codes. (helpful for student challenges related to: Math, 2)
- Assist students who are having difficulty putting their thoughts into words. Use cueing or modeling to assist students in making their written work clear. (helpful for student challenges related to: Written Expression, Language, Math, Attention, 1, 2, 4, 5, 8, 10, 14, 15, 20, 21, 23)
- Provide opportunities for students to use dictation software to write their responses. Set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general classroom for students to use dictation software if needed. (helpful for student challenges related to: Written Expression, 8, 17)

Suggestion 5

Lesson section: Teacher Materials - Rethink, Reflect and Revise

Task description: The teacher leads students in a discussion regarding the new language elements in Paint Pot (such as the Touched and Drag events and variable). Students are asked to raise questions and to describe the event-handling that occurs in this app and how the use of the variable makes the program more abstract.

Some students may have difficulty:

- understanding the teacher's discussion prompts because of phrasing and terminology (Language, Attention, 5, 6, 11, 23)
- recalling or retrieving information (Language, 9, 12, 15, 18)
- expressing and articulating thoughts with the correct words and phrases (Language, 5, 8, 9, 11)
- sustaining attention while classmates explain their thoughts, and comprehending the information shared (Language, Attention, 6, 11, 13, 14)
- using socially appropriate language in communication (Language, Attention, 5, 8, 24, 28)

Teacher adjustment recommendations - adaptations:

- Check for understanding of discussion prompts; clarify and rephrase when needed, and define terminology. (helpful for student challenges related to: Language, Attention, 5, 6, 11, 23)
- Project key points and terminology from this lesson on a screen as well as the key points raised by students, or alternatively, write this information on a white board or poster notes for students to view throughout discussion (helpful for student challenges related to: Language, 5, 8, 9, 12, 15, 18)
- Allow enough wait time before calling on students to give them adequate time to think about their responses (helpful for student challenges related to: Language, 5, 8, 9, 11, 12, 15, 18)
- Rephrase and recap student responses to emphasize essential points and to clarify information shared by students that may not be clear to their peers (helpful for student challenges related to: Language, Attention, 6, 11, 13, 14)
- Throughout the discussion help students by modeling phrasing for both content and social appropriateness (helpful for student challenges related to: Language, Attention, 5, 8, 24, 28)

Teacher adjustment recommendations - accommodations: None

Mobile CSP: 3.4 Paint Pot Projects

Adjustment Suggestions

Suggestion 1

Lesson Section: Teacher Materials- Hook/Motivation

Task Description: Students engage in a **class discussion** reviewing how the Paint Pot app was created, and discuss possible app enhancements.

Some students may have difficulty:

- recalling or retrieving information about procedures presented previously (e.g., programming commands) (Language)
- sustaining attention while classmates explain their thoughts (Attention)
- comprehending discussion prompts (Language)
- expressing thoughts with the correct words and phrases to articulate them (Language)

Teacher adjustment recommendations - adaptations:

- Present previously- introduced commands visually (project on a screen or slide, or provide in a handout) to refresh students' memory from previous lessons (e.g., 3.2, the first lesson where the Paint Pot app is introduced). Check for understanding, and clarify and rephrase when necessary

Teacher adjustment recommendations - accommodations: None

Suggestion 2

Lesson Section: Teacher Materials-Experiences and Exploration and Student Materials – Creative Mini Projects

Task Description: Students **work in pairs** on mini-project enhancements to Paint Pot, and **read a dense list of text instructions** to understand the requirements for the activity. *This list of mini-projects is filled with many lines of text without any visuals showing students what their results should look like.*

Some students may have difficulty:

- reading and comprehending activity directions, particularly when presented as dense text on websites (Reading)
- distinguishing instructions/to-dos from other information when embedded in with general information (Attention, Language)
- breaking down tasks into smaller steps (Attention)
- recalling the use of each command and the type of variable that should be entered in the command (Language)
- identifying spelling or syntax “errors” when debugging (e.g., the difference between “Square1” and “squar1”) (Language)
- thinking flexibly and systematically about command use (Cognitive flexibility: ADHD, Reading, Written Expression, Math)
- working effectively and efficiently in pairs (Attention/Social Skills)

Teacher adjustment recommendations - adaptations:

- Project activity instructions on a screen and read any particularly challenging directions aloud as a group and provide several examples.
- Create a reference sheet listing new code; provide a short descriptor of the command and the type of variable that should be entered in the command.
- Create a reference sheet that list possible “errors” that cause bugs and ways to rectify the issues as a starting point for those who may have difficulty with debugging (Cognitive flexibility: ADHD, Reading, Written Expression, Math)
- Place students in partnerships or groups that will be supportive of learning differences and minimize difficulties that could arise because of social skills or other factors.

Teacher adjustment recommendations - accommodations:

- Work directly with pairs who need extra support to make progress with a task. As needed, model the necessary steps to write conditional expressions for the desired program outcomes.
- Offer students the use of text-to-speech software to read the instructions.
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, and clarify when needed.

Suggestion 3

Lesson Section: Students Materials- Self Check and Reflection and Teacher Materials – Rethink, Reflect and/or Revise

Task Description: Students read and complete several interactive exercises, and then read and respond to reflection questions where they describe their solution to a problem, how the if/else block was used to solve the problem, and why a picture isn't visible when the app is restarted. Finally, students engage in discussion to articulate the issues they encountered while modifying the Paint Pot app.

Some students may have difficulty:

- reading and comprehending the self-check and reflection questions (Reading, Language, Attention)
- recalling newly introduced vocabulary and concepts (Language)
- concentrating, particularly if they need additional time to process information and complete work (Attention)
- putting their thoughts into words (Written Expression)
- typing or hand-writing responses (Written Expression)
- putting their thoughts into words (Language)
- using socially appropriate language in communication and collaboration (Language)
- sustaining attention while classmates explain their thoughts (Attention)

Teacher adjustment recommendations – adaptations:

- As students discuss key points, provide a visual with a summary of those key points.
- Rephrase and recap student responses to emphasize essential points and to clarify information shared by students that may not be clear to their peers.
- Allow enough wait time before calling on any student so they have time to process and come up with responses.

Teacher adjustment recommendations - accommodations:

- Offer students the use of text-to-speech software to read and reread questions and explanations, and to listen to and edit their own written responses.
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, and clarify when needed.
- Provide opportunities for students to use dictation software to write their responses. Set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general classroom for students to use dictation software if needed.
- Model phrasing for students who may have difficulty translating their thoughts to language and who have difficulty retrieving the words they would like to use.

Suggestion 4

Lesson Section: Teacher Materials, Optional – Presentations

Task Description: (Optional): Students share their finished enhancements via mini presentations.

Some students may have difficulty:

- finding the correct words and phrases to articulate thoughts (Language)
- expressing their thinking in writing in a way comprehensible to others (Language)
- using socially appropriate language in communication and collaboration (Language, Attention/Social Skills)

Teacher adjustment recommendations - adaptations:

- Rephrase and recap student responses to emphasize essential points and to clarify information shared by students that may not be clear to their peers.

Teacher adjustment recommendations - accommodations:

- Honor requests from students who do not want to present, particularly if the student has verbal expression challenges. For those willing to present, provide support for practice prior to the presentation.
- Model phrasing for students who may have difficulty translating their thoughts to language and who have difficulty retrieving the words they would like to use.

Mobile CSP: 4.9 Real World Models

Suggestion 1

Lesson Section: Teacher Materials – Hook/Motivation

Task Description: Students watch videos about solar system models, and then engage in a discussion about differences between the different models.

Some students may have difficulty:

- understanding concepts in the videos conveyed only through words (Language)
- maintaining focus & attention; comprehending new information presented quickly in a video (Attention, Language)
- recalling or retrieving information (Language)
- expressing thoughts with the correct words and phrases to articulate them (Language)
- sustaining attention while classmates explain their thoughts (Attention)
- identifying and articulating key take-aways from videos (models and the elements in models) (Attention, Language)
- comprehending information and gaining knowledge from the teacher and classmates through discussion (Language)

Teacher adjustment recommendations - adaptations:

- Watch videos two times with the closed captioning enabled (*only available in Spanish for the Vimeo video*).
- Allow enough wait time before calling on any students to give them adequate time to process information and come up with their responses.
- Explicitly summarize the main points.

Teacher adjustment recommendations - accommodations: None

Suggestion 2

Lesson Section: Teacher Materials – Experiences and Explorations

Task Description: The teacher demonstrates how to use the rabbits and wolves simulation, then divides students into teams of 4, where each student takes on a POGIL role, described in the “POGIL role cards.” Before beginning the activity, students read information about the applet on the simulation website.

Some students may have difficulty:

- reading dense text in the Quality Indicators for POGIL Roles handout and in the simulation “Learner” tab (Reading, Attention)
- working effectively and efficiently in groups (e.g., contributing equally to a shared product, using socially appropriate language in communication, reading social cues, sustaining attention while partners explain their thoughts) (Language, Attention/Social Skills)
- sustaining attention in the demo and while classmates explain their thoughts (Attention)
- using socially appropriate language in communication and collaboration (Language, Attention/Social skills)
- sustaining attention while classmates explain their thoughts and comprehending the information (Attention, Language)

Teacher adjustment recommendations - adaptations:

- Place students in partnerships or groups that will be supportive of learning differences and minimize difficulties that could arise because of social skills or other factors.
- Display a simplified version of the roles and responsibilities on a discussion slide, white board, or poster as an additional place for students to view the information during the activity.

Teacher adjustment recommendations - accommodations:

- Offer students the use of text-to-speech software to read and reread the Quality Indicators for POGIL Roles sheet and the Learner tab of the simulation.
- For students who need assistance with reading the material, read it aloud and check for understanding.

Suggestion 3

Lesson Section: Student Materials – POGIL Activity for the Classroom

Task Description: Student groups start the simulation and write responses to questions about it (hypothesis, prediction, and portfolio question).

Some students may have difficulty:

- interpreting and understanding data represented in different graphs and charts (Math)
- identifying number patterns (Math)
- distinguishing between slight image, pattern, and color differences in the simulation (e.g., young rabbit vs. adult rabbit, shades of green) (Visual discrimination challenges often associated with Math and Reading disorders)
- expressing/writing thoughts with the correct words and phrases to articulate them (Language, Written Expression)
- writing down ideas quickly and accurately (Written Expression, Language)
- typing or hand-writing responses (Written Expression)

Teacher adjustment recommendations - adaptations:

- Point out the differences between the images and colors in the simulation and why they are important.
- Check for understanding of the activity questions; clarify and rephrase when needed, and define terminology.

Teacher adjustment recommendations - accommodations:

- Assist students who are having difficulty interpreting the simulation graphs and charts; provide guidance and instruction as needed.
- Work directly with groups who need additional support around the activity (forming a hypothesis, making a prediction, experimenting, and considering other options) to ensure students understand the questions that need to be answered and the process for answering those questions.
- Offer students the use of text-to-speech software to read and reread the activity questions, and to listen to and edit their own written responses, if needed.
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, clarify when needed.
- Provide opportunities for students to use dictation software to write their responses (*if each student completes their own handout*). Set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general classroom for students to use dictation software if needed.

Suggestion 4

Lesson Section: Student Materials – Reflection: For Your Portfolio

Task Description: Students answer reflection questions about models and the rabbits and wolves simulations in their portfolio.

Some students may have difficulty:

- putting their thoughts into words (Written Expression)
- typing or hand-writing responses (Written Expression)
- concentrating (especially if done at home), particularly if they need additional time to process information and complete work (Attention)

Teacher adjustment recommendations – adaptations: None

Teacher adjustment recommendations – accommodations:

- Offer students the use of text-to-speech software to listen to and edit their written responses.
- For students who need assistance with reading and comprehending the questions, read it aloud to them, check for understanding, and clarify when needed.
- Provide opportunities for students to use dictation software to write their responses. If done at school, set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general classroom for students to use dictation software if needed.

Mobile CSP: 7.6 Cryptography

Suggestion 1

Lesson Section: Teacher Materials – Hook/Motivation: Information Hiding activity and Experiences and Explorations – Part 1: Caesar Cipher Activity

Task Description: Students complete an unplugged activity to use cryptographic techniques to calculate average age. Then individually, they complete the Caesar Cipher activity, checking their results with a neighbor.

Some students may have difficulty:

- hand-writing and typing responses (Written Expression)
- writing quickly and accurately (Written Expression, Language)
- identifying number patterns and the sequence of numbers (Math)
- concentrating, particularly if they need additional time to process information and complete their unplugged activity calculation while others wait (Attention, Math)
- sustaining attention while classmates add their age in the unplugged activity (Attention, Language)

Teacher adjustment recommendations - adaptations:

- Allow enough wait time for each student to complete the required calculations and writing to contribute to the activity.
- Explicitly summarize the main points.

Teacher adjustment recommendations - accommodations:

- Honor requests from students who do not want to participate in the unplugged activity, particularly if the student experiences math-related challenges.
- Assist students who are having difficulty identifying number patterns; provide guidance and instruction as needed.
- Allow students to use calculators, if needed.

Suggestion 2

Lesson Section: Teacher Materials – Experiences and Explorations: Video or Slide Presentations

Task Description: Students learn new content and concepts presented via several pre-recorded videos or teacher-advanced PowerPoint slides about the principles of cryptography, and then engage with an interactive activity. There are four points in the lesson when students pause to view the slides or videos.

Some students may have difficulty:

- reading and understanding new vocabulary (Language)
- identifying number patterns and the sequence of numbers (Math)
- maintaining focus & attention; comprehending new information presented quickly (via video) (Attention, Language)
- identifying key take-aways (Attention, Language)

Teacher adjustment recommendations - adaptations:

- Provide a PDF handout of the key slides for students to reference while watching the videos or slide presentation, and throughout the lesson. Encourage students to take notes on the handout.
- Watch videos with the closed captioning enabled (if videos are used).
- Explicitly summarize the main points within each set of slides or video.
- Work through additional examples that illustrate the logic in cryptography ciphers, and provide clarification when necessary.

Teacher adjustment recommendations - accommodations:

- Some students may need additional one-on-one time with the instructor to understand the ciphers and how to encrypt and decrypt.

Suggestion 3

Lesson Section: Student Materials - Cipher Activities

Task Description: Students complete several interactive activities where they encode and decode messages using different ciphers and run frequency histograms.

Some students may have difficulty:

- reading and comprehending directions and questions; reading dense text (Reading, Attention)
- scanning, reading, and reviewing messages in the ciphers and the frequency analyzer tool (Reading, Attention)
- retrieving and recalling information and cryptography-related vocabulary and concepts (e.g., encrypt and decrypt, frequency analysis, and brute force attack) (Language)
- comprehending and using mathematical principles; thinking flexibly and systematically (Math)

Teacher adjustment recommendations - adaptations:

- Project activity instructions on a screen and read any complex activity directions aloud as a group.
- Create a handout for students with the instructions for each activity so that they can open the widgets in separate windows to complete work (to make it easier to focus without the busy background).

Teacher adjustment recommendations - accommodations:

- For students who need additional support, work with them through other examples that illustrate the logic behind decryption and encryption, and provide clarification when necessary. Demonstrate how each cipher works, if necessary.
- For students who need further assistance with reading and comprehending the material, read it aloud to them, check for understanding, and clarify when needed.
- Offer students the use of text-to-speech software to read the instructions.

Suggestion 4

Lesson Section: Student Materials – Self Check and Reflection

Task Description: Students read and respond to multiple-choice questions that assess their understanding of the lesson content and technical terms. Students are then asked to respond to reflection questions, where they must describe how ciphers can be broken, and then define “symmetric encryption.”

Some students may have difficulty:

- reading and comprehending the multiple-choice questions and the explanations of correct or incorrect responses (Reading, Language, Attention)
- recalling newly introduced vocabulary and concepts (Language)
- concentrating, particularly if they need additional time to process information and complete work (Attention)
- putting their thoughts into words (Written Expression)
- typing or hand-writing responses (Written Expression)

Teacher adjustment recommendations - adaptations: None

Teacher adjustment recommendations - accommodations:

- Assist students who are having difficulty answering the self-check questions because of the terminology. Help them identify where to find relevant information in the PDF handout of the slides.
- Offer students the use of text-to-speech software to read and reread questions and explanations, and to listen to and edit their own written responses.
- For students who need assistance with reading and comprehending the material, read it aloud to them, check for understanding, and clarify when needed.
- Assist students who are having difficulty putting their thoughts into words. Use cueing or modeling to assist students in making their written work clear.
- Provide opportunities for students to use dictation software to write their responses. Set aside space in a secluded corner of the room, hallway, or somewhere else outside of the general classroom for students to use dictation software if needed.