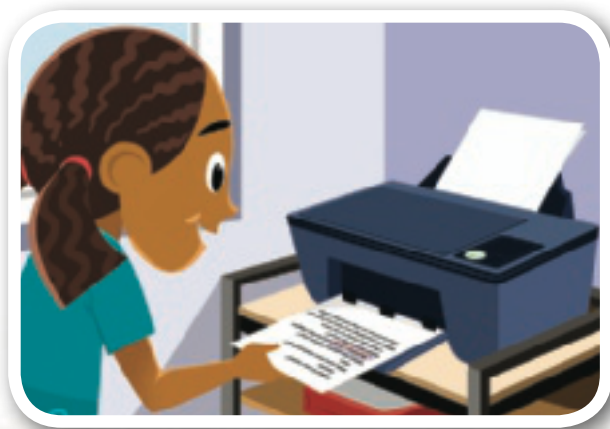


Helpful Computers



Teacher Guide

Print



Games



Homework



Helpful Computers

Teacher Guide



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Helpful Computers

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Helpful Computers

Teacher Guide

Core Knowledge Computer Science™ 1

Introduction

ABOUT THIS PROGRAM

Core Knowledge Computer Science Conceptual Approach Framework

Grade	Title and Driving Question	Emphasis is on ...	Overarching Unit Objective
K (ages 5–6)	Computers All Around Us What are computers and where can we find them?	recognizing	Identify computer devices and parts and operate them age-appropriately.
1 (ages 6–7)	Helpful Computers What can computer programs do?	using	Experience a variety of age-appropriate programs designed for different purposes.
2 (ages 7–8)	Using Computers How can we use computers and the internet?	using	Use a variety of age-appropriate programs and websites with increasing skill and independence under supervision.
3 (ages 8–9)	Codes and Computers How do programmers build computer programs?	deciphering and evaluating	Model use of symbols, codes, and steps in simple processes and problem solving.
4 (ages 9–10)	Problem-Solving and Computers What kinds of problems can we solve with computers?	deciphering and evaluating	Model solution design in increasing complexity and involving conditionals and loops.
5 (ages 10–11)	Designing Computer Programs What kinds of computer programs can I develop?	planning and designing	Write, evaluate, and debug code to execute grade-appropriate tasks.

Skills and Performance Summary

Grade K

The goal of the instruction and cumulative experiences in this unit is for young students to build a concept of what makes a thing a computer. Students think about how tools and devices can be helpful for completing tasks. Though students will not specifically study simple and compound machines in science until a later grade level,

they are able from everyday exposure to differentiate devices that need a power source and those that do not. Within the class of devices that need a power source, students can form a further classification of electronic devices—ones that do something with information that is put into the device. Upon recognizing input-processing-output characteristics of devices, students can also begin to classify and use devices for different purposes, including playing games, communicating, and doing schoolwork.

Grade 1	Building on the recognition established in the previous grade, the goal of the instruction and cumulative experiences in this unit is for young students to begin using computer devices for various purposes, including game play, communication, and schoolwork. Through practice, students understand that the operation of devices has a series of steps in common, in which users input information, the device performs a process, and then a useful output occurs. Inputs include the use of a mouse, keyboard, touchscreen, game controller, camera, and microphone. Output includes screen visuals (text, still images, video), hard-copy printout, and audio. Accessing desired outputs from computers depends first on successful operation of input devices.
Grade 2	Building on the use of devices established in the previous grade, the goal of the instruction and cumulative experiences in this unit is for young students to continue using with increasing independence computer devices for various purposes, including game play, communication, and schoolwork. With increasing practice in successfully inputting information, students can consider ways to achieve creative outputs that use and combine text, graphics, visual data displays, photos, animations, video, and audio.
Grade 3	In this grade level, the emphasis begins to shift from use—skillfully inputting information to prompt outputs—to the unseen processes inside computing technology. The goal of the instruction and cumulative experiences in this unit is for students to identify the output of every computer device as a solution to a problem and deconstruct the solution into the necessary steps required. Students discern that computers do not think on their own to solve problems but only execute step-by-step instructions that are built into them. And they begin to dissect messages into the granular parts that make them up and transmit them.
Grade 4	Building on the concepts of symbols, codes, signals, and step-by-step instructions established in the previous grade, the goal of the instruction and cumulative experiences in this unit is for students to continue articulating steps of increasingly complexity to solve problems. Beyond dissecting solutions into granular steps, students think forward in scenarios with conditional branching options (if-then statements) and loops (if-then, repeat prior instruction). Students relate what computing devices do to their programming, and they build understanding that complex computer programming is the outcome of building, layering, and chaining together links of fundamentally simple code.
Grade 5	In this grade level, the emphasis begins to shift from examination—figuring out how instructions make computing devices do what they do—to creative application of that knowledge. They step forward from the role of computer technology user into a beginning maker role. Students begin to use functional computer language to craft code for executable tasks.

Note to Teachers and Curriculum Planners

This unit introduces Grade 1 students to real-world examples and fundamental concepts related to devices that utilize computer technology. The unit includes a story-based Student Book and this Teacher Guide. The lesson sessions alternate between those focused on the Student Book and others that are interactive in nature and do not involve a Student Book chapter.

This unit can be integrated into your existing science or math curriculum. The lessons can be inserted intermittently, or the entire unit can be taught on consecutive days. The unit can also be offered as an enrichment course.

What are the relevant CSTA Concepts for this unit?*

This unit, *Helpful Computers*, has been informed by the K–12 Computer Science Standards put forth by the Computer Science Teachers Association (CSTA). The CSTA K–12 Computer Science Standards delineate a core set of learning objectives designed to provide the foundation for computer science curricula and implementation at the K–12 level. The CSTA Standards introduce fundamental concepts of computer science beginning at the elementary school level.

Online Resources



For detailed information about the CSTA references, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Grades K–2 CSTA Standards

Concepts	Subconcepts	Level 1A (ages 5–7) By the end of Grade 2, students will be able to . . .
Computing Systems	Devices	1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)
	Hardware and Software	1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware). (P7.2)
	Troubleshooting	1A-CS-03 Describe basic hardware and software problems using accurate terminology. (P6.2, P7.2)

* The K–12 Computer Science Framework, led by the Association for Computing Machinery, Code.org, Computer Science Teachers Association, Cyber Innovation Center, and National Math and Science Initiative in partnership with states and districts, informed the development of this work. Authors of the CSTA K–12 Computer Science Standards were not involved in the production of this product, and their endorsement is not implied.

Source:
Computer Science Teachers Association (2017). CSTA K–12 Computer Science Standards, Revised 2017. Retrieved from <http://www.csteachers.org/standards>.

K–12 Computer Science Framework. (2016). *Framework view by grade band*. Retrieved from <http://www.k12cs.org>

Concepts	Subconcepts	Level 1A (ages 5–7) By the end of Grade 2, students will be able to . . .
Networks and the Internet	Cybersecurity	1A-NI-04 Explain what passwords are and why we use them and use strong passwords to protect devices and information from unauthorized access. (P7.3)
Data and Analysis	Storage	1A-DA-05 Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data. (P4.2)
	Collection, Visualization, and Transformation	1A-DA-06 Collect and present the same data in various visual formats. (P7.1, P4.4)
	Inference and Models	1A-DA-07 Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions. (P4.1)
Algorithms and Programming	Algorithms	1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks. (P4.4)
	Variables	1A-AP-09 Model the way programs store and manipulate data by using numbers or other symbols to represent information. (P4.4)
	Control	1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem. (P5.2)
	Modularity	1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions. (P3.2)
	Program Development	1A-AP-12 Develop plans that describe a program’s sequence of events, goals, and expected outcomes. (P5.1, P7.2)
		1A-AP-13 Give attribution when using the ideas and creations of others while developing programs. (P7.3)
		1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. (P6.2)
Impacts of Computing	Culture	1A-IC-16 Compare how people live and work before and after the implementation or adoption of new computing technology. (P7.0)
	Social Interactions	1A-IC-17 Work respectfully and responsibly with others online. (P2.1)
	Safety, Ethics, and Law	1A-IC-18 Keep login information private, and log off of devices appropriately. (P7.3)

Integrated Practices

1. Fostering an Inclusive Computing Culture
 - 1.1 Include the unique perspectives of others . . .
 - 1.2 Address the needs of diverse end users . . .
 - 1.3 Employ self and peer-review advocacy . . .
2. Collaborating Around Computing
 - 2.1 Cultivate working relationships . . .
 - 2.2 Create team norms, expectations, and equitable workloads . . .
 - 2.3 Solicit and incorporate feedback . . .
 - 2.4 Evaluate and select technological tools . . .
3. Recognizing and Defining Computational Problems
 - 3.1 Identify complex, interdisciplinary, real-world problems . . .
 - 3.2 Decompose complex real-world problems . . .
 - 3.3 Evaluate whether it is appropriate and feasible . . .
4. Developing and Using Abstractions
 - 4.1 Extract common features . . .
 - 4.2 Evaluate existing technological functionalities . . .
 - 4.3 Create modules and develop points of interaction . . .
 - 4.4 Model phenomena and processes and simulate systems . . .
5. Creating Computational Artifacts
 - 5.1 Plan the development of a computational artifact . . .
 - 5.2 Create a computational artifact . . .
 - 5.3 Modify an existing artifact . . .
6. Testing and Refining Computational Artifacts
 - 6.1 Systematically test . . .
 - 6.2 Identify and fix errors . . .
 - 6.3 Evaluate and refine . . .
7. Communicating About Computing
 - 7.1 Select, organize, and interpret data sets . . .
 - 7.2 Describe, justify, and document computational processes . . .
 - 7.3 Articulate ideas responsibly . . .

(See *K12 Computer Science Framework* for full text of the Practices integrated into the standards.)

What Teachers Need to Know

Supportive information on the content standards and the concepts they address is provided throughout the lessons at points of relevance:

Know the Standards: These sections, found later in this Teacher Guide, explain what to teach and why, with reference to CSTA and Core Knowledge expectations.

Know the Science: These sections provide supporting, adult-level, background information or explanations related to specific computer science concepts or examples.

A Special Note to Grade 1 Teachers Before Starting This Unit

Why Study Computer Science in Kindergarten?

For many Grade 1 teachers, the suggestion that computer science should be a part of the Grade 1 curriculum may seem questionable. For many teachers, precious instructional time is devoted to teaching students reading and math fundamentals.

The study of computer science in Grade 1, however, is consistent with the Core Knowledge approach to learning. Knowledge builds upon knowledge, and computer science builds upon the foundational understanding that many devices share basic underlying technology. And that technology operates through shared processes that are simple at their core but are combined in increasingly complex ways that can produce unlimited outcomes. Grade 1 students can build on what they learned in Kindergarten: to recognize devices and describe what those devices can do. They can also consider step-by-step instructions, if-then scenarios, and simple codes that carry meaning. These building blocks promote readiness for students to put concepts together and make their own instructional codes in later elementary grades.

USING THE STUDENT BOOK

Student Book



The *Helpful Computers* Student Book includes seven chapters, intended to be read aloud by the teacher as the students look at images on each page.

As you will note when you examine the Student Book, limited text is included on each page. Instead, colorful and engaging illustrations dominate the Student Book pages. The design of the Student Book in this way is intentional because students in Kindergarten–Grade 2 are just learning to read. At these grade levels, students are learning how to decode written words, so the complexity and amount of text that these young students can actually read is quite limited.

While some advanced students may be able to read words on a given page of the Student Book, as a general rule, students should not be expected or asked to read aloud the text on the Student Book pages. The text in the Student Book is there so that teachers and parents can read it when sharing the Student Book with students.

The intent of the Grades K–2 lessons is to build students’ understanding and knowledge of computer science concepts, as well as of associated practices and skills. It is for this very reason that in Grades K–2 the core content of each lesson is reinforced to students using a teacher Read Aloud, accompanied by example images and diagrams. Cognitive science research has clearly documented that students’ listening comprehension far surpasses their reading comprehension well into the late elementary and early middle school grades. Said another way, students are able to understand and grasp far more complex ideas and text that they hear read aloud than they would ever be able to read or comprehend when they read to themselves. For a more thorough discussion of listening and reading comprehension and the underlying cognitive science research, teachers may want to refer to Appendix A of the Common Core State Standards for English Language Arts, noting in particular the Speaking and Listening section of the appendix.

Online Resources



Use this link to download the Online Resources for this unit, where the specific link to this appendix can be found:

www.coreknowledge.org/cksci-online-resources

USING THE TEACHER GUIDE

Instructional Design

The *Helpful Computers* unit is the Grade 1 installment in the elementary series. To meet CSTA Standards, we encourage teachers to complete the corresponding grade-level unit each school year. Each lesson part requires thirty to forty-five minutes of instruction time. The time it takes to complete a full lesson depends on class size and individual circumstances.

Within the Teacher Guide, each Core Lesson is generally composed of two or three parts. Each segment concludes with a Check for Understanding, providing the teacher with a quick opportunity for formative assessment. At the end of this unit Introduction, you will find a blank Pacing Guide, which you may use to plan how you might pace the lessons. We strongly recommend that you preview the unit in full before beginning. This will help you prepare your pacing guide before teaching the first lesson.

Features

The unit is composed with several integrated features that support learning for all students and development for teachers.

This Computer Science unit can be completed BOTH in classrooms that have computers and devices for students and those that do not. Look for the icons at left to indicate the types of student interactions recommended within each lesson. Pay attention to those icons most relevant to your classroom situation.

Unplugged



There are many opportunities for students to complete foundational exercises relevant to the concepts of computer science without needing access to computers. These activities are designated by the Unplugged icon.

Device-Based



Several activities and extensions do require that students work on computers, and those experiences are designated by the Device-Based icon.

Online Resources



A few activities and demonstrations recommended in this unit require the use of internet-connected devices. These experiences are indicated by the Online icon and will also include references to the Online Resources Guide for links to the recommended internet resources.

Differentiation

Adjustments to instruction appear in the text, indicated by **SUPPORT**, **EXTEND**, and **CHALLENGE** notations.

SUPPORT—Reading, writing, listening, and/or speaking alternatives appear for students who are English language learners, have special needs, or read below the grade level. Extra support is suggested for students who struggle to meet targeted expectations.

EXTEND—Extensions are suggested for students with high interest or who have already met the performance expectations.

CHALLENGE—Additional, relevant, and interesting exercises are suggested for students to explore that exercise math, reading, or science skills/comprehension that pushes beyond the grade level.

Teacher Development

Information in the instructional text, Know the Science boxes, and Know the Standards boxes is provided to support ongoing teacher development with regard to both content and the teaching process.

Monitor Progress

Opportunities for formative assessment appear throughout the instructional support. These instances are most consistently noted in a Check for Understanding that concludes each lesson segment.

The Core Lessons

- Lesson time: Each Core Lesson part constitutes one classroom session of thirty to forty-five minutes. Some activities and performance tasks will require setting aside a longer block of time.
- Lesson order: The lesson parts are coherently sequenced to build from one to the next, linking student engagement across lessons and helping students build new learning on prior knowledge.

Driving Question: What can computer programs do?		
Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.		
Lesson and Part	Title	Interaction Type and Learning Objective
Lesson 1, Part 1	Computers for Work and Play	Student Book Read Aloud: Chapter 1, "Computers for Work and Play" • Recognize that computers operate programs that make them do different things.
Lesson 1, Part 2	What Can We Use Computers to Do?	Classroom Interactive • Identify different ways computers are used for work and play.
Lesson 2, Part 1	Making a User Account	Student Book Read Aloud: Chapter 2, "Making a User Account" • Describe how to make a user account and how to protect accounts.
Lesson 2, Part 2	How Do You Create a User Profile?	Classroom Interactive • Explain how to create a user profile. • Understand the importance of keeping account login information private. • Create a username and strong password to protect private information.
Lesson 3, Part 1	Selecting from Menus	Student Book Read Aloud: Chapter 3, "Selecting from Menus" • Select and operate software to perform a task from a menu of options.
Lesson 3, Part 2	Composing an Avatar	Classroom Interactive • Understand that real-world things can be represented by symbols in a computing program. • Follow a sequence of instructions to complete tasks.
Lesson 4, Part 1	Some Types of Games	Student Book Read Aloud: Chapter 4, "Some Types of Games" • Describe the different parts of a computer to use during game play.

Lesson 4, Part 2	Steps in a Task	Classroom Interactive • Break down the choices and steps needed to complete a task. • Communicate a sequence of instructions to others. • Understand the importance of being kind and respectful when communicating online.
Lesson 5, Part 1	Typing and Clicking	Student Book Read Aloud: Chapter 5, "Typing and Clicking" • Describe different reasons to use typing and clicking on a computer.
Lesson 5, Part 2	Computers and Data	Classroom Interactive • Understand that computing devices allow information to be collected, saved, and retrieved. • Organize data in a useful way. • Create a visual representation of the data to identify patterns.
Lesson 6, Part 1	Saving Work and Reopening It	Student Book Read Aloud: Chapter 6, "Saving Work and Reopening It" • Describe how to save work and open files
Lesson 6, Part 2	What Is Debugging?	Classroom Interactive • Be aware that debugging enables computer problems to be found and fixed.
Lesson 7, Part 1	Tools for Drawing and Printing	Student Book Read Aloud: Chapter 7, "Tools for Drawing and Printing" • Identify the tools used for creating drawings and printing on a computer.
Lesson 7, Part 2	Planning and Implementing a Design	Classroom Interactive • Develop a plan for designing a project with specific goals. • Explain design decisions and steps taken to complete the design. • Give credit for ideas of others.

Activity Pages

Activity Pages



AP 2.2

AP 5.2

AP 6.2

Blackline reproducible masters for Activity Pages and an Answer Key are included in Teacher Resources at the back of the Teacher Guide. The icon shown to the left appears throughout the Teacher Guide wherever Activity Pages (AP) are referenced.

The Activity Pages can be organized into a learning portfolio for each student to demonstrate their progress relative to expectations and as student work products.

Make sufficient copies for your students in advance of each lesson.

Lesson 2, Part 2—Username and Password (AP 2.2)

Lesson 5, Part 2—Survey (AP 5.2)

Lesson 6, Part 2—Sequence (AP 6.2)

Online Resources for Science

Online Resources



For each unit, the Teacher Guide includes references to online resources (including external websites and downloadable documents) to enhance classroom instruction. Look for the icon on the left.

Use this link to download the CKSci Online Resources for this unit:

www.coreknowledge.org/cksci-online-resources

The Online Resources Guide also links to lists of additional recommended children's books that support the content of this unit.

Teaching Strategies

Start with the familiar.

Lead with an experience. Begin each lesson with a demonstration, activity, or question about a phenomenon to engage students and focus their attention on the topic. Start with the familiar. Every science topic introduced to students relates in some way to their known world and everyday experiences. The purpose of every lesson is to build a bridge between what is familiar to students and broader knowledge about the way the world works.

Ask driving questions.

Each multipart lesson contributes to the unit's Driving Question. And at the beginning of each Teacher Guide lesson segment, you will find a reminder of the Overarching Unit Objective. Each lesson activity provides an incremental concept to help students move toward the objective and ultimately be able to offer a confident answer to the Driving Question. Pose discussion questions in each class session with the Driving Question and Overarching Unit Objective in mind.

Encourage scientific thinking.	Approach the lessons with students not as learning about computer science, but as learning about the world with a scientific mind. Throughout the lessons, encourage students to ask questions about what they observe, do, and read. Record relevant questions in a prominent place in the classroom. Guide students back to these questions as opportunities to answer them emerge from readings, demonstrations, and activities.
Use continuous Core Vocabulary instruction.	During instruction, emphasize Core Vocabulary terms and their meanings in context rather than relying on isolated drill for memorization of definitions. Through scaffolded questioning, encourage students to come up with definitions in their own words and to use the words in their own sentences. Core Vocabulary words for each lesson, as well as Language of Instruction, other key terms teachers are encouraged to use in discussing topics with students, are provided at the start of each lesson. You can find Core Vocabulary and selected Language of Instruction definitions in the Glossary at the back of this Teacher Guide.
Emphasize observation and experience.	Lessons employ various ways for students to learn, including watching, listening, reading, doing, discussing, and writing.
Make frequent connections.	Use a combination of demonstrations and reading materials, rich with examples, to help students recognize how the concepts they are learning apply in their everyday lives. Prompt students to relate lesson content to their own experiences, to relate the new and unfamiliar to the familiar, and to connect ideas and examples across disciplines.
Monitor student progress.	Use verbal questioning, student work, and the Check for Understanding prompts at the end of each lesson part to monitor progress during each lesson and to measure understanding at the conclusion of the unit. Many lessons provide tips to help you support students who need further explanations or clarifications.

Effective and Safe Classroom and Online Activities

Conducting safe classroom demonstrations and activities and safe online interactions is essential to successful elementary education. The following resources, included at the back of this Teacher Guide, provide Core Knowledge's recommendations for developing effective science and computer science classroom activities:

- Internet Safety
- Student Online Safety Contract
- Strategies for Acquiring Materials

These resources may also be accessed within the CKSci Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Online Resources



MATERIALS AND EQUIPMENT

The unit requires a variety of materials to support various ways of learning (including doing, discussing, listening, watching, reading, and writing). Prepare in advance by collecting the materials and equipment needed for all the demonstrations and hands-on investigations.

- A large whiteboard, blank sheets of printer paper, student notebooks, pencils, and scissors are routinely required but not listed below.
- A classroom computer, tablet, or other computing device, as needed for discussion, is referred to in the materials for lesson segments in which it is used but is not repeated in the materials listed here. Internet access and the means to project images/videos for whole-class viewing are also required in many lesson segments but not repeated below.

Lesson 1, Part 2

- list of classroom rules

Lesson 2, Part 1

- laptop or desktop classroom computer

Lesson 3, Part 2

- clipboards or hardcover books
- tape

Lesson 4, Part 2

- chenille sticks (approx. 6 per student)
- small beads with a hole big enough to slide a chenille stick through (2 per student)

Lesson 6, Part 1

- computer and software with blank word-processing document digitally displayed for students to view

Lesson 6, Part 2

- paper clips
- stapler and staples

Lesson 7, Part 2

- classroom construction sets or blocks
- scrap materials from parents, such as shoeboxes, other small boxes, paper tubes, wallpaper, or gift wrap scraps
- blank or scrap paper—printer, construction, tissue, etc.
- glue, scissors, markers, tape, etc.

HELPFUL COMPUTERS PACING

_____’s Class

Note to Teacher: *Helpful Computers* can be taught on consecutive days as a supplemental unit to your science or math curriculum. It can also be offered as an enrichment program. If the program is implemented in consecutive thirty- to forty-five-minute class sessions, it will take sixteen days to complete.

Week 1

Day 1

Day 2

Day 3

Day 4

Day 5

--	--	--	--	--

Week 2

Day 6

Day 7

Day 8

Day 9

Day 10

--	--	--	--	--

Week 3

Day 11

Day 12

Day 13

Day 14

Day 15

--	--	--	--	--

Week 4

Day 16

--	--	--	--	--

LESSON 1, PART 1

Computers for Work and Play

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Recognize that computers operate programs that make them do different things.

Instructional Activities

- teacher Read Aloud
- whole-class discussion

CSTA Standards

Concept: Computing Systems

Subconcepts and Standards:

Devices: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)

Hardware and Software: 1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware). (P7.2)

For detailed information about the CSTA Standards, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Core Vocabulary and Language of Instruction

A Glossary at the end of this Teacher Guide lists definitions for Core Vocabulary and selected Language of Instruction.

Core Vocabulary terms are those that students should learn to use accurately in discussion. During instruction, expose students repeatedly to these terms but not through isolated drill or memorization.

computer **video game**

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

cursor **internet** **monitor** **mouse** **online**

Instructional Resources

Student Book



Ch. 1

Student Book, Chapter 1
Computers for Work
and Play

Materials and Equipment

Collect or prepare the following:

- internet access and the means to project images/video for whole-class viewing

THE CORE LESSON

1. Focus attention on today's topic.

Tell me about a time that you used a computer. What did you do on the computer? Whom did you use the computer with? Were there any rules for using the computer?

2. Read together "Computers for Work and Play."

Student Book



Ch. 1

While some students may be able to read words on a given page of the Student Book, students should not be expected or asked to read aloud the text on the Student Book pages. The text in the Student Book is there so that teachers and parents can read it when sharing the Student Book with students.

Read Aloud Support

Ask students to turn to page 2 of the Student Book and look at the image as you read aloud. Remind them that the title of this chapter is "Computers for Work and Play." Read the rest of the pages in the chapter. Before reading pages 8 and 9, tell them to pay special attention to what Hanna must do before she can play her game on the computer.

Ask students to look at the pictures on pages 2–4. Read the pages as students follow along. After reading page 4, lead a discussion about what they know about the library.

CHAPTER
1

Computers for Work and Play

Hanna brings a letter home from school.

It has a fun homework assignment!

Hanna must play some online computer games.

Later she will do a report.

She will use a computer to make her report, too.

Her report will tell about the computer games.



Hanna's letter says she should work with a grown-up.
It tells the adult how to help Hanna find the computer games.
They need to use the internet.
Hanna's dad will be her partner.
He says, "This is going to be fun!"



3

Know the Science

For students to use computers and the internet appropriately and safely, they should first build foundational knowledge regarding the ways computers and the internet work, as well as the different terms used to describe their parts and functions. This chapter helps students to develop initial understandings regarding:

- Adults should always help and supervise when we are using computers and the internet.
- Devices and the internet can be used to carry out a variety of tasks, including completing homework, writing documents, and playing games.
- There are different physical parts of computing devices that are used to input information into an electronic device.

But Hanna and Dad have a problem.
Hanna's sister, Lesia, has computer homework, too.
Lesia is using the family's computer.
Dad has an idea.
He says, "We can go to the library. The library has computers that anyone can use."



4

Ask students the following questions:

LITERAL—What is the problem that Hanna and her dad have?

» Her sister, Lesia, is using the family computer, and Hanna cannot use it.

INFERENTIAL—Why does Hanna go to the library?

» She goes to the library so she can have a computer to use for her assignment.

Ask students to look at the pictures on page 5. After reading page 5, ask students if they have ever been to a library before. Lead a discussion about what Hanna and her dad might see and do inside the library.

Hanna and Dad head to the library.
They are in luck!
There is a computer available.
Dad pulls up an extra chair.
The two sit down to get started.
But the computer screen is dark.



5

Ask students the following questions:

LITERAL—Why can't Hanna get started?

» The computer screen is dark.

INFERENTIAL—Why is the computer screen dark?

» The computer is not on or ready to use.

Ask students to look at the picture on page 6. Explain that it shows Hanna and Dad sitting at a computer station in the library. Notice that Hanna is pressing a button on the computer.

Hanna presses the button on the monitor.
Nothing happens.
Then Hanna finds the power button for the computer.
She turns the computer on.
She can hear it start to make some sounds.
Dad says now they must wait.
The computer needs time to start up.
It just takes a minute or two.



6

Ask students the following questions:

INFERENTIAL—Hanna and Dad must wait for the computer to start up. This is also called booting up. What does “booting up” mean?

» It means turning on.

LITERAL—What button does Hanna press that makes the computer turn on?

» Hanna presses the power button on the computer.

Ask students to look at the picture on page 7 as you read aloud. Discuss where you notice Hanna's right hand.

The computer screen says, "WELCOME to the Library."
A button on the screen says, "Click here for rules."
Hanna uses the mouse to move the arrow pointer on the screen.
She points the cursor at the button.
She clicks on the button on the screen.
The rules for using the library computer appear.
There are a lot of words!



Ask students the following questions:

LITERAL—How does Hanna open the screen that has the rules?

» Hanna points the cursor at the button on the screen and clicks.

LITERAL—What did Hanna use to click the button on the screen?

» Hanna used the mouse.

Ask students to look at the pictures on pages 8 and 9. Talk about what they notice on the screen in each picture.

Dad helps Hanna understand the words.
He summarizes what the rules mean.
Here is what he says:

1. Treat the equipment with respect.
2. If you go online to use the internet, only use appropriate websites.
3. If you are under age 13, access the internet only with the help of an adult.
4. Make a username and password using your library card.
5. Do not share private information.
6. Do not share passwords.



8

7. Be kind when communicating with other people online.
8. Tell an adult if someone online is mean.
9. Tell an adult if someone online asks you for private information.

Before they can continue, Hanna must click a button on the screen.
Clicking this button means that she agrees to follow the rules.



9

Ask students the following questions:

LITERAL—What are some rules for using the computers at the library?

- » Some rules for using the library computers are do not share passwords, have an adult to help you, etc.

EVALUATIVE—Why do you think rules are needed for using the computer at the library?

- » Student answers will vary but should include that the computers are a special item that should be treated with care.

Emphasize that computers are also electrical devices that require safety awareness and should be operated with adult supervision.

3. Check for understanding.

Unplugged
Activity



Show students images of desktop computers similar to the one Hanna uses in the library. Lead a whole-group discussion on naming the different parts of the desktop computer.

SUPPORT—Remind students that there are parts to a desktop computer. There is a monitor, which has the screen. The screen is where the information is displayed, and then there is a processor that actually runs the computer.

EXTEND—If you have a class computer or if students want to think about a home computer, ask them to make a list of rules that they think should be used when using the computer.

What Can We Use Computers to Do?

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Identify different ways computers are used for work and play.

Instructional Activities

- whole-class discussion
- independent activity
- paired activity

CSTA Standards

Concept: Computing Systems

Subconcepts and Standards:

Hardware and Software: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks and recognize that users have different needs and preferences for the technology they use. (P1.1)

Devices: 1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware). (P7.2)

Troubleshooting: 1A-CS-03 Describe basic hardware and software problems using accurate terminology. (P6.2, P7.2)

For detailed information about the CSTA Standards, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

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computer device technology

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

component hardware program software

Materials and Equipment

Collect or prepare the following:

- internet access and the means to project images/video for whole-class viewing
- list of classroom rules
- markers, crayons, or colored pencils

Advance Preparation

- none

THE CORE LESSON

1. Focus attention on today's topic.

How are computers helpful for schoolwork and jobs? Discuss how computing technology has changed over time with students. Ask them how their parents would have done a report for school. What about their grandparents? Ask them if they have ever seen a typewriter. What types of games did their parents and grandparents play then, and what types of games do students play now? Computer devices can be used to help us with many things for school, work, and play. And the internet helps us to do research and communicate with one another easily.

Ask students if they have ever used a computer or the internet. What type of devices have they used? Reiterate that no matter what the device, it is important to treat computer equipment with respect and use the internet safely and respectfully.

2. Facilitate the activity.

Unplugged
Activity



1. Lead a discussion on the importance of rules. Highlight safety as one reason we need rules.
2. Have students name some of the classroom rules that are followed each day. List the responses on the board or project them on a central screen for the whole class.
3. Project the actual classroom rules.
4. Discuss reasons for classroom rules.
5. Have students individually draw or write about a safety rule they follow each day. The safety rule can be at school, home, or another location.

3. Check for understanding.

Unplugged
Activity



Partner students, and tell them to share their drawing or text of the safety rule they follow each day. Have them compare what is the same and different with the safety rules they shared. Why are the safety rules important?

Know the Standards

TEACHER DEVELOPMENT

1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. People use computing devices to perform a variety of tasks accurately and quickly. Students should be able to select the appropriate app/program to use for tasks they are required to complete. For example, if students are asked to draw a picture, they should be able to open and use a drawing app/program to complete this task, or if they are asked to create a presentation, they should be able to open and use presentation software.

1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware). When communicating about computing devices, it is important to describe basic hardware and software components with accurate terminology. Hardware components of a computer system can include desktop computers, laptop computers, CPUs, tablet devices, monitors, keyboards, mice, speakers, and printers. A wide variety of software applications can be used to perform required tasks based on the needs of the user. Common software types include word processors, spreadsheets, presentation software, databases, drawing programs, social media, and web browsers.

1A-CS-03 Describe basic hardware and software problems using accurate terminology. A computing system is composed of hardware and software. Hardware consists of physical components. Students should be able to identify and describe the function of external hardware, such as desktop computers, laptop computers, tablet devices, monitors, keyboards, mice, and printers, and potential problems with the hardware.

1A-IC-16 Compare how people live and work before and after the implementation or adoption of new computing technology. Computing technology has positively and negatively changed the way people live and work. In the past, if students wanted to read about a topic, they needed access to a library to find a book about it. Today, students can view and read information on the internet about a topic, or they can download e-books about it directly to a device. Such information may be available in more than one language and could be read to a student, allowing for great accessibility.

LESSON 2, PART 1

Making a User Account

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Describe how to make a user account and how to protect accounts.

Instructional Activities

- teacher Read Aloud
- whole-class discussion

CSTA Standards

Concept:

- Computing Systems
- Networks and the Internet
- Impacts of Computing

Subconcepts and Standards:

Devices: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)

Cybersecurity: 1A-NI-04 Explain what passwords are, and use strong passwords to protect devices and information from unauthorized access. (P7.3)

Safety, Law, and Ethics: 1A-IC-18 Keep login information private, and log off of devices appropriately. (P7.3)

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password **username**

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

cursor **icon** **log in** **screen** **website** **window**

Instructional Resources

Student Book



Ch. 2

Student Book, Chapter 2
Making a User Account

Materials and Equipment

Collect or prepare the following:

- internet access and the means to project images/video for whole-class viewing
- laptop or desktop classroom computer (on a login screen)
- a digital or chart paper document that has rules to follow (some true and some not) and two columns that say “true”/“not true”

THE CORE LESSON

1. Focus attention on today’s topic.

Turn your computer off in preparation for this lesson, and turn it on for students so that it leaves your login screen waiting. Have students watch, telling them you need to log in to your computer. Ask them, “What do I type in this box?” (pointing to the username), and take student responses. Then ask them what goes in the next box (pointing to the password), and take student responses.

2. Read together “Making a User Account.”

Student Book



Ch. 2

While some students may be able to read words on a given page of the Student Book, students should not be expected or asked to read aloud the text on the Student Book pages. The text in the Student Book is there so that teachers and parents can read it when sharing the Student Book with students.

Ask students to turn to page 10 of the Student Book and look at the image as you read aloud. Remind them that the title of this chapter is “Making a User Account,” and tell them to pay special attention to the process that Hanna must follow before she can play the online game.

Page 10

Ask students to look at the picture on page 10. Talk about what they notice on the screen.

CHAPTER
2

Making a User Account

Hanna and Dad are at the library.
They are using the computer there.
Now Hanna needs to make her user account.
There are boxes on the screen for Hanna to type into.
First, she enters the number from her library card.
Then she needs to make up a user name.
This is a name that she will use whenever she signs in
to use the library computer.
It is not her real name.
Hanna’s real name is private information.



10

Ask students the following questions:

LITERAL—What is a username?

- » A username is a name that Hanna makes up that she will use to login into the computer whenever she is at the library.

EVALUATIVE—Tell me something that is private information.

- » Students may come up with additional responses but should include that Hanna’s real name is private information.

Ask students to look at the pictures on page 11. Talk about how this screen is different from the screen on page 10.

Next, Hanna needs to make up a password.
She will need to enter the password whenever she uses the library computer.
Hanna needs to keep her password private.
That way, other people can't pretend to be her on the computer.
Dad is the only other person who knows her password.



11

Ask students the following questions:

LITERAL—Why does Hanna need to keep her password private?

» So other people can't pretend to be her on the computer.

INFERENTIAL—Besides Dad, is there anyone else Hanna might safely share her password with?

» She might share her password with other caretakers, like her mom, that take her to the library.

Ask students to look at the pictures on page 12. Ask students to describe what they notice on the screen. Ask what they think the magnifying glass is used for.

Hanna has made her account to use the library computer.
Now she is ready to start her homework.
The letter from school tells how to find the game website.
The computer screen shows a small box to type into.
The box contains a little picture of a magnifying glass.
It is the icon for searching.



12

Ask students the following questions:

LITERAL—What is the little picture of a magnifying glass?

» It is the icon for searching.

INFERENTIAL—When might you search for something on a computer?

» When you are looking for websites or information.

Ask students to look at the pictures on page 13. Talk about what they notice on the screen.

Hanna types “public TV games” into the search window.
Then, she presses the “return” key.
The screen changes.
It shows a list of websites that match what Hanna typed into the search box.



13

Ask students the following questions:

LITERAL—What words did Hannah type in? What were the results?

» Hanna typed in the words “public TV games” and she got a list of websites.

EVALUATIVE—How does the search box work?

» You write words into the box, press return, and it lists websites that match the search words.

Ask students to look at the picture on page 14. Explain that it shows the results of her search of “public TV games.”

Hanna uses the mouse to move the cursor around on the screen.

Underlines appear under some of the words.

Those are called links.

Clicking on a link takes a user to another website on the internet.

Hanna looks at the link at the top of the list.

This is the website with the games Hanna’s teacher wants her to play.

She clicks on the link.

The screen changes again.



14

Ask students the following questions:

LITERAL—Hanna sees that some words are underlined. Why do underlines appear under some of the words?

» Underlines appear under the words because they are links.

LITERAL—What happens when you click on a link?

» When you click on a link, it takes you to another website on the internet.

Ask students to look at the pictures on page 15. Discuss that links take you to websites on the internet. Ask students to share different websites they have visited.

Now the screen looks familiar!
This is the website for the TV channel that Hanna watches often.
The TV channel shows many kids' programs.
She recognizes pictures of some of her favorite TV characters.
This website has games for kids to play.



15

Ask students the following questions:

LITERAL—Describe the website that Hanna is using.

- » It is a website for a TV channel that shows kids' programs. It has games for kids to play.

Remind students that when clicking on links, it is important to always have an adult with them. We do not always know the websites that links take us to, so adults can help make sure we are only clicking on links that are safe.

Ask students to look at the picture on page 16 as you read aloud. Discuss that sometimes websites ask you to create a username and password but that this is something you should do with the help of an adult.

First, Hanna must sign in to the website.
 She needs to enter her user name and password.
 But Hanna does not have an account for this website.
 She needs to make one.
 Hanna just made a new library account, so she knows how!



16

Ask students the following questions:

LITERAL—What does Hanna need to do to use the website?

» She has to log in by entering her username and password.

EVALUATIVE—What do you remember about how to make a username or password?

» The username should not be your real name, and the password should be kept private.

Ask students to look at the picture on page 17. Talk about what they notice about how the password is displayed in the picture. It has many * symbols because the password is intended to be private, which means secret.

Hanna makes up a user name.
It is not her real name.
Then she makes up a password.
The password has letters and numbers.
It also has a symbol.
The password is not easy to guess.
Now Hanna can log in to play the games on the website.



17

Ask students the following questions:

LITERAL—What does the password she make up have?

» It has letters, numbers, and a symbol.

EVALUATIVE—Why do you think it is important for passwords to be private?

» Student answers will vary but should include that passwords are meant to be information just for the user.

3. Check for understanding.

Unplugged
Activity



Digitally or on chart paper, display a list of rules (some true and some not) that students should follow when using a computer. Then guide students through sorting the rules into true or not true categories.

EXTEND—Have students imagine they are going to log in to an online game. Teach them to create appropriate usernames, and then teach them how to create a password. Remind them that they can tell their friends their usernames, but they should not share their passwords with each other.

How Do You Create a User Profile?

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objectives

- ✓ Explain how to create a user profile.
- ✓ Understand the importance of keeping account login information private.
- ✓ Create a username and strong password to protect private information.

Instructional Activities

- whole-class discussion
- whole-class activity

CSTA Standards

Concepts:

- Computer Systems
- Networks and the Internet
- Impacts of Computing

Subconcepts and Standards:

Devices: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use.

Cybersecurity: 1A-NI-04 Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access.

Safety, Law, and Ethics: 1A-IC-18 Keep login information private, and log off of devices appropriately.

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internet password username

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

link log in protect secure

Materials and Equipment

Collect or prepare the following:

Activity Page



AP 2.2

Activity Page 2.2

Username and Password (AP 2.2)

Advance Preparation

- Make copies of AP 2.2 for each student.

THE CORE LESSON

1. Focus attention on today's topic.

We can do work and play games on computer devices. When we have to stop, we can return to them at a later time at the same place we left off. To do that, the program needs to remember who we are. Ask students how a computer can remember who they are.

We need to set up an account specific to us. Ask students if anyone has ever created an account before. If so, ask why it is important to keep the information you enter into the computer very private. Remind them that we do not want anyone else getting into our account, as it may contain private information, such as our name or contact information. We protect our account with a username and a strong password—which we do not share with anyone except for parents. A strong password contains different characters, such as numbers, letters, and symbols. It is not too short, and it does not contain our real name.

Also, it is important to always log off when we are through playing so no one can pretend to be us on the computer and access our information.

2. Facilitate the activity.

Activity Page



AP 2.2

Unplugged
Activity



1. If possible, project a copy of AP 2.2 as you lead the activity for students.
2. Read the following prompts to students:
 - The students want to use their computer devices to play games and activities. Can you help them open the correct app?
 - John Miller wants to play a maze game. Draw a line from John's device to the correct app.
 - Paulo Rodriguez wants to read books. Draw a line from Paulo's device to the correct app.
 - Irene Lin wants to play a math game. Which app should she choose?
 - Nyema Forth wants to draw and paint. Select the best app for her.
3. Next, read the following to students:
 - Each student needs to create an account to use their app. Can you help them make sure their usernames and passwords are private, and their passwords are strong? Circle the usernames that are private and passwords that are strong.
 - Now create private usernames and stronger passwords for each student.

3. Check for understanding.

Unplugged
Activity



Ask for a volunteer to come up to the whiteboard and write revised usernames and passwords for each student. Lead a discussion about which usernames are private and not private, which passwords are strong or not strong, and why. Discuss how they could be better by being longer, using more types of characters, having less connection to the user's real name, etc.

EXTEND—Ask students to create an original student account with their own app preference and strong username and password.

Know the Standards

TEACHER DEVELOPMENT

1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. People use computing devices to perform a variety of tasks accurately and quickly. Students should be able to select the appropriate app/program to use for tasks they are required to complete. For example, if students are asked to draw a picture, they should be able to open and use a drawing app/program to complete this task, or if they are asked to create a presentation, they should be able to open and use presentation software.

1A-NI-04 Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access. Learning to protect one's device or information from unwanted use by others is an essential first step in learning about cybersecurity. Students are not required to use multiple strong passwords. They should appropriately use and protect the passwords they are required to use.

1A-IC-18 Keep login information private, and log off of devices appropriately. People use computing technology in ways that can help or hurt themselves or others. Harmful behaviors, such as sharing private information and leaving public devices logged in, should be recognized and avoided.

Selecting from Menus

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Select and operate software to perform a task from a menu of options.

Instructional Activities

- teacher Read Aloud
- whole-class discussion

CSTA Standards

Concept: Computing Systems

Subconcepts and Standards:

Devices: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)

Cybersecurity: 1A-NI-04 Explain what passwords are, and use strong passwords to protect devices and information from unauthorized access. (P7.3)

Safety, Law, and Ethics: 1A-IC-18 Keep login information private, and log off of devices appropriately. (P7.3)

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click cursor scroll

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game menu mouse slide

Instructional Resource

Student Book



Ch. 3

Student Book, Chapter 3
Selecting from Menus

Materials and Equipment

Collect or prepare the following:

- internet access and the means to project images/video for whole-class viewing
- blank paper
- markers, crayons, colored pencils

THE CORE LESSON

1. Focus attention on today's topic.

Ask students, when you go to a restaurant, how do you know what to order? (Pause for answers.) Computer games and other activities on a computer also contain menus. Menus show options for the user.

2. Read together "Selecting from Menus."

Student Book



Ch. 3

While some students may be able to read words on a given page of the Student Book, students should not be expected or asked to read aloud the text on the Student Book pages. The text in the Student Book is there so that teachers and parents can read it when sharing the Student Book with students.

Read Aloud Support

Ask students to turn to page 18 of the Student Book and look at the image as you read aloud. Remind them that the title of this chapter is "Selecting from Menus," and tell them to pay special attention the options Hanna has for the games she wants to play.

Ask students to look at the pictures on pages 18 and 19. Talk about what they notice about the character on page 19.

CHAPTER 3

Selecting from Menus

Hanna has made an account to play online games.
Next, she does something really fun.
She makes an avatar.
An avatar is like a cartoon character.
It goes with Hanna's user name.
When Hanna plays a game on the site, she appears as the character.



18

Hanna makes choices to design her avatar.
She points the cursor to objects on the screen and clicks on them.
She chooses a skin color.
She chooses what the hair and eyes look like.
She chooses clothes and shoes.



19

Ask students the following questions:

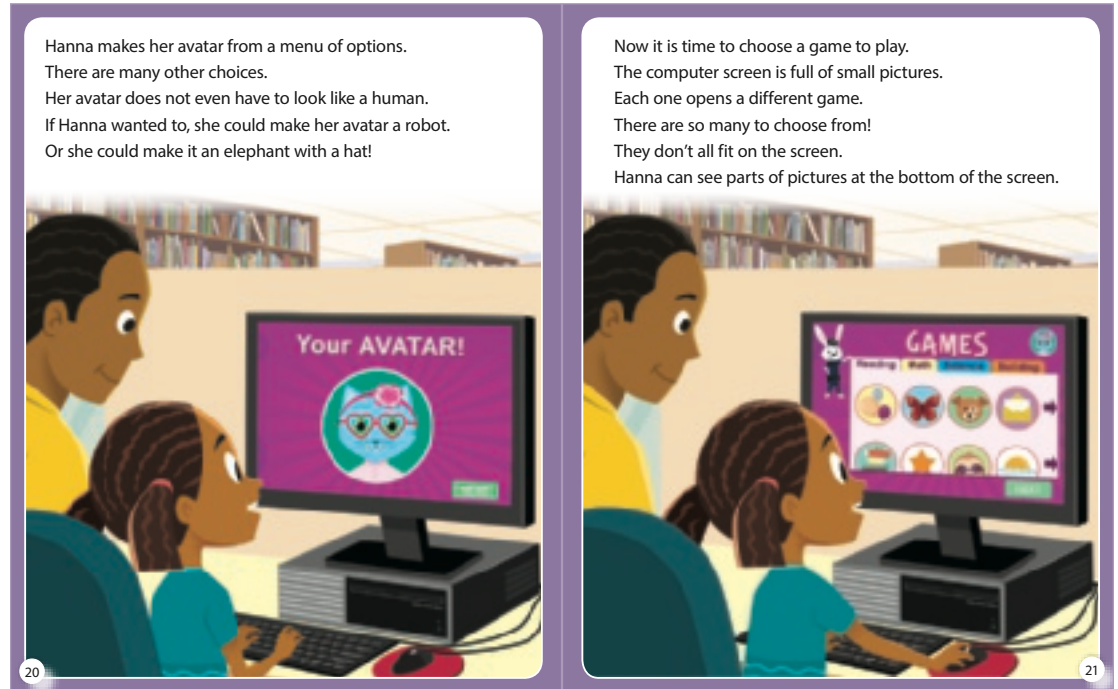
LITERAL—What is an avatar?

- » An avatar is like a cartoon character that acts like Hanna when she plays a game.

LITERAL—What are the things Hanna can choose for her character?

- » She can pick the skin color, hair color, eye color, clothes, and shoes.

Ask students to look at the pictures on pages 20 and 21. Explain that they show the many options you can make when you are playing an online game.



Ask students the following questions:

LITERAL—How does Hanna create her avatar?

» She uses the menu of options.

LITERAL—What opens on the screen when it is time to choose a game to play?

» The computer screen becomes full of small pictures.

Ask students to look at the picture on page 22 as you read aloud. Discuss how websites can organize their games into different menus. In this setup, you might notice that there are arrows letting you know there are more games if you scroll over.

Hanna sees an arrow at the side of the screen.
 She clicks on the arrow.
 The contents of the screen slide off the screen.
 And new pictures slide into view.
 Hanna continues scrolling to the side until she sees all the pictures.
 She scrolls down to see even more.
 Which game will she choose first?



22

Ask students the following questions:

LITERAL—How does Hanna get the games she cannot see to slide into her view?

» She clicks on an arrow, and new pictures slide into view.

INFERENTIAL—What kind of games might you see on the first screen compared to the ones on the screens you can't see?

» The games you might not be able to see are ones that you might have to pay for or maybe are more difficult to use. They also might be in order of which ones are played more often.

Ask students to look at the picture on page 23. Talk about what they notice about the options for this website.

Dad draws Hanna's attention to the top of the screen.
There are colored tabs there.
So far, Hanna has only scrolled through the games on the "Reading" tab.
She clicks on the "Math" tab and sees more game pictures.
Then, she clicks on the "Science" tab and sees even more.
Last, Hanna clicks on the "Building" tab.
She wants to choose a building game.



23

Ask students the following questions:

LITERAL—What tabs are available for Hanna to choose from?

- » The tabs that Hanna can choose from are reading, math, science, and building.

INFERENTIAL—What is a tab?

- » A tab is like a second page that can be opened in a website.

3. Check for understanding.

Unplugged
Activity



Give students paper so that they can draw and create their own avatar. If you have access to an online program, you may have students create an online avatar.

LESSON 3, PART 2

Composing an Avatar

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objectives

- ✓ Understand that real-world things can be represented by symbols in a computing program.
- ✓ Follow a sequence of instructions to complete tasks.

Instructional Activities

- whole-class discussion
- whole-class activity

CSTA Standards

Concept: Algorithms and Programming

Subconcepts and Standards:

Algorithms: 1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.

Variables: 1A-AP-09 Model the way programs store and manipulate data by using numbers or other symbols to represent information.

For detailed information about the CSTA Standards, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Core Vocabulary and Language of Instruction

A Glossary at the end of this Teacher Guide lists definitions for Core Vocabulary and selected Language of Instruction.

Core Vocabulary terms are those that students should learn to use accurately in discussion. During instruction, expose students repeatedly to these terms but not through isolated drill or memorization.

avatar **steps** **symbol**

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

algorithm **instructions** **represent** **sequence**

Materials and Equipment

Collect or prepare the following:

- large whiteboard
- large stack of blank paper
- crayons, markers, or colored pencils
- clipboards or hardcover books
- tape

Advance Preparation

- Set out crayons, markers, or colored pencils.
- Set out a stack of clipboards or hardcover books for students to set paper on as they write during the gallery walk.
- Draw a paper-shaped rectangle on the whiteboard in a vertical orientation.

THE CORE LESSON

1. Focus attention on today's topic.

How do you create a computer avatar? Ask students if they think it would be fun to climb inside a computer and play the games themselves.

Since they cannot be inside the computer, tell students they can use symbols called avatars to represent themselves on the screen.

2. Facilitate the activity.

Unplugged
Activity



1. Hand out a blank sheet of paper to each student. Tell them they will be drawing their own unique "Stick-Avatar." If students drew an avatar in Lesson 3 Part 1, they can choose to use these avatars.
2. Ask them to not to put their name on the page, as they will be guessing whose avatar is whose.
3. Using a whiteboard or a sheet of paper, demonstrate where to draw an approximately 2-inch-wide circle about a third of the way down the page.
4. Attach a stick "body" connected to the head that is about 4–5 inches long.

5. Then hide the sheet or erase the whiteboard, and tell students they need to carefully follow the step-by-step instructions verbally.
 - a. Draw two arms on your stick person.
 - b. Draw two legs on your stick person.
 - c. Draw hair on your stick person.
 - d. Draw something on your stick person's head (hat, bow, sunglasses, etc.).
 - e. Draw eyes on your stick person.
 - f. Draw a mouth on your stick person.
 - g. Draw a nose on your stick person.
 - h. Draw shoes on your stick person.
 - i. Draw hands on your stick person.
6. When all steps are finished, instruct students to color and add detail as they wish to complete their stick person. Encourage them to add favorite items in their stick person's hands or backgrounds that are personally relevant.
7. Students turn in their final stick person to you. In no order, number the pages in the bottom corner.
8. Tape the sheets on the whiteboard or around the room in a gallery walk. Students roam the gallery silently. On another blank sheet of paper, they list the number and make a guess of whose avatar it is by writing their classmates' names next to each number using best-guess spelling.

3. Check for understanding.

Unplugged
Activity



Regroup and lead a class discussion revealing the identity of each avatar. Ask students to discuss why not all of the avatars are exactly the same, even though the same initial steps were followed exactly by everyone. Ask students why they thought each avatar belonged to a particular student. What were the identifying features that represented their stick person?

Know the Standards

TEACHER DEVELOPMENT

1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks. Composition is the combination of smaller tasks into more complex tasks. Students could create and follow algorithms for making simple foods, brushing their teeth, getting ready for school, or participating in cleanup time.

1A-AP-09 Model the way programs store and manipulate data by using numbers or other symbols to represent information. Information in the real world can be represented in computer programs. Students could use thumbs up/down as representations of yes/no, use arrows when writing algorithms to represent direction, or encode and decode words using numbers, pictographs, or other symbols to represent letters or words.

LESSON 4, PART 1

Some Types of Games

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Describe the different parts of a computer to use during game play.

Instructional Activities

- teacher Read Aloud
- whole-class discussion

CSTA Standards

Concepts:

- Computing devices
- Networks and the Internet
- Impacts of Computing

Subconcepts and Standards:

Devices: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)

Cybersecurity: 1A-NI-04 Explain what passwords are and use strong passwords to protect devices and information from unauthorized access. (P7.3)

Safety, Law, and Ethics: 1A-IC-18 Keep login information private, and log off of devices appropriately. (P7.3)

Social Interactions: 1A-IC-17 Work respectfully and responsibly with others online. (P2.1)

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keyboard mouse screen

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click drag and drop enter menu save slide

Instructional Resource

Student Book



Ch. 4

Student Book, Chapter 4
Some Types of Games

Materials and Equipment

Collect or prepare the following:

- internet access and the means to project images/video for whole-class viewing

THE CORE LESSON

1. Focus attention on today's topic.

There are many options and websites for playing games online. Have you ever played an online game? Tell me what kind of game it was and how it's played.

2. Read together "Some Types of Games."

Student Book



Ch. 4

While some students may be able to read words on a given page of the Student Book, students should not be expected or asked to read aloud the text on the Student Book pages. The text in the Student Book is there so that teachers and parents can read it when sharing the Student Book with students.

Read Aloud Support

Ask students to turn to page 24 of the Student Book and look at the image on pages 24 as you read aloud. Remind them that the title of this chapter is "Some Types of Games," and tell them to pay special attention to the games that Hanna plays as you read.

Ask students to look at the picture on pages 24 and 25. Talk about what they notice about what is on the screen.

CHAPTER 4 Some Types of Games Hanna is using a computer at the library. She looks at pictures for games on the screen. She points the cursor to a game picture. The game is called "Building a Farm." She clicks the mouse and the game opens. She is happy to see her avatar standing in the game!	Hanna builds a home for her avatar. She puts windows and doors in it. She chooses rugs and furniture. Outside, she builds a fence and a barn. She chooses trees and bushes. She plants a garden. She selects animals to live on her farm.
24	25



Ask students the following questions:

LITERAL—Describe how Hanna is using the computer

- » She is looking at pictures for games, pointing the cursor, clicking the mouse to open the game.

LITERAL—What are some choices Hanna made while playing the game?

- » She chose to put windows and doors, rugs and furniture in the home. She chose to put a fence, a barn, have trees, bushes, and a garden and animals outside the farm.

Ask students to look at the picture on page 26. Ask students to guess what Hanna will do next in this part of the game.

Hanna makes all her choices from menus in the game.
Each menu has pictures to choose from.
She drags her choices from the menus to the building space.
To drag an object, Hanna holds the mouse button down while she slides the mouse.
To drop the object in her building space, she releases the mouse button.



26

Ask students the following questions:

LITERAL—Where does Hanna make all of her choices in the game?

» She makes all her choices from the menus in the game.

LITERAL—How does Hanna get her choices from the menus to the building space?

» She drags the object from the menu and then drops it into her building space.

Ask students to look at the pictures on page 27. Talk about what they notice on the screen.

Next, Hanna wants to play a sorting game.
But she will want to keep building in this game later.
She wants to save what she has done so far.
She clicks on the SAVE button at the bottom of the game screen.
Then she clicks on the EXIT button.
She is back at the screen with the menu of all the games.



Ask students the following questions:

LITERAL—What buttons does Hanna push?

» She pushes the SAVE and EXIT buttons.

EVALUATIVE—What does the SAVE button do?

» It saves her work so she can continue her work again later.

Ask students to look at the picture on page 28. Explain that it shows where the arrow keys are located on the keyboard.

Hanna clicks on a new game picture.
It opens a game called "Sorting Veggies."
Her avatar appears in this game, too!
Hanna guides her avatar around the screen.
She uses the arrow keys on the keyboard to move.
She makes her avatar walk up and down on the screen.
She also makes her avatar walk to the left and right.



Ask students the following questions:

LITERAL—Hanna uses the arrow keys to move her avatar. Which ways does her avatar move?

» It moves up and down and left and right.

INFERENTIAL—Imagine Hanna were playing a different game. Would that change the ways her avatar could move?

» No, the arrow keys only move things up, down, left, or right.

Ask students to look at the pictures on page 29. Ask students to describe how they think Hannah is feeling and what she might do in the game.



Ask students the following questions:

LITERAL—What is Hannah moving on the screen?

» She is moving the vegetables and sorting them.

EVALUATIVE—What do you think it means to “drag and drop” something?

» It means to click on something with the mouse and move it to another place on the screen.

Ask students to look at the picture on page 30. Talk about what they see in the image.

A timer keeps track for one minute.
At the end of the minute, the game is over.
Hanna gets points for the items she sorted.
Her score appears on the screen.
Hanna saves her score.
Maybe she can beat it the next time she plays.



Ask students the following questions:

LITERAL—How does Hanna know when her time is up in the game?

» A timer keeps track of how long Hanna has been playing the game.

LITERAL—What did Hanna make sure she did before leaving the game?

» She clicked on the SAVE button at the bottom of the game screen.

Ask students to look at the pictures on page. 31 Explain that the screen is showing the avatars of two players, and they are talking to each other.

Hanna can also see the scores of other players.
 She can see their avatars.
 It is like playing a game with friends.
 But they are not in the same room.
 The players can send each other messages.
 Hanna clicks on the player with the best score.
 Then she clicks on the “comment” button.
 She types “Great job!” in the window.
 Then she taps the “return” key.
 A reply comes right back to her.
 The player replies, “Thanks!”



31

Ask students the following questions:

INFERENTIAL—How is this like playing a game with friends?

» Text text text

LITERAL—Describe the buttons Hannah pressed in order to talk to other players.

3. Check for understanding.

Unplugged
Activity



Ask students to turn and talk with a partner and tell how the two games that Hanna played were alike and how they were different. Then ask each pair to share what they talked about.

EXTEND—Offer students a chance to go to your computer lab or classroom computer and practice playing a game and saving it.

ALERT—Remind students that when playing games online, they should not engage in talking with people they don't know in real life.

LESSON 4, PART 2

Steps in a Task

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objectives

- ✓ Break down the choices and steps needed to complete a task.
- ✓ Communicate a sequence of instructions to others.
- ✓ Understand the importance of being kind and respectful when communicating online.

Instructional Activities

- independent activity
- partner activity
- whole-class discussion

CSTA Standards

Concept:

- Algorithms and Programming
- Impacts of Computing

Subconcepts and Standards:

Control: 1A-AP-10 Develop programs with sequences and simple loops to express ideas or address a problem.

Modularity: 1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.

Social Interaction: 1A-IC-17 Work respectfully and responsibly with others online.

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break down online step-by-step

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

decompose digital citizenship menu respectful sequence

Materials and Equipment

Collect or prepare the following:

- large whiteboard
- chenille sticks (approx. 6 per student)
- small beads with a hole big enough to slide a chenille stick through (2 per student)

Advance Preparation

- Draw three large boxes on the whiteboard. Label them Color, Eye Color, and Position.
- In the Color box, list all of the colors of chenille sticks available.
- In the Eye Color box, list all of the options for eye color available. Refer to the colors of the beads to make the list.
- In the position box, list options for students to position their stick person: standing, kneeling, crawling, downward dog, or plank.
- Set out the piles of chenille sticks and beads for students.

THE CORE LESSON

1. Focus attention on today’s topic.

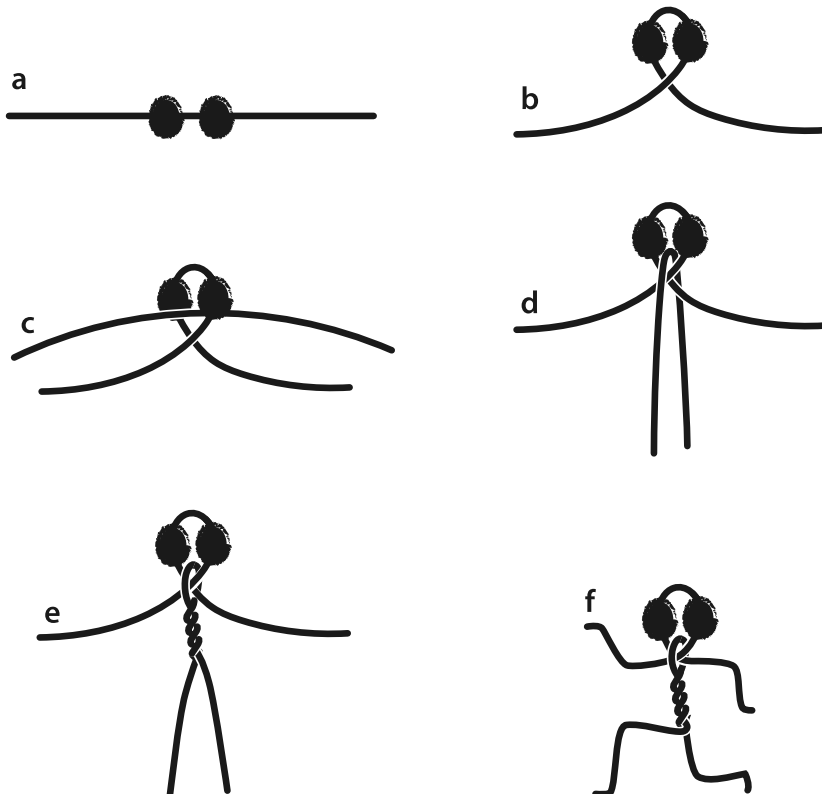
How do you break down steps to complete and communicate a task? If we want to build something, we need to make the right choices and break down the steps to get it done, especially when we need to communicate those steps to others. Ask students if they have ever taught a friend or family member to do something—a sports move, a craft, using a remote control, etc. Was it important that the instructions were clear and in the correct order? Remind them of the importance of being kind, positive, and respectful when we communicate with others—whether in person or online.

2. Facilitate the activity.

Unplugged
Activity



1. Instruct students that they will be making selections to create their own unique stick person and design an action for them. Then, use their stick person to teach another student how they can make their stick person do the action.
2. Discuss the chenille stick and eye color options.
3. Students come up to choose their chenille sticks and beads and then return to their desks.
4. Using the images shown, demonstrate each step of the stick person creation, with students following along. Ideally the images are only for your use. Let students visualize their own stick person as you talk them through the steps.
 - a. Slide two beads onto a chenille stick for the eyes.
 - b. Loop the chenille stick.
 - c. Stick the second chenille stick through the loop.
 - d. Bend the ends down of the second chenille stick.
 - e. Twist the ends of the second chenille stick.
 - f. Bend the ends of both chenille sticks for hands and feet.
5. After completing the steps needed to create their basic stickperson, students work independently to choose and form an action for their stickperson. They should be thinking of the steps needed to teach the action to another student so that student can have their stick person do the action.



6. Place students into pairs. Without revealing their original stick person action, each student takes a turn verbally directing their partner through each step in creating the action for their stick person. The pairs switch roles and create the other partner's stickperson action with verbal instructions.

3. Check for understanding.

Unplugged
Activity



Regroup the class, and ask students to share their challenges and successes guiding each other through a step-by-step process. How did they change their directions if their partner did not get the action correct?

CHALLENGE—Challenge students to design other chenille stick creatures, such as a dog, cat, or fish. Can they guide a partner through the steps needed to create their new chenille stick creature?

Know the Standards

TEACHER DEVELOPMENT

1A-AP-10 Develop programs with sequences and simple loops to express ideas or address a problem. Programming is used as a tool to create products that reflect a wide range of interests. Control structures specify the order in which instructions are executed within a program. Sequences are the order of instructions in a program. For example, if dialogue is not sequenced correctly when programming a simple animated story, the story will not make sense. If the commands to program a robot are not in the correct order, the robot will not complete the task desired. Loops allow for the repetition of a sequence of code multiple times. For example, in a program to show the life cycle of a butterfly, a loop could be combined with move commands to allow continual but controlled movement of the character.

1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions. Decomposition is the act of breaking down tasks into simpler tasks. Students could break down the steps needed to make a peanut butter and jelly sandwich, to brush their teeth, to draw a shape, to move a character across the screen, or to solve a level of a coding app.

1A-IC-17 Work respectfully and responsibly with others online. Online communication facilitates positive interactions, such as sharing ideas with many people, but the public and anonymous nature of online communication also allows intimidating and inappropriate behavior in the form of cyberbullying. Students could share their work on blogs or in other collaborative spaces online, taking care to avoid sharing information that is inappropriate or that could personally identify them to others. Students could provide feedback to others on their work in a kind and respectful manner and could tell an adult if others are sharing things they should not share or are treating others in an unkind or disrespectful manner on online collaborative spaces.

LESSON 5, PART 1

Typing and Clicking

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Describe different reasons to use typing and clicking on a computer.

Instructional Activities

- teacher Read Aloud
- whole-class discussion

CSTA Standards

Concept: Computing devices

Subconcept and Standard: Devices: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)

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click cursor type

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icon keyboard mouse program scroll

Instructional Resource

Student Book



Ch. 5

Student Book, Chapter 5 Typing and Clicking

Materials and Equipment

Collect or prepare the following:

- internet access and the means to project images/video for whole-class viewing

Advance Preparation

Create a short survey that asks students to select their favorite vegetable, fruit, and dessert.

THE CORE LESSON

1. Focus attention on today's topic.

Think about when you have seen someone using a computer. What did you notice about how they used the keyboard? (Pause for answers.) Guide students to recognize that people use the keyboard to type information into the computer.

2. Read together "Typing and Clicking."

Student Book



Ch. 5

While some students may be able to read words on a given page of the Student Book, students should not be expected or asked to read aloud the text on the Student Book pages. The text in the Student Book is there so that teachers and parents can read it when sharing the Student Book with students.

Read Aloud Support

Ask students to turn to page 32 of the Student Book and look at the image as you read aloud. Remind them that the title of this chapter is "Typing and Clicking," and tell them to pay special attention to the ways Hanna has to input information into the computer as you read.

Ask students to look at the picture on page 32. Talk about what they notice about what is on the screen now that Hanna has closed out of her game. Explain that this is a pop-up message that came up, asking her to take the survey. Hanna can click “no” if she does not want to take the survey. You don’t have to do what the pop-up message is asking you to do.

CHAPTER

5

Typing and Clicking

Hanna has been using a computer at the library.

She is done playing a sorting game now.

She closes the online game.

When she clicks “sign out,” a message pops up on the screen.

It says, “Wait. Please take a survey before you go.”



32

Ask students the following questions:

LITERAL—Does Hanna have to take the survey?

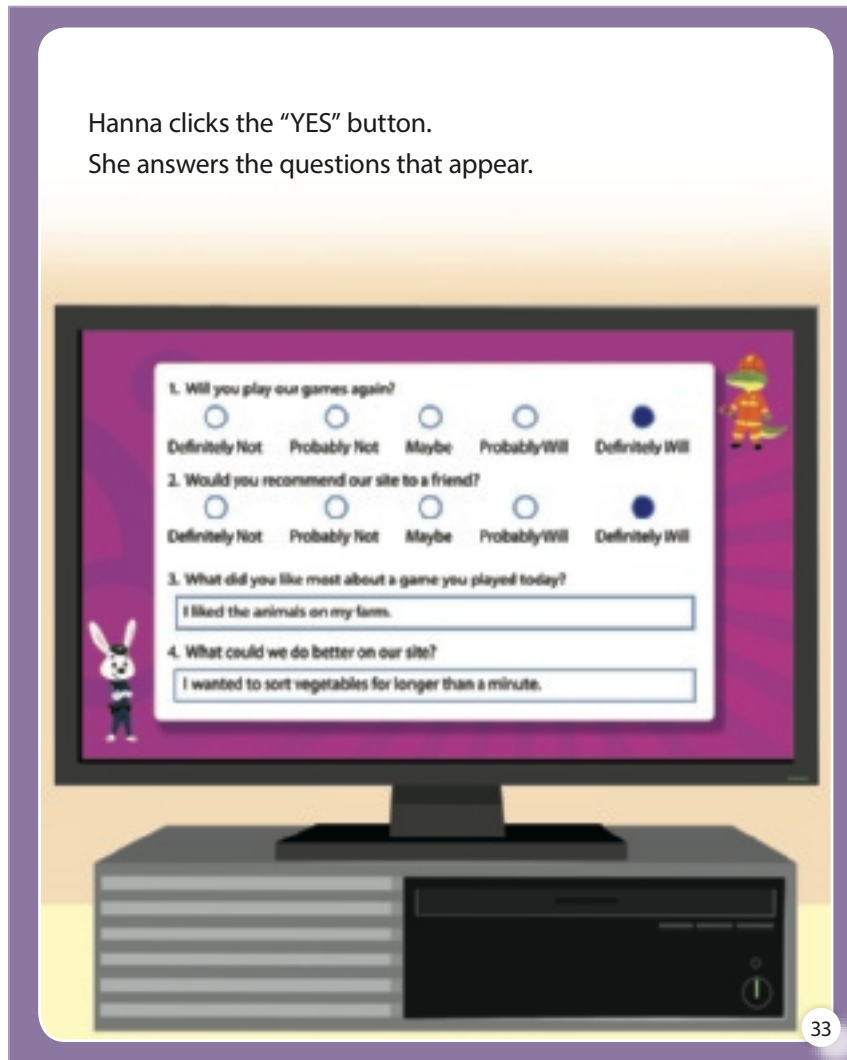
» No, you never have to click yes on a pop-up.

INFERENTIAL—What are some reasons why Hanna might say no, and not take the survey?

» She might not have time, it might ask for private information, or she doesn’t want to.

Hanna clicks the “YES” button.

She answers the questions that appear.



Ask students the following questions:

LITERAL—What button does Hanna click for the survey to show on the screen?

» Hanna clicks the YES button.

EVALUATIVE—When are surveys important?

» Student answers will vary but should indicate that surveys are important for people to get feedback about what users like and don't like.

Ask students to look at the pictures on page 34. Ask students to describe what they think is happening in the picture.

Hanna and Dad head home from the library.
Lesia is finished with her homework now.
It's now Hanna's turn to use the family's computer at home.
Hanna needs to write a report about the games she played.



34

Ask students the following questions:

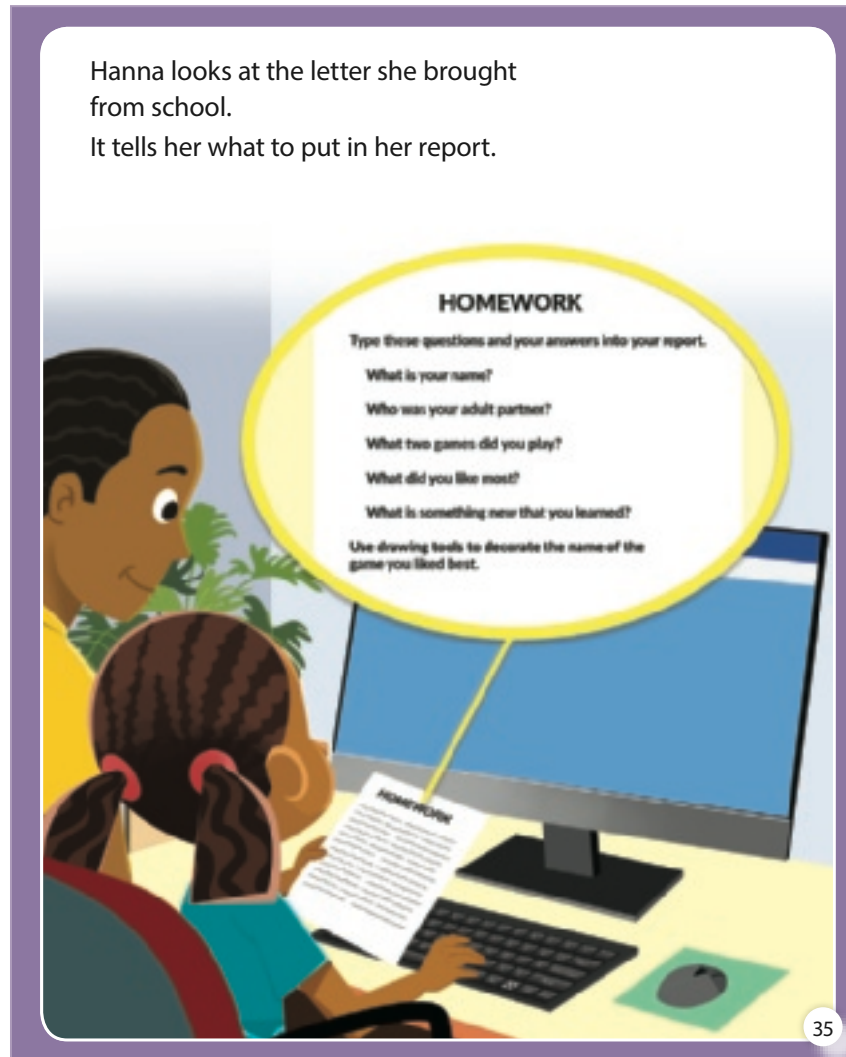
LITERAL—What does Hanna need to do when she gets home?

- » She needs to use the family's computer and write a report about the games she played.

INFERENTIAL—What do you think Hanna's report will say?

- » Her report might describe the games she played and if she liked them.

Ask students to look at the picture on page 35. Explain that it shows the questions that Hanna needs to respond to by typing on the computer.



Ask students the following questions:

INFERENTIAL—What are drawing tools?

- » Drawing tools are things like markers or shapes or lines that can be used on the computer instead of like the ones we have in class.

LITERAL—What will Hanna write for the answer to the question about the two games she played?

- » She will write that she played Building a Farm and Sorting Veggies.

Ask students to look at the picture on page 36 as you read aloud. Discuss that usually the apps that are available have little pictures, or icons, that can be a clue as to what the app is used for. On the computer screen, you can see there are different icons that Hanna might use depending on why she is using the computer.

Dad shows Hanna an icon on the computer.
It looks like a tiny piece of paper.
This is the program that Hanna will use for her report.
Hanna clicks on the icon.
It opens a blank page on the screen.



Ask students the following questions:

LITERAL—What icon does Hanna click on to type her work?

» She clicks on an icon that looks like a tiny piece of paper.

INFERENTIAL—Why is there a blank page on the screen when Hanna clicks on the icon?

» There is a blank page because this is the page that Hanna is supposed to begin typing on.

Ask students to look at the picture on page 37. Talk about what they notice about the way Hanna has typed her writing. Students should see that there are uppercase letters, spaces, and punctuation in Hanna's writing. They might also notice that there is a large space between each question.

The cursor blinks at the top of the page.
Hanna begins to type.
Her father helps her.
First, she types the questions from the
school letter.



Ask students the following questions:

LITERAL—What does Hanna type?

» She types the questions from the school letter.

EVALUATIVE—Why is the cursor blinking?

» The cursor is blinking to tell the user that this is where they should begin typing.

3. Check for understanding.

Unplugged
Activity



Using the survey you developed for students to select their favorite food items, have students take turns responding as a whole group, digitally, or individually on their own computers.

EXTEND—Offer students an opportunity to use a computer to type in their first and last name. Depending on the time available, you may ask them to include their favorite color, hobby, or food.

Computers and Data

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objectives

- ✓ Understand that computing devices allow information to be collected, saved, and retrieved.
- ✓ Organize data in a useful way.
- ✓ Create a visual representation of the data to identify patterns.

Instructional Activities

- whole-class discussion
- small-group activity
- whole-class activity

CSTA Standards

Concept: Data Analysis

Subconcepts and Standards:

Storage: 1A-DA-05 Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.

Collection, Visualization, and Transformation: 1A-DA-06 Collect and present the same data in various visual formats.

Inference and Models: 1A-DA-07 Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.

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data organize pattern

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collect prediction representation visualize

Materials and Equipment

Collect or prepare the following:

- large whiteboard
- blank printer paper

Activity Page



AP 5.2

Activity Page 2.2
Survey (AP 2.2)

Advance Preparation

- Clear the whiteboard.
- Draw a sample bar graph with numbers on the left side and letters on the bottom
- Make copies of AP 5.2 for each student.

THE CORE LESSON

1. Focus attention on today's topic.

When we play activities on a computer or on the internet, our data can be collected—usernames, passwords, activity choices, game scores, our opinions, etc. Ask students how they think real-world data can be useful.

Can it be helpful for us to know if computer programs are working as they should? It can help us determine what things people like best. Data doesn't always look just like numbers; it can be colorful, clear, and useful in helping us visualize patterns and help us make predictions.

2. Facilitate the activity.

Activity Page



AP 5.2

Unplugged Activity



1. Pass out a copy of AP 5.2 to each student.
2. Instruct students to put their name on the survey sheet.
3. Using the images on the page, they should answer the questions as you read them aloud:
 1. What is your favorite dessert?
 2. What is your favorite winter activity?
 3. What is your favorite summer activity?
 4. What is your favorite type of pet?
 5. What is your favorite food?
4. Students answer the questions by circling the image that best matches their favorites.
5. After all survey questions are answered, collect them.
6. Place the class into five groups—as equal as possible. Assign each group one of the questions to organize.
7. Groups should quickly discuss their question. Do they have any predictions about which answer will be the most favorite? The least favorite?
8. Each group creates a two-column chart on a blank sheet of paper. They write or draw the survey options on the left side of the chart.
9. Groups then take turns with the completed surveys to collect the data for their question. They can use a tally mark for each response in the right side of the chart.
10. When all data are collected and organized, groups can move to the whiteboard and use the bar graph template to create a visualization for their data.

3. Check for understanding.

Unplugged
Activity



Invite each student group to share their data visualization with the class. What did they predict about their question before they collected the data? Was their prediction correct about the favorite option? The least favorite? Was there anything surprising? What was the most helpful way to view the data—the individual surveys, the tally chart, or the bar graph?

SUPPORT—If needed, draw template bar graphs on the whiteboard for each group with numbers and options already labeled. Students only need to add the bars to depict the survey answers.

CHALLENGE—Challenge students to graph a larger set of data by giving the survey to other classes or grade levels.

Know the Standards

TEACHER DEVELOPMENT

1A-DA-05 Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data. All information stored and processed by a computing device is referred to as data. Data can be images, text documents, audio files, software programs or apps, video files, etc. As students use software to complete tasks on a computing device, they will be manipulating data.

1A-DA-06 Collect and present the same data in various visual formats. The collection and use of data about the world around them is a routine part of life and influences how people live. Students could collect data on the weather, such as sunny days versus rainy days, the temperature at the beginning of the school day and end of the school day, or the inches of rain over the course of a storm. Students could count the number of pieces of each color of candy in a bag of candy. Students could create surveys of things that interest them, such as favorite foods, pets, or TV shows, and collect answers to their surveys from their peers and others. The data collected could then be organized into two or more visualizations, such as a bar graph, pie chart, or pictograph.

1A-DA-07 Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions. Data can be used to make inferences or predictions about the world. Students could analyze a graph or pie chart of the colors in a bag of candy or the averages for colors in multiple bags of candy, identify the patterns for which colors are most and least represented, and then make a prediction as to which colors will appear most and least in a new bag of candy. Students could analyze graphs of temperatures taken at the beginning of the school day and end of the school day, identify the patterns of when temperatures rise and fall, and predict if they think the temperature will rise or fall at a particular time of the day, based on the pattern observed.

Saving Work and Reopening It

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Describe how to save work and open files.

Instructional Activities

- teacher Read Aloud
- whole-class discussion

CSTA Standards

Concepts:

- Computing Systems
- Data and Analysis

Subconcepts and Standards:

Devices: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)

Storage: 1A-DA-05 Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data. (P4.2)

For detailed information about the CSTA Standards, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Core Vocabulary and Language of Instruction

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Core Vocabulary terms are those that students should learn to use accurately in discussion. During instruction, expose students repeatedly to these terms but not through isolated drill or memorization.

click icon scroll

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

document file save window

Instructional Resource

Student Book



Ch. 6

Student Book, Chapter 6
Saving Work and Reopening It

Materials and Equipment

Collect or prepare the following:

- internet access and the means to project images/video for whole-class viewing
- computer and software with blank word-processing document digitally displayed for students to view

THE CORE LESSON

1. Focus attention on today's topic.

Tell students that when we are working or playing on the computer, we want to save our work often. We want to do this so that we can go back to what we were working on without having to type it all over again or play the game from the start. Ask students, have you ever played a game and forgotten to save it? What happened?

2. Read together "Saving Work and Reopening It."

Student Book



Ch. 6

While some students may be able to read words on a given page of the Student Book, students should not be expected or asked to read aloud the text on the Student Book pages. The text in the Student Book is there so that teachers and parents can read it when sharing the Student Book with students.

Read Aloud Support

Ask students to turn to page 38 of the Student Book and look at the image as you read aloud. Remind them that the title of this chapter is "Saving Work and Reopening It," and tell them to pay special attention to how Hanna saves and accesses her report file when she needs to go back to working on it as you read.

Ask students to look at the picture on page 38. Talk about what they notice about the save screen. On this screen, there is a space for Hanna to write the name of the file and a place to select where the file should be saved.

CHAPTER
6

Saving Work and Reopening It

Hanna is working on her school report.
She has typed questions into a document.
But it is dinner time.
She must stop working for a short time.
She has not typed her answers yet.
She must save her work and finish later.
Hanna clicks "SAVE."
A pop-up window appears on the screen.
She names her report file so she can find it later.



38

Ask students the following questions:

LITERAL—What does Hanna do when she needs to stop working and have dinner?

» She saves her work to a folder so that she can find it later.

EVALUATIVE—What do you think is a good name to save a file?

» Guide students to understanding that you should pick a file name that gives you a reminder about what the file is.

Ask students to look at the picture on page 39. Explain that it shows a folder that holds Hanna's saved file. Hanna will need to click twice in order for the file to open.

After dinner, Hanna returns to the computer.
She opens the folder where she put her report.
She finds the name of her report file.
Hanna double-clicks on the file name to open her report again.
It looks just like it did when she saved it.
Now Hanna can add her answers to the questions.



Ask students the following questions:

LITERAL—What does Hanna look for so that she can open her report?

» She looks for the name of her report file.

LITERAL—What can Hanna do now that she has opened the file?

» She can add her answers to the questions.

Ask students to look at the picture on page 40 as you read aloud. Discuss that when we are typing, sometimes we can make errors. The typing programs let you go back to where your mistakes are and fix them.

Hanna reads the first question again.
 She spots a spelling mistake.
 The last word says "nome" instead of "name."
 Hanna clicks to place the cursor after the letter "o."
 She taps the backspace key.
 It deletes the incorrect letter.
 Then she types the correct letter "a."
 That was easy to fix!



40

Ask students the following questions:

INFERENTIAL—Does the typing program tell you if there are spelling errors?

» Some typing programs underline the mistake in a red squiggly line.

LITERAL—How does Hanna fix her spelling error?

» To fix her spelling error, Hanna places her cursor after the letter "o" and then presses the backspace key and types in the correct letter "a."

Ask students to look at the picture on page 41. Talk about what they notice about Hanna's responses to the questions. Hanna has written her responses underneath each of the questions.

Hanna types her answers to the questions.
Her dad reminds her to save her work.
She is almost finished with her report.



Ask students the following questions:

EVALUATIVE—Hanna noticed her spelling error right away. Do you notice when you make mistakes? How do you fix them?

» Student answers will vary.

EVALUATIVE—Hanna learned how to drag and drop things while playing the online games. What is something new that you have learned during this chapter?

» Student answers will vary.

3. Check for understanding.

Unplugged
Activity



Have a blank document open for students to watch you. Tell them you are going to write a message to them. Ask students, “Where do I begin typing?” Begin typing a message: “You are a graete class” (with the intentional spelling error). Ask students, “What do you notice about my message?” Then tell students you want to come back to writing this message tomorrow, and ask them, “What should I do so that I can keep this message like it is until tomorrow?”

LESSON 6, PART 2

What Is Debugging?

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Be aware that debugging enables computer problems to be found and fixed.

Instructional Activities

- whole-class discussion
- small-group activity

CSTA Standards

Concept: Algorithms and Programming

Subconcept and Standard: Program Development: 1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.

For detailed information about the CSTA Standards, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Core Vocabulary and Language of Instruction

A Glossary at the end of this Teacher Guide lists definitions for Core Vocabulary and selected Language of Instruction.

Core Vocabulary terms are those that students should learn to use accurately in discussion. During instruction, expose students repeatedly to these terms but not through isolated drill or memorization.

debug **fix** **modify**

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

open **retrieve**

Materials and Equipment

Collect or prepare the following:

- paper clips
- stapler and staples

Activity Page



AP 6.2

Activity Page 6.2 Sequence (AP 6.2)

Advance Preparation

- Make enough copies of AP 6.2 for groups of three or four.
- Cut each sheet into pieces, and stack them into the order shown on the sheet.
- Clip each stack together.
- Randomly remove one piece from each stack with the exception of the first or last piece. Keep track of which stack the removed pieces came from.

THE CORE LESSON

1. Focus attention on today's topic.

Ask students what tools they can use to fix a mistake on a page of schoolwork. Prompt them to discuss erasers, starting over, etc. Ask them if they have ever tried to fix a broken toy or device. Were they able to fix it? What tools did they use?

Tell students that many computer programs allow us to make changes when we find a problem or decide we want to do something different. But to fix a problem, we first need to find the issue. This is called debugging—finding and fixing the “bugs.”

2. Facilitate the activity.

Online Resources



1. Show students a sample flip-book online. Discuss how a flip-book breaks down each small step of a movement and places the steps in order so the individual pieces combine to create an animation.
2. Break students into groups of three or four. Tell the groups that they are going to create a flip-book of a running stick person.
3. They should take turns demonstrating the running movement in slow motion to break down the steps involved in running.
4. Provide each group with the incomplete stack of the AP 6.2 pieces.
5. Groups work together to figure out the missing piece in their running stickperson flip-book.

6. When they believe they have it in the correct order, they should ask you for the missing piece. They should put the piece in the correct location and then test out their flip-book.
7. When the animation is working properly, they should carefully staple the flip-book together.

3. Check for understanding.

Unplugged
Activity



Ask students how difficult it was to debug their running stickperson flip-book and what steps they used to do so. Did they demonstrate and observe the steps needed to run in slow motion? Did they pull apart their pile and look at the whole animation in order?

CHALLENGE—Challenge students by first mixing up the pieces in each pile. Student groups have to both put the pieces in order and identify the missing piece.

EXTEND— Invite student groups to create their own stickperson flip-book. They should pick a simple motion and then break down the steps involved before drawing each step in the correct order and stapling the pieces together.

Know the Standards

TEACHER DEVELOPMENT

1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. Algorithms or programs may not always work correctly. Students should be able to use various strategies, such as changing the sequence of the steps, following the algorithm in a step-by-step manner, or trial and error, to fix problems in algorithms and programs.

LESSON 7, PART 1

Tools for Drawing and Printing

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objective

- ✓ Identify the tools used for creating drawings and printing on a computer.

Instructional Activities

- teacher Read Aloud
- whole-class discussion

CSTA Standards

Concept: Computing Devices

Standards:

Devices: 1A-CS-01 Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)

Hardware and Software: 1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware). (P7.2)

For detailed information about the CSTA Standards, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Core Vocabulary and Language of Instruction

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icon **picture** **printer**

Language of Instruction consists of additional terms that you should use when talking about concepts in the lesson. Students benefit from your modeling the use of these words without the expectation that students will use or explain the words themselves.

mouse **save** **screen** **tools**

Instructional Resource

Student Book



Ch. 7

Student Book, Chapter 7 Tools for Drawing and Printing

Materials and Equipment

Collect or prepare the following:

- internet access and the means to project images/video for whole-class viewing

THE CORE LESSON

1. Focus attention on today's topic.

Ask students, "Did you know that you can use your computer device for drawing?" Tell students that some people have jobs in which they draw and design clothing using the computer. Some people may not think it is easy to draw on the computer, but others may find it fun and exciting to do. There are different tools that we can use to help us draw when we are using a drawing program on the computer.

2. Read together "Tools for Drawing and Printing."

Student Book



Ch. 7

While some students may be able to read words on a given page of the Student Book, as a general rule students should not be expected or asked to read aloud the text on the Student Book pages. The text in the Student Book is there so that teachers and parents can read it when sharing the Student Book with students.

Read Aloud Support

Ask students to turn to page 42 of the Student Book and look at the image as you read aloud. Remind them that the title of this chapter is "Tools for Drawing and Printing," and tell them to pay special attention to the tools Hanna uses for drawing and designing as you read.

Ask students to look at the picture on page 42. Talk about what they notice about the icon for the drawing program. Remind students that icon pictures are used as clues to help you know what the program will be about. In this case, the drawing program has a marker and paintbrush.

**CHAPTER
7****Tools for Drawing and Printing**

Hanna is almost done with her report for school.

She played online games.

Next she typed questions.

Then she typed answers to the questions.

Now Hanna needs to decorate the name of her favorite game.

Dad helps her find a menu of drawing tools in the writing program.

First, she chooses the pencil tool.

She uses the mouse to draw a line under “Building a Farm.”

Then she chooses the oval tool.

She makes an oval around the name of the game.



42

Ask students the following questions:

LITERAL—Where does Hanna find the tools she needs for drawing?

» She finds the tools in the menu.

LITERAL—What tools does Hanna use to design her work?

» Hanna uses the pencil tool and the oval tool.

Ask students to look at the picture on page 43. Explain that it shows the options for Hanna to select colors from. When you are drawing on a computer, the default, or automatically selected, color is usually black. But we can change this to be almost any color we want. We can even pick a color, decide that we don't like it, and change it into a different color.

Hanna wants her decorations to stand out.
 She uses the color palette.
 She selects the line.
 She changes its color to red.
 She selects the oval.
 Hanna changes the color of the oval to purple.



43

Ask students the following questions:

EVALUATIVE—What other ways do you think Hanna could make her decorations stand out?

» Student answers will vary.

INFERENTIAL—How is Hanna able to change the color of her line and oval?

» She selects the item, and then she chooses the new color that she wants.

Ask students to look at the picture on page 44 as you read aloud. Discuss that when you finish your work on the computer, you have options on what to do next. Sometimes you may just want to save your work and keep it on the computer, sometimes you may want to send it to someone else, and sometimes you may want to print it.

Hanna saves her report again with all the changes she has made.

She has one more button to click before she closes her file.

Hanna clicks “print.”

Now the printer puts Hanna’s report on paper.

It looks just like the report she made on the computer screen.

In the morning, Hanna will take her report to school.



Ask students the following questions:

INFERENTIAL—Why does Hanna print her report?

» Hanna prints the report so that she can bring it to school.

EVALUATIVE—Do you think Hanna’s teacher is going to like her report? Explain.

» Student answers will vary.

Ask students to look at the picture on page 45. Talk about about Hanna's reaction to playing the board game and how that is similar or different to her reaction to playing the computer game. Playing games online is fun, but we have to also manage our screen time well.

It's not quite time for bed, though.
Hanna asks Dad, "Can I log back in and build more of my farm?"
"Let's save that for tomorrow," Dad says.
"We have probably had enough screen time for today."
Hanna and Lesia decide to play a board game instead.



45

Ask students the following questions:

EVALUATIVE—How do you feel when you are told to take a break from online game time?

» Student answers will vary.

EVALUATIVE—How much time is too much screen time? Explain.

» Student answers will vary.

3. Check for understanding.

Unplugged
Activity



Ask students, if you were going to use a drawing program, what shapes could be available for you to use? Tell students you can create many different shapes and different lines. Ask students, do you have to use only one color? Tell students that can use any color you'd like and that each item can be its own color. Ask students, "How would you recognize the program you want is a drawing program?"

Planning and Implementing a Design

Driving Question: What can computer programs do?

Overarching Unit Objective: Experience a variety of age-appropriate programs designed for different purposes.

AT A GLANCE

Learning Objectives

- ✓ Develop a plan for designing a project with specific goals.
- ✓ Explain design decisions and steps taken to complete the design.
- ✓ Give credit for ideas of others.

Instructional Activities

- whole-class discussion
- small-group activity
- whole-class presentation

CSTA Standards

Concept: Algorithms and Programming

Subconcept and Standards:

Program Development: 1A-AP-12 Develop plans that describe a program's sequence of events, goals, and expected outcomes.

Program Development: 1A-AP-13 Give attribution when using the ideas and creations of others while developing programs.

Program Development: 1A-AP-15 Using correct terminology, describe steps taken and choices made during the iterative process of program development.

For detailed information about the CSTA Standards, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Core Vocabulary and Language of Instruction

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credit design plan

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program development goals

Materials and Equipment

Collect or prepare the following:

- classroom construction sets or blocks
- scrap materials from parents, such as shoeboxes, other small boxes, paper tubes, wallpaper, or gift wrap scraps
- blank or scrap paper—printer, construction, tissue, etc.
- glue, scissors, markers, tape, etc.

Advance Preparation

- Pull out materials and classroom toys/kits that are available for building a stick person city.
- Request shoeboxes or other small boxes from parents.
- Set out paints, markers, colored pencils, glue, scissors, tape, etc.

THE CORE LESSON

1. Focus attention on today’s topic.

How do you plan and implement a design? Ask students how they achieve a goal or complete a project. Do they plan first or just jump right in? What if the project is very complex—would they take time to plan first? Ask students if they have ever worked on a project with classmates or friends. Prompt them to share important parts of working together as a team, such as listening to others’ ideas, each doing their part, and giving credit to others.

2. Facilitate the activity.

1. Using the same groups as in Lesson 6.2, tell students that they will work together to create a stick city for their chenille stick people created in Lesson 3.2.
2. Student groups first discuss the elements they would like to create for their stick city—a school, a hospital, a library, a store, etc. Each group member decides which component they will be responsible for designing and creating.
3. After a bit of time allotted for independent planning, students share their design plan with their group.
4. Using the available materials—shoeboxes, construction sets, paper, scrap materials, etc.—each student creates their portion of the stick city. This could be buildings made from classroom blocks or other construction toys. Students could cut, glue, and decorate shoeboxes brought from home. If resources are not available, students can draw their city components on blank paper.

3. Check for understanding.

Unplugged
Activity



When all groups have completed their stick cities, they should present them to the rest of the class. Each student should discuss their own design, including what it does for the stick people, how they planned it, and any special features it has.

To practice giving credit to others, each group member should introduce the next person in their group and tell the class what part of the stick city they designed. For example, “Jonathan made a super tall office building for our stick people to work inside.”

Know the Standards

TEACHER DEVELOPMENT

1A-AP-12 Develop plans that describe a program’s sequence of events, goals, and expected outcomes.

Creating a plan for what a program will do clarifies the steps that will be needed to create a program and can be used to check if a program is correct. Students could create a planning document, such as a story map, a storyboard, or a sequential graphic organizer, to illustrate what their program will do. Students at this stage may complete the planning process with help from their teachers.

1A-AP-13 Give attribution when using the ideas and creations of others while developing programs. Using computers comes with a level of responsibility. Students should credit artifacts that were created by others, such as pictures, music, and code. Credit could be given orally, if presenting their work to the class, or in writing or orally, if sharing work on a class blog or website. Proper attribution at this stage does not require a formal citation, such as in a bibliography or works cited document.

1A-AP-15 Using correct terminology, describe steps taken and choices made during the iterative process of program development. At this stage, students should be able to talk or write about the goals and expected outcomes of the programs they create and the choices that they made when creating programs. This could be done using coding journals, discussions with a teacher, class presentations, or blogs.

Teacher Resources

Activity Pages

- Username and Password (AP 2.2) **97**
- Survey (AP 5.2) **98**
- Sequence (AP 6.2) **99**

Activity Pages Answer Key: *Helpful Computers* **100**

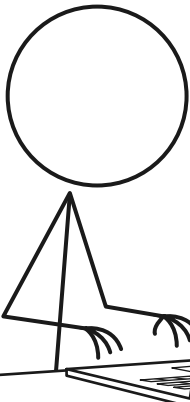
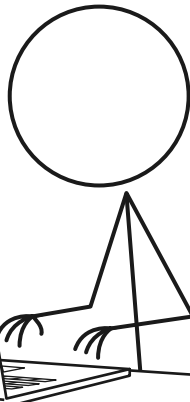
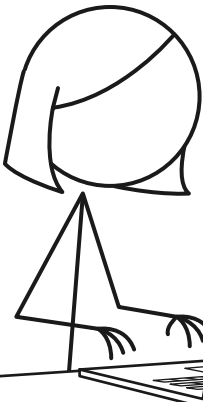
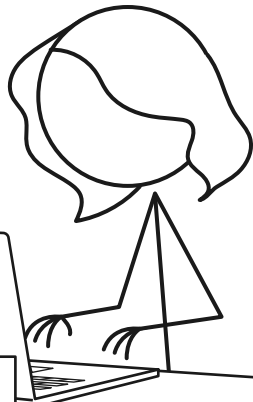
Name _____

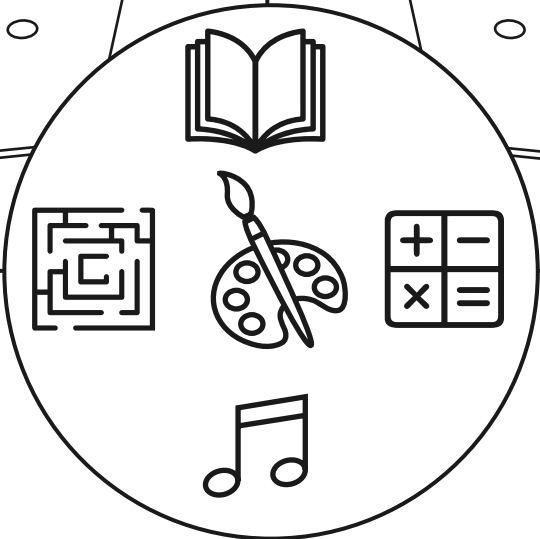
Date _____

Activity Page 2.2

Use with Lesson 2.2

Username and Password

 johnmiller  miller1234  LOG IN	 prodrig  prodrig  LOG IN
 irene-lin  i*!24  LOG IN	 NyFor  meerkat@18  LOG IN



Activity Page 5.2

Use with Lesson 5.2

Survey

1. What is your favorite dessert?

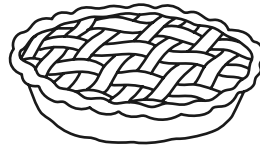
A.



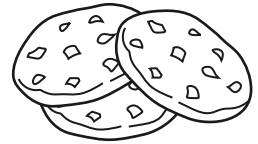
B.



C.

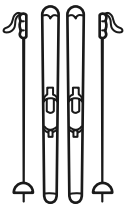


D.

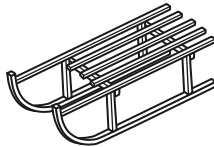


2. What is your favorite winter activity?

A.



B.



C.

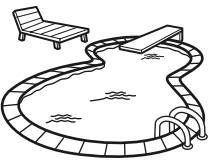


D.



3. What is your favorite summer activity?

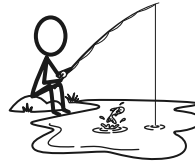
A.



B.



C.



D.



4. What is your favorite type of pet?

A.



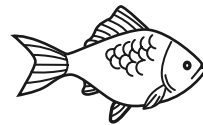
B.



C.



D.



5. What is your favorite food?

A.



B.



C.



D.



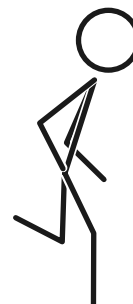
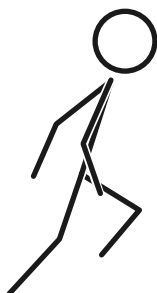
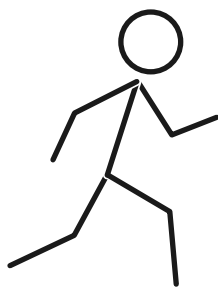
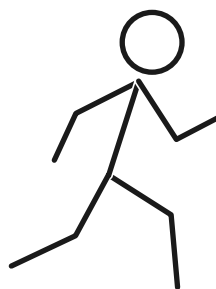
Name _____

Date _____

Activity Page 6.2

Use with Lesson 6.2

Sequence



Activity Pages Answer Key: Helpful Computers

This answer key offers guidance to help you assess your students’ learning progress. Here you will find descriptions of the expectations and correct answers for each Activity Page of this unit.

Username and Password (AP 2.2) **(page 97)**

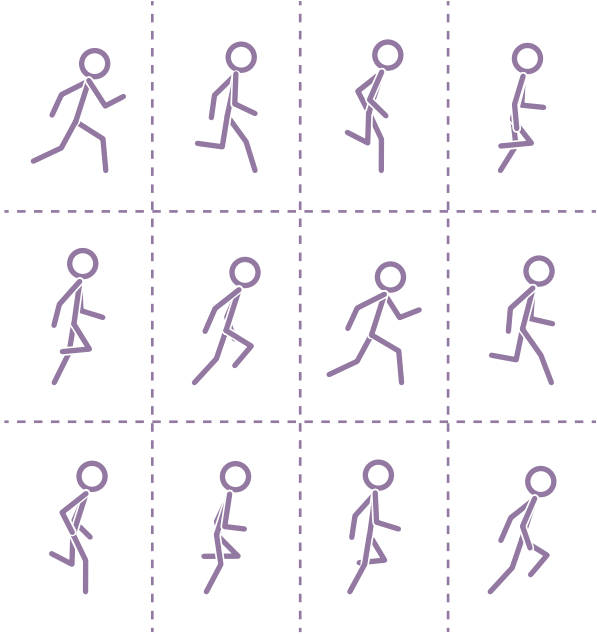
Nyema Forth, shown at bottom right, has the best combination of username and password.

- Her username does not reveal her real name.
- Her password is a complex combination of characters that does not reveal any personal information.

Survey (AP 5.2) **(page 98)**

Students’ responses will vary depending on their personal preferences.

Sequence (AP 6.2) **(page 99)**



Glossary

Purple words and phrases are Core Vocabulary terms for the unit. **Bold-faced words and phrases** are additional vocabulary terms related to the unit that you should model for students during instruction and that are often used within the Student Book, and these latter terms do not have specific page numbers listed. Vocabulary words are not intended for use in isolated drill or memorization.

A

algorithm, n. a step-by-step list, or directions, on how to solve a problem or perform a task

attribution, v. give credit, explain the cause of something

avatar, n. a picture or image on a device that represents a person or animal

B

breakdown, v. take apart into simpler or smaller parts

C

click, v. to push on something, like a button on a mouse

collect, v. to gather together

component, n. a part of a something

computer, n. an electronic device that is used to store, organize, and work with lots of information at a high speed

credit, n. recognition for the work that a person or people did

cursor, n. a pointer on a computer screen that shows where to click or where letters and numbers can be typed in

D

data, n. information

debug, v. finding and fixing problems

decompose, v. break something down into smaller pieces or steps in order to solve a problem

design, v. make plans for a certain goal or purpose

device, n. an object or tool that turns on and off and is used to do a certain job, such as a cell phone or flashlight

digital citizenship, n. using computers and technology to connect with others in respectful and responsible ways

document, n. a computer file that contains information like text or pictures or videos

drag and drop, v. moving computer files or pictures from one place to another by clicking on them and moving them across the screen

E

enter, n. a keyboard button that is used to move the cursor to the next line or submit information

F

file, n. a storage unit for information in an electronic device

fix, v. to make better or make something work again

G

game, n. a program that is played on the electronic device

goals, n. the result or end that a person wants to happen

H

hardware, n. the parts of an electronic device; the parts that can be seen

I

icon, n. small pictures that show the apps on the monitor

internet, n. many computers all over the world that are connected together and share information with each other

instructions, n. directions or a list that describes how to do something

iterative, adj. the repeating of a sequence or pattern

K

keyboard, n. a piece of hardware with buttons for letters, numbers, and symbols. When the keys are pushed, it sends information to the computer

L

link, n. a word or button that, when clicked, takes you to another webpage or document

log in, v. to enter a user name and password in order to use some websites

M

menu, n. a list of options to choose from

modify, v. to change something

monitor, n. a piece of hardware that displays pictures and words. They often look like televisions

mouse, n. a small tool used with computers. A person moves the mouse to point at, select, and move items on the screen.

O

online, adj. connected to the internet

organize, v. put things in order or put similar parts together

open, v. make the contents inside of a file available to use

P

password, n. a secret word, phrase, or group of letters, numbers, and symbols that help keep information safe and private

pattern, n. something that happens over and over in the same way

plan, n. the way something is to be done and is thought out ahead of time

prediction, n. a statement that describes what might happen or what is expected to happen

picture, n. an image that looks the same as something else, like an object or person

printer, n. hardware that prints information like pictures or text from a computer or other electronic device

private, adj. personal and not to be shared

protect, v. to keep something safe

program, n. steps or list of instructions that tells computer how to do a task

program development, n. a type of job where people make plans for and create programs

R

represent, v. to stand for something else

representation, n. a picture, object, drawing, or symbol that looks like or stands for something

respectful, adj. being polite and thoughtful towards other people and things

retrieve, v. to bring back or get back

S

save, v. make sure your work or information will be stored for use later

screen, n. the part of the monitor or device that shows pictures and words

scroll, v. to move what you see on a screen up or down or side to side

sequence, n. a pattern or steps that happen in a certain order

slide, v. move from side to side, often off or onto the screen

secure, n. safe and free from danger

software, n. what instructs the computer device to complete tasks

step-by-step, adv. doing one step at a time

steps, n. a list of things to do

symbol, n. an object, shape, or picture that represents something else

T

technology, n. programs or inventions that help solve problems

tools, n. parts of a program or app that help someone accomplish certain tasks and do specific things

type, v. to write using a computer or device with a keyboard

U

username, n. a special name that is used when signing on to a website or computer

V

visualize, v. to form a picture of something in your mind

video game, n. a game played on a computer or electronic device

W

website, n. a group of pages on the World Wide web that are connected to each other

window, n. an area on a computer screen that shows a program and can be made bigger or smaller and open or closed.

Internet Safety

Though online resources present many rich opportunities for student learning, unsupervised online activity for children is not advised. The U.S. Department of Justice provides the following guidelines, Keeping Children Safe Online:

- **Discuss internet safety and develop an online safety plan** with children before they engage in online activity. Establish clear guidelines, teach children to spot red flags, and encourage children to have open communication with you.
- **Supervise young children's use of the internet**, including periodically checking their profiles and posts. Keep electronic devices in open, common areas of the home, and consider setting time limits for their use.
- **Review games, apps, and social media sites** before they are downloaded or used by children. Pay particular attention to apps and sites that feature end-to-end encryption, direct messaging, video chats, file uploads, and user anonymity, which are frequently relied upon by online child predators.
- **Adjust privacy settings and use parental controls** for online games, apps, social media sites, and electronic devices.
- **Tell children to avoid sharing personal information, photos, and videos online** in public forums or with people they do not know in real life. Explain to your children that images posted online will be permanently on the internet.
- **Teach children about body safety and boundaries**, including the importance of saying "no" to inappropriate requests both in the physical world and the virtual world.
- **Be alert to potential signs of abuse**, including changes in children's use of electronic devices, attempts to conceal online activity, withdrawn behavior, angry outbursts, anxiety, and depression.
- **Encourage children to tell a parent, guardian, or other trusted adult** if anyone asks them to engage in sexual activity or other inappropriate behavior.

Copy and distribute the Student Safety Contract, found on the next page. Prior to the start of the first lesson, do a read-along, and have students agree to the expectations for when they engage in computer and online activities.

Online Resources



For additional support for safety in the computer science and online instruction, follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Student Online Safety Contract

Dear Parent or Guardian,

During computer science class, we want to create and maintain a safe classroom. With this in mind, we are making sure students are aware of the expectations for their behavior while engaged in computer science activities. We are asking you to review the safety rules below with your student and sign this contract. If you have any questions, please feel free to contact me.

For important safety information about children, computers, and the internet, consider resources at these sites:

<https://protectyoungeyes.com/>

<https://sharedhope.org/>

<https://www.justice.gov/coronavirus/keeping-children-safe-online>

_____ / ____/____/____/

Teacher signature and date

_____ / ____/____/____/

Parent or guardian signature and date

When doing online activities, I will do the following:

- Only do online activities with the supervision of an adult.
- Only visit websites and use apps that I am guided to by my teacher, parent, or trusted adult guardian.
- Never use my real name or reveal personal information if I communicate with others online.
- Tell a trusted adult right away if anyone online asks questions about my name, where I live, or where I go to school.
- Be careful around electronic devices and only plug them in or unplug them when an adult is supervising.

I understand and agree to the safety rules in this contract.

_____ / ____/____/____/

Student signature and date

Print name

Strategies for Acquiring Materials

The materials used in the Core Knowledge Computer Science program are readily available and can be acquired through both retail and online stores. Some of the materials will be reusable and are meant to be used repeatedly. This includes items such as plastic cups that can be safely used again. Often these materials are durable and will last for more than one activity or even one school year. Other materials are classified as consumable and are not able to be used more than once.

Online Resources



The Material Supply List for this unit's activities can be found online. Follow the links in the Online Resources Guide for this unit:

www.coreknowledge.org/cksci-online-resources

Ways to Engage with Your Community

The total cost of materials and technology can add up for an entire unit, even when the materials required for activities and demonstrations have been selected to be individually affordable. And the time needed to acquire the materials adds up too. Reaching out to your community to help support STEM education is a great way to engage parents, guardians, and others with the teaching of science and computer science, as well as to reduce the cost and time of collecting the materials. With that in mind, the materials list can be distributed or used as a reference for the materials teachers will need to acquire to teach the unit.

Consider some of the following as methods for acquiring the science materials:

- **School Supply Drive**—If your school has a supply drive at any point in the year, consider distributing materials lists as wish lists for the science department.
- **Open Houses**—Have materials lists available during open houses. Consider having teams of volunteers perform an activity to show attendees how the materials will be used throughout the year.
- **Parent-Teacher Organizations**—Reach out to the local PTO for assistance with acquiring materials.
- **Science Fair Drive**—Consider adding a table to your science fair as part of a science materials drive for future units.
- **College or University Service Project**—Ask service organizations affiliated with your local higher education institutions to sponsor your program by providing materials.
- **Local Businesses**—Some businesses have discounts for teachers to purchase school supplies. Others may want to advertise as sponsors for your school/programs. Usually you will be asked for verifiable proof that you are a teacher and/or for examples of how their sponsorship will benefit students.

Remember: If your school is public, it will be tax exempt, so make sure to have a Tax Identification Number (TIN) when purchasing materials. If your school is private, you may need proof of 501(c)(3) status to gain tax exemption. Check with your school for any required documentation.



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Editorial Director
Daniel H. Franck

Subject Matter Expert

Sarah J. Huibregtse, PhD

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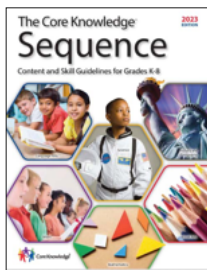
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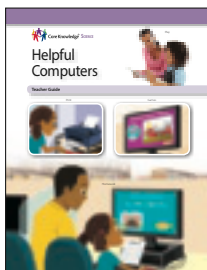
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What is the Core Knowledge Sequence?

The *Core Knowledge Sequence* is a detailed guide to specific content and skills to be taught in Grades K–8 in language arts, history, geography, mathematics, science, computer science, and the fine arts. In the domain of computer science, the *Core Knowledge Sequence* outlines topics that build systematically grade by grade to support student learning progressions coherently over time.



For which grade levels is this book intended?

In general, the content and presentation are appropriate for students in the early elementary grades. For teachers and schools following the *Core Knowledge Sequence*, this book is intended for Grade 1 and is part of a series of **Core Knowledge SCIENCE** units of study.

For a complete listing of resources in the
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