EAST HAMPTON PUBLIC SCHOOLS

East Hampton, Connecticut

Superintendent's Update

Week of January 29, 2018

2/2/18

The vision of the East Hampton Public Schools: Preparing and inspiring our students to be innovative, responsible, contributing members of an ever-changing global society.

Courage. Kindness. Friendship. Character.
These are the qualities that define us as human beings, and propel us, on occasion, to greatness.
~ R. J. Placio, Author of *Wonder*

This week in our Schools

Monday, January 29 – Board of Education Meeting in the East Hampton High School T-Bell, 6:30 PM. During this meeting the four school Principals and the Director of Curriculum will present information on the items that are included in the Superintendent's proposal for the 2018-19 Budget. The Principals will also address a few of the items currently not included in the budget and their impact on the schools' programming. **The Board will ask questions and audience members will be given an opportunity to voice their opinion concerning recommended cuts and proposed new programming.**

- **Wednesday, January 31 – Grade 8 Parent Planning Night at East Hampton High School, 6:30 PM.** Grade 8 parents should not miss this meeting. It's the prefect chance to learn about the High School. Information on school scheduling and graduation requirements will be presented by the academic area team leaders and Administration.
- **Friday, February 2 – Ground Hog Day.** Let's hope that the Ground Hog does not see his shadow and spring arrives early! Visit http://www.groundhog.org for fun information about the day. You can even livestream the event at http://visitpa.com/groundhog-day-live-stream/.
- **Thursday, February 1 – World Read Aloud Day.** Who will you read to today?
- **Friday, February 2 – Grade 7 & 8 Dance at the Middle School, 7:00 PM.**

Coming Soon – *and you should be part of this!*

The week of February 5-9
is "Start with Hello" Week.

START with Hello

Start With Hello encourages students to reach out and include those who may be dealing with chronic social isolation and create a culture of inclusion and connectedness.

Click here for more information.

The week of February 12-16
is "Random Acts of Kindness" Week.

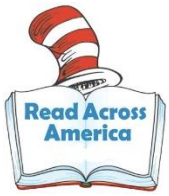
random act of kindness

Random Acts of Kindness (RAK) is a non-profit foundation that believes in spreading kindness in schools, communities and homes. Share the power of kindness to change the way people see and experience the world.

Click here for more information.

Additional resources:
https://wonderthebook.com/choose-kind
http://choosekind.tumblr.com/resources

February 2018 Calendar

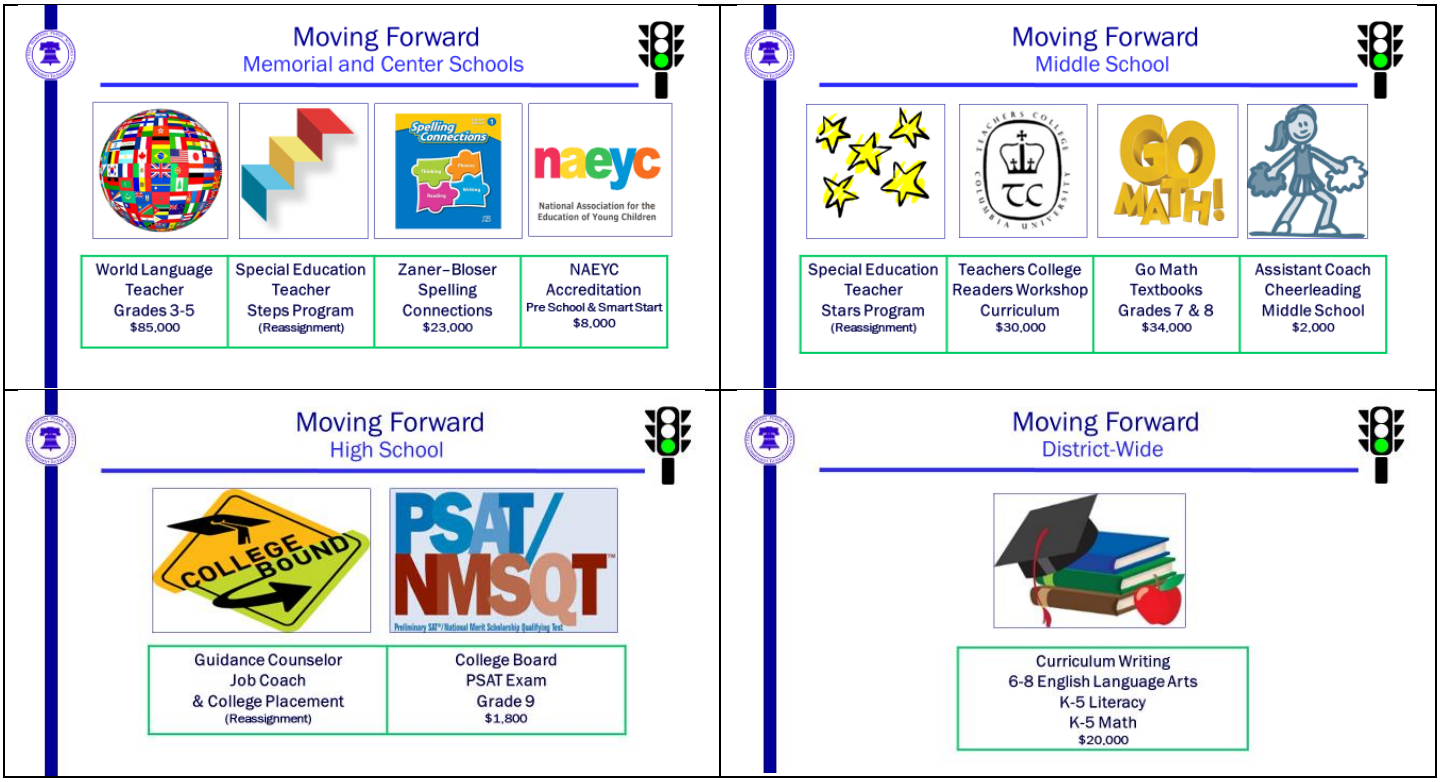
28	29	30	31	1	2	3
Christa McAuliffe Recognition Day (Actual)	Board of Education Meeting - EHHS T-Bell, 6:30 PM BUDGET DISCUSSION		Grade 8 High School Parent Planning Night High School 6:30 PM	 World Read Aloud Day *Make sure you read to someone!*	 Middle School Dance Grades 7 & 8 7:00 PM	
4	**5**	**6**	**7**	**8**	**9**	**10**
Start with Hello Week  	 Board of Education Meeting - EHHS T-Bell, 6:30 PM BUDGET DISCUSSION		School Counselors Appreciation Day Middle School to Wolf Pack game Elementary PTO Center School 6:30 PM BUDGET INFORMATION BY SUPERINTENDENT Middle School PTO Middle School Library 6:00 PM Project Graduation High School Library 6:30 PM  Center School 5:30-6:15		 PTO Brain Show Memorial School Cafeteria 6:30 & 7:30 PM *Register in advance with the PTO!*	
11	**12**	**13**	**14**	**15**	**16**	**17**
Random Acts of Kindness Week				 Superintendent's Advisory Council 94 Main St. 9:00-10:15 AM BOOK DISCUSSION! High School WINTER CONCERT 7:00 PM	 Coffee & Chat With the Superintendent 94 Main St. 7:30-9:00 AM BOOK DISCUSSION!	
18	**19**	**20**	**21**	**22**	**23**	**24**
	 No School	Winter Recess Day No School	Late Arrival for Students Professional Development Morning	National Day of DIGITAL LEARNING #DLDAY www.digitallearningday.org/	 School Volunteers Appreciation Day Coffee & Chat With the Superintendent 94 Main St. 7:30-9:00 AM	 CPR training for adults High School 9:00 AM 10:45 AM 1:00 PM
25	**26**	**27**	**28**	**March 1**	**2**	**3**
	Board of Education Meeting - EHHS T-Bell, 6:30 PM BUDGET APPROVAL				 National Read Across America Day	

Notes

Budget Information is available!

 **Board of Education Meetings** **(High School - 6:30 PM)** Monday, January 29 Monday, February 5 Monday, February 26	 **Superintendent's Advisory Council** **(94 Main Street - 9:00-10:15 AM)** Thursday, February 15 Thursday, March 15
 **Coffee and Chat with the Superintendent** **(94 Main Street – 7:30-9:00 AM)** Friday, February 16 Friday, February 23 Friday, March 9	 **Board of Finance Meetings** **(High School T-Bell)** Monday, March 12 – 6:00 PM Friday, March 16 – 4:00 PM

Be part of the decision-making process. Your voice matters.



The Superintendent of Schools presented the 2018-19 Budget with the above items included or added into the Budget based on input from parents, teachers, and administrators. The number one requested item by parents was the World Language Teacher for grades 3-5. The item with the next amount of requests was the Assistant Cheerleading Coach at the Middle School. The Board of Education now must decide to approve these additions or choose from others that were not included. To include some of the above items, the High School teaching staff is being reduced by one Math Teacher and one Science Teacher. **To offer feedback to the Board, plan to attend the January 29 and/or February 5 Board of Education meetings** (6:30 PM at the High School.) Opinions of students, teachers, and parents are welcome – and important!

Town wide CPR day for all!

The East Hampton Rotary Club and East Hampton Ambulance Association have joined with the Parks and Recreation Department to offer a **free class in Adult CPR/AED Training** at a town wide event on **Saturday, February 24, 2018**. The training will be held at East Hampton High School during 3 two-hour sessions. The sessions are scheduled for 9:00 AM, 10:45 AM, and 1:30 PM. Childcare will be available through the Rotary Interact Club.

East Hampton is a designated American Heart Association **Heart Safe Community**, with the goal of a trained responder and AED within a minute of every cardiac arrest. It has been proven that early CPR along with early defibrillation increases the survival rate of the cardiac arrest victim.

The event is open to all in East Hampton! Bring your family members, friends, neighbors and co-workers to ensure that East Hampton works together to save lives.

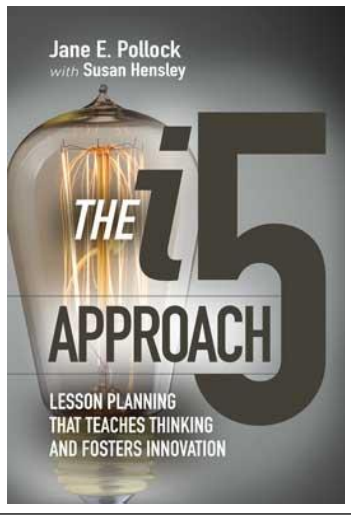
Become a part of a lifesaving team of First Responders and join us on February 24. To register, call East Hampton Parks and Recreation Department at 867-267-7300 or visit www.easthamptonrec.com. You can make a difference!

Thoughts

Giving our students the time to think – and the skills to think!

We often talk about developing critical thinking and creative thinking in the classroom. However, we talk more about activities that require thinking rather than exactly "how" we teach students to think. The authors of the new book, ***i5 Approach,*** feel that there are certain classroom experiences that train students to think. In addition, many of those experiences designed to enhance thinking utilize technology. Take a few moments to read about the approaches that train our students to connect thinking with information, images, interaction, inquiry, and innovation.

It's a good read because the tools and suggestions are all available to us.



i5 Approach by Jane E. Pollock and Susan Hensley

Chapter 1. Teaching Thinking

Henry Molaison, or "HM," became a celebrity in the field of neuroscience—not for what he knew, but for what he did not know. In 1953, a surgeon removed a part of Henry's brain, the hippocampi, in an effort to reduce the occurrence of debilitating seizures. When Henry, then 27 years old, awoke from surgery, he could eat, breathe, walk, and talk; he seemed recovered and no longer suffered seizures. Soon, however, it became obvious that Henry had only a few long-term memories, and he was able to remember new experiences for just a couple of minutes, at the most.

Until his death in 2008, HM lived in "permanent present tense," as Suzanne Corkin put it in her 2013 book of that name. HM's procedural memory (what he could "do") was intact, but he had lost the ability to encode, store, and retrieve declarative information (what he needed to "know"). Over the next few years, neuropsychologist Dr. Brenda Milner, would point to his case as proof that people process procedural and declarative knowledge differently. It turns out that the surgeon removed the part of the brain that processes declarative knowledge, so Henry lost the need to think.

Thinking Naturally and Thinking *Better*

Humans with intact and healthy brains think. We *need* to think. We must sort through the thousands of bits of information we take in from the world around us, anticipate multiple reactions that might occur in response to any number of events, plan and predict consequences, and evaluate our actions to make adjustments. In other words, our daily interactions require us to think.

Many of our biological processes are automatic and happen naturally, but many of our procedural capabilities are developed through effort and practice. For example, in life and in school, we can get better at speaking a language, playing an instrument, singing a song, or building a cabinet. Can we get better at thinking?

In *The Brain That Changes Itself* (2007), psychiatrist Norman Doidge says yes. He describes Michael Merzenich's research that focuses on helping people think better. For example, Doidge writes, Merzenich and his team have developed practical exercises to support what they call the executive functions of the frontal lobes, including, "focusing on goals, extracting themes from what we perceive, and making decisions. The exercises are also designed to help people categorize things, follow complex instructions, and strengthen associative memory, which helps put people, places, and things into context" (2007, p. 90). In summary, Doidge notes that Merzenich's research shows that we can teach people to think better, and Merzenich and others offer training and exercises to support the executive functions. The next question is, are these newly acquired understandings of how the brain works something we can apply in schools?

We say yes. With so much information, imagery, and interaction to process from the outside environment, thinking—inquiry—is something of a survival mechanism. If students can become better thinkers through practice, and research says they can, making this a goal for schooling is both logical and correct. In schools, teachers are familiar with "guided" and "independent" practice time for students, recognizing that it's a necessary component of instruction aimed at building proficiency with procedural curriculum goals. Teachers can teach students to use and practice thinking skills to make meaning of the declarative knowledge in the curriculum and use that knowledge to generate original ideas and products.

Inquiry skills are a keystone of the i5 approach, which identifies 12 processes that teachers can teach students to use to gain deeper understanding of declarative content knowledge and become better thinkers overall. We group these processes into four categories (see Figure 1.1):

- **Association**

  Compare: Describe how items are the same and different.

  Classify: Group items together based on shared traits.

  Make analogies: Identify a relationship or pattern between a known and an unknown situation.

- **Synthesis**

  Investigate: Explain the theme of a topic, including anything that is ambiguous or contradictory.

  Construct an argument: Make a claim supported by evidence and examples.

- **Analysis**

  Analyze perspectives: Consider multiple takes on an issue.

  Analyze systems: Know how the parts of a system impact the whole.

  Analyze reasoning for error: Recognize errors in thinking.

- **Taking Action**

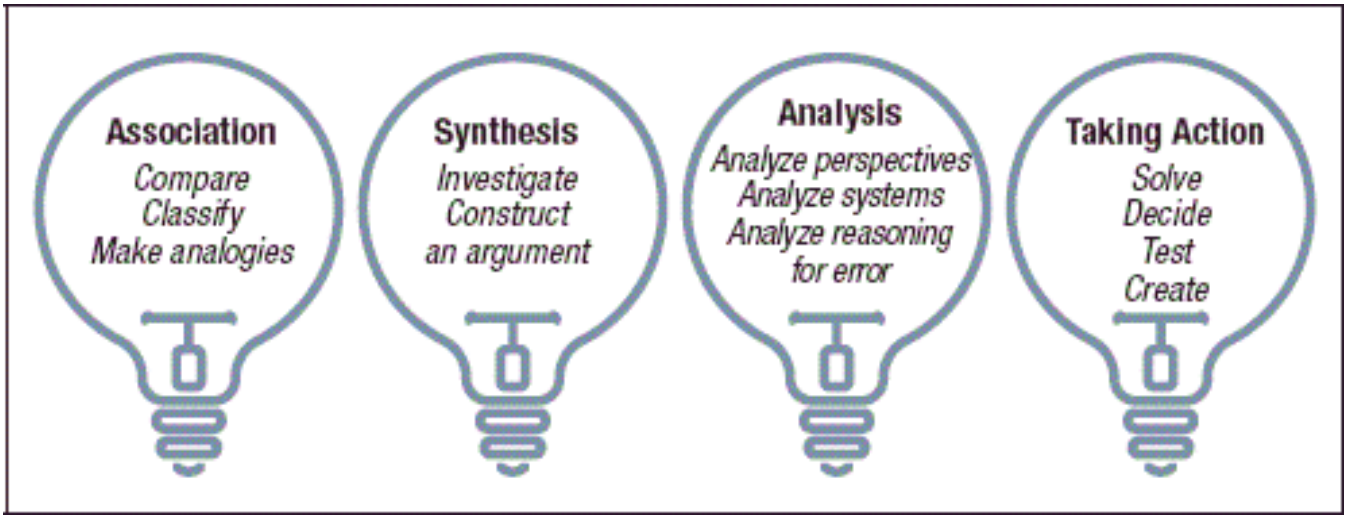
  Solve: Navigate obstacles to find a good solution to a problem.

  Decide: Select from among seemingly equal choices.

  Test: Observe, hypothesize, experiment, and conclude.

  Create: Design products or processes to meet standards and serve specific ends.

Figure 1.1. The Skills of Inquiry—aka Thinking Skills



Taken together, these skills can be described as *the skills of inquiry*, and they've become familiar parts of the curriculum over the past few decades. Chances are, the lessons taught in most classrooms already feature most or all the skills listed above, and students are expected to use each of these processes to varying degrees.

But the critical question is whether teachers are deliberately teaching the skills of inquiry in the same way we might teach the steps of adding fractions, conjugating verbs, creating a website, making an omelet, or serving a volleyball? Do we teach students to compare, for example, or do we assign a task assuming they know how to compare? Do we expect students to be able to analyze points of view, or do we teach them to do this, step-by-step, and then give them the practice they need to get better doing it?

Following the i5 approach means ensuring that the lessons you deliver provide an opportunity for all students to learn to use inquiry skills to process all the declarative knowledge that we teach in school. And it means teaching, scaffolding, and reviewing these skills to help students become better, more innovative thinkers.

Two Types of Knowledge

This is a good place to clarify the confusion about declarative and procedural knowledge. These two types of knowledge are well-illuminated by David Bainbridge, the author of a book that looks at both the anatomy of the brain and the history of neuroscience, *Beyond the Zonules of Zinn: A Fantastic Journey Through Your Brain* (2008). Bainbridge explains that our brains process procedural and declarative knowledge differently. He describes how our ancestors spent a good amount of time seeking food as they moved through the rich natural environment, where they honed their abilities to see, hear, smell, taste, and touch. We have inherited brains that can move our bodies in productive ways. Exactly as our dogs and cats at home do, we use our cerebellum, or the "little brain," to move (and breathe, digest, circulate blood, etc.). These functions are automatic; *procedural knowledge* is the name we use for knowledge we have practiced enough times so that, once learned, its application *seems* automatic. With a bit of DNA and practice, some skills become automatic so that we can do them—*reproduce these actions*—without thinking.

Bainbridge continues his discussion about the need to procure food and inserts the idea that humans evolved beyond moving toward food (or away from it, in the case that they might become food to other animals) to remembering where food was stored, which food was in which area, and where it might be available again. Our ancestors generated a vast library of labels for this previously experienced information so that they could use it later and in new situations. This led to a much deeper demand than could be handled by just the "little brain." Our "bigger" brains grew to include a prefrontal cortex—an area of the brain that processes the type of knowledge known as *declarative knowledge*, or anything we know that we might "declare." Although the mechanism has not been pinpointed, we know that the evolution of language in humans coincides with the emergence of our prefrontal cortex. The human brains developed the ability to move our bodies but also to move ideas. The process for moving ideas needed a name to distinguish it from procedural knowledge, and it got one: *thinking*.

To become more proficient at skills—or procedural knowledge—a person practices. To productively use declarative knowledge, a person thinks. Thinking skills are the brain's way of processing declarative information for retention so that it can be manipulated and reorganized with other information to generate new ways to act.

The process of thinking is slow, and the thinker requires information and time to remember, reorganize, and produce results. In school, some tasks intend for students to reproduce knowledge (procedural goals), and other tasks intend for students to produce a new version of the knowledge (declarative goals).

Now let's identify insights about teaching thinking skills. A teacher can identify whether he or she wants students to learn a topic as procedural knowledge (to reproduce it) or as declarative knowledge (to retain and reorganize to produce an original insight). If the teacher decides to teach a topic procedurally, the students will need lots of practice and feedback. But if the teacher decides to teach information declaratively, then the students will need lots of information and an opportunity to learn and use the steps to one of the thinking skills.

Remember Bainbridge's description of hunters and gatherers moving through the rich environment and gathering input? Compared to the wilderness or a savannah, most classrooms come up short in terms of environmental stimuli; students generally hear and see, but there aren't that many opportunities to use the other senses of touching, tasting, and smelling the learning topic. That means that students need to compensate for the lack of stimulation to gather enough information, imagery, and interaction to set the thinking or inquiry processes in motion. The solution is to use digital devices.

Using technology compensates for the lack of stimulation in a print-only classroom. Complex sensory input is now more readily accessible than ever before, and students can view video and images, hear audio, and actively engage with what seems to be unlimited content and information. In short, the i5 approach informs the "why" of using technology in the classroom and directs digital devices into being a critical element of classroom instruction. It's a means to enrich the way students receive content and create the environment for developing better thinking.

As a side note, technology can be used in a way that improves students' procedural knowledge, too. Access to video, for example, allows students to watch a skill demonstration—and review it multiple times, studying each step as closely and as often as necessary. Access to video recording equipment in the classroom allows teachers and students to document skill development, to track progress, acquire feedback, and practice and perfect repetitive procedures. The caveat is that using technology can bolster procedural knowledge, but it cannot replace carrying out the procedure. You can read about swimming online, but most people agree that until you get in the water and start swimming, you will not become a better swimmer.

Technology deployed to develop declarative knowledge has fewer limitations. It gives students access to a seemingly unlimited amount of information to "think about" compared to what would be available in a non-digital classroom. Because our main concern in this book is the possibilities for teaching thinking that technology has opened we will be focusing on declarative knowledge and the thinking skills, leaving the discussion of using technology to improve procedural knowledge to another author.

How to "i5" Your Lessons

In the simplest application of the i5 approach, revising a current lesson is a matter of answering the "i5 questions":

1. How would more *information* help students see the details and breadth of this lesson's topic?
2. How would visual *images* or nonlinguistic representations add meaning to the topic or give it context?
3. How would *interacting* with others, live or through social media, provide clarifying, correcting, and useful feedback?
4. How would teaching or incorporating *inquiry*—a thinking skill—boost active engagement and questioning with the topic to increase aptitude?
5. What *innovative* ideas or insights could students produce in conjunction with this learning?

Let's take a closer look at each of these key questions and determine why they are so important before we move into lesson planning for teaching thinking and fostering innovation in Chapter 2.

- **The Role of Information**

*How would more **information** help students see both the details and breadth of a topic?*

Just 20 years ago, a standard U.S. history textbook provided only one example of a constitution: the U.S. Constitution. Today, students can research information about "constitutions" online and find documents from dozens of countries in their native languages and translated into English. This breadth of content adds to students' understanding of nations and

lays the groundwork for in-depth analysis using a higher-order thinking skill such as comparing different documents to find similarities and differences among them.

In *Think Better: An Innovator's Guide to Productive Thinking* (2008), Tom Hurson writes, "More than any other commodity, information is everywhere. Not only can almost anyone access almost anything at almost no cost, but, unlike corn and wheat, information doesn't have to be consumed to be used. Quite the opposite: the more it's used, the more it grows" (pp. 9–10).

In a classroom today, when Donna Martin teaches a poem by Gwendolyn Brooks or a novel by Gabriel García Márquez, her students have access to biographies, images of where and how these writers lived, critiques by both those who support and those who question their work, and, of course, recommended works shared by hundreds of people around the world. Ms. Martin says that when she is planning to deliver the new information in her lessons, digital sources are critical. She can direct students to visit websites to find biographical or autobiographical information; she teaches students to search for the right information they need to answer questions but also to delve deeper.

In Belinda Parini's physical education classes, students learn about factors that affect fatigue. Ms. Parini says she now plans instruction time to include short segments for students to search for information online. By reading athletes' own writings, accessing data charts, and studying current science articles that support the knowledge of metabolic changes, students improve their abilities to predict fatigue factors and solutions in various case studies.

When planning to teach lessons today, many teachers search online to prepare their lectures or to present information to students. But teachers can also, and should also, have students use digital devices during class to search for information related to the learning goal and then teach them how to evaluate what they find for usefulness and accuracy. In the i5 approach, teachers and students access information during instruction to increase access to declarative knowledge, but also to become better thinkers.

- **The Role of Images**

*How would visual **images** or video add meaning to the topic or give it context?*

Images are powerful. Henry Luce, the publisher of *Time* magazine, acquired *Life* magazine in 1936 so that readers could *see* the news, not just read about it. This new magazine literally changed the way its readers saw the world. A simple photograph of a young girl named Anne Frank gave a face to the Holocaust on the August 18, 1958, cover of *Life*. Similarly, the televised broadcast of the first step on the Moon's surface left an enduring footprint in viewers' memories.

Second grade teacher Lauren Eide enhances her students' comprehension in a social studies class as they learn about different cultures. They read *Four Feet, Two Sandals*, by Karen Lynn Williams and Khadra Mohammed (2007). Online, they see maps of areas to determine where the people in the book live and learn about challenges faced by residents of different geographic areas. They watch an online video about life in a refugee camp. The images and information support the reading, so that students discuss, question, and logically deduce what could happen in these parts of the world.

In *Classroom Instruction That Works* (Marzano, Pickering, & Pollock, 2001), Jane and her colleagues showed nonlinguistic representation as a technique with the high probability of improving student achievement, at $d = 0.75$. Stated differently, when students can see an image or a video of a person delivering an address in a theatrical production, hear sounds of animals, or see how chemical processes change substances through virtual experimentation, they attend to the content and remember it much better so they will store and use it again.

Some researchers say that 70 to 90 percent of the information that comes to the brain is visual. Because 40 percent of all nerve fibers connected to the brain are linked to the retina, the brain can process visual information 60,000 times faster than it processes text (Visual Teaching Alliance, n.d.). David Bainbridge (2008) suggests that when we discuss how humans process information, we should use "image" as a verb, not a noun; we *image* information as it comes to us, as our brains work to resolve the features of a new object or stimulus into a familiar picture so that we can respond to it more effectively.

When high school math teacher Becky Efurd teaches about parabolas, she shows a video of high jumpers in field competition as an illustration of an otherwise abstract concept. In health class, students can watch videos to find out how to tape a foot after an injury. Only a few years ago, students in Gary Nunnally's economics class learned about supply chains and the importance of coffee trade via a photo in the textbook, a few short paragraphs, and his lecture. Today, Mr. Nunnally plans lessons so his students can virtually visit a coffee plantation in Manizales, Colombia, where they are able to access information regarding the supply and markets. Students can view commodities trading online, in real time.

They may not be able to smell the coffee via the internet, but they can access and experience information about the production and economy of coffee in engaging ways that encourage further research.

Using technology in the classroom, either by providing images or cuing students to search for an image, allows more students to more quickly engage in the topic of the lesson. Incorporating nonlinguistic representations in lessons provides opportunities for immediate engagement at any grade level and especially for students who speak another language at home. In much the same way that *Life* transformed magazine reading, teachers using digital devices and the i5 approach can transform classroom learning.

- **The Role of Interaction**

*How would **interacting** with others, live and through social media, provide clarifying and useful feedback?*

As social beings, we crave interaction. Humans constantly seek, receive, and respond to feedback. Personal digital devices make such interaction in an educational setting a reality for students, thanks to the individualized and often immediate feedback they can provide. Websites and programs such as Google Hangouts, instant messaging, texting, Skype, Facetime, and even the more traditional e-mail exchanges are optimal tools for interaction. We are lucky to live in a time of instant communication.

As we consider how to encourage students to interact with others, however, we must address two challenges that are brought to our attention by neuroscience research. The first is that human brains developed to seek distractions. Because distractibility (for food sources) is a trait that helped our ancestors survive, it persists in the gene pool today. In the hands of children, digital devices offer zillions of personal distractions, so using technology in the classroom will usually trigger a positive reaction from students; they will like it.

The second challenge is that humans are natural socializers or, as David Bainbridge (2008) describes us, "compulsive communicators" (p. 307). Today all of us seem to use digital devices to feed our compulsion. Introduce a social media network to teenagers who are still amygdalating (OK, that's not a real word, but it implies emoting instead of reasoning) and lack fully-formed prefrontal cortices, and these students will be all but compelled to interact at the click of a keyboard or the swipe of a fingertip.

At this point, you might be thinking that interaction may not be such an advantage to learning in a classroom, but it can be highly productive. In the language arts classroom, students writing a story or a speech can receive immediate feedback if they share a file or work on a shared document. In world language classes, students can practice conversation via Skype links between Boston and Bucharest or Cedar Rapids and Caracas. In science, interaction in lab settings epitomizes the work of pairs of young scientists who use digital devices to make quick searches, check accuracy, and organize information.

The sobering aspect of distraction and socialization is that as much as we humans enjoy them, we are wired to set goals. In any situation, humans set goals and then strive to connect new information to previously experienced knowledge so we act, either quickly or in well-planned or strategically thoughtful ways, to meet those goals. To be specific, in a classroom setting the learning intention is critical. If it is clear to students at the onset of the lesson, the human need for interaction (pair-sharing, talking at tables, shoulder partners) can be used as a tool to encourage them to interact for clarification, correction, and to seek more information to meet the goal or objective for the lesson.

Feedback is necessary for effective learning and can come from multiple sources. The essence of interaction in the i5 approach is that students learn to seek input or correction from the teacher, from themselves by searching, and from others to clarify information or rectify mistakes. Obtaining feedback in a classroom often means frequent and timely interaction and students can use digital devices to focus and streamline these exchanges.

- **The Role of Inquiry**

*How would teaching **inquiry** or a thinking skill boost active engagement and questioning with the topic to increase aptitude?*

The i5 approach for planning lessons supports teaching and developing students' thinking power. It's built on findings about the executive functions offered by the neuroscientists, research on effective instructional approaches that formed the basis of *Classroom Instruction That Works* (Marzano et al., 2001) and a series of thinking skills that Jane and these same colleagues developed in the book, *Dimensions of Learning* (Marzano et al., 1997). And although teaching thinking is compatible with various lesson planning approaches, it is best facilitated through a schema called the Master Learners

model (GANAG) first published in *Improving Student Learning One Teacher at a Time* (Pollock, 2007). In *Classroom Instruction That Works*, Jane and her colleagues found that three areas of thinking showed high effect sizes: identifying similarities and differences ($d = 1.61$), generating and testing hypotheses ($d = 0.61$), and questioning ($d = 0.59$). The inquiry aspect of the i5 approach emerged from the research in those categories of thinking. The 12 thinking skills in Figure 1.1 are the focus of inquiry instruction.

Students come to class with the natural ability to think in the world around them; our challenge as teachers is to teach them to effectively think about math, humanities, music, and the other content we teach in school. The i5 approach guides teachers to do just that—and to enlist digital devices in the effort.

- **Fostering Innovation**

*What **innovative** ideas or original presentations could students produce?*

Elkhonon Goldberg (2009) writes about how the prefrontal cortex powers the actions we take. Humans with healthy brains are constantly encoding, storing, and retrieving information in response to newly sensed information. Thinking is powered by memory. We can retrieve and apply that information to the various new tasks, decisions, situations, and interactions we face. And it's the frontal lobes we rely on to do that work.

According to Goldberg, what makes humans unique is that we can generate a mental picture of something that does not exist—like a mermaid, for instance. Before Disney animation, and even before libraries filled with illustrated volumes, people were calling up images of fish they had seen and combining it with the image of a human being to create the visual concept of a mermaid; this was thanks to the function of their prefrontal cortices. In short, the frontal lobe is used to produce original thoughts with newly sensed or remembered information. Humans use the prefrontal cortex to think so that they can innovate.

Economist Tom Grasty (2012), considering what skills will be beneficial within society in the years ahead, shares an interesting distinction between invention and innovation:

In its purest sense, "invention" can be defined as the creation of a product or introduction of a process for the first time. "Innovation," on the other hand, occurs if someone improves on or makes a significant contribution to an existing product, process or service. (para. 5)

Grasty notes that after the invention of the transistor, most of the products we use today could arguably be considered "innovations," rather than inventions. Innovation, he believes, is what we need to be teaching students.

With access to digital devices and the internet, students can seek information or view images to add meaning to a topic, interact with others to seek feedback, and use all those memories to power their own ideas, through inquiry, to innovate.

The i5 Student and 21st Century Skills

Susan's son, Samuel, is a typical high school student. Technology use is part of his daily life. In addition to using the internet to download songs and videos for entertainment, he searches for information to help him learn the newest dance steps, refine his soccer moves, improve and record his trumpet practice, or find the instructions for assembling a new bookcase for his bedroom. He interacts with friends through texts and shares images through social media. Samuel games with friends he will never meet face-to-face.

Our professional challenge is to teach students like Samuel to apply 21st century skills to their academic lives as effortlessly as they apply them to their personal lives. There are several different interest groups with varying definitions of what students should know and be able to do in the 21st century. What exactly are the 21st century skills we want students to use?

The Partnership for 21st Century Learning (P21, formerly known as Partnership for 21st Century Skills) coalition has spent more than a decade bringing 21st century skills to the center of education in the United States and has developed a guiding framework (P21, n.d.). Bernie Trilling and Charles Fadel, authors of *21st Century Skills* (2009), narrow the list to three main categories: learning and innovation skills, digital literacy skills, and life and career skills.

The International Society for Technology Education (ISTE) produced the National Education Technology Standards for Students in 2009. The revised 2016 version describes indicators for seven standards, including Empowered Learner, Digital Citizen, Knowledge Constructor, Innovative Designer, Computational Thinker, Creative Communicator, and Global Collaborator.

What they have in common is that they both attempt to describe what students in the digital era need to know and be able to do to demonstrate knowledge and to use available tools to research, create, and communicate.

The i5 approach provides a way to teach students to meet these indicators in the classroom, and it helps produce citizens who will succeed in the increasingly digital world. If the P21 and ISTE/NETS standards describe what we want for our graduates, the i5 approach describes how to pursue it.

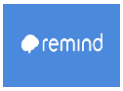
The Other "i"

To paraphrase Ralph Waldo Emerson, "Every artist began as an amateur." The intent of the i5 approach is to guide our amateur students to use digital resources to become their very best selves. Inspired by Emerson, the i5 approach encourages teachers to teach so that students learn to think for themselves, actively self-assess, and relentlessly seek and use resources available to become their very best. The goal for students using the i5 approach can be captured with another "i"—to be a contributing *individual.*

Help our students become great "thinkers!"

East Hampton Public Schools — Making Kindness & Caring Common

Paul K. Smith



East Hampton STRONG

26 Miles of Hope