



How All Children Can Realize Their Potential: The View of a Curriculum Developer and Parent of a Child with Dyslexia

Prepared Remarks of Lynne Munson to
the International Dyslexia Association
October 24, 2018

You may be wondering: Who is Great Minds®? We're not well-known in the intervention space.

We do not design materials *exclusively* for learners who are dyslexic. We design materials for *all* learners. And I'll explain, in the course of this talk, how that benefits learners who are dyslexic in particular.

The first thing to know about Great Minds is that we are different. We are not a publisher, and we have little in common with almost every other company that creates core curriculum.

In fact, we do almost everything differently than do others in our space. Starting with not just *how* we make curriculum but even *why* we make it.

We are a group of educators from every rank in the profession and every part of the country. I have two colleagues here with me today: Great Minds Director of Humanities Rachel Stack, who has taught English and more at all levels—elementary through high school—and now hails from Kentucky, and Content Architect for Humanities Lorraine Griffith, who joined Great Minds full-time recently after retiring from the Buncombe County School District in North Carolina, where she spent the majority of 30 years teaching elementary school.

Lorraine and I were among a group of educators who came together 10 years ago and formed the nonprofit we now call Great Minds.

We did it because we were unhappy with the instructional materials in our classrooms, schools, and homes.

The market was dominated by scripted, procedural materials that drove expectations down. We knew that both teachers and students deserved better.

So, we started writing and sharing curriculum—based on what research told us works and what we saw working in classrooms.

These materials celebrate *knowledge*, *respect* the craft of teaching, and acknowledge the *true* capabilities of students.

Our motto is, "Every child is capable of greatness."

The emphasis is not just on greatness and having uncompromisingly high standards, but on a commitment we share with teachers who use our materials to get *every* child there, including the 1 in 5 who are dyslexic. *Especially*, I'll say here among friends and family, especially the 1 in 5 who are dyslexic.

Another driving force behind Great Minds' commitment to serving students who are dyslexic is personal.

My daughter is dyslexic.

Sophia is 12 now, and she is striving in every way. She is here with us today. Would you stand up, Sophia?

Sophia was diagnosed with dyslexia during her Kindergarten year, but my husband and I were aware there was something exceptional about her far earlier.

Is anyone familiar with one of these?

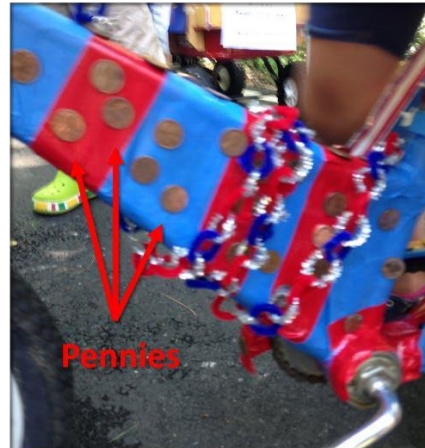


It was a gift. A quilted item in each pocket corresponds to the letter. You're supposed to put the apple in the A and umbrella in the U. I tried to have Sophia play with this in Kindergarten, but she struggled mightily to put the right objects into the pockets they were supposedly destined for. I tried again and again, to her and our frustration.

We wondered why she was not catching on to this. Her intelligence was obvious and abundant. At an early age she was fascinated with history, real history.

The first time Sophia heard the Gettysburg Address, she fell in love with it. She memorized it by listening to it over and over on a long drive to a beach vacation. When we visited Gettysburg a few years later, she stood as close as you can get to where Lincoln had stood and delivered the address herself from memory—in the rain.

At age six she decorated her bike for the neighborhood July 4 parade by covering it with pennies and rode it wearing a stovepipe hat. See the beard? She LOVED—loves—Abraham Lincoln.



We knew she had the background knowledge she needed to learn to read—but it just wasn't happening.

Once she was diagnosed, Sophia had Orton-Gillingham tutoring on top of the kind of “workshop”-type English language arts (ELA) instruction you get at the vast majority of schools, public or private.

She never disliked school but when ELA instruction was taking place, she felt like a bystander. It was literally purposeless for her.

Suffice it to say that being Sophia's mom has taught me many things about courage (hers), intensity, frustration, even sadness. But the thing she's taught me that's essential to our conversation here today, and to our work at Great Minds, is that there is no difference in curiosity, no difference in desire, no difference in the intensity of thirst for knowledge between students with dyslexia and those without.

If anything, kids with dyslexia thirst for knowledge more because they have to grapple over so many barriers to get to it.

I don't know about you, but I go to many education conferences and I wonder when I see all the panels on “Grit” and “Mindset” and the rest (and I like the books on those topics and have read them all), has anyone noticed that students who are dyslexic have all of those qualities and more?

Why not study what makes these kids tick and see what others can learn from that? I know I've learned a great deal watching Sophia learn.

So, I ask you, why is it so often the case that we take these knowledge-thirsty, gritty students and teach them in ways that *distance* them from the rich knowledge they so need and desire?

Why, just when the hands-on science learning is about to begin, are they often removed from the classroom for another language intervention session?

Why, just as the class is about to view a great video on John Adams, does the teacher come over and whisper in the ear of the student who is dyslexic: “It's time to go out for resource?”

Why do we pare down materials for kids who are dyslexic and reduce expectations for them?

And why, when they are emerging from elementary school and in adolescence and still struggling to read, do we give them “baby books” to practice their sound-spelling patterns?

My colleague Lorraine has said, “Students should not be defined by their intervention.”

I think we all know what she means. And I accuse no one in particular of this. This is simply the air we breathe. But it should not be.

There should be no barriers between kids who are dyslexic and all they want to know.

The barriers I’m talking about are not the ones they are born with, but the ones that *we* construct when we put curriculum before them that is devoid of knowledge, is inaccessible and, quite often, is failing much of the rest of the students in the classroom, too.

We can remove those barriers when we give teachers curricula that is accessible *and* exceptional. An accessible curriculum built on high expectations can tear down barriers for all students—not just kids who are dyslexic but also English learners, students with few print materials at home, and students with limited access to museums, books, fine art, and music.

I’m asking you to consider the novel idea that there could be a core curriculum that teaches writing, vocabulary, grammar, and more as effectively to students who are dyslexic as to striving readers.

Further, consider the notion that the knowledge-richness and intelligent design I’m describing can not only make ELA curriculum effective for all learners but work for mathematics and science instruction as well. This is the kind of accessible curriculum that should be in all classrooms.

I’ll stop preaching at you and read you a letter. It is from a parent of three elementary-age children who attend a neighborhood public school in Atlanta. Their mom, Caren Solomon Bharwani, sent this letter to Great Minds five or six weeks ago. She writes:

This is the first year that our school has fully used Wit & Wisdom [that’s Great Minds’ ELA curriculum] from K–5 and it’s been absolutely life-changing for my 1st grader, and as a byproduct, our whole family. I have a 5th grader and a 3rd grader who are also using it, loving it, and progressing very well with it, but the way it has resonated with my 1st grader has been astounding to watch. He entered Kindergarten with an IEP for a variety of reasons, but his diagnosis was delayed development “other.”

He was aware that he couldn’t do what others could and became extremely angry and rebellious when anything involving reading, writing, or critical thinking was asked of him—and he got even further behind in Kindergarten. And then, when school started in Atlanta on Aug. 1 and the new W&W was rolled out as our new ELA curriculum, it was like a switch flipped in him.

He often sees things and will tell me without being prompted, what he notices and what he wonders. He tells me about the stories they read in school, about the art they learn about and how it relates to the stories they read. He wants me to buy every book in every module for him to read and re-read at home.

More important than all of this, he RUNS out of the car and into the building for school every single morning. He used to hide in the bathroom or the stairwell until he was caught in order to avoid school because he hated books and reading so much. While he’s still far behind, in the one short month he’s been

back in school, he's made incredible strides to catch up and his teachers have every confidence that he will be exactly where he needs to be in no time, because he's motivated by what he's doing. It's not only peaceful at home, it's joyful, and I wholeheartedly believe that it's because of Wit and Wisdom.

So, thank you. Thank you for creating a program that isn't like every other program. Thank you for creating a program that speaks to lots of different types of learners. Thank you for recognizing that not all kids learn the same way. Thank you for helping children understand that ELA is more than just a book and an assignment. Thank you for giving my child a path to a love of literature.

Her first grader is named Ajay, and when I talked to her she confirmed that he, of course, has dyslexia. I'll continue to talk about Ajay and his experience in the course of this speech.

As I said at the top, Great Minds' core curricula are designed for *all* children. *Wit & Wisdom*[®] is in comprehensive use by some of the largest and most diverse school districts in 45 states, including in Atlanta, Baltimore City, Philadelphia; in mid-sized Mad River School District in Ohio; and even in the smaller Albany Public School District in Laramie, Wyoming.

We have three curricula: *Wit & Wisdom*, *Eureka Math*[™], and *PhD Science*[™]. Each is designed following the same few fundamental principles.

All curricula should be: Knowledge-based. Coherent. Educative. Uncompromising.

Knowledge-based. Knowledge is taught both for its own sake and as the medium through which every skill is taught. By knowledge, we do not mean ephemeral knowledge or knowledge of the student's choosing.

We mean knowledge that has been curated by teachers with the goal of maximizing background knowledge.

Coherent. When instructional materials are coherent, there is a clear relationship between the parts and the whole. When learners develop coherent understanding of any body of knowledge, they examine each new idea and how it fits with ideas they understand already.

Educative. Instructional materials should be educative for both students *and* teachers. We believe in the essential and irreplaceable role that teachers play in classrooms. Teachers should never be scripted. We provide them with materials worthy of their practice and their intelligence and which require deep, sustained study.

Uncompromising. We hold students to high standards and do the same for ourselves. Our materials assume that all students are capable of greatness. It is our job to get them there—each and every one of them. We take best pedagogical practices and typically hone and innovate and pressure test them until we know they work.

Let's see how this all comes together by looking at what Caren's son Ajay is experiencing that is working so well for him. After we peruse *Wit & Wisdom*, we'll look at aspects of *Eureka Math* and *PhD Science*, too.

I'd like to note something about phonics. As I know everyone here is acutely aware, the foundations of reading are most effectively taught—to all students—via a structured, systematic phonics program. We did

not attempt to create one when we built *Wit & Wisdom*. Instead we recommend Wilson Language Training’s programs, with their deep research base and long track record of success.

We’re also collaborating with Wilson right now on a series of readable books, aligned with Wilson’s Foundations® and with the topics in *Wit & Wisdom*. We call these readable books *Geodes*™ because there’s a surprising bounty of knowledge in each one. I’ll discuss *Geodes* more in a bit.

Ajay is experiencing a curriculum that assumes he will take an interest in real knowledge, or what I like to call “knowledge worth knowing.”

Our point of view about content runs counter to widely held beliefs in the field that kids must be allowed free choice in their reading (and writing) or that the texts put before them must be aligned with their personal interests or that what they read about must have immediate relevance to their lives as they are today, and so on.

I’m sure you are familiar with these prevailing ideas.

Instead, we take it as our goal to open up the world to children, not just today’s wide world, in its entirety, but yesterday’s world, and thousands of years before that.

The Continents: Kindergartners learn not just about where they live but about all the world’s continents.

A Great Heart: Fourth graders explore what it means to have a great heart, literally and figuratively.

A Hero’s Journey: Sixth graders examine the significance and power of the hero’s journey as they read contemporary versions of the Indian epic The Ramayana and Homer’s Odyssey.

The Great War: In seventh grade, students ask, How do literature and art illuminate the effects of war? while studying World War I.

GRADE	MODULE 1	MODULE 2	MODULE 3	MODULE 4
K	The Five Senses	Once Upon a Farm	America, Then and Now	The Continents
1	A World of Books	Creature Features	Powerful Forces	Cinderella Stories
2	A Season of Change	The American West	Civil Rights Heroes	Good Eating
3	The Sea	Outer Space	A New Home	Artists Make Art
4	A Great Heart	Extreme Settings	The Redcoats Are Coming!	Myth Making
5	Cultures in Conflict	Word Play	A War Between Us	Breaking Barriers
6	Resilience in the Great Depression	A Hero’s Journey	Narrating the Unknown	Courage in Crisis
7	Identity in the Middle Ages	Americans All	Language and Power	Fever
8	The Poetics and Power of Storytelling	The Great War	What Is Love?	Teens as Change Agents

Now let's zoom in on the module Ajay was experiencing during that first month of school when his mother sent her letter.

He was engaged in a study called "A World of Books," exploring the lengths to which we go to gain knowledge. Here are the books Ajay was experiencing, all as read-alouds.

Grade 1 Module 1: A World of Books



The module begins with an exploration of museum masterpieces through the lens of the alphabet in *Museum ABC*.

It continues with three narrative picture books and an informational text telling the ways people all over the globe access books.

And it concludes with *Green Eggs and Ham*, which requires no explanation.

We selected what my friend Carol Jago calls a "bouquet" of texts. Works that speak to each other and which, together, reinforce and extend the knowledge and vocabulary related to the topic at hand.

Grade 1 Module 2: Creature Features



This month, Ajay moved on to the second module of first grade. He’s studying “Creature Features” and asking why animals look different. Again, all the books he’s experiencing are read aloud.

This module opens with the fable *Seven Blind Mice*.

It introduces students to two works of art: Henri Matisse’s *The Snail* and Albrecht Dürer’s *Young Hare*.

Through examining these works, students learn why animals interest artists and study how artists render animal features.

A word about using art in the classroom—and you will see we don’t use it only in ELA. Teaching students how to access fine art is a major building block in cultural knowledge that can easily be missed if it is not provided in school.

It is also another extraordinary access opportunity for striving readers, who, when art is projected on the screen, can be with you in real time alongside your advanced readers. Focusing close reading, discussion, and writing on carefully chosen visual text is a major access and knowledge-building opportunity for all.

Me...Jane is a visually stunning biography of a young Jane Goodall.

Sea Horse: The Shyest Fish in the Sea is a remarkably comprehensive look at one of the most mysterious and unusual fish.

These are two skillfully crafted, interactive informational texts that explain that some creatures have unique ways of protecting themselves, which can make them unexpectedly dangerous to humans.

Note again that this “bouquet” of books is drawn from several genres—from informational text to biography to fable and once again fine art (both painting *and* collage). We are always being intentional about exposing students to how a wide variety of texts can inform their study of a topic.

Using great content is step one. Now let's talk a little about what we do with that content that is working for Ajay.

WONDER

What do I notice and wonder about this text?

ORGANIZE

What is happening in this text?

REVEAL

What does a deeper exploration of this text reveal?

DISTILL

What is the essential meaning of this text?

KNOW

How does this text build my knowledge?

It is essential to equip students with a predictable yet flexible process for deep consideration of complex texts. Lessons must be structured with a purposeful progression that enables students to access, understand, and analyze these texts. Our progression in *Wit & Wisdom* consists of five stages: Wonder, Organize, Reveal, Distill, and Know.

In the course of their education, students internalize these stages and develop habits of mind that will enable them to approach and be successful with many different types and levels of texts in class and elsewhere.

WONDER

What do I notice and wonder about *Young Hare*?

Let's apply the content stages to a piece of art that Ajay's experiencing right now—Dürer's *Young Hare*.

In the first stage—Wonder—students observe what is most obvious and share the questions that first come to mind.

When you ask kids what they notice and wonder—rather than to tell them what to think, you are creating active, engaged learners. Kids sense immediately that this is not a passive classroom.

Wonder starts with 30 seconds of silent contemplation. It's tough to keep kids quiet, even tougher for the teacher to resist the temptation to talk. But it's essential to slow down and teach the art of looking.

So let's do this ourselves. Please take a moment to turn and tell someone sitting next to you a couple of the things you notice and wonder about *Young Hare*.

Go ahead.

Here's what I noticed at a glance: This is a rabbit. It looks real. It's brown. It's by itself.

Here's what I wonder: Is it a painting or a photo? Why paint a rabbit? Why are its ears so big? Who made this image?



ORGANIZE

What do I see when I look more closely?

Now we're going to Organize, which, when working with visual text, means you are going to look more carefully. Look at all four corners of the artwork; take your time and observe more intentionally. This time let's just do it silently.

Now I'm seeing that this rabbit is very still, has long whiskers, is looking at something, has unruly eyebrows. Tiny hairs make up the fur, brown is made from lots of colors, some parts are fuzzy, some clear.

REVEAL

What does a deeper exploration of texture reveal in *Young Hare*?

In the Reveal stage, we choose one of the deeper observations and go even deeper into a particular aspect of craft. We could choose to delve in to color, brushstrokes, or the variety of lines. Pick one and turn and talk about that one.

I chose to focus more deeply on the brushstrokes. I saw that Dürer applied layer upon layer of brushstrokes—of different color, thickness, length, clarity, and so on—to paint this rabbit. I thought about how he achieved a lifelike quality.

DISTILL

What does *Young Hare* teach us about Albrecht Dürer?

When we Distill, we synthesize what we learned and make a whole of the parts.

In this case, we're appreciating that there was a great deal more involved in painting this rabbit than was obvious at first. In fact, this is far more than just a painting of a rabbit.

This work passes a test I like to apply to art: Even if you look at just a small section of this work you will find it incredibly intriguing. You can't experience that with everything you look at, for example, an

advertisement or poster. But you can with fine art. Something makes fine art stand apart—and we notice that in the Distill phase.

KNOW

How did studying *Young Hare* contribute to my knowledge?

Know. Only now do we share some basic facts about the artist, the period in history, and so on. In the earlier stages, we want students to use their eyes alone and not be distracted by context.

So here we'd explain that Albrecht Dürer painted *Young Hare* (oh, it is *not* a rabbit) with watercolor in 1502 and that it measures just 10 by 9 inches.

In a moment we'll turn and talk about what you now know that you did not before you looked at this work of art. It can be about Dürer or about art or about hares. What can you cogently share with a peer as a result of studying this work?

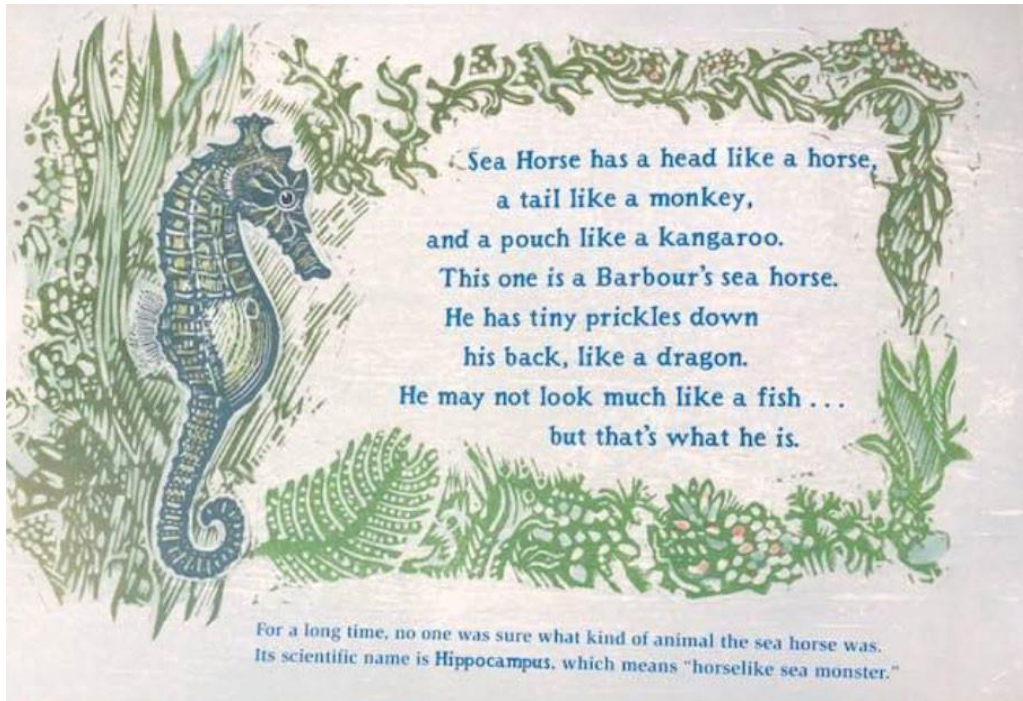
Go. What I now know is that artists choose subjects that intrigue and challenge them. And that that challenge need not be physically massive—a vast landscape, a crowd of people. It can be as small as painting a hare and the artist may need very little space—even as little as one of the papers on your lap—to do that exploration. Dürer looked at a young hare and found a world of endless complexity and interest.

Now I can take what I learned from looking closely at a single painting of a hare into a museum anywhere and look at anything more intelligently. One can also apply that learning to many things in everyday life.

When we look at a piece of art, we pay close attention both to the content and to artist's craft. And when we notice a written text, we pay close attention to the choices writers and illustrators make, all while indulging in knowledge.

Let's look at a single page from a knowledge-rich *Geodes* book and see what we can learn. The book is *Sea Horse: The Shyest Fish in the Sea*.

And this is page 8:



Notice

What do I notice and wonder?

I notice that there are different kinds of sea horses because this one is called a Barbour's sea horse. I wonder why it's called that.

I notice that a sea horse has tiny prickles down his back. I wonder if the sea horse uses those prickles to survive.

I wonder what that small print was on the bottom of the page—the part you didn't read aloud to me.

Organize

Let me organize my thinking. What's happening?

The author is describing the Barbour sea horse. There are many details.

- Head like a horse
- Tail like a monkey
- Pouch like a kangaroo
- Tiny prickles like a dragon

Reveal

What does a deeper exploration of language reveal? The sea horse body is compared to other animals.

The author says “like a” a lot.

I know horses, monkeys, and dragons, so those give me some idea of what a sea horse looks like.

What does a deeper exploration of text features reveal? The seahorse has fins.

There are plants near the seahorse.

I can see the head, pouch, tail, and dragon back and how they all go together on the sea horse. There is small print, a caption at the bottom of the page.

The sea horse was a mystery.

Its science name is *Hippocampus* and it means “horse-like sea monster.”

Distill

What is the central idea?

Barbour sea horses have body parts that look like other animals.

Know

I now know that sea horses have pouches.

A sea horse is a fish, even though it doesn’t look like one. Sea horses have been mysterious to scientists for a long time.

The ultimate goal of exploring this text, as with the Dürer, is to gain new knowledge. Students learn that we always gather important info as we read, study, and question.

I want to point out that you have a handout called a Question Cube that we use to help students generate questions about texts of any kind. Note that the tool uses symbols, so it is accessible to nonreaders. It is particularly helpful in developing the habit of “wondering.”

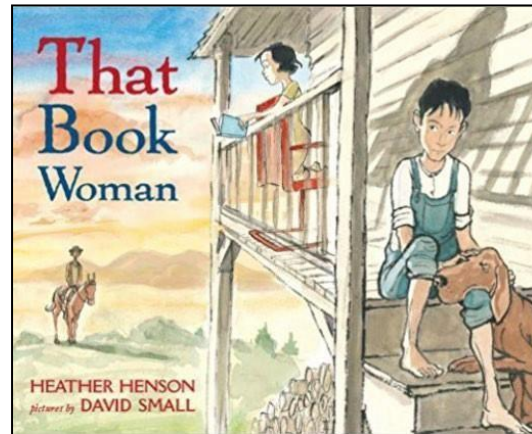
I do not want to spend time here detailing our approach to writing, in large part because you would be hearing something very similar to what another speaker just described.

A quality curriculum should teach writing as an exercise in making meaning. Like The Writing Revolution, our approach employs close examination—down to the sentence level—of craft, structure, development, style, conventions, and process.

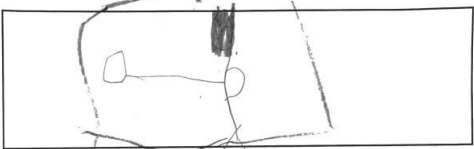
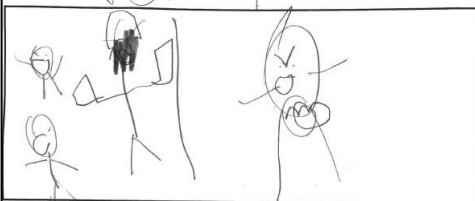

In *Wit & Wisdom*, no skill is taught outside of great content. Everything—reading, writing, speaking, spelling, and more—is integrated and taught via knowledge-rich texts that students hear and/or read again and again.

You have another handout of an exercise that engages students in practicing *end* punctuation with the content of the fable *Seven Blind Mice*. An ELA curriculum should never miss an opportunity to stress knowledge—even while teaching punctuation.

Let's check in on Ajay's progress. His mother sent us a formative assessment he took toward the end of the first module of instruction, which is all about how kids worldwide access books.



Ajay has been asked to do a retelling of a book called *That Book Woman*, in which a young boy, Cal, in the rural Appalachian Mountains initially does not like books, until a persistent packhorse librarian changes his mind.

<p>Handout 21: WR & Widen</p> <p>Name: <u>AJAY</u></p> <p>Assessment 21: Focusing Question Task 4</p> <p>Directions: Write and illustrate to retell the story, <i>That Book Woman</i>.</p>  <p>It started in <u>a house</u></p> <p>when <u>The book woman</u></p> <p><u>showed up</u></p>	<p>Handout 21: WR & Widen</p> <p>Name: <u>AJAY</u></p>  <p>The book woman brought books to the family.</p> 
---	---

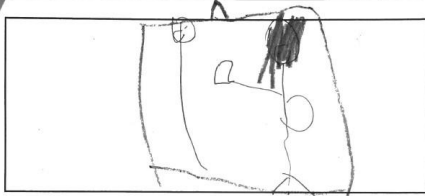
As you can see, Ajay can use both words and pictures to tell us what he knows. He wrote: “It started in a house when the book woman showed up.”

He’s drawn a house with an adult and child interacting, books being handed out, and a mountain range with a packhorse librarian.


Ajay writes, “Finally, Cal likes reading.”

Handbook 21-101 & Wilson

Name: _____



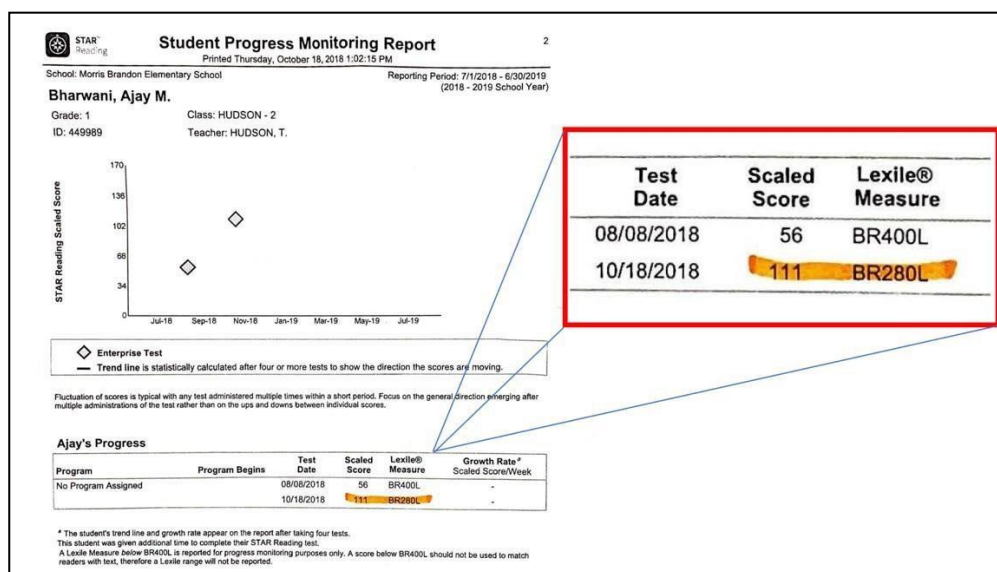
Finally, can likes
reading.



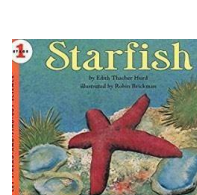
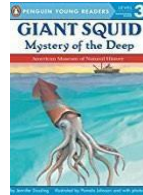
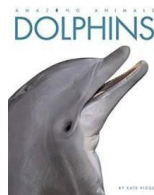
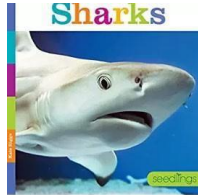
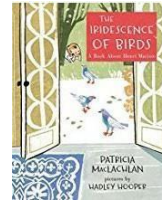
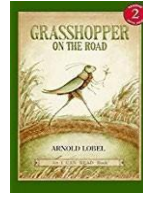
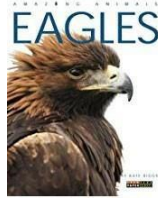
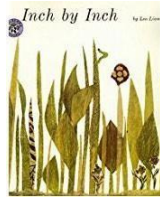
It's almost as if he's writing about himself. Remember, this is a child with dyslexia at the beginning of first grade.

As Ajay's mom noted: "The progress is remarkable. The way the assessment is presented allows him to show that he does know the material, and not just by handwriting. Being able to use illustration along with writing is so helpful to him, and it keeps up the motivation to continue working hard on his writing, which has clearly improved tremendously."

Ajay's mom also just sent us his scores on the STAR Assessment, an independent benchmark assessment that measures comprehension and monitors growth. As you can see, Ajay's score nearly doubled from 56 in August to 111 in October.



Volume of Reading, Grade 2 Module 2: Creature Features

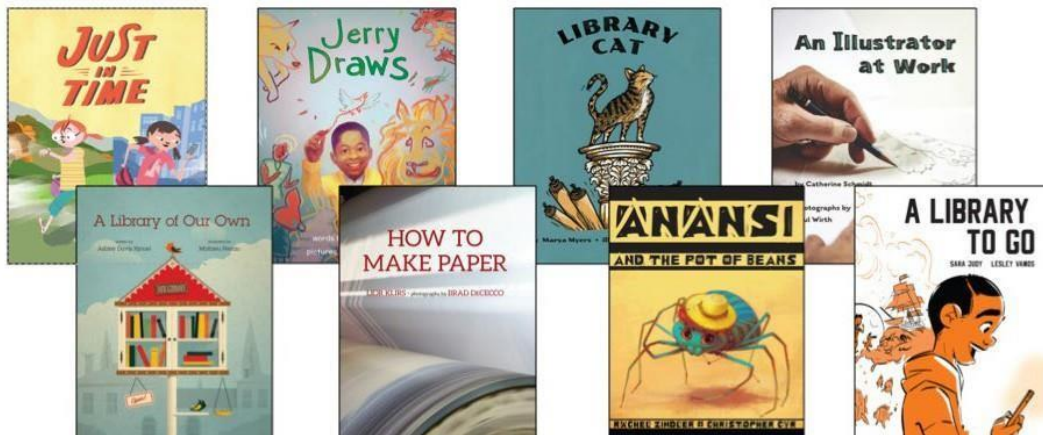


There are more ways to expose students to even more texts on the topics in the curriculum. Almost every classroom has independent reading time. To focus that time on reading (or being read to) more deeply on topics in the curriculum, we have “Volume of Reading” libraries for classrooms.

Research shows that the more students read and are read to on the same topic, the more knowledge they build and the more they develop their academic vocabulary. These titles are just a few from the Volume of Reading library for “Creature Features.”

These are among the books that Ajay is insisting his mother buy.

These are the *Geodes* books I mentioned earlier—there are 64 in all per grade. It thrills me just to see these covers.



To tell you about them, I’m going to read from a letter Barbara Wilson and I wrote to teachers, introducing this series:

Children’s early reading experiences affect their attitude toward books and shape their reading identity. It is essential that the books a child is given to read in the early years are just the right fit—both to practice essential decoding skills and to gain a love of reading and knowledge.

All too often, “decodable” books fail to provide the practice needed, while also lacking interest, complexity, beauty, and other qualities likely to compel readers of any age. Why not do something better?

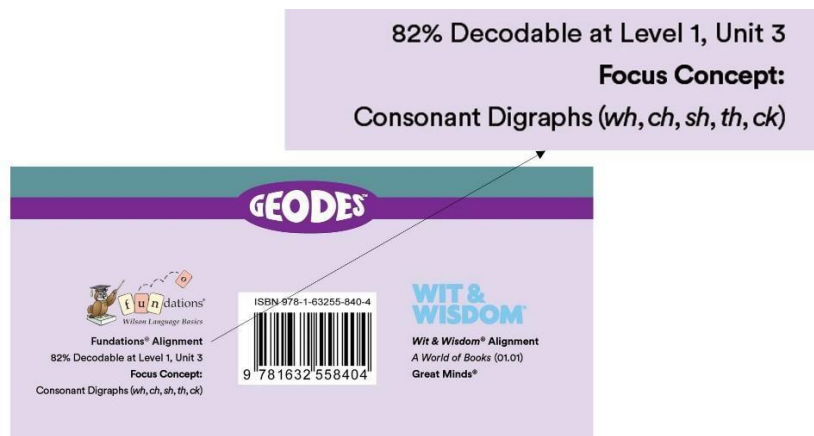
Thus we set out to create a whole new experience for our youngest readers by tapping into our organizations’ core strengths—Wilson Language Training’s expertise in foundational reading skills instruction and Great Minds’ experience at building students’ knowledge.

And we could not be more proud of the result.

This is a spread from a book titled *Library Cat*. The story is about a cat whose job is to protect the scrolls inside the library in the ancient city of Alexandria in Egypt. Each illustration in this book is a woodcut, handmade by an artist. Another *Geodes* book shows the woodcutter’s process—it shows how this book’s illustrations were made.



The books align both with the scope and sequence of Wilson’s Foundations® program and with the module topics in *Wit & Wisdom*. The result: books that build knowledge while developing a child’s skills for success and love of reading.



All core curricula—not just ELA—must be accessible.

We know a knowledge-rich approach is essential, even to mathematics.

Enter Ajay once again, because *Eureka Math* is his curriculum too. Caren says there was one thing he would always say when anything about mathematics came up: “I hate math. I’m not doing anything with math.”

Now, Caren says, “Homework is the number 1 thing Ajay wants to do when he gets home. His siblings want to be in the room when he does his homework. They love to watch him be so excited.”

What has changed Ajay’s attitude toward math? My guess is two things.

First, an accessible curriculum removes the barriers in math for Ajay.

Next, he’s not memorizing math facts and processes; he’s acquiring math knowledge in a systematic, structured, and coherent way that reveals the logic behind mathematics. He’s learning the “why” behind what he’s doing when he does math. Here’s a peek.

Consider this first grade word problem:

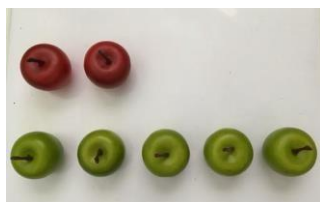
Pam has 2 red apples and 5 green apples. Pam has how many apples altogether?

Let’s first notice the care taken with the wording. The first sentence begins with the most readable words, red apples before green apples, for example.

The second sentence is phrased to increase readability. Rather than asking, “How many apples does Pam have altogether?,” it repeats the readable phrasing, “Pam has,” to mirror the opening sentence.

We are teaching math here, not reading. The goals should be to reduce the reading load so that the math can be seen clearly and accessed by the most students possible.

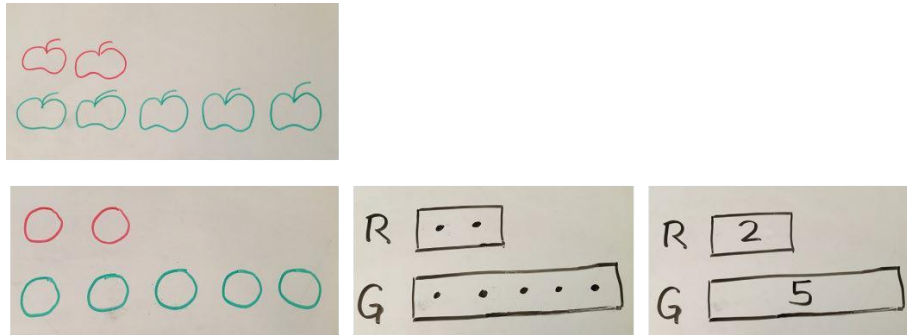
Pam has 2 red apples and 5 green apples. Pam has how many apples altogether?



When we're introducing a new concept, we start students with concrete material that is as lifelike as possible, and gradually become more abstract, transitioning to general manipulatives—discs here. This introduces students to the idea of modeling.

Next, the teacher introduces drawn models.

Pam has 2 red apples and 5 green apples. Pam has how many apples altogether?



You'll notice here, as with the concrete, the drawings also progress in abstraction; we call this the **Concrete– Pictorial–Abstract progression**.

The model shown in this last drawing is called a tape diagram. It helps students see relationships between quantities. *Eureka Math* students use tape diagrams all the way through early algebra.

These and other model drawings are at the heart of our **Read–Draw–Write protocol**, which helps all students, especially striving readers, process and solve word problems. Read–Draw–Write also helps reveal the “why” behind mathematical processes and standard algorithms.

Let's do a Grade 4 word problem using Read–Draw–Write. Here it is:

Jan has 8 fewer cards than Tom. Jan has 32 cards. How many cards does Tom have?

Let's read the first part:

Jan has 8 fewer cards than Tom. What can we draw?

Thinking back to our tape diagrams from before, we could draw a tape showing Jan's cards and another tape showing Tom's cards.

Would one be longer than the other? How much longer? Can you see it in your mind's eye?

So now, after you have used models that reveal *why*, you use the standard algorithm—addition—and get the answer: 40.

The Read–Draw–Write protocol leverages visualization to encourage sense making, which is what math is all about. Math is not rote skill. It is a set of ideas, a body of knowledge, that must be acquired in a coherent way so that it makes “sense” and you can use it in the real world.

Jan has 8 fewer cards than Tom. Jan has 32 cards. How many cards does Tom have?

Read – Draw – Write

Who has more, Jan or Tom? If so, what can we label?

Jan has 8 fewer cards than Tom. Jan has 32 cards. How many cards does Tom have?

Read – Draw – Write

What else can we label? Where does the 8 belong in our drawing?

Jan has 8 fewer cards than Tom. Jan has 32 cards. How many cards does Tom have?

Jan

32

 --8--|

Tom

?

Read – Draw – Write

Is this right?

Let's read the next chunk: "Jan has 32 cards." What can we add to our drawing to show that Jan has 32 cards?

Jan has 8 fewer cards than Tom. Jan has 32 cards. How many cards does Tom have?

Jan	<input type="text"/>	--8--
Tom	<input type="text"/>	

Read – Draw – Write

Students may add their number above or inside the box—whatever is helpful to them. Let's read the next chunk: "How many cards does Tom have?"

What part of our drawing would show how many cards Tom has? Let's add a question mark.

Jan has 8 fewer cards than Tom. Jan has 32 cards. How many cards does Tom have?

Jan	<input type="text" value="32"/>	--8--	$32 + 8 = 40$
Tom	<input data-bbox="647 1251 894 1299" type="text" value="?"/>		Tom has 40 cards.

Read – Draw – Write

What do we notice? Visually you can see, because of tape diagrams and our annotations, that $32 + 8$ is going to equal the number of cards Tom has.

Before we leave this problem, let me point out that it is common in math instruction to tell students to circle "key words," in this case "fewer" to signal what standard algorithm to use. But that's the equivalent of guessing what a word says rather than decoding it. "Fewer" suggests subtraction, when this is actually an addition problem.

As students acquire a knowledge of mathematics, they learn how to choose their own models to fit a problem.

Let's take a look at this authentic student work by Julia to solve this problem: "Mr. Ramos has 139 pencils and 88 erasers. How many more pencils than erasers does he have?"

Name Julia

$$88 \xrightarrow{+20} 108 \xrightarrow{+2} 110 \xrightarrow{+20} 130 \xrightarrow{+9} 139$$

Mr. Ramos has 139 pencils and 88 erasers. How many more pencils than erasers does he have?

Mr. Ramos has 51 more pencils than erasers. $88 + 51 = 139$

	hundreds	tens	ones
P.	1	3	9
E.		8	8

In the center, Julia depicts each number by using a place value table. On the right, she's drawn a tape diagram and used a little squiggle to show how many more pencils than erasers.

In the top corner, Julia has used a method for finding the difference between 88 and 139 by gradually adding to 88 in manageable chunks, working with easy numbers, until she sees what it takes to get to 139.

What beautiful sense-making she displays throughout her work.

As students work on a problem like the one we did, we often suggest that they "turn and talk" to a partner at different stages. By saying their thinking aloud, putting their own words to the idea, turn and talk opportunities help students prove to themselves and others that they get it.



This is just a glimpse into how math knowledge can be developed deeply for all students.

Like ELA and math, science curricula also must be developed with knowledge-richness and accessibility.

Our science curriculum, PhD Science, takes an approach similar to *Wit & Wisdom's*. We build knowledge while teaching science skills through an exploration of compelling phenomena.

Phenomena

Grade and Module	Anchor Phenomenon	Module Name
Grade 3 Module 1	The Galveston Hurricane of 1900	Weather and Climate
Grade 3 Module 2	Monarch Butterflies	Survival
Grade 4 Module 1	The Grand Canyon	Earth Features
Grade 4 Module 2	Windmills	Energy
Grade 4 Module 3	Elephants Sensing Rainstorms	Sense and Response
Grade 4 Module 4	Amelia Earhart	Light
Grade 5 Module 1	The Statue of Liberty	Matter
Grade 5 Module 2	Trees	Ecosystems

So, whether it is learning about weather by studying the Galveston hurricane of 1900—arguably the most catastrophic weather event in U.S. history—or about chemical change by looking at the patina on the Statue of Liberty or about how sound waves travel through matter by learning how elephants sense coming storms, students are *never outside great content*, not for a moment.

Notice and Wonder

Piet Mondrian's Windmills



Let's focus on Grade 4 Module 2, where students explore the topic of energy through an examination of windmills.

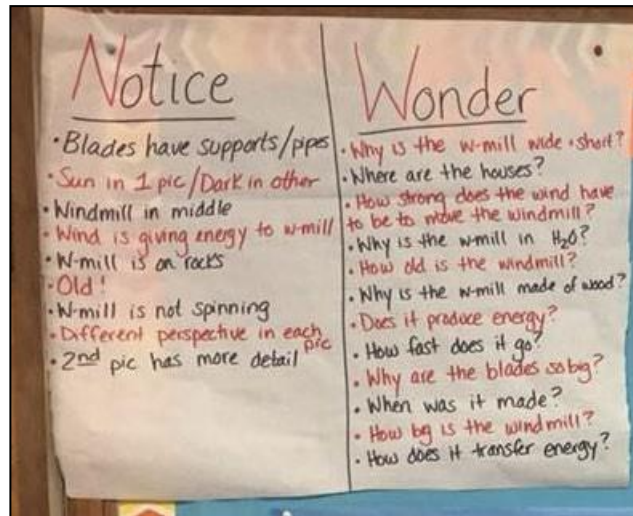
Students kick off their study of energy by noticing and wondering about windmills in the context of—drum roll—art.

They react to two paintings by Mondrian, layering additional levels of knowledge—about landscape and geography, about perspective, and simply about the scale of windmills.

How much better is this than two boring photos of windmills? Why miss any opportunity to build knowledge?

Notice and Wonder

As students look at the paintings and compare them to today's wind turbines, they write down what they notice and what they wonder on sticky notes or in their Science Logbooks. They share their ideas with a partner, in a small group, and then finally they all create a class chart that will remain visible throughout the module.



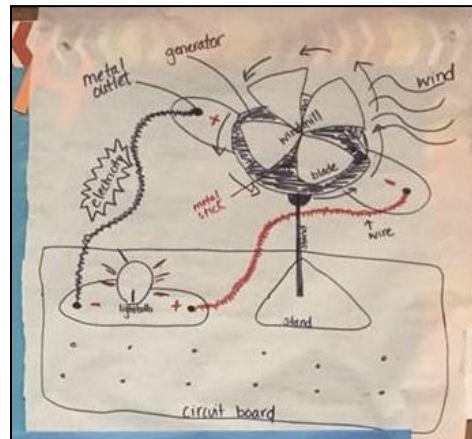
Activity—Building a working model

Next, students engage in activities that allow them to interact with science. Here, students build a working model of a wind turbine that lights a bulb. This activity generates more questions about energy and how the wind turns the blades to power a generator to light a bulb.



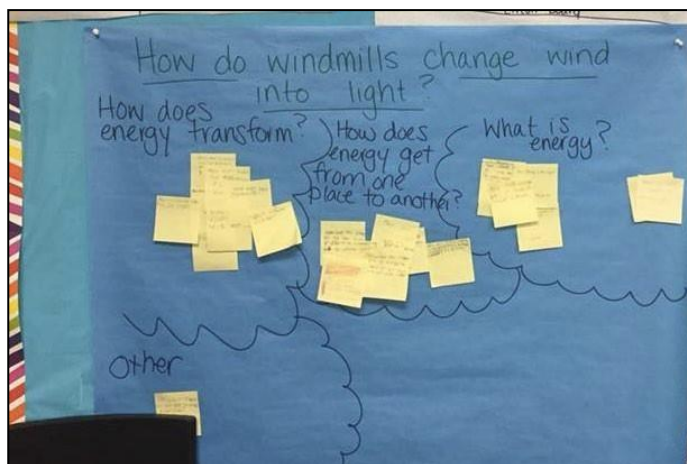
Anchor Model Students collaborate to draw a shared class anchor model of the windmills they constructed. This model is detailed and gets modified as students develop more knowledge during the course of the

module. This shows the anchor model after they have added arrows to indicate the flow of energy and to identify energy transfer and transformation.



Module Driving Question Board

After building and modeling a windmill that turns wind into light, students record any questions they have on sticky notes, which the teacher organizes into categories revealing the module's Essential Question: "How do windmills change wind into light?"



Assessments—and this is of course true for all subjects—must be accessibly designed if they are to accurately measure what students know and can do. In science, we ensure accurate measurement of student knowledge and skills by:

- Making our assessments readable
- Expecting students to model (illustrate) to explain reasoning
- Using illustrations in instructions, as appropriate
- Having formative daily assessments be verbal as often as possible

As with math, this is just a glimpse into the methods we use to build scientific knowledge deeply and accessibly.

It should be considered a best practice in instructional materials design to create materials that will be effective for the greatest number of students. But we know that is not happening.

The most obvious question, to my mind, is, why aren't more reading foundations programs structured, systematic, and informed by the Orton-Gillingham approach? But that's just a start.

Why don't more decodable readers build knowledge *and* practice sound-spelling patterns?

Why, when writing is being taught, do teachers too often abandon not only structure but also books on topics worth writing about?

Why don't more math programs use visually clear models to teach math as a deep and portable body of knowledge instead of a shallow procedural skill?

Why does science instruction avert its gaze from the unbelievable curiosity that the world's phenomena hold, only to embrace the teaching and reteaching of the scientific method?

Finally, why aren't we teaching all students in real time by using more visual texts—starting but certainly not ending with fine art?

There is not enough intelligent design in curriculum publishing today. It springs from what I believe is an insufficient level of respect either for what *students* can do or for what *teachers* can do.

That further depresses expectations for dyslexic students who, when their presence in the classroom is even acknowledged, are greeted with “baby” books and rote materials at best.

Let's return to Ajay and his fantastic mother. Caren says that Ajay notices and wonders everywhere they go.

His mom says there is a painting en route to Ajay's karate class. He's been walking past it for two years, but now he makes her stop and discuss it. He reads signs at the grocery store.

The richness of his school experience has unlocked his desire to explore his world and given him the confidence he needed to talk about it.

Caren says, “I never really knew what was going on in his head. I had no idea my kid could read.”

When I spoke to Caren just six or eight weeks into the school year, she was already brimming with confidence about her son's future, not just for that school year, but for his entire education and beyond.

Her exact words were, “He's going to be just fine. I don't worry about him anymore.”

If you are a parent of a child with dyslexia, you know that there is nothing more electrifying and liberating than being able to say what Caren said about her Ajay: “I don't worry about him anymore.”

We know—and we’ve known for some time—that building background knowledge is essential to the education of all children, especially striving readers and particularly students who are dyslexic.

And we know how to do this, as Judy and I have tried to describe today. We know what methods to use and how those methods can bring *every* single subject in the curriculum to life for all students.

To not use these methods, to peddle curricula that are devoid of knowledge and that perpetuate practices that honestly work for even less than the middle 50 percent is tantamount to educational malpractice.

As educators, our job, in the fullest sense, is to truly leave no child behind—including our kids with dyslexia, the future Patricia Polaccos and Richard Bransons and Charles Schwabs of the world.

We know that exceptionalism exists in significant proportions among students with dyslexia. I can guarantee you that at Great Minds, no future authors or adventurers or even CEOs will be neglected.

Let’s use what we know to help all kids. It’s as simple as that.

My daughter Sophia is older than Ajay and benefits from being at a school that is designed around her needs. She attends the Riverside School outside Richmond, Virginia. Riverside is one of too few schools in the United States that is accredited by the Academy of Orton-Gillingham Practitioners and Educators.

At Riverside, students receive four hours a week of one-on-one reading foundations instruction, so they move at their own pace and leave no stone unturned as they build reading skills one sound-spelling pattern at a time.

They also use both *Wit & Wisdom* and *Eureka Math*, and the kids are thriving with both.

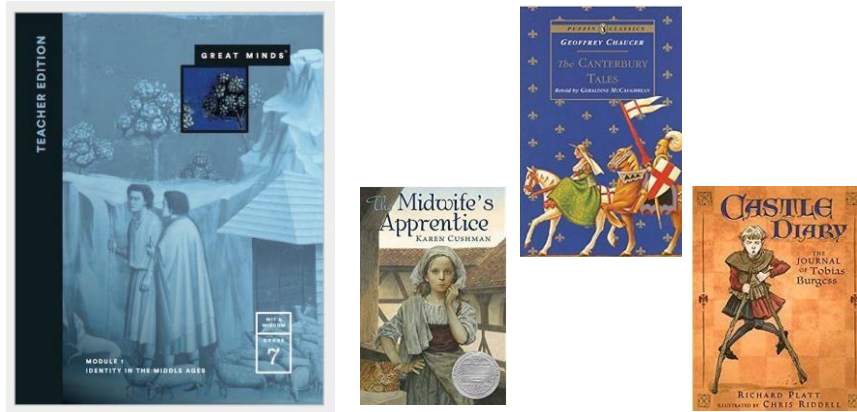
Riverside is not our local public school. In fact, to get Sophia the education she needed, we had to move our family and buy a new home. Sophia and her brother, George, were born near Washington, D.C., where Great Minds is based. When we realized that the Fairfax County School District in northern Virginia (one of the most celebrated districts in the nation) would not meet Sophia’s needs, we moved two hours south.

Most parents can’t do that. And no parents should have to do that to get their children the education they need.

That education should be in every school in America, as it is in Ajay’s neighborhood public school.

As I said, they use *Wit & Wisdom* at Riverside. Sophia began the year with the first module of *Wit & Wisdom*’s seventh grade program.

Grade 7 Module 1: Identity in the Middle Ages



That module explores “Identity in the Middle Ages,” and yes, if you are wondering, the kids read an adaptation of the *Canterbury Tales*, and they listen to the original prologue read aloud.

I don’t know about you, but I read that in high school.

In the module’s first lesson, students closely read these three quotations about identity, choose one, think about what it means, decide whether they agree with it, and explain why or why not.

Lesson 1: Welcome/Launch

“Be yourself; everyone else is already taken.”

-Oscar Wilde

“It takes courage to grow up and become who you really are.”

-E.E. Cummings

“To be nobody but yourself in a world which is doing its best, night and day, to make you everybody else means to fight the hardest battle which any human being can fight; and never stop fighting.”

-E.E. Cummings

Here is what Sophia wrote:

“‘Be yourself; everyone else is already taken’ by Oscar Wilde means be yourself because that is who you are best. I agree with the quotation because it is so important to just get out and be yourself, and so important to not hide behind the mask of shame to be out there in the light of glory.”

—Sophia

Ajay’s mom said it best. To paraphrase: “She’s going to be just fine. I don’t worry about Sophia anymore.”

Thank you.