6 Technology in the Common Core

This chapter focuses on the CCSS in ELA and math that have technology-related components written into them, first identifying and then analyzing these standards. This will prepare you for the later chapters, where we offer practical examples of how you can integrate these standards into your curriculum.

As instructional coaches, we know that there are those of you who are excited about technology, those of you who think it is an annoyance, and those of you who still fear it. These standards affect all of you because they force your districts and you, as teachers, to use technology more pervasively. Schools feel pressure to address areas that may have been avoided in the past due to cost or apprehension. If you are a fan of technology, you welcome this focus; if you are not, you still need to become proficient. You simply cannot avoid technology in your classroom.

Where Is Technology in the ELA Standards?

The CCSS are designed to prepare students for college, the workforce, and a technology-rich society. And as you learned in the last chapter, the ELA standards have the CCR anchor standards—reading, writing, speaking and listening, and language at their core. Following is a summary of those CCR standards that are embedded with technology in Grades K–5.

Where Is Technology in the Math Standards?

As mentioned in Chapter 5, the math standards are written differently, and the technology standard in math (yes, only one standard) is separate from the rest of the math standards. However, this technology standard is meant to be used ubiquitously. Though many math standards do not overtly say that technology is required, if there is a need for a calculator or statistical analysis using a computer then that is what students should use. In math, the understanding is that these technology tools are used across grade levels and throughout the math standards even though there

ELA Standards (Grades K-5) in Which Technology Appears

READING (K-5)

- CCR Reading (R) Standard 7 (tinyurl.com/h9n9ek9)
 - Reading Literature (RL)
 - Reading Informational Text (RI)
- CCR Reading (R) Standard 5 (tinyurl.com/z7cqpqj)
- Note: We will get into more detail about related anchor standard R.5 later in this chapter.

WRITING (K-5)

- CCR Writing (W) Standard 2 (tinyurl.com/zt6kysv)
- CCR Writing (W) Standard 6 (tinyurl.com/zmxfdp8)
- CCR Writing (W) Standard 8 (tinyurl.com/jercjbv)

SPEAKING AND LISTENING (K-5)

- CCR Speaking and Listening (SL) Standard 2 (tinyurl.com/gvdrr3g)
- CCR Speaking and Listening (SL) Standard 5 (tinyurl.com/hrw3bdu)

LANGUAGE (K-5)

• CCR Language (L) Standard 4 (tinyurl.com/hmu54nx)

is only one written standard. (Note: This math standard is presented in detail after the grade-specific ELA standards at the end of this chapter.)

What about Using Technology in All Subjects?

Because technology is integrated throughout the CCSS, we should discuss in more depth what this actually means as you go about implementing the curriculum day to day. Though the standards give you specific language, the use of technology has been left wide open. They use terms like "digital tools," "other media," and "both print and digital" to let you choose what is appropriate to the lesson. The standards are trying to infuse technology into everyday classroom use, as opposed to having a separate period in a computer lab or someplace you send the students while you are meeting, planning, or collaborating with colleagues. Technology must become like the pencil: simply another tool to choose when students need to find the most appropriate one to complete the task at hand.

CCSS strongly encourage project-based lessons and are designed to be cross-curricular. Also, the standards are looking for higher-level thinking, learning, and application. All of these things lead to technology as the most appropriate tool in many situations. They fit very well into the Partnership for 21st Century Learning (P21) Framework for 21st Century Learning (**tinyurl.com/nzvwyen**) and the ISTE Standards for Students (**iste.org/standards**). If you have been working for some time on lessons that integrate technology and you think you will have to begin again, you will be relieved to know that the technology-embedded standards are not so different.

How Do You Put ELA Technology Standards into Context?

When you look at the patterns of technology use in the standards, you improve your integration planning and learning achievements with these standards. Let's take a quick look at the technology patterns in the related K-5 standards.

- **R.7:** Although R.7 does not state standards that include technology until tGrade 2, earlier grades can use it both in preparation for successive grade levels and differentiation. The standard then continues to develop in subsequent grades comparing text and illustrations in various formats that include technology.
- **RL.7:** This standard begins in kindergarten, comparing illustrations and text, and then grows through the grades, using all types of media to compare, support, and analyze the story's meaning. Essentially, the purpose of the standard is to get meaning from more than the text. Meaning can also come from all the accompanying media and even the format of the story.
- **RI.7:** This is similar to RL.7 but refers to informational text, history, science, and technology. Thus, you must keep in mind informational graphics—maps; photographs; diagrams; charts; and other media in history, science, and technical subjects—and the way in which they augment information or help to solve a problem.
- **RI.5:** Beginning in kindergarten with learning the parts of a book, this standard grows through third grade to an analysis of text structure. Of course, informational text in the digital age is not only in book form. Getting meaning through the use of electronic menus and graphics in digital media is an important skill that must also be taught.
- **W.2:** From drawing, writing, and telling about a topic in kindergarten, this standard evolves into producing a thesis in high school. It is your basic research paper that now includes an expectation to use any and all media that is appropriate for conveying the information.
- **W.6:** This is one of the few anchor standards that is solely technology-driven. From kindergarten through high school, students are required to use technology to collaborate with others when writing. Of course, this requires keyboarding skills, but they are not mentioned in the standard until Grade 3.
- **W.8:** Although not explicitly stated in grades K-2, primary teachers should know that CCR W.8 does state technology be used. Digital sources could be taught to younger students who are ready. Technology in this standard

is expected from Grade 3 through high school. This writing standard is keying in on the gathering of information, analyzing the information, and avoidance of plagiarism using multiple sources, digital as well as text when writing informative or explanatory works.

- **SL.2:** This standard expects the use of technology from kindergarten through Grade 12. It is a listening standard, but in today's world, all kinds of diverse media are constantly available. Students need to be able to analyze and make decisions about this content.
- **SL.5:** Beginning with the use of pictures when speaking in kindergarten, this standard builds to making strategic use of digital media for presentations in high school. Learning to use media in presentations is critical for college and career readiness.
- **L.4:** This is a very straightforward standard that clarifies the meaning of words at all grade levels. Starting in second grade, students need to know how to find word meanings using not just print but digital dictionaries, glossaries, and thesauruses.

What about Assessment?

You don't begin a trip without an end in mind, and the end that must always be kept in mind with the CCSS is the standardized test your state administers. Even though students in K-2 will not be taking part in the national assessments, it is important to prepare them for its eventuality. Whether it is the PARCC, Smarter Balanced assessment, or some other assessment your state is developing, it will certainly involve technology.

This, of course, depends on your state and district. In fact, the tests that are being developed will expect students to write short passages using the computer starting in third grade. This is just one example of an assessment (keyboarding) that is not overtly stated as a standard in kindergarten, first grade, or second grade but is expected as a performance outcome in third grade. Educators know you can't start teaching keyboarding in Grade 3 and expect students to be proficient in Grade 3. So it is important to start with the end in mind.

The tests will require some level of competence in selecting and highlighting text, dragging and dropping text, and moving objects on the screen. In the math areas of the test, tools that might be needed for the exam (calculators, rulers, a slide rule) will be available on the screen. Students may need headphones for text-to-speech features. To find a full list of technology skills needed for the PARCC computer-based assessment go to **tinyurl.com/y8ge25a4.** For Smarter Balanced requirements, visit **tinyurl.com/y8wvrcqj**.

The best way to prepare students is to know in advance the scope of technology they will need to master. Many things about the tests that your state is using are continually changing. The changes mean your students may not be as fully prepared as you would like them to be. However, your preparation—giving students opportunities to use a myriad of technologies as often as possible—will help them to be as ready as they can be for the assessments.

What Are the ELA Standards with Technology?

The following is a listing of where technology appears in the CCSS. The first section contains the anchor standards, and the second section has the more specific grade-level standards. The standards are ordered by level so that you can find those related to the grade you teach more quickly. The part of the standard that pertains to technology is in boldface type. It is always helpful to look at the standards above and below your level to see where the students have come from and where they are going on their educational journey. Please refer to the second book in this series if you would like to see other grade levels.

Reading

CCSS.ELA-Literacy.CCRA.R.7

R.7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Note **R.5** as well: Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

The **R.5** anchor standard does not have any multimedia but does overtly include technology in its informational-text (RI) strand concerning the use of electronic text from Grades 1–3 (**RI.1.5**, **RI.2.5**, **RI.3.5**). It has a non-technical focus in **RI.4.5** and **RI.5.5**.

Writing

CCSS.ELA-Literacy, CCRA.W.2, CCSS.ELA-Literacy.CCRA.W.6, and CCSS.ELA-Literacy.CCRA.W.8

W.2: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Note: Anchor standard W.2 does not have multimedia but does include technology in its strand starting in Grade 4 (**W.4.2.a**).

- **W.6: Use technology, including the internet**, to produce and publish writing and to interact and collaborate with others.
- **W.8:** Gather relevant information from multiple print and **digital sources**, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

Speaking and Listening

CCSS.ELA-Literacy.CCRA.SL.2 and CCSS.ELA-Literacy.CCRA.SL.5

- SL.2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.5:** Make strategic use of **digital media** and **visual displays** of data to express information and enhance understanding of presentations.

Even when your grade does not have a technology standard included in these main anchor strands (**R.7**, **W.6**, **W.8**, **SL.2**, **SL.5**, **L.4**), it is implied that it be used. We have listed here only those that state a technology use. For instance, the first time that **RI.7** overtly states the use of technology is in Grade 4 (**RI.4.7**); but because it is in the anchor standard, it is implied that technology be used in **RI.7** in Grades 1–3 (**RI.1.7**, **RI.2.7**, **RI.3.7**) whenever it is appropriate to use it.

What Are the ELA Grade-Level Standards with Technology?

Following is where ELA grade-level standards appear in the CCSS (listed by grade). Note the following abbreviations: reading literature (RL), reading informational text (RI), writing (W), speaking and listening (SL), and language (L). We are including Grade 3 to give the technology standards some context. Please refer to the other books in this series to get a sense of the full scope of technology standards, Grades K-12. (Note: as in the preceding section, the part of the standard that pertains to technology is in boldface type.)

Kindergarten

- **W.K.6:** With guidance and support from adults, explore a variety of **digital tools** to produce and publish writing, including collaboration with peers.
- **SL.K.2:** Confirm understanding of a text read aloud or information presented orally or through **other media** by asking and answering questions about key details and requesting clarification if something is not understood.
- **SL.K.5:** Add drawings or other **visual displays** to descriptions as desired to provide additional detail.

Grade 1

- **RI.1.5:** Know and use various text features (e.g., headings, tables of contents, glossaries, **electronic menus, icons**) to locate key facts or information in a text.
- **W.1.6:** With guidance and support from adults, use a variety of **digital tools** to produce and publish writing, including in collaboration with peers.
- **SL.1.2:** Ask and answer questions about key details in a text read aloud or information presented orally or through **other media**.
- **SL.1.5:** Add drawings or other **visual displays** to descriptions when appropriate to clarify ideas, thoughts, and feelings.

Grade 2

- **RL.2.7:** Use information gained from the illustrations and words in a print or **digital text** to demonstrate understanding of its characters, setting, or plot.
- **RI.2.5:** Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, **electronic menus, icons**) to locate key facts or information in a text efficiently.
- **W.2.6:** With guidance and support from adults, use a variety of **digital tools** to produce and publish writing, including in collaboration with peers.
- **SL.2.2:** Recount or describe key ideas or details from a text read aloud or information presented orally or through **other media**.
- SL.2.5: Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
- **L.2.4.e:** Use glossaries and beginning dictionaries, both print and **digital**, to determine or clarify the meaning of words and phrases.

Grade 3

- **RI.3.5:** Use text features and search tools (e.g., **key words, sidebars, hyperlinks**) to locate information relevant to a given topic efficiently.
- **W.3.6:** With guidance and support from adults, **use technology** to produce and publish writing (using **keyboarding skills**) as well as to interact and collaborate with others.
- **W.3.8:** Recall information from experiences or gather information from print and **digital sources**; take brief notes on sources and sort evidence into provided categories.
- SL.3.2: Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

- **SL.3.5:** Create engaging **audio recordings** of stories or poems that demonstrate fluid reading at an understandable pace; add **visual displays** when appropriate to emphasize or enhance certain facts or details.
- **L.3.4.d:** Use glossaries or beginning dictionaries, both print and **digital**, to determine or clarify the precise meaning of key words and phrases.

Grade 4

- **RL.4.7:** Make connections between the text of a story or drama and a **visual** or oral **presentation** of the text, identifying where each version reflects specific descriptions and directions in the text.
- **RI.4.7:** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, **animations**, or **interactive elements on webpages**) and explain how the information contributes to an understanding of the text in which it appears.
- **W.4.2.a:** Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and **multi-media** when useful to aiding comprehension.
 - W.4.6: With some guidance and support from adults, use technology, including the internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
 - **W.4.8:** Recall relevant information from experiences or gather relevant information from print and **digital sources**; take notes and categorize information, and provide a list of sources.
 - **SL.4.2:** Paraphrase portions of a text read aloud or information presented in **diverse media and formats**, including visually, quantitatively, and orally.
 - **SL.4.5:** Add **audio recordings and visual displays** to presentations when appropriate to enhance the development of main ideas or themes.
 - **L.4.4.c:** Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and **digital**, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.

Grade 5

- **RL.5.7:** Analyze how visual and **multimedia elements** contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, **multimedia presentation** of fiction, folktale, myth, poem).
- **RI.5.7:** Draw on information from multiple print or **digital sources**, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- **W.5.2.a:** Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and **multimedia** when useful to aiding comprehension.
 - W.5.6: With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.
 - **W.5.8:** Recall relevant information from experiences or gather relevant information from print and **digital sources**; summarize or paraphrase information in notes and finished work, and provide a list of sources.
 - **SL.5.2:** Summarize a written text read aloud or information presented in **diverse media and formats**, including visually, quantitatively, and orally.
 - SL.5.5: Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
 - **L.5.4.c:** Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and **digital**, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.

Grade 6

RL.6.7: Compare and contrast the experience of reading a story, drama, or poem to **listening to or viewing an audio, video,** or live version of the text, including contrasting what they "see" and "hear" when reading the text to what they perceive when they listen or watch.

- **RI.6.7:** Integrate information presented in **different media or formats** (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
- W.6.2.a: Introduce a topic; organize ideas, concepts, and information using strategies such as definition, classification, comparison/contrast, and cause/ effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
 - **W.6.6:** Use **technology**, **including the internet**, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of **keyboarding skills** to type a minimum of three pages in a single sitting.
 - **W.6.8:** Gather relevant information from multiple print and **digital sources**; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.
 - **SL.6.2:** Interpret information presented in **diverse media and formats** (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
 - **SL.6.5:** Include **multimedia components (e.g., graphics, images, music, sound) and visual displays** in presentations to clarify information.
- **L.6.4.c:** Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and **digital**, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.

What Is the Math Standard with Technology?

The Standards for Mathematical Practice (SMP) are skills that all of your students should look to develop. As you learned in Chapter 5, there are eight SMP, which are designed to overlay the math content standards. In other words, the math practice standards apply to every one of the math content standards. So, although MP5 is the only standard that includes technology, it actually means that every math content standard should use the appropriate tools, including tools that use technology.

Following is MP5, taken verbatim from the CCSS website. As in the preceding two sections, any text that pertains to technology is in boldface type.

CCSS.MATH.PRACTICE.MP5

MP5: Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a **graphing calculator**. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that **technology** can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use **technological tools** to explore and deepen their understanding of concepts.

It is important to note the standard's emphasis on using technology pervasively. Keep technology in mind, not only when teaching the standards but in the assessment as it creates a learning advantage for your students.

We hope you have taken away important information on where technology can be found in the CCSS. In the next chapter, we discuss practical strategies and offer helpful resources so you can begin teaching the CCR standards with technology right away.