<u>**Expert Pack: The Evolution of the Internet**</u>
Lexile Range: 1070-1630

Topic/Subject: The Evolution of the Internet

Texts/Resources

Books
1. "The Internet"

Articles
1. "The Internet of Things"
2. "In the Programmable World, All our Objects Will Act as One"

Videos
1. "History of the Internet"
2. "The Future of the Internet- The Advanced Apes"

Rationale and Suggested Sequence for Reading

This text set begins with a book, "The Internet," which provides information on the very beginnings of the internet. It explains how the idea for the internet was conceived and how it grew from there. The set continues with a short video, "History of the Internet" that gives an overview of the evolution of the internet over the last 50 years. The video begins with a review of information from the first article and continues with information about how the internet evolved over time. The video ends by asking viewers to consider how their lives would be different without the internet. The next resource is an article called "The Internet of Things" and discusses how sensors are being embedded in many everyday objects allowing them to connect to each other wirelessly. This is a natural progression from the previous article as it predicts how the internet will continue to evolve and how our lives will be different because of the internet. It gives examples of how the connectivity of objects will change our world, and the pros and cons of this connectivity. The high Lexile level of this text is due to sentence length more than it is to vocabulary and teachers should use their judgment as to how much support students might need with this. The idea of connectivity continues in the article, "In the Programmable Future, All Our Objects Will Act as One", which is much longer than the other 2 articles. It expands on the idea of the previous article by giving many more examples of how our lives will change. It asks readers to imagine a world where many daily activities become automated, and one in which people are no longer tied to their devices. The final resource in this text set ties all of the information together with a video: "The Future of the Internet

– The Advanced Apes." It reviews the evolution of the internet, gives examples of the Internet of Things, and provides viewers a glimpse into the future as it considers an interplanetary internet and the establishment of a Martian colony.

The Common Core Shifts for ELA/Literacy
1. Regular practice with *complex* text and its academic language
2. Reading, writing and speaking grounded in *evidence* from text, both literary and informational
3. Building *knowledge* through content-rich nonfiction

College and Career Readiness Anchor Standards for Reading Literary and/or Informational Texts
1. *Read closely to determine what the text says explicitly and to make logical inferences from it*; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. *Determine central ideas or themes of a text and analyze their development*; summarize the key supporting details and ideas.
10. *Read and comprehend complex literary and informational texts independently and proficiently.*

Annotated Bibliography

1070L "**The Internet**"
Author: Ned Jensen
Genre: Informational book
Length: 1,404 words
Synopsis: This article gives information what the internet is, how it works and on the very beginnings of the internet.
Citation: The Internet. *Reading A-Z.* Retrieved from https://www.raz-plus.com/books/leveled-books/book/?id=907&lang=English
Recommended Student Activities: Picture of Knowledge

N/A "**History of the Internet**"
Author: Life Noggin
Genre: video
Length: 3:40
Synopsis: This video gives a brief overview of the evolution of the internet over the last 50 years.
Citation: - https://www.youtube.com/watch?v=h8K49dD52WA
Recommended Student Activities: The video ends with the question, "How would your life be different without the internet?" The recommendation is that students do a quick-write activity using that question as a prompt.

1630L **"The Internet of Things"**
Author: Bloomberg
Genre: Informational article
Length: 4 pages
Synopsis: This article discusses how sensors are being embedded in many everyday objects allowing them to connect to each other wirelessly. It predicts how the internet will continue to evolve and how our lives will be different because of the internet. It gives examples of how the connectivity of objects will change our world, and the pros and cons of this connectivity.
Citation: Bloomberg (Oct. 24, 2016). The Internet of Things. Retrieved from https://www.bloomberg.com/quicktake/internet-things
Recommended Student Activities: Quiz Maker

1290L **"In the Programmable World, All Our Objects Will Act as One"**
Author: Bill Wasik
Genre: Informational
Length: 4405 words
Synopsis: This article speculates on the future development of smart houses where everything is connected and programmable.
Citation: Wasik, Bill. (2013, May 14). In the Programmable World, All Our Objects Will Act as One. *Wired*. Retrieved from http://www.wired.com/2013/05/internet-of-things-2/all/
Recommended Student Activities: Wonderings

N/A **"The Future of the Internet/The Advanced Apes"**
Author: PBS Digital Studios
Genre: Informational Video
Length: 6:35 minutes
Synopsis: This video reviews the history of the internet and explores how the internet could change in the future.
Citation: The Future of the Internet/The Advanced Apes [Video file]. (n.d.). Retrieved from https://www.youtube.com/watch?v=E1CHWJ6ZY4c
Recommended Student Activities: The video ends with the question, "How is the internet changing and how will it shape our lives in the future?" The recommendation is that students do a quick-write activity using that question as a prompt.

Supports for Struggling Students

By design, the **gradation of complexity** within each Expert Pack is a technique that provides struggling readers the opportunity to read more complex texts. Listed below are other measures of support that can be used when necessary.

● Provide a brief **student-friendly glossary** of some of the academic vocabulary (tier 2) and domain vocabulary (tier 3) essential to understanding the text

● Download the Wordsmyth widget to classroom computers/tablets for students to access student-friendly definitions for unknown words. http://www.wordsmyth.net/?mode=widget

● Provide brief **student friendly explanations** of necessary background knowledge

● Include **pictures or videos** related to the topic within and in addition to the set of resources in the pack

● Select a small number of texts to **read aloud** with some discussion about vocabulary work and background knowledge

● Provide **audio recordings** of the texts being read by a strong reader (teacher, parent, etc.)

● **Chunk the text** and provide brief questions for each chunk of text to be answered *before* students go on to the next chunk of text

● Pre-reading activities that focus on the **structure and graphic elements** of the text

● Provide **volunteer helpers** from the school community during independent reading time.

● Use Expert Packs as the **resources for Guided Reading** with a small group of students

Why Text Sets Support English Language Learners

Those acquiring English as a second language have to learn many words in English to catch up with their English-only peers. Vocabulary builds at a much quicker pace when reading a set of connected texts. Text sets are an adaptable resource perfect for building knowledge and vocabulary. Student use of text sets can vary in terms of independence or teacher supports based on the individual needs of the students in the room. Activities found within the text set resources reflect several best practices for English Language Learner instruction including:

- Providing brief, engaging texts that provide a high volume of reading on a topic.
- Providing web-based resources and/or videos that are tied to the content of the texts students are reading.
- Providing opportunities for students to learn new vocabulary through the use of student-friendly definitions in resource-specific glossaries.
- Allowing for options to reinforce newly learned vocabulary and/or content through graphic organizers.
- Providing opportunities for students to reinforce new vocabulary through multi-modal activities including written work, group discussion, viewing visual content, and reading texts that feature the vocabulary.

Teachers of ELLs may use the protocols on the following pages to provide additional support to students who are struggling to access the content within text sets because they are new to English.

ELL Text Set Protocol Grades 3-12

The goal of text sets is to help students build knowledge through a volume of independent reading, and it is important that educators provide scaffolds to allow English Language Learners to be successful in engaging meaningfully with the texts, even as students are still developing English language skills. The protocol below can be used for teaching with text set resources as a full class. Students can also be trained on the protocol so that they can utilize text sets in small groups or partnerships as a resource for independent or reciprocal reading and study.

Please note that this protocol includes options for teachers. Individual decisions should be made considering the needs of the students and the demands of the content, keeping in mind that the goal of each scaffold is to allow students to meaningfully access the text and move toward independent, knowledge-building reading.

Step one: Build knowledge and vocabulary.

Introduce students to the overall topic/content of the text set, including knowledge demands needed to engage in the content, and domain-specific vocabulary necessary for comprehension. This should be done prior to engaging with the texts themselves; time allotted to this activity should reflect student needs (anywhere from 5 minutes prior to reading, to a full day's lesson is appropriate).

Options for this step include:
- Engage students in reading and discussing auxiliary texts (of lesser complexity) and resources (illustrations, photographs, video clips) on the topic of the text set.
- Pre-teach a few key content-specific terms prior to students engaging with a text set. (Ideas for text-focused vocabulary instruction can be found [here](#).)
- Provide the student-friendly glossary included in the text set prior to reading each text.
- When possible, allow students to read texts in their home language about the topic under study.

Step two: Read text orally.

Focusing on one resource at a time, allow students to listen to a fluent read of the resource, while following along with their own copy of the text.

Options for this step include:
- Have a fluent reader model the first read of a text or resource.
- Have students engage in a buddy/partner read.
- Use recordings of the text to provide additional opportunities to hear expert reading.

Step three: Engage in group discussion about the content.

Allow students time in partnerships or small groups to discuss the content of the resource.

Options for this step include:
- Allow for discussion/conversation (in the students' home language if possible) with a small group of students reading the same text set prior to writing or provide heterogeneous language groupings to talk about content and discuss what students are learning.
- Have students refer to the student-friendly glossary included with each text set to identify meanings for new vocabulary necessary for comprehension.

Step four: Write about what was read.

Options for this step include:
- Use the "Rolling Knowledge Journal" and/or "Rolling Vocabulary Journal" as a shared writing routine/graphic organizer to help to scaffold the writing process and capture student knowledge over time.

- Provide students with several supports to help students engage in writing/drawing about what they read:
    - Use mentor texts about which students can pattern their writing.
    - Allow them to write collaboratively.
    - Show students visual resources as prompts, etc.
    - Provide language supports such as strategically chosen sentence starters.

Repeat steps one through four with each resource in the text set as appropriate.

Expert Pack: The Evolution of the Internet

Learning Worth Remembering

Cumulative Activities – The following activities should be completed and updated after reading each resource in the set. The purpose of these activities is to capture knowledge building from one resource to the next, and to provide a holistic snapshot of central ideas of the content covered in the expert pack. *It is recommended that students are **required** to complete one of the Cumulative Activities (Rolling Knowledge Journal or Rolling Vocabulary) for this Expert Pack.*

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1. **Rolling Knowledge Journal**
   - Read each selection in the set, one at a time.
   - After you read *each* resource, stop and think what the big learning was. What did you learn that was new *and important* about the topic from *this* resource? Write or list what you learned from the text about (topic).
   - Then write or list how this new resource added to what you learned from the last resource(s).

Title	Write or List	
	New and important learning about the topic	**How does this resource add to what I learned**
1. "The Internet"	Began in the 1960s when the U.S. Department of Defense wanted to create a way to communicate if there was a disaster or war. From there universities started creating networks of computers to communicate better as well.	

2. "History of the Internet"	1971 is when email first started. In 1991 the World Wide Web was started and the internet became accessible to anyone with a connection.	The first computers filled entire rooms. After the first message was sent it paved the way for email. Ordinary people began using the internet in the 1990s.
3. "Internet of Things"	Sensors are now being embedded in many everyday objects allowing them to connect to each other wirelessly. Some examples of this are washing machines that automatically reorder detergent when it's running out, and apps that allow homeowners to turn up the heat when they are away from home. The first sensors were put in vending machines so that companies could tell when the machines needed to be refilled without physically traveling to check the machines. Concerns about embedding sensors in everyday objects revolve around the possibility of hackers stealing information and of terrorists using devices for their activities.	As more and more people have access to the internet, more uses are being developed. Scientists and technology experts continue to envision ways for the internet to evolve.
4. "In the Programmable World, All our Objects Will Act as One"	Explores the "Internet of Things" by detailing a Smart House that exists to interpret the owner's needs completely online.	Students get an opportunity to explore the possibilities of what the internet can do and how it can change the dynamics within a home.
5. "The Future of the Internet/Advanced Apes"	This video reviews the history of the internet and explores how the internet could change in the future.	This resource gives students a balanced look of the past and the potential future of the internet

2. Rolling Vocabulary: "Sensational Six"

- Read each resource then determine the 6 words from each text that most exemplify the central idea of the text.
- Next use your 6 words to write about the most important idea of the text. You should have as many sentences as you do words.
- Continue this activity with EACH selection in the Expert Pack.
- After reading all the selections in the Expert Pack, go back and review your words.
- Now select the "Sensational Six" words from ALL the word lists.
- Use the "Sensational Six" words to summarize the most important learning from this Expert Pack.

Title	Six Vocabulary Words & Sentences
"The Internet"	Words: bandwidth, byte, clients, server, snail mail, domain name 1. The bandwidth used while streaming a video is greater than the bandwidth when you're reading an article. 2. Many bits of information create a byte of information. 3. Other computers, like the ones we have at home, on the internet are called clients. 4. Computers that provide information so you can go on the Internet are called servers. 5. Sending letters and information through the post office is called snail mail because it takes a long time compared to an email. 6. Domain names are given to websites instead of using numbers to identify them.
"History of the Internet"	Words: internet, communicate, proposed, various, accessible, influence 1. The internet is made up of millions of computers that are linked together. 2. The internet has made it much easier to communicate with people all over the world. 3. The idea for the internet was first proposed over 50 years ago. 4. People have various reasons for using the internet. 5. The internet is accessible by many more people today than it was in the past. 6. The internet has had a great influence on how we live our lives.
"The Internet of Things"	Words: issues, attach, severed, regard, feature, mainstream 1. All kinds of devices are being connected to the Internet, and this is raising the possibility of security issues. 2. Sensors can be attached to washing machines and when pressed will reorder laundry detergent. 3. In October of 2016 hackers launched a cyber-attack that severed internet access to millions of people. 4. Consumers will be willing to regard devices with sensors as necessary once

	they become more affordable.
	5. In order to reduce hacking, devices need to have a <u>feature</u> that allows them to disconnect from the Internet.
	6. Companies will need to figure out how to make devices affordable to <u>mainstream</u> consumers.
"In the Programmable World, All our Objects Will Act as One"	Words: intelligent, choreograph, network, future, devices, programmable
	1. In our houses, cars and factories, we're surrounded by tiny, <u>intelligent</u> devices that capture data about how we live and that we do.
	2. Soon, we'll be able to <u>choreograph</u> them to respond to our needs, solve our problems, and even save our lives.
	3. A <u>network</u> links the home's very sinews, its walls and ceilings and windows and doors.
	4. This is the language of the <u>future</u> – tiny intelligent things all around us, coordinating their activities.
	5. The intelligence once locked in our <u>devices</u> now flows into the universe of physical objects.
	6. The <u>programmable</u> world could actually let us put more of our gadgets away, automating activities we normally do by hand and putting intelligence from the cloud into everything we touch.
"The Future of the Internet"	Words: quantitative, enhance, curate, ubiquitous, infused, exponential
	1. Changes in the internet aren't just <u>quantitative</u>, there are other changes as well such as how we use the internet.
	2. The internet can <u>enhance</u> our memories by allowing us to preserve our memories through blog posts, etc.
	3. The internet allows us to <u>curate</u>, or collect, information so we can share it with others.
	4. The use of mobile computers has become practically <u>ubiquitous</u> now that so many people are using them.
	5. Technology is <u>infused</u> in almost everything we do in our day to day lives.
	6. The current generation has experienced <u>exponential</u> change as the internet has evolved.
Sensational Six	Words: Internet, mainstream, attach, programmable, devices, exponential
	The **internet** is the world's largest computer network and includes the World Wide Web, email, and social networking sites. When the Internet was opened up to ordinary consumers and became **mainstream**, new uses for it began to be developed. We now have **devices** that can have sensors **attached** to them that are **programmable**, so that homeowners can have remote access to their homes when they are away. The current generation has experienced **exponential** change as the internet has grown and evolved.

1. Rolling Knowledge Journal

- Read each selection in the set, one at a time.
- After you read *each* resource, stop and think what the big learning was. What did you learn that was new *and important* about the topic from *this* resource? Write or list what you learned from the text.
- Then write or list how this new resource added to what you learned from the last resource(s).

Sample Response

Title	Write or List	
	New and important learning about the topic	**How does this resource add to what I learned already?**

2. Rolling Vocabulary: "Sensational Six"

- Read each resource then determine the 6 words from each text that most exemplify the central idea of the text.
- Next use your 6 words to write about the most important idea of the text. You should have as many sentences as you do words.
- Continue this activity with EACH selection in the Expert Pack.
- After reading all the selections in the Expert Pack, go back and review your words.
- Now select the "Sensational Six" words from ALL the word lists.
- Use the "Sensational Six" words to summarize the most important learning from this Expert Pack.

Sample Response

Title:	Six Vocabulary Words & Sentences
Sensational Six	Words:

Learning Worth Remembering

Singular Activities – the following activities can be assigned for each resource in the set. The purpose of these activities is to check for understanding, capture knowledge gained, and provide variety of ways for students to interact with each individual resource. Students may complete some or none of the suggested singular activities for each text. Singular activities should be assigned at the discretion of the teacher

1. **A Picture of Knowledge** (Recommended for "The Internet")

- Take a piece of paper and fold it two times: once across and once top to bottom so that it is divided into 4 quadrants.

- Draw these shapes in the corner of each quadrant.
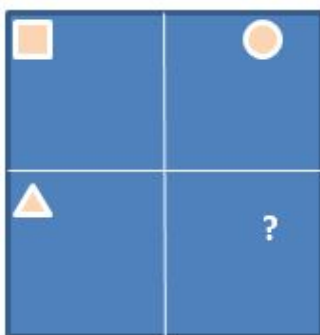
1. Square
2. Triangle
3. Circle
4. Question Mark

- Write!

  Square: What one thing did you read that was interesting to you?
  Triangle: What one thing did you read that taught you something new?
  Circle: What did you read that made you want to learn more?
  Question Mark: What is still confusing to you? What do you still wonder about?

- Find at least one classmate who has read [selection] and talk to each other about what you put in each quadrant.

2. Quiz Maker (Recommended for "The Internet of Things")

- Make a list of # questions that would make sure another student understood the information.
- Your classmates should be able to find the answer to the question from the resource.
- Include answers for each question.
- Include the where you can find the answer in the resource.

Question	Answer

3. Wonderings (Recommended for "In the Programmable World, All our Objects Will Act as One")

I'm a little confused about:	This made me wonder:
On the left, track things you don't understand from the video and the article. **I am confused about or do not understand….**	On the right side, list some things you still wonder (or wonder now) about this topic. **I wonder or would like to learn more about….**

Expert Pack: The Evolution of the Internet
Expert Pack Glossary

"The Internet"

Word	*Student-Friendly Definition*
bit	Small amount of information stored on a computer *When 8 bits are combined they create a byte.*
broadband	High-speed internet *Consumers will pay more for broadband internet.*
fiber-optic	A cable used to carry signals made from thin glass or plastic *A fiber-optic cable sends signals faster than a wire cable.*
ISP	Acronym for Internet Service Provider *You pay a monthly fee to your ISP.*
URL	Acronym for Uniform Resource Locator *You type in a URL to go to a particular website.*

"History of the Internet"

Word	*Student-Friendly Definition*
network	A system of computers that are connected to other computers *Researchers wanted computers to be able to communicate with each other so they developed computer networks.*
ARPANET	Advanced Research Projects Agency Network *The ARPANET was the government's computer network in 1969, and was used to send the first message between computers.*
Transmission control protocol (TCP)	The rules used to manage how computers exchange information *When computers around the world began to talk with each other it was necessary to have rules to manage that communication, and that's when TCP was developed.*
World Wide Web (WWW)	An information system on the Internet that allows documents to be connected to each other *The development of the World-Wide Web was a turning point in Internet history because it meant that anyone with an Internet connection could have access to the internet.*
browser	A computer program that locates and displays web pages *Some common browsers are Chrome, Firefox, and Safari.*
graphical interface	A computer program that lets users use pictures and icons rather than just text to interact online *Without the graphical interface we would have to learn lots of complicated computer language in order to communicate online.*

"Internet of Things"

Word	Student-Friendly Definition
divulge	To disclose *There are concerns that if all of our devices are connected to the Internet, private information will be divulged to hackers.*
dubbed	To give a title to something *Now that more and more devices are connected to the Internet, the resulting network has been dubbed the Internet of Things.*
dwarf	To be caused to appear small *As more and more devices are connected to the Internet, the Internet of Things will dwarf the Internet of People.*
fashion	To make, shape, or form *The U.S. is trying to fashion rules that make it more difficult for hackers to steal information.*
novelty	New or unusual *Consumers are not apt to buy expensive objects just because they are a novelty.*

"In the Programmable World, All our Objects Will Act as One"

Word	Student-Friendly Definition
data	Facts or information used usually to calculate, analyze, or plan something *Data gives people the information they need to make decisions based on trends going forward.*
device	An object, machine, or piece of equipment that has been made for some special purpose *Often, the various tools people use to access information/other people are known as devices (ex. iPad, cell phones).*
programmable	To work out a sequence of operations to be performed (by a mechanism) *We often think about programmers as people with a ton of experience writing and studying programmable computers and software.*

"The Future of the Internet/Advanced Apes"

Word	Student-Friendly Definition
developed world	Countries that are considered more economically and technologically advanced make up the developed world *The United States, Canada, and Japan are all part of the developed world.*
developing world	Countries that are not as advanced economically and technologically are considered to be part of the developing world *China, Mexico, and Uruguay are all part of the developing world.*
nomadic computing	Nomadic computing is the use of mobile devices like laptops, tablets, and smart phones *Every day more and more people are using nomadic computing to communicate.*