K-5 Computer Science

Teacher Notes

Domain Standard (Competency): Reflective Researcher

The Teacher Notes were developed to help teachers understand the depth and breadth of the standards. In some cases, information provided in this document goes beyond the scope of the standards and can be used for background and enrichment information. Please remember that computer science encompasses both fundamental skills, such as computational thinking and digital citizenship, that all students should be introduced to in order to be viable citizens in a digital society as well as discrete skills that are endemic to specific career clusters.

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Reflective Researcher

CSS.RR.K-2.8
Select appropriate sources to conduct authentic research to produce a relevant and credible product.

CSS.RR.3-5.8
Gather, evaluate, and organize quality information from multiple sources

This domain addresses an abstract level of thinking in students. We now live in an age of information. Information is available on our finger tips. It is said that over 90% of the data was generated over the last two years. 2.5 quintillion bytes of data is created every day. A conversation between people invariably leads to trying to find some information which in turn leads to conducting a web search. Each search, each addition of an Internet Of Things device (such as Siri or Alexa) only adds on to the data. With looking for information on the Internet becoming a regular activity, it is important that children as young as kindergarteners understand the importance of research, the caution that should be applied while doing research and the tools and methodologies used to conduct research.

Students need to be reflective on how to conduct research. Beginning at the K-5 level students should have good work habits in place. Reflective research is about students knowing how to go on the Internet and look for information. They should learn about websites and the different types of websites that have information about the same topic. How does one typically know if a resource available is valid? Authenticity plays a key role. Providing information that may not be available elsewhere (rare, inner insight). Resources that provide citations are considered valid. Teaching students how to find useful information is important. Students capabilities between K-2 and 3-5 grade levels are highly varied. At the younger age groups, students are still learning to read and write. However, with digital tools students can draw, paint and record their voices. Digital storytelling is an excellent way of conducting and recording research. Kindergarteners and early learners listen to information provided in videos (BrainPop Jr. is highly recommended) and can narrate their thoughts by having their voice recorded.

With the older students establishing formal research processes is needed. Students now can master their writing skills along with establishing their research skills. Students should be taught to evaluate websites and learn to access multiple resources and get information from all the resources. Learning to work with a group, taking multiple viewpoints and considering them is important. Students should learn to use technology tools to conduct research. Learning about references and the importance of citing information needs to be taught to students. Understanding copyright issues and Creative Commons is needed. While this takes a much bigger significance for students in middle school and at the high school level exposing students

to the fact that information is a commodity and people who have created the information should be given the credit due to them.

Reflective Researcher encourages students to consider all aspects of research and encourages students to do responsible work while conducting search and create artifacts as the result of the research.

CSS.RR.K-2.8.1

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

1. **Understand that answers to questions can be found through research from a variety of sources.**

This first element is about teaching students to understand the idea of research. Today's society is an information driven society. Students before entering school are familiar with smart phones, tablets, etc. Schools and students must start adapting new technologies and new ideas. Research and research methods that traditionally were introduced to students in higher grade levels are to be introduced as ideas to the younger children. Students need to learn basic research strategies and ideas / concepts using the computer and the internet. Early education classrooms need to treat technology and interactive media as tools to help with research. It is necessary to show students that research can be done without technology as well. By going to the library, reading books, magazines and other newspapers. And show them how to do it using technology as a tool.

Resource Links
https://thecurrent.educatorinnovator.org/collection/technology-in-kindergarten
https://nwcommons.nwciowa.edu/cgi/viewcontent.cgi?article=1019&context=education_masters

CSS.RR.K-2.8.2

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

2. **Understand that resources on the Internet vary in quality and are found in a variety of places so care is needed in selection**

The second element of this domain examines the quality of materials on the Internet and instructs teachers to help student identify high quality resources and avoid resources that are questionable in content. An important idea to acknowledge is that with the availability of the Internet technology and hence research resources are available to students you have been traditionally at a disadvantage. In that sense technology has become an equalizer in current day society. However, teachers need to be aware that there needs to be a lesson or multiple lessons that teach students how to identify a resource as being valuable. Resources that originate in educational institutions are useful and have authentic information. Government institutions have websites that are clearly laid out and do not have advertisements and are careful about privacy laws. Not for profit organizations have an extension of .org. While these are usually authentic and can be used by children, apply caution and ask students to get them verified by you before getting information from the site. Provide constant feedback to students about their journey on the Internet and keep encouraging them to find multiple resources that indicate the same information. That is a good way to verify the authenticity of the information provided.

Resource Links
https://www.scholastic.com/teachers/articles/teaching-content/6-online-research-skills-your-students-need/
http://www.kathleenamorris.com/2018/02/23/research-filter/

CSS.RR.K-2.8.3

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

3. **Understand there is an appropriate place to find information to research the answer to a question.**

The third element is to understand that there are websites that have information that are accurate. In order to find those, it is important to use the right search terms and use good search engines. Explain to students that search terms are words that should be entered the search bar. The programs then go and search the internet and provide results. Good search engine programs know which sites to avoid displaying. Some of the important things to know while search for terms is that the advanced option helps limit the number of hits that are received.
https://www.google.com/advanced_search
Show this site to the students and using examples explain how they can target their search. Also explain to student the different types of search terms that can be used.

One Word Search	A single word that the student in interested in knowing more about.
One-phrase Search	Instead of one word it could be a phrase.
Multiple term Search	To make the search specific entering multiple words may help.
Quotation Marks	To search for very specific multiple words that the student wants it to occur together use these.
AND	Combines the two search terms. And gives results that show both terms in the page. But not necessarily together.
Not	Combines the two search terms and shows pages where either one of the search term shows up.

Common Terms	Using the commonly used terminology such as “Shoes” rather than “sneakers”
Synonyms	Be careful about synonyms. It is a good idea to use the thesarus to find the more commonly used words for the word the student is searching for
Asteriks	When unsure of spelling use this to indicate the letter the word starts with or exists somewhere in the word.
Question Marks	When the rest of the keywords could be anything and the student is unsure use this.
Significant word	Put the most important word first

Show students this video on how to search for information on the internet.
https://youtu.be/7RlB1CJovTs

Resource Links
https://edu.gcfglobal.org/en/internetbasics/using-search-engines/1/
https://ahrefs.com/blog/google-advanced-search-operators/
https://blog.hubspot.com/marketing/google-advanced-search-tips
https://www.kiddle.co/
http://www.kidrex.org/
https://www.kidzsearch.com/

CSS.RR.K-2.8.4

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

4. **Progress from using a teacher developed list of resources, to selecting resources independently.**

The fourth element is important in this domain because it encourages the student to start working independently. In the previous element the teacher will train the student by providing them with specific search terms. They will also work the students on helping them pick the right search engine that works for them.
In this element students will start working on their own. A good way to encourage this is to give them a project. Two projects are outlined in the next couple of domains which provide scaffolding to the students and lead them gently to independent work.
Students can be asked to create a writing digital portfolio. For this project students write on the computer. Students are expected to write simple sentences. And they have to know spellings of simple words. Simple grammar rules as well as space between words are simple ideas that students are not aware of this is where a software tool for writing is very helpful. When young children have to write on paper and students do not have hand co-ordination to use the pencil it can make them fall behind. However if they use a software and write with it and research for information now they are becoming independent and developing their own skill sets.

Resources:
http://earlyconnectionserie.org/
https://nwcommons.nwciowa.edu/cgi/viewcontent.cgi?article=1019&context=education_masters
https://thekindergartensmorgasboard.com/2019/03/research-projects-in-kindergarten.html

CSS.RR.K-2.8.5

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

5. **Select digital and analog resources, explain why a source was selected, and describe why it was the best source.**

The fifth element discusses how students can select their sources for information and describe why it was the best choice. This is important because in the process they are reflecting on the actions they have taken and they are writing about it. Many students do not recognize the purpose for writing stories. Some do not find it engaging and get off task. They lack any motivation even if they are quite capable in their skills.
One student who was interviewed by a teacher was asked why she writes her stories every day. She responded, "I don't know. To keep them in my writing folder." This is evidence that students need to see a purpose for their work. It is not simply to practice and to improve their writing and only share it with a teacher. Students need to understand that the purpose is to share and express ideas with others. Students can even narrate their experiences using digital tools such as Animaker Class and Book Creator. In the previous element we discuss how students can write their own stories. These would be simple sentences and will use the software to overcome any challenges that they encounter. For this element where students need to explain their process – writing it may be more challenging. However if they can record themselves and listen and improve their recordings it may prove to be interesting. There are many tools / apps that let young children record stories. Students should also be trained to save their resources – bookmark and organize them and be able to get to the resources when needed. There are plenty of tools that help with this.

Resources:
https://nwcommons.nwciowa.edu/cgi/viewcontent.cgi?article=1019&context=education_masters
https://www.techlearning.com/tl-advisor-blog/30-sites-and-apps-for-digital-storytelling
https://www.diigo.com/

Little Bird Tales	http://littlebirdtales.com/	A great one for students to create their art and record their voice
Pixton for Schools	http://www.pixton.com/schools/overview	A digital portal for creating comics
StoryJumper	http://www.storyjumper.com/	An excellent one for building stories from scratch or from a story starter.

VoiceThread	https://voicethread.com/products/k12/	A popular site for creating interactive stories and collaborating with others.
Nawmal	https://school.nawmal.com/	Helps created animated videos.

CSS.RR.K-2.8.6

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

6. **Collect and organize data.**

The sixth element is important when the student who is learning numbers also learns to quantify. In its simplest form teaching students to organize similar types of things, comparing one collection with another collection. Basic math skills with a slight difference. Students are connecting the information to real life scenarios and researching about them and finding connections.

The first example illustrated here is **Gracie and Friends Birthday Cake**. This is an iOS app found in iTunes. It is an excellent math game that points out groups of anything -- toys, shoes, pencils, etc. -- and ask how many there are. Te teacher can then re-arrange the objects and ask again. Have kids practice making quick number judgments to match quantities, such as choosing the right number of napkins to pass out to their table at snack. This shows them how to make the data relevant and how to organize data. Collection of such data now becomes very easy. They just have to use the internet search terms they have been practicing to get similar data and practice the skills in this element.

The second example illustrated here is **Brain Pop Jr.** https://jr.brainpop.com/

This software has short videos that serve as an introducing to the topic on numbers where the numbers represent the number of objects in a collection. Watch the video as a class, pausing once or twice throughout or at the end to check for understanding. Then guide students through the activities you think are beneficial or allow students to choose.

Resources:
https://www.commonsense.org/education/top-picks/10-best-math-tools-for-elementary-schoolers
https://jr.brainpop.com/

CSS.RR.K-2.8.7

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

7. **Create a product of research collaboratively or independently. (e.g., table of data, writing assignment, collection of resources).**

The seventh element have students work together to collaborate. In this domain the focus is using technology to collaborate. A true brainstorm is not possible without collaboration. Collaboration provides a safety net; it helps you catapult your thinking and develop ideas that may seem crazy at first. There are plenty tools that can be used to collaborate and do research as a team. Collaborative learning has been shown to not only develop higher-level thinking skills in students and boost their confidence and self-esteem as well. Group projects can maximize educational experience by demonstrating the material, while improving social and interpersonal skills. Students learn how to work with various types of learners and develop their leadership skills. Here are some tools that help students research collaboratively.

Resources:
http://neatoday.org/new-educators/benefits-of-collaboration/

Padlet	www.padlet.com	Padlet as a portfolio for showcasing their best school projects on their profile.
Drawp	iTunes	Drawp to encourage group brainstorming and teamwork. Students can brainstorm digitally and even make collaborative presentations by creating pictures to add to a slide show
FlipGrid	www.flipgrid.com	Short video-logs allow students to share ideas and opinions in a fun and hands-on way, as video submissions are often more enticing to students than a written response and a perfect solution for our youngest students who can record their videos as they still learn to read and write.

CSS.RR.K-2.8.8

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

8. **Create and share a research project reflecting and crediting a variety of quality resources**

The eighth element is the ultimate element in the domain that asks the student to put all the skills together and create a research project. To demonstrate knowledge of this element students can be asked to create another project or complete one of the projects that were started to demonstrate elements four and five. Students can either write a digital portfolio and indicate the websites where they have got the information from or record their research experiences by narrating a story. The key skill that needs to be demonstrated is understanding references. Students are required to be able to state either in their voice recording or in writing where they received their information. Students should be taught that this is giving credit to the person who created the resource. It is also a good practice to show students the various reference formats. As a fun activity students can create references in various formats using some each reference creating tools such as Easy Bib.

Resources:
https://thekindergartensmorgasboard.com/2019/03/research-projects-in-kindergarten.html
https://nwcommons.nwciowa.edu/cgi/viewcontent.cgi?article=1019&context=education_masters
https://www.techlearning.com/tl-advisor-blog/30-sites-and-apps-for-digital-storytelling
https://www.naeyc.org/resources/topics/technology-and-media/preschoolers-and-kindergartners
http://www.citationgenerator.com
http://www.schrockguide.net/uploads/3/9/2/2/392267/workscited_1_6.pdf

CSS.RR.3-5.8.1

Gather, evaluate, and organize quality information from multiple sources.

1. **Understand and use effective research strategies to locate information and other resources.**

The first element focuses on teaching students on how to conduct research. The expectation is students have been exposed to the concept / idea of research and are now progressing to understand how to do the actual research. They have to learn simple concepts and methodologies that are independent of technology. As a second step then teach them how to use the technology tools to conduct the research. Students will use scaffolding to research and organize information for writing a research paper. A research paper scaffold provides students with clear support for writing expository papers that include a question (problem), literature review, analysis, methodology for original research, results, conclusion, and references. Students examine informational text, use an inquiry-based approach, and practice genre-specific strategies for expository writing. Depending on the goals of the assignment, students may work collaboratively or as individuals. There are several collaborative tools that help students work collaboratively on research projects. Here is a collaborative activity that teaches students how to search effectively. Ask a simple question such as "When is Abraham Lincoln's birthday?" When one or more students have found the answer, have one student take the class through the steps he or she took to find the answer; if possible, do this on a screen so that everyone can watch. Along the way, ask probing questions. What key words did you type into the search engine? Why did you choose these words? Which results did you click on? Why did you choose those sources over the others on the page? How many steps did it take? Are you sure the sources are reliable and that the answers are correct? How can you tell? How would you verify the information? If time permits, play around by using different key words and clicking on different results, to see how the search for the answer to the question changes. End the activity with a thought question – is there something new you learned about searching on the Internet? If so, list it in your journal.

Here are ten steps to teach students how to research online:
1. Explain the search term you are looking for within your search bar.
2. Find the best term you can find. Identify a credible resource.
3. Look at the best websites to find the information.
4. Search encyclopedias
5. Look for information that addresses your specific question.
6. Look for facts
7. Look for specific facts.

Resources:
https://www.wabisabilearning.com/blog/10-steps-teaching-online-research-skills
https://learning.blogs.nytimes.com/2010/02/22/just-google-it-developing-internet-search-skills/?mcubz=0

CSS.RR.3-5.8.2

Gather, evaluate, and organize quality information from multiple sources.

2. **Evaluate the accuracy, perspective, credibility and relevance of information, media, data, or other resources.**

The second element trains students on evaluating resources found online. This is a critical piece to conducting research. And using technology (and the Internet) this becomes very important.

Resources:
https://web.archive.org/web/20140626135022/http://www.library.ucla.edu/libraries/college/thinking-critically-about-world-wide-web-resources

1	**Does the purpose of the web page match my needs?**
2	**All the links all active? Does the information read completely?**
3	**Knowing what you know so far of the topic you are doing research does it match with what the website states?**
4	**Is the date of the coverage of the site somewhat recent?**
5	**Are the links pointing to resources external to the site or within the site?**
6	**Does the site have appropriate multimedia resources?**
7.	**Do you feel that the website information is valuable?**

CSS.RR.3-5.8.3

Gather, evaluate, and organize quality information from multiple sources.

3. **Use information from multiple sources to identify real-world issues and create solutions.**

The third element requires students to understand that good research involves listening to multiple perspectives and different viewpoints. Access to information resources has now become easily available. One assumes that student research and use of resources would have

improved. However, there are some significant challenges. The challenges facing today's information-seeker are far different from those of only a few years ago. Both instructors and students must develop information literacy. They needs to become good at assessing one's information needs, searching for possible sources of information, evaluating the credibility and quality of sources, and integrating information across sources. Too often, assignments have not kept pace with the changing information environment. An emphasis on using multiple resources is especially important in classes stressing life-long learning, communication skills, critical analysis, and the development of personal values. In today's "information society," students need to find and use resources regardless of the requirements made by their teacher. This perspective is presented by explaining to students the value of collaboration and the information explosion that has resulted because of the Internet. In addition, students should be encouraged to read information from multiple resources specifically those that contradict or present alternating viewpoints. Since this leads to inquiry. Some the qualities that a research mind needs are inquiry- interpretation, reflection and action as well as the self-reflection on the work done. Furthermore, students should explore various websites to understand multiple applications of the topic they are doing research on. Teachers need to encourage this even though this becomes increasingly uncomfortable as the student gains more knowledge than the student putting both the teacher and the student in a learner's role.
For example – doing research on self-driving cars . Students should look beyond the Tesla website to see the progress in the innovation and advances the technology has had in recent times.
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Resources:
http://www.kathleenamorris.com/2018/02/23/research-filter/
https://www.ideaedu.org/Client-Resources/Teaching-Learning-Resources/Encouraged-students-to-use-multiple-resources-eg-Internet-library-holdings-outside-experts-to-improve-understanding

Grade by grade progression

Kindergarten

Please download and save this resource. It has excellent examples on how to teach references progressively form Kindergarten to 5th graders. It provides examples for citations for different types of publications with increased content and complexity as the grade level increases.
http://www.schrockguide.net/uploads/3/9/2/2/392267/workscited_1_6.pdf

Description of Reflective Researcher for kindergarten:
In kindergarten students have minimum attention span are beginning to learn how to read and write. At this stage using their ability to express their thoughts and having them watch videos to research about various things should be used. Keep the videos short and informative. Lots of color, sound and action. These are ones that students will be able to reproduce. Typing simple words with spacing and identifying pictures using image searches and the touch screen that match the words are excellent forms of research. Interactive media is the key in these early stages. Students and drag and drop pictures into search engines and listen to information about the pictures. While creating their artifacts students can resize pictures and rearrange them to form digital collages.

Some artifacts that kindergarteners can create include pictorial stories, digital collages and digital story telling using voice recordings.

Sample activity: Pick a theme like your favorite holiday scene or your favorite story. Using software on touch screens such as Corell Draw It! students should drag and drop pictures to create a collage. Write one-word descriptions for the pictures. Resize the pictures as needed and rearrange them in the appropriate sequence that your story follows.

First grade

"*The heart and soul of good writing is research; you should write not what you know but what you can find out about.*" – Robert J. Sawyer.

At this grade level students are starting to write short stories and essays. Creating digital portfolios by researching for information and recording it should start. While many students can still use interactive media such as sound and images, using videos and writing sentences should also be encouraged. Today's students have more information at their fingertips than ever before, and this means the role of the teacher as a guide is more important than ever. Students should be able to visit multiple sites and review the material from various resources. They should be able to capture the information and use them to create their portfolios. Students also need a lot of practice using quotation marks and citing sources. They should understand that they must give credit to the person creating the resource. How formal you make your teaching of citation will depend on your students' age and your curriculum guidelines. Use Kathy Schrock's reference sheet to guide you.Some artifacts that students can create are short stories with pictures and words. Using StoryBoard students can pictorially create stories that have simple sentences in them.

Some artifacts that students can create include pictorial stories using software such as Storymaker. (https://www.carnegielibrary.org/storymaker/)

Sample activity: Write a short story about your favorite movie character. Use Storymaker to create the story. Work with students by going through the process of developing a short story using images. Students can participate by using the interactive whiteboard to add items or text to the story. And then finally create the story. Students will need help in making sure their story is saved.

Second grade

At this grade level students can have some abstract thinking. They can do formal research and can write an essay around a topic. They should be able to enter search terms and look for information. Evaluating a site and its content should start playing an important role. Today's students have more information at their fingertips than ever before, and this means the role of the teacher as a guide is more important than ever. Students should be able to visit multiple sites and review the material from various resources. Students should start thinking about how to solve new problems, see patterns, and combine multiple perspectives. The topic of researching and filtering information can be broken down in many ways. Embedding explicit teaching and provide lots of opportunity for practice and feedback. Use Kathy Schrock's reference sheet to guide you. Some artifacts that students can create are short stories with pictures and words. Using StoryBoard students can pictorially create stories that have simple sentences in them. Student can collaborate to create artifacts such as short digital stories and work together to produce digital artifacts. Students can also write short essays such as my first day of school, my Christmas holiday.

Some artifacts that students can create are using Writing apps such as StoriumEdu (www.storiumedu.com) is a good tool that is customizable and has simple instructions that it is usable by the younger children.

Sample activity: Write a short essay on why a computer is an important tool. The students are still young and so the teacher will have to help setup the environment and help them create and save the documents. Before the students get to writing, the teacher will need to do some thinking and setup. A couple of steps include create a story world, select cards for the world's setting, beginning and ending as well as be prepared to face the successes and setbacks students will face. Step two is to create a scenario that broadly outlines the story which the students can then follow. Once this is done, the students should be able to type their thoughts that they have researched and enter it into the software.

Third grade

Students should be able to write digital interactive stories, create videos and write short essays at this stage. They should be active researchers trying to figure out how to find useful information on the internet. Solid research skills underpin this. Having the fluency to find and use information successfully is an essential skill for life and work. Evaluating the websites for information, getting information from multiple resources, getting varied perspectives are all part of the research process. Students can evaluate multiple search engines and pick one that they find gives them the best results. Teachers need to ensure that Safe Search is activated in all the search engines. Students also need to realize that information belongs to someone. The internet can offer a confusing web of information at times. Students need to be shown how to look for the original source of information. And if it is used credit should be given to the owner. Students also need a lot of practice using quotation marks and citing sources. Use Kathy Schrock's reference sheet to guide you. Students can research collaboratively using technology tools that help with collaboration to research multiple resources

Some artifacts that students can create are using Writing apps such as StoriumEdu (www.storiumedu.com) is a good tool that is customizable and has simple instructions that it is usable by this age group. The essays can be individual or can be worked collaboratively bringing together multiple perspectives.

Sample activity: Using the Writing App in a group of two or three write a short essay on "what is a search engine and give at least two examples of useful search engines."? Before the students get to writing, the teacher will need to do some thinking and setup. A couple of steps include create a story world, select cards for the world's setting, beginning and ending as well as be prepared to face the successes and setbacks students will face. Step two is to create a scenario that broadly outlines the story which the students can then follow. Students should cite references as is age appropriate.

Fourth grade

Students at this age level should now be comfortable at writing short essays, researching for them on the internet. Watching, reading multiple resources and getting information and using them. The teacher should now teach them to analyze the information available, gather various perspectives – both by visiting multiple sites and working collaboratively. Teaching them to connect the dots rather than collect the dots. Student can do this by reflecting on the research done and the essay that they have written. When visiting a website a student can get a quick summary of what the website information. There are some free online tools that summarize information for you. This could be considered as a handy reference for students to try out and evaluate. For example, students could try writing their own summary and then comparing it to a computer summary. SMMRY is an example of a tool where you can enter text or a URL of an article. students lots of practice writing information in their own words. Students can benefit from simply learning how to put information in their own words. Students in this age group can investigate the difference between paraphrasing and summarizing. While it is important that they should not plagiarize, need to be assured that they can use information from other sources, and they should. They just need to say who, where it was from. Use Kathy Schrock's reference sheet to guide you on how students at this age level should be citing references.

Some artifacts that students can create are using Writing apps such as ThinkCERCA (https://thinkcerca.com/). This is a complete – one size fits all resource. Teachers can arrange for whole-class access to the site during the school day or, if possible, assign students to read specific articles as part of a flipped classroom. High-interest texts can spark classroom discussions, provides helpful feedback tools for teachers.

A sample activity can be to create an interactive story or essay that gives information about their favorite technology such as smart phones or a social media tool or a smart assistant such as Siri or Alexa.

Fifth grade

Students at this grade are familiar with the research process and are knowledgeable about search engines and the pros and cons of using the Internet effectively. Students should now be able to create videos and other presentations to support their essays on various topics. Students should be creating artifacts both collaboratively and individually. Teachers should instruct students about copyright and creative commons and how to identify resources of both kinds. Now students should be using references as is age appropriate. Use Kathy Schrock's reference sheet to guide you on how the references should be cited. A skill that can be practiced is organizing the information. At this grade level teachers can teach students to create a system for students to organize their information while they're searching. There are many apps and online tools to curate, annotate, and bookmark information, however, they could just set up a simple system like a Google Doc or Spreadsheet. Students today have a lot of information at their fingertips. The web is filled with disconnected pieces of information and it's growing all the time. Even the most specific terms bring up many results and very soon they are lost in vast oceans of information. Hence organization is key. The format and function should be simple and clear. This means students don't have to put much thought into using and designing their collections. Instead, they can focus on the important curation process.
Wakelet (www.wakelet.com) is a good tool for allows you to save, organize, tell stories, and share content from around the web. This helps with information organization.

Some artifacts that students can create are videos using iMovie and Windows Movie Maker to highlight the research they have done. Another tool students can use Wakelet. This is an organization tools that lets students curate content in useful way. A portfolio of bookmarks in Wakelet can be an artifact that students at this age group can produce. This can be done individually or collaboratively.
A sample activity could be creating a movie on "how technology helps students collaborate better" Students can design this as a supplement to the essay the student has written. Since this project is now large (having multiple deliverables) multiple students can collaborate on this project.