



Learning Design and Research Base for Edmentum Courseware

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Bloomington, Minnesota

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Introduction

Today's students eagerly expect, and often have need for digital learning environments. As the sophistication of educational technology has expanded, many teachers have come to rely on online learning, whether to capture and analyze real-time student performance data, or to deliver individualized content in a blended classroom. We have seen this effect most recently when schools were forced to close their physical locations during the coronavirus pandemic; virtual tools and educational technology became a major delivery mechanism and key support. Technology continues to be a meaningful tool used by educators to maintain instruction with their students. Knowing that technology will never replace the importance of teachers, educators have embraced the additional opportunities to set up their students for success. Engaging digital content has expanded what teachers can do within a traditional classroom or a blended learning environment, and multiple implementations confirm its power to enable instruction in a virtual setting on a large scale. Furthermore, schools and districts have been able to utilize digital educational tools to reach students who have not had success in traditional school settings or who require more flexibility in setting, schedule, or instructional pace. Data gathered from engaging digital content serves a key role in continuity planning for the future.

Edmentum develops research-based digital educational solutions and tools to support teachers in creating successful student outcomes, no matter the educational setting. The roots of the company trace back to the early 1960s and the University of Illinois at Urbana-Champaign under the name PLATO. The company created what most experts agree was the first authentic computer-assisted instructional system designed for widespread use (Dear, 2017).

That first digital learning system was a milestone, not only because it was computer-based, but also because learning scientists designed it. PLATO embodied revolutionary instructional principles that incorporated leading insights in education and psychology. It featured a number of innovations useful for instruction, including digital graphics overlaid with text and animation; both essential to quality computer-based education. Later, audio added a key feature for reaching students for whom reading had been a barrier to understanding. PLATO grew to include:

- opportunities for social learning with teacher-student interaction
- a rigorous curriculum
- sound assessments
- personalized learning strategies to increase student motivation and achievement

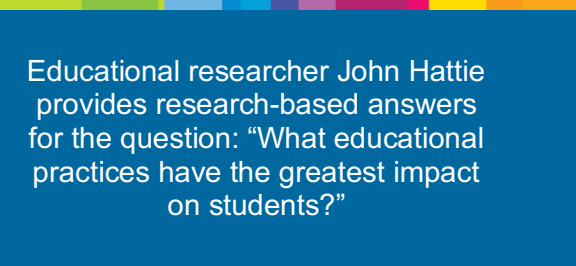
A blue rectangular graphic with a multi-colored horizontal bar at the top. The text is white and centered.

Founded in innovation, we are committed to being educators' most trusted partner in creating successful student outcomes everywhere learning occurs.

Edmentum Mission Statement

Today, the PLATO system has evolved to be what is now known as Edmentum Courseware—national or state-specific, standards-aligned, online courses for students ranging from 6th grade to adult learners. What has remained constant for over 50 years is the priority Edmentum places on educator needs and student outcomes. Edmentum's use of instructional pedagogy and architecture goes back to innovations in 1960 and remains at the forefront of our innovation. Over the years, the research community at large, including educational psychologists, practitioners, learning scientists, and philosophers of education, have continued to research and expand the principles of learning theory, which are then rigorously applied to Edmentum Courseware.

Today, educators operate in a variety of learning environments from brick-and-mortar schools to remote learning (and everything in between). Teachers create supportive and engaging atmospheres and develop relationships that foster learning. Their impacts on students are wide-ranging, including teaching academic knowledge and skills, developing critical thinking, and helping students to develop into moral people and good citizens. Edmentum programs honor the role of teachers as a critical influence on student learning—indeed, teacher relationship is shown to have one of the largest impact effects on student learning, according to John Hattie’s meta-analysis of more than 1,200 studies (Hattie, 2009, 2012, 2015). Schools are turning to technological solutions, including online courseware, to give teachers additional tools to meet the needs of a wide range of different learners. Educators also view technology as a way to anticipate and prepare for the needs of the future. Edmentum partners with educators, making it easier to provide individualized learning for every student through easy-to-use technology, high-quality content, and actionable data.



Educational researcher John Hattie provides research-based answers for the question: “What educational practices have the greatest impact on students?”

This paper discusses:

- the needs of today’s learners and educators
- six foundational research-backed learning design principles of Edmentum Courseware that support teachers and students in achieving learning outcomes
- the role of Edmentum Courseware in learning environments

Who Are Today’s Learners?

Self-paced, independent, tech-integrated, active, diverse, and impatient are some of the adjectives that describe today’s students. Traditional learning environments of the past do not match the needs of many of these learners. Recent work by University of Arizona educational researchers (Seemiller & Grace, 2016, 2019) indicates that students who are in school now and who will be entering school in the coming years share some common characteristics and a common context that shapes their worldview. By understanding the specific needs of today’s learners, educators can better prepare for and teach these learners.

Seemiller and Grace describe today’s students as *tech-integrated*, compared to the previous generation, who they describe as *tech-savvy*. Because current students have been immersed early and often in technology—cell phones, tablets, and smart devices—and have information available instantly through the internet, they tend to expect technology to make their lives work in an everyday way. They approach new objects as technological in nature even if they aren’t sure how they are used. For example, kindergartners are frequently confused by a desktop computer with a mouse. They’ve been known to point the mouse toward the computer screen like the more familiar television remote control. Toddlers used to tablets may swipe images in magazines expecting them to change.

Seemiller and Grace found characteristics of tech-integrated learners that can be well served by online courseware. Tech-integrated learners can benefit from the following qualities of courseware.

Active learning. This generation's work style tends to be active and investigation focused. Self-directed, online work can enable that interaction style.

Independent work. The individual nature of technology has helped students become accustomed to independent learning. This approach doesn't preclude lessons where students work collaboratively in groups, engage in discussion, and give feedback. But the modality of online learning is uniquely suited to independent work not bound by location, space, and time.

Individualized pacing. The current generation of students prefers self-directed work and tends to view teachers as facilitators of learning, rather than transmitters of knowledge. Today's learners are motivated by milestones. It's extremely difficult for teachers to manage a large class of students all working at their own pace, on the content they are ready for at that moment. Technology supports teachers in providing more highly individualized instruction than possible without it. Materials that are customizable to fit the learner's individual needs allow teachers to provide key milestones to guide student pace.

Who Are Today's Teachers?

Today's teachers recognize that the needs of their students are more diverse than ever, which makes the requirements of the teaching profession more demanding than ever. Most teachers are on the road to embrace technology to help manage data and support instruction and individualization.

In many school systems, technology has fundamentally restructured teachers' roles in education and the way students understand teachers and interact with them. In generations past, teachers were considered the sole source of knowledge for their particular topic, and students had few other ways to easily access information. Today's world is flooded with a multitude of easily accessible information, and the job of teachers is no longer limited to providing every detail of instruction about a topic, but to act as a facilitator to help students learn how to evaluate and use the information they access. Teachers are also critical in building relationships with students: understanding them as whole-learners and using their connection to influence and motivate. Both facilitating learning and building relationships help teachers meet students where they are instructionally as a way to improve learning outcomes, providing the right experiences and opportunities in the right way at the right time.

In classrooms with many students, it's challenging and unsustainable for teachers to provide individualized instruction for each learner. Digital learning tools can be used to facilitate effective personalized learning. As discussed earlier, the thoughtful and deliberate integration of technology into classrooms gives teachers the power to efficiently do more. Teachers can utilize technology to assign individual practice, grade student work, monitor progress towards meeting key milestones, and communicate student learning with families. Teachers are eager to support students based on individualized needs. Used appropriately and innovatively, technology provides teachers the tools to meet the individual needs of larger numbers of students effectively and in a sustainable way.

Edmentum Courseware Learning Design Principles

John Hattie’s meta-analysis of evidence-based educational research reveals the impact of key influences on student learning. He ranks these influences by effect size (Hattie, 2009, 2012, 2015). Edmentum Courseware has based its principles in the research of Hattie’s large effect practices.

Edmentum’s six learning design principles provide the bedrock of Courseware’s learning methodology. Each principle has a sound basis in theory, best practice, and research.

Mastery Learning

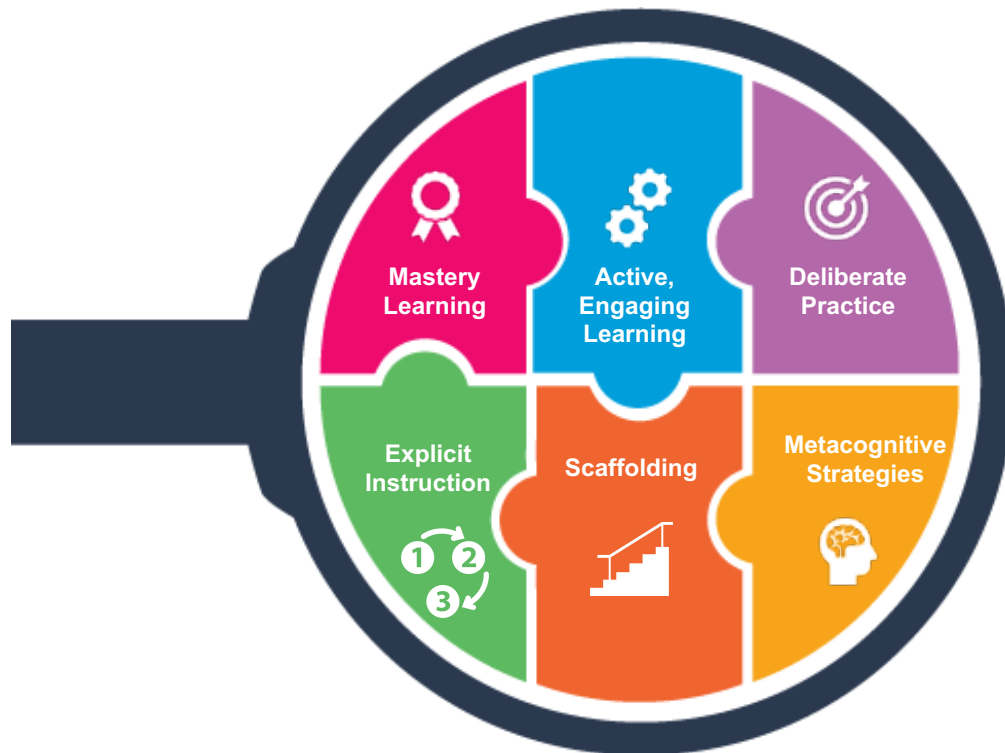
Focus on efficient learning. Students show mastery of key content, invest time on not-yet-mastered content, and proceed through learning new content at their own pace.

Active, Engaging Learning

Involve learners in responding to and manipulating information while they learn—ensuring their involvement in building understanding and minimizing passive reception of information.

Deliberate Practice

Offer intentional, structured, and sustained practice that builds thoughtfully in complexity to support increasing levels of understanding.



Explicit Instruction

Support successful learning by providing clear skill statements, modeling of learning outcomes, and reducing cognitive load.

Scaffolding

Buoy learning by providing specific supports when learners need them and systematically removing them—leading to independence as learners approach mastery.

Metacognitive Strategies

Engage students in reflecting on how they best learn and evaluating their thought processes to help themselves along their learning path.

Mastery Learning

Mastery learning, which has also been called competency-based learning, focuses students on content that they have not yet mastered and enables learners to work at their own pace to master new concepts. It establishes an efficient investment of learning time because learners spend less time on what they already know while efficiently investing time on what they need to master (Le, Wolfe, & Steinberg, 2014). It supports the positive message that every child, if given enough time and the right approach, can learn well-defined skills to the level of mastery (Anderson & Krathwohl, 2001). A key feature of mastery learning is that students' progress through learning objectives at their own pace demonstrating mastery through small assessments as they work. Assessments provide information to allow learners and their teachers to make decisions that best suit each learner. This ensures that the pace of instruction matches what each student is ready to learn (Haynes et al., 2016; Le et al., 2014).

Mastery Learning

Focus on efficient learning. Students show mastery of key content, invest time in not-yet-mastered content, and proceed through learning content at their own pace.



How Edmentum Courseware Applies the Mastery Learning Principle

Unit Pretests identify material that learners have already mastered and that which they still need to master. Pretests assess each unit and provide teachers and students with information about what students have already mastered. Students are exempt from lessons on already-mastered content, allowing them to focus their time on content they still need to master.

The screenshot shows a pretest results window titled "Pretest: Literary Devices in Fiction" with a total time on task of 00:03:29. A green checkmark icon indicates completion. The score is 90% (18/20). Below the score is a table with two columns: "Module" and "Score".

Module	Score
Subject and Theme in Fiction	100% (4/4)
Tone and Mood in Fiction	100% (4/4)
Character and Plot Development in Fiction	100% (4/4)
Narrative Techniques in Fiction	100% (4/4)
Symbolism in Fiction	50% (2/4)

At the bottom of the window is a "Close" button.

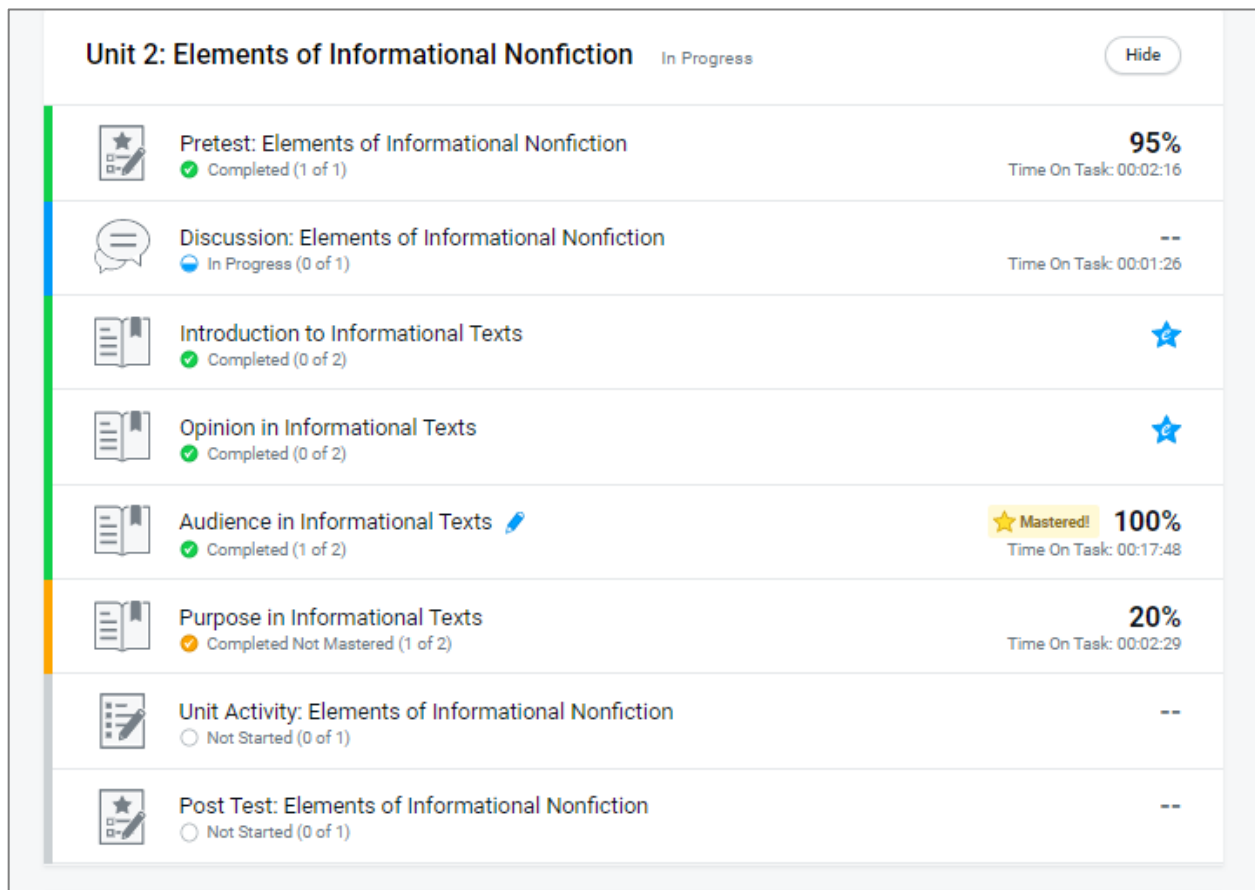
Performance on pretest enables learners to skip material they have mastered, focusing work on material not yet mastered.

This pretest will impact the learner's lesson assignment. The first four lessons in the module will show as complete because of mastery in pretest. The last lesson will show as not mastered until the learner successfully works through the material.

Backward design ensures a powerful relationship between goals, instruction, and assessment. Edmentum begins with carefully chosen mastery objectives and then defines the assessment experience that will best demonstrate mastery. Each assessment goal defines a learning experience that drives towards the ability to perform well on the assessment ultimately demonstrating mastery of the learning objective. This approach to instructional design is known as *backward design* (Wiggins & McTighe, 2005).

Rigorous instruction is based on alignment with national and local standards to focus on important concepts and drive performance. Carefully chosen mastery objectives are aligned to national and state standards to support mastery required for course completion and high-stakes assessments.

Checks for understanding inform and streamline instruction. After completing a lesson, students take a mastery test. Learners and their teachers can use mastery test results to make decisions about what to review, whether to choose to retake the lesson, and what other learning experiences would be helpful.



Use student data to make learning decisions. For example, the orange indicates the lesson has not been mastered, providing an opportunity for learner and teacher to decide whether to redo lesson or find another way to master the material.

Learners have control over time, place, path, and pace of learning, which supports them to impact their own learning. The flexibility inherent in digital curriculum makes it possible for learners to work any time and any place. Courseware allows students to speed up when they understand material and slow down or repeat material when they need more time to understand.

Active, Engaging Learning

Active learning is an instructional method that involves students in responding to instruction, encouraging them to manipulate information, and to interact more deeply directly during the learning process. Active learning contrasts with a traditional lecture format, in which a teacher delivers information to a classroom of students who passively receive it (Bonwell & Elson, 1991). Techniques that encourage active learning tend to be better at promoting higher-level learning and skills. Hattie’s research shows that as students become active in the process of their own education, learning outcomes improve. Learners “reach the stage where they become their own teachers, they can seek out optimal ways to learn new material and ideas, they can seek resources to help them in this learning, and when they do they can set appropriate and more challenging goals” (Hattie, 2009, pp. 86–87).

Active, Engaging Learning
 Involve learners in responding to and manipulating information while they learn—ensuring their involvement in building understanding and minimizing passive reception of information.

How Edmentum Courseware Applies the Active, Engaged Learning Principle

Interactivity in lessons engages learners. A variety of learning experiences across courses motivate students and enhance thoughtful learning. Multiple representations and ways of interacting with content help learners develop rich understandings.

- Check-for-understanding items are embedded frequently within lessons. Students apply recent learnings, get immediate feedback on whether they answered correctly, and get a full explanation of the correct answer. Some check-for-understanding items in Algebra II include open-on-demand worked examples to provide additional support.

Question

Choose the manipulation that keeps the balance.

$5x - 3 = 2x$

For help, see this [worked example](#).

$\frac{5x - 3}{5} = \frac{2x}{2}$

$5x - 5x - 3 = 2x - 2x$

$5x - 3 + 3 = 2x$

$5x - 3 + 3 = 2x + 3$

Submit

Worked Example

$-4x + 6 = 2x$

$-4x + 4x + 6 = 2x + 4x$

$\frac{6}{6} = \frac{6x}{6}$

$x = 1$

Always do exactly the same thing to both sides of the equation to keep balance.

Add the same value to both sides to keep balance.

Divide both sides by the same value to keep balance.


This Algebra item allows students to use what they just learned. If they need help to be successful, they may activate the open-on-demand worked example.

- Warm-Up items activate prior knowledge and encourages learners to make connections. These activities give an additional boost to the new learning of already understood concepts.
- Highlighter tool functionality provides ways for learners to interact with readings.

Reading for Textual Evidence in *Rogue Heart*
 Read this excerpt from the novel *Rogue Heart* by Axie Oh.

Rogue Heart is a science fiction novel that takes place in China in the distant future. The narrator is a teenage girl who is new to the city, the culture, and the language.

Use the Highlighting tool (👉) to mark details that supports the idea that the narrator is recovering from a past filled with fear.



The dreamers gather in Neo Beijing's starlight district. The wanderers and the thrill-seekers. Those with poems in their souls and secrets in their hearts. All those racing toward the bright, unknowable future.

All those running from pasts painful and unforgiven.

If you listen carefully, you can hear the song of the city. It's in the sharp, raucous laughter of the kids barreling down the crowded streets, in the heavy electronic beats erupting like great beasts from basement clubs, in the wind whistling through dark alleys, and in the rain as it drops on to the city like so many falling stars.

Two years ago, I stumbled into the city, half starved and afraid, and I couldn't hear the song. My heart beat louder than the music.

Memories rise unbidden—of pain, of loss, of a handsome face so beloved yet turned from me. I place a hand against my throat until the rapid pulse steadies. The past is in the mind, as Dr. Koga used to say. Let it go. Let it be.

The future is in the heart.

Use of highlighter tool in English 10 encourages close interactions with text.

- Science courses utilize simulations, virtual, and augmented reality labs to engage students in active learning.



In Biology, learners may complete an augmented reality respiration lab.

They record their findings.

Dichotomous Key 📄

The monarch butterfly belongs to the Order _____.

- It has one two pairs of wings.
- The wings are armor-like triangular.
- It has a _____ and does not have long filaments at the abdomen.

The rhinoceros beetle belongs to the Order _____.

- It has one two pairs of wings.
- The wings are armor-like triangular.
- The hind-wings are _____.





The pyramid ant belongs to the Order _____.

- It has a _____ and a pair of antennae.
- The antennae are _____ and bent.

The common green grasshopper belongs to the Order _____.

- It has one two pairs of wings.
- The wings are armor-like triangular, and have similar different shape and size.
- It has long hind legs that allow it to _____ and initiate _____.

Based on these insects' characteristics, classify each of the following insects by their Order.

			
Order _____	Order _____	Order _____	Order _____

- An in-course notebook tool provides an opportunity for learners to take notes and record observations.

Real-world examples and applications make learning relevant. Students apply their acquired knowledge to contexts and real-world artifacts that help them see how what they are learning is relevant to them.

Introduction

Warm-Up

You've probably heard the term "tone of voice" or even "watch your tone." What does *tone* mean in these instances?

In these cases, *tone* refers to the way someone sounds.

In informational text, a writer or speaker's tone also refers to his or her attitude. Tone in a text is the author's attitude toward the subject he or she is writing about.

A writer's tone toward the topic could be serious, humorous, critical, optimistic, playful, or any number of other attitudes.

In this lesson, we'll analyze how the tone of Nelson Mandela's inaugural speech is revealed through his word choice, message, and writing style.



Students have the opportunity to apply what they've learned to the text.

Diction and Tone in Mandela's Speech: Your Turn

As you read the excerpt, try to **identify the tone** of this section. Use the Highlighting tool (L) to mark **diction and syntax that contribute to the tone**.

Inaugural Address
by Nelson Mandela (excerpt)

That spiritual and physical oneness we all share with this common homeland explains the depth of the pain we all carried in our hearts as we saw our country tear itself apart in a terrible conflict, and as we saw it spurned, outlawed and isolated by the peoples of the world, precisely because it has become the universal base of the pernicious ideology and practice of racism and racial oppression. We, the people of South Africa, feel fulfilled that humanity has taken us back into its bosom, that we, who were outlaws not so long ago, have today been given the rare privilege to be host to the nations of the world on our own soil.

We trust that you will continue to stand by us as we tackle the challenges of building peace, prosperity, non-sexism, non-racialism and democracy. We deeply appreciate the role that the masses of our people and their political mass democratic, religious, women, youth, business, traditional and other leaders have played to bring about this conclusion. . . .

We would also like to pay tribute to our security forces, in all their ranks, for the distinguished role they have played in securing our first democratic elections and the transition to democracy, from blood-thirsty forces which still refuse to see the light.




Deliberate Practice

Deliberate practice refers to intentional, highly structured, and sustained student effort that impacts knowledge and skill acquisition and retention. The learning curve relies on the link between practice, reinforcement, immediate feedback, and performance (Campitelli & Gobet, 2011; Hattie & Yates, 2013). When learners engage in deliberate practice, they are motivated by a compelling desire to improve. Therefore, they exert the effort to practice until they master the content. Hattie's research shows students' deliberate practice is a powerful influence on student achievement because initial learning can be consolidated from surface knowledge to long-term memory (Hattie, 2009; Hattie & Yates, 2013).

Deliberate Practice

Offer intentional, structured, and sustained practice that builds thoughtfully in complexity to support increasing levels of understanding.



How Edmentum Courseware Applies the Deliberate Practice Principle

Practice and feedback are employed within lesson tutorials. Integrated items allow learners to immediately apply new knowledge to gain new levels of understanding. Students receive immediate feedback about whether their answers are correct or incorrect, including an explanation of the correct answer, which encourages students to learn from their mistakes and successes.

Question

Match the event in health care to its effect.
Drag each tile to the correct box.

Tiles

Pairs

only licensed doctors could practice medicine	→	regulation of medical practice
better understanding of the human body and its workings	→	permission to perform dissections
advances in genetic engineering and gene therapy	→	discovery of DNA structure
link between microorganisms and diseases	→	invention of the microscope

Correct!

Try Again

Explanation:
The invention of the microscope helped scientists understand the link between microorganisms and diseases. The discovery of the structure of DNA led to advances in genetic engineering and gene therapy. The regulation of medical practice led to allowing only licensed doctors to practice medicine. The permission to perform dissections led to a better understanding of the human body and its workings.

Practice includes a variety of formats. This Health example of a drag-and drop matching format includes an explanation to support learning.

Sets of practice items follow tutorials in Algebra courses. Extended practice provides additional application of recent learning to problems. These items also include feedback and correct answer explanations.

Question

Select the correct answer from each drop-down menu.
Look at this expression, and complete the statements.
 $3x + 2(x + 2) + 4$

In the first term, 3 is **a coefficient**.

In the second term, $(x + 2)$ is **a factor**.

In the last term, 4 is **a constant**.

Submit

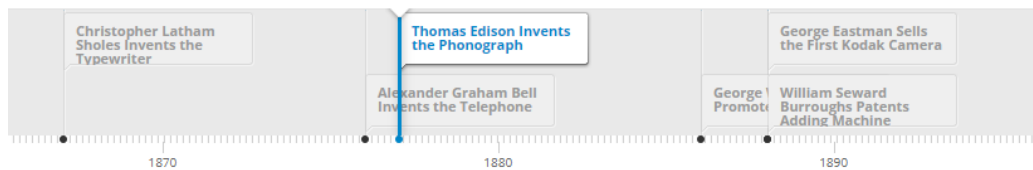
Explanation:
The 3 in the first term is multiplied by a variable, x . So it is a coefficient.
The $(x + 2)$ in the second term is multiplied by 2. So, it is a factor.
The 4 in the last term is not multiplied by anything. It is a fixed value, so it is a constant.

Additional practice in Algebra II provides immediate feedback and explanation.

Items are constructed to support and build mastery. Item types are selected for the best pairing of the skill and the demonstration of mastery. Items are put in an order to build from basic foundation to application of higher-level learning. This sequencing includes the appropriate level of rigor to allow students to understand and improve their mastery.

The screenshot shows a lesson activity interface. At the top, it says 'Lines, Angles, and Mathematical Proofs: Tutorial' and '9 of 49'. The main title is 'Lesson Activity: Linear Pair and Supplementary Angles'. Below the title, it lists educational goals: Mathematical Practices, Inquiry, and 21st Century Skills. The 'Directions' section asks the student to read instructions and check answers. The 'Activity' section explains the use of the GeoGebra tool. 'Question 1' asks the student to calculate the sum of two adjacent angles in a linear pair. A diagram shows a straight line with points A, B, and C. Point B is between A and C. A ray extends upwards from point B, creating two adjacent angles: $\angle ADB$ (45°) and $\angle BDC$ (135°). Below the diagram is an 'Input...' field and a 'Submit' button.

In Geometry, students learn through manipulating figures using powerful graphing tools.

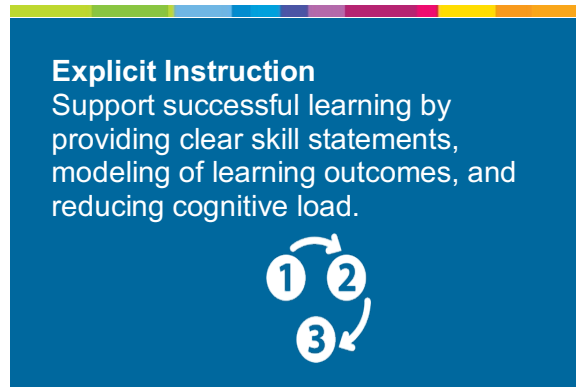


The screenshot shows a history lesson titled 'Timeline: The Era of Invention'. The text describes the US Industrial Revolution in the late 1800s and mentions that users can interact with the timeline. To the right of the text is a black and white photograph of an early typewriter, likely the one invented by Christopher Latham Sholes.

In History, students can interact with timelines to understand the chronology and interaction of historic events.

Explicit Instruction

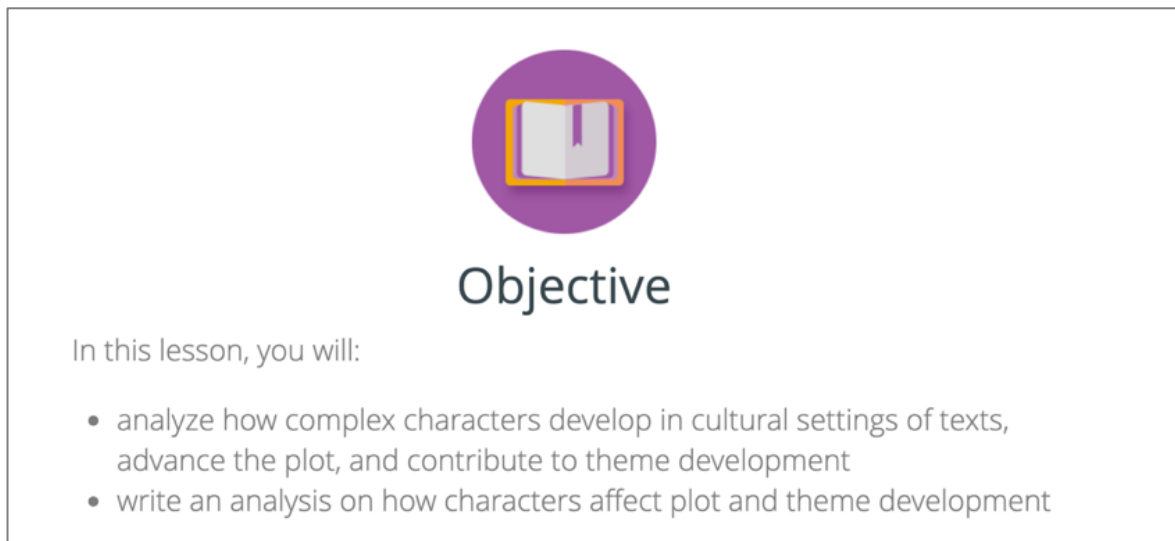
The term *explicit instruction* refers to a “group of research supported behaviors that are to design and deliver instruction in order to provide needed supports for successful learning through clarity of language and purpose, and reduction of cognitive load” (Hughes, Morris, Therrien, & Benson, 2017).

A blue rectangular graphic with a multi-colored horizontal bar at the top. The text inside reads: "Explicit Instruction Support successful learning by providing clear skill statements, modeling of learning outcomes, and reducing cognitive load." Below the text is a circular icon with three numbered steps (1, 2, 3) connected by arrows in a clockwise cycle.

Explicit Instruction
Support successful learning by providing clear skill statements, modeling of learning outcomes, and reducing cognitive load.

How Edmentum Courseware Applies the Explicit Instruction Principle

Clear instructional goals and skill statements. Each tutorial opens with an objective so both learner and educator know the goal of the lesson. Instruction and assessment are developed using backward-design to ensure learners meet learning goals.

A white rectangular graphic with a purple circular icon at the top center containing a book. Below the icon is the word "Objective" in a large, bold font. Underneath is the text "In this lesson, you will:" followed by a bulleted list of two items.

Objective

In this lesson, you will:


- analyze how complex characters develop in cultural settings of texts, advance the plot, and contribute to theme development
- write an analysis on how characters affect plot and theme development

English 10 lesson objectives reveal clarity of purpose.

Break instruction down to address well-defined skills. The introduction of new content is carefully managed to avoid cognitive overload (Archer & Hughes, 2011).

Text Structures Show the Relationships Between Ideas

The purposeful organization of ideas can help effectively support a thesis. Authors use several common text structures to show the relationships between information and ideas. Click on each type of text structure to learn more about it.



Chronological

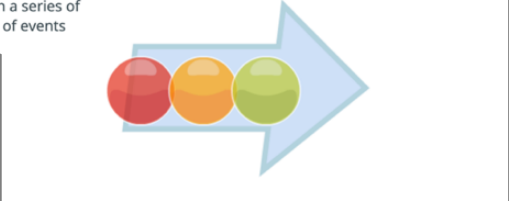
A chronological text structure organizes text in a series of logical steps or according to the development of events over time.

Analyzing Text Structure

Look at the text to examine how the author organizes the information that develops the thesis. Use the Highlighting tool (H) to **mark phrases that indicate the text structure the author uses.**

1. *Cool* is still cool. The word, the emotional style, and that whole flavor of cultural cachet¹ remains strong after more than half a century. It is, according to linguistic anthropologist² Robert L. Moore, the most popular slang term of approval in English. Moore says *cool* is a counterword, which is a term whose meaning has broadened far beyond its original denotation.
2. For a millennium or so, *cool* has meant low in temperature, and temperature itself has long been a metaphor for psychological and emotional states (a cool reception, hotheaded). Chaucer, the *Oxford English Dictionary* tells us, used *cool* to describe someone's wit. Shakespeare to say, "More than cool reason ever comprehends."
3. But starting around the 1930s, *cool* began appearing in American English as an extremely casual expression to mean something like "intensely good." This usage also distinguished the speaker, marking them as from mainstream culture.
4. As its popularity grew, *cool's* range of possible meanings exploded. It is almost impossible to try to determine all the qualities collecting in the hidden folds of *cool*. These meanings include self-possessed, disengaged, quietly disdainful, morally good, intellectually assured, aesthetically rewarding, physically attractive, fashionable, and on and on.
5. *Cool* as a multipurpose slang word grew prevalent in the fifties and sixties, eventually outshining countless other informal expressions such as *groovy*, *smooth*, *awesome*, *phat*, *sweet*, just to name a few. Along the way, however, it has become much more than a word to be broken down and defined. It is practically a way of life.

¹ high status or state of respect
² an expert in the study of human behavior and past and present societies



Focused text analysis occurs after explicit instruction on specific concepts.

Guided problems and examples provide models to support learning. Explicit instruction embedded in guided problem solving is in the form of worked examples and models that reveal the thinking process. This structure has been found to have a high impact on student learning (Archer & Hughes, 2011).

Translating Descriptions into Algebraic Expressions

Understanding the meaning of mathematical words and phrases helps us translate words and phrases into algebraic expressions.

Let's look at an example.

1. Break the mathematical description into meaningful phrases.
2. Translate each phrase into symbols to create an algebraic expression.
3. Read the algebraic expression to double check that it means the same as the mathematical description.

6 multiplied by the absolute value of 7 less than the cube of a number

$$6 \cdot |n^3 - 7|$$

In Algebra, the example clarifies the thinking process.

The gradual release of responsibility model moves learners from guided to independent work in a step-wise fashion. Within each lesson, learners begin with an overview of the concept, interact with guided examples, and apply their learning in check-for-understanding items. Mastery test performance indicates how well learners can work independently with the content. Additional review is available prior to taking the master test for increased reinforcement when necessary.

Task 1 Print

Organizing the Progressive Era

The Progressive Era impacted and transformed the US social and political landscape. For this task, you will create a timeline to show the chronological sequence of events from the Progressive Era.

Viewing: [Answer Key](#) [Unanswered](#)

Question

Part A

Organize the following events from the Progressive Era on the timeline.

is passed

Unit Activities are rich experiences where learners apply what they learned, demonstrating ability to independently interact with complex ideas.

Part B

Next, use the table below to describe the historical context and significance of each event. Include information about how these events may have impacted one another.

Progressive Era Event	Historical Context and Significance
1.	
2.	
3.	
4.	
5.	
6.	
7.	

Task 2 Print

Presenting the Progressive Era

Using your timeline and the notes from your table, create a presentation in response to the following prompt:

Evaluate the effectiveness of Progressive Era reformers and the federal government in bringing about reform at the national level. In your response, be sure to analyze the successes and limitations of these efforts in the period between 1900 and 1920.

It may also be helpful to analyze events prior to 1900 because many Progressive ideals began to take shape in the late 1800s. Follow the Process section below to help you research and create your presentation. You may include your timeline in your slideshow presentation. When you finish your presentation, submit your timeline and slideshow to your teacher using the drop box.

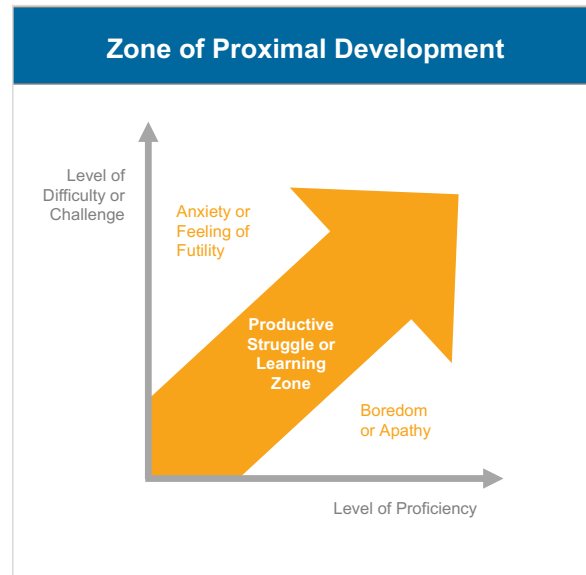
Scaffolding

Instructional scaffolding is a process where instructional supports provide aid to students in mastering content until they can apply new skills and strategies independently (Dickson, Chard, & Simmons, 1993; Rosenshine & Meister, 1992). Scaffolding is particularly important when students are first encountering new material, and as they develop a mastery of the content, the supports can be gradually removed as they develop skills to complete work independently. Scaffolding reduces barriers to learning by removing unnecessary complications or difficulties. For example, if reading is a barrier to a math student, simplified text and audio support for reading can help that learner access the math instruction.

Scaffolding
 Bouy learning by providing specific supports when learners need them and systematically removing them—leading to independence as learners approach mastery.

Hattie writes “scaffolding is essential for cognitive development as students move from spectator to performer after repeated modeling by adults.” (Hattie, 2009, p. 327).

Vygotsky describes a Zone of Proximal Development, where the level of difficulty or challenge is balanced with a learner’s level of proficiency so that the work of learning isn’t too difficult or too easy. When learners are working on content in which they are proficient and has little challenge for them, they become bored or apathetic. When learners are insufficiently proficient with material and it’s difficult or challenging, they become anxious or feel that they can never be successful with their work. When learners are outside of this optimal learning zone (the zone of proximal development), the time they are investing is not productive. Scaffolds are additional learning supports that can move learners into more challenging material where they are not yet proficient. The scaffolds help learners achieve an appropriate level of productive struggle (Vygotsky, 1978).



This graph of the Zone of Proximal Development reveals an area of productive struggle and learning.

How Edmentum Courseware Applies the Scaffolding Principle









Edmentum Courseware includes a large variety of scaffolds for learners. Learners may choose when to use most of the scaffolds, so they are implemented when the learner needs them and are not as the learner becomes more proficient. This powerful ability to choose support when needed is intrinsically motivating and empowering.

Glossary links and pop-ups support vocabulary development. If learners need additional support on new academic language, they can click on glossary links or pop-ups for expanded support. The glossary is always available in the resource tab in the sidebar.

Audio supports a variety of learners. Audio is available to read text to provide access to content for struggling readers. It’s also helpful for English learners who may understand what they hear better than what they read. Brain-based learning shows that simultaneous reading and listening to information is more effective on developing listening fluency than a single modality, particularly for students learning English (Chang & Millett, 2014; Woodall, 2010).

A translation tool supports English language learners. English language learners may activate translations of text using primary language dictionaries for 19 languages. This tool is in the sidebar.

Interactive Tools. Students can access a variety of tools that provide support and additional interactivity.

	The Table of Contents for the tutorial reveals where the learner is, what has been completed, and what is coming. Learners may select to return to a previous lesson to review sections they have already completed.
	In Resources learners have access to a variety of materials to support their success. Resources may include Guided Notes, Glossary, short summaries of key instructional material, and more.
	The Dictionary provides a definition powered by Merriam-Webster for any text the learner enters.
	In Reading Tools learners can enable automatic narration for slides. They can also enable click to speak which reads aloud any text the student selects.
	In Translate learners may choose one of 19 languages. They may then enter or copy and paste words to be translated into that language.
	A calculator is available as a ready alternative to a handheld calculator.
	Math Tools include a Graph tool to plot x-y functions and data and a Data Plot tool to plot box plots and histograms.
	The Highlighter tool includes multiple colors, enabling students to mark on-screen text to create meaningful engagement.

Video clips augment instruction. Students can explore lesson topics by playing short videos. The videos provide another modality or approach to the content.


Women in the Political Realm

For a half a century after nonwhite men were granted the right to vote by the Fifteenth Amendment, women in the United States couldn't cast ballots in any election. It was only in 1920 that they gained suffrage with the ratification of the Nineteenth Amendment.

This milestone helped launch the journey for women's social equality that would continue through the century. To some extent, women took a more active role in national politics after 1920. However, their impact was less dramatic than had been expected. They did not vote as a bloc, so they did not exert significant power on political decisions.

As is typically the case, legal rights have a weak tangible effect on the people who receive them at the time of their enactment. But in the 1920s women were better positioned to work for greater social equality.

This video provides a glimpse of how developments in fashion, dance, and music signaled the arrival of the modern woman in the 1920s.



Video in US History gives learners a peek into the past.

Guided notes provide layers of support. These printable notes align to key learnings in lessons. To complete them, learners record and summarize key pieces of information from the lesson. The physical act of writing (if the notes are printed out) adds an additional modality to the mix. As Hattie notes, summarization is one of the most powerful learning strategies (Hattie, 2009).

edmentum Guided Notes

Name: _____ Date: _____

The Unit Circle

Objective

In this lesson, you will use the unit circle to describe and apply radian measure, arc length, and Pythagorean identities.

Radian Measure

Radians are a measurement related to the distance traveled along the _____ of a circle. When we measure an _____ along the circumference of a circle equal in length to the _____ of the circle, the angle created has a measure equal to _____ radian.

For a circle with a radius of 1, the circumference is $C = \pi$.

ANGLES AND ARC LENGTH

subtended angle: the angle formed by an object at a given external point or arc

arc length: _____

Formula to find the arc length, s , when the central angle is θ .

$$s = \theta r$$

Guided Notes: The Unit Circle 1

Guided notes ensure that learners summarize key learnings.

Strategic use of color supports learners in seeing connections. The visual support reduces the amount of explanation and makes it easier for learners to follow the instruction.

Writing About Key Ideas

Making and Supporting a Claim

You analyzed the development of several key ideas in the first half of Mandela's speech. Here's an example of the process to make and support a **claim** about one of them.

1. Make a claim that states a key idea you've identified
2. Explain how the key idea is revealed in the text.
3. Provide evidence that supports your text analysis.

A key idea in Mandela's inaugural speech is his hope for South Africans to unite and create a new and just society. He develops this key idea in the first few paragraphs by repeating words and ideas about humanity and rebirth. For example, he asks his audience to "consider humanity's belief in justice," and says that a society must be "born of which all humanity will be proud."

Use of color in English 10 connects instruction to model.

Find the value of $3|x^3| - y^2$ when $x = -3$ and $y = -5$.

$$= 3|(-3)^3| - (-5)^2$$

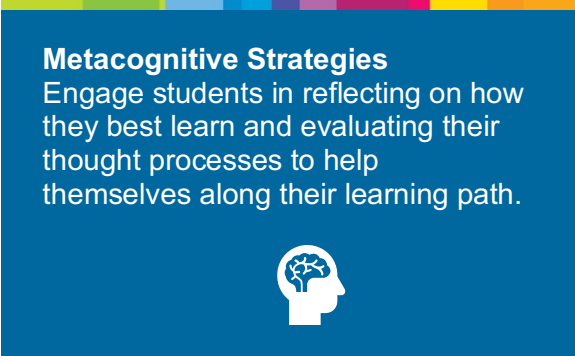
Substitute

$$= 3|27| - 25$$

Color in an Algebra 2 lesson helps learners track substitution.

Metacognitive Strategies

Metacognition means thinking about one's thinking, and in an educational context, it refers to students' self-understanding and knowledge about themselves as learners. Students use metacognitive skills to select, monitor, manage, and evaluate cognitive processes to self-reflect on how they learn and strategically employ the most effective learning strategy in their work. Thoughtful self-monitoring practices are associated with better learning (National Research Council, 2005; Pellegrino & Hilton, 2013).



Metacognitive Strategies
Engage students in reflecting on how they best learn and evaluating their thought processes to help themselves along their learning path.

Metacognition skills enables students to:

- understand the goals of the learning process;
- reflect on and determine the best strategies for learning;
- monitor their own understanding of a specific topic; and
- reflect on misunderstandings that may be preventing a full understanding of academic material.

Instructional strategies that utilize metacognition have been found to be strongly associated with positive educational outcomes (Hattie, 2009, 2012). Students with strong metacognitive skills outperform students who don't have the ability to reflect on their learning strategies. "Strong learners can explain which strategies they used to solve a problem and why, while less competent students monitor their own thinking sporadically and ineffectively and offer incomplete explanations." (Pellegrino & Hilton, 2013)

Attention to metacognition appears throughout Courseware. It includes instruction that focuses on metacognition and opportunities for learners to self-monitor.

How Edmentum Courseware Applies Metacognitive Strategies

Clarifying Big Ideas lessons create solid foundations through metacognition practice of examining commonly misunderstood ideas. Based on content-area research that identifies specific misunderstandings that students often hold, Clarifying Big Ideas lessons appear in Algebra II and English 10 courses. The lessons prepare learners for greater success by repairing misunderstandings around important foundational principles. Through clearly drawing student attention to the misunderstanding and articulating the big ideas that underpin learning, students are able to productively apply those big ideas throughout the course and better prepare themselves for success in higher-level courses.

✓ **These ideas ARE True.**

- There are many ways to solve algebraic equations and problems.
- We can use reasoning and intuition to justify solutions.

The two students in the Warm-Up solved the problem different ways. They both found the correct solution.

✗ **These ideas are NOT True.**

- There is only one correct way to solve an algebra problem.
- Solving a problem requires following a certain procedure, even if you don't understand it.



I used logic to find that x equals 0.

I used algebraic manipulation to find x is 0.

$7x + 9 = 9$

Learners consider how others solve problems and think about what big ideas they hold are true or not true.

Think-alouds reveal modeled thinking so learners can reflect on that thinking and their own. Think-alouds appear in videos, as instruction, and as interactions where learners see other students' thinking and decide whether they agree with the thinking or not.

Making Big Ideas Clear

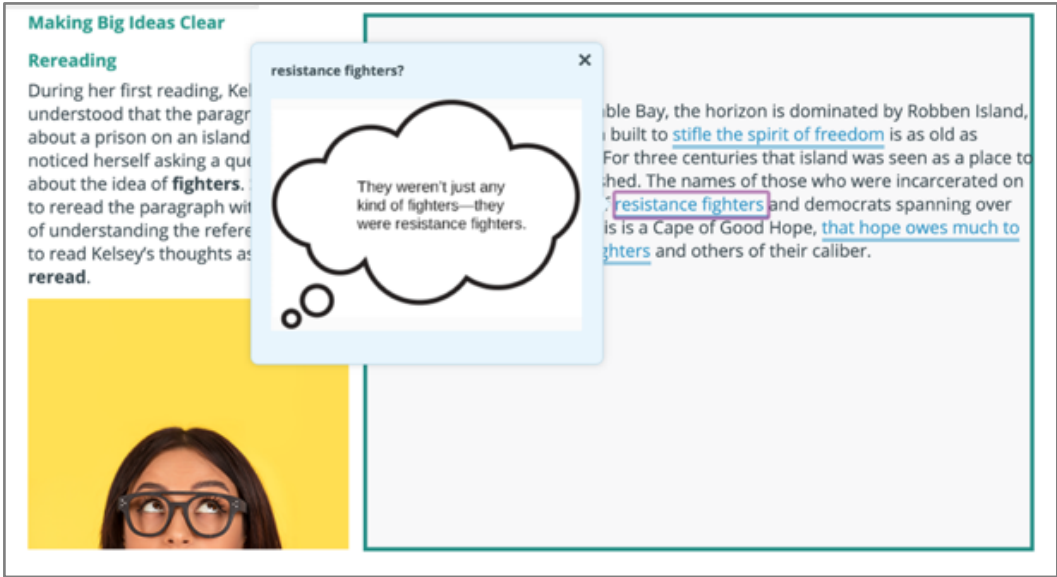
Rereading

During her first reading, Kelsey understood that the paragraph about a prison on an island noticed herself asking a question about the idea of **fighters**. She decided to reread the paragraph with the goal of understanding the reference to understand the reference to read Kelsey's thoughts as she reread.

resistance fighters?

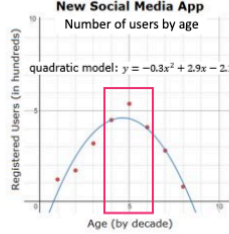
They weren't just any kind of fighters—they were resistance fighters.

able Bay, the horizon is dominated by Robben Island, built to stifle the spirit of freedom is as old as For three centuries that island was seen as a place to be feared. The names of those who were incarcerated on the island were resistance fighters and democrats spanning over centuries. This is a Cape of Good Hope, that hope owes much to the resistance fighters and others of their caliber.



Think alouds from a model student in English 10.

Generalizations support not only the steps for solving problems but the thinking behind them. Lessons pair the generalized logical thinking and process on the left and follows with an illustrative example on the right.

<p>Using the Graph</p> <p>We can also use a graph to model a situation. We use the graph to help with predictions and decisions.</p> <p>When we are analyzing the information in a graph, we ask questions.</p> <ul style="list-style-type: none"> • What does the graph show? • What equation fits best? Does it accurately fit existing data and predict new data? • What important questions can I ask about the graph? • How do the answers to those questions help me make decisions? 	<p>New Social Media App Number of users by age</p>  <p>quadratic model: $y = -0.3x^2 + 2.9x - 2.1$</p> <p>Registered Users (in hundreds)</p> <p>Age (by decade)</p> <p>Question and answer:</p> <ul style="list-style-type: none"> • What age range should app ads target? <ul style="list-style-type: none"> • The greatest number of users are between 40 and 60 years old. • Ads should appeal to those users.
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General logic on the left is coupled with an illustrative example on the right.

Edmentum Courseware Meets Today's Needs

Every course is designed to meet the needs of today's teachers and learners. Many students need the opportunity to independently access engaging digital content on their own timing under the guidance of a supportive teacher. At the same time, teachers are looking for tools to more efficiently support the individualized needs of a wide range of learners. Courseware provides a wide range of benefits to meet these needs.

Addressing Today's Learner

Self-paced learning. Individual differences and learning styles are all part of the movement toward individualized learning. Edmentum Courseware always supports the ability of students to advance at their own pace using multiple media formats.

Dynamic, interactive, digital content that engages students. Learning is best when students are engaged. Edmentum's Courseware always engages the student to interact with lessons.

Addressing Today's Teacher

Courses are easily customized by teachers to meet local standards, pacing guides, and student needs. For teachers, one-size does not fit all. Different localities have their own standards and pacing guides. Sometimes it's not practical to encourage self-pacing. Some teachers might want to add lessons or practice sessions. Courses are always customizable and can be made to fit a teacher's goals and objectives.

- Educators have the option to build their own courses by selecting various resources, lessons, modules, or units.
- Course material can be added, deleted, reordered, or combined across subject area to meet student and classroom needs. Teachers can add weblinks, documents, or teacher-created digital drop boxes.
- Within a specific course, teachers can decide whether whether they want to use pretests or posttest.

A rigorous alternative to traditional classroom courses. Edmentum Courseware has always emphasized the rigor and relevance of course materials. These elements are part and parcel of the mastery learning approach and of the emphasis on intrinsically motivating learners. Edmentum challenges students with rigorous instruction and practice across a broad range of subjects and courses in ways that are relevant.

Flexible assessments. Edmentum assesses aptitude and achievement in many different ways. Pretests are diagnostic tests that help determine how well-prepared the student is. In many cases because of the quality of pretests, Edmentum can accurately judge what a particular student can profitably skip within a unit. The posttests and End of Semester Test confirm how well the student has mastered the material. Finally, a variety of teacher-graded activities and assignments provide more subjective indicators of student progress. This full range of assessment techniques makes Edmentum's assessments useful, accurate, and flexible.

Data and Reports powerfully inform instructional decisions.

- Real-time student performance data is presented with clear visualizations and is easily accessible through dashboards.
- Pacing data clearly shows which students are not on track to meet the end date that teachers set.
- The course gradebook can be customized with activity weights and is auto-populated as students complete assignments, with overall student grades and activity specific grading details.

Conclusion

Digital learning environments are an integral part of instruction for many learners and educators. Three key benefits of Edmentum Courseware are the ability to individualize material and deliver it anytime, anyplace for each learner; easy access to increasing amounts of data that can impact instruction; and flexible flexibility to meet the needs of diverse learners.

Courseware design is based on six principles of learning design. These six principles are research-proven educational practices that lead to student learning (Hattie, 2009, 2012, 2015) and are aligned to the needs of today's learners and educators.

There is no one-size-fits-all instructional design. At Edmentum, we have created a powerful synthesis of design and technology with the explicit goal to support teachers in meeting the learning needs of all students. Teachers incorporating technology into their classrooms can scale to more personalized solutions. This efficient method of individualized instruction and environment can be sustained over long periods of time and will result in improved student learning and outcomes.

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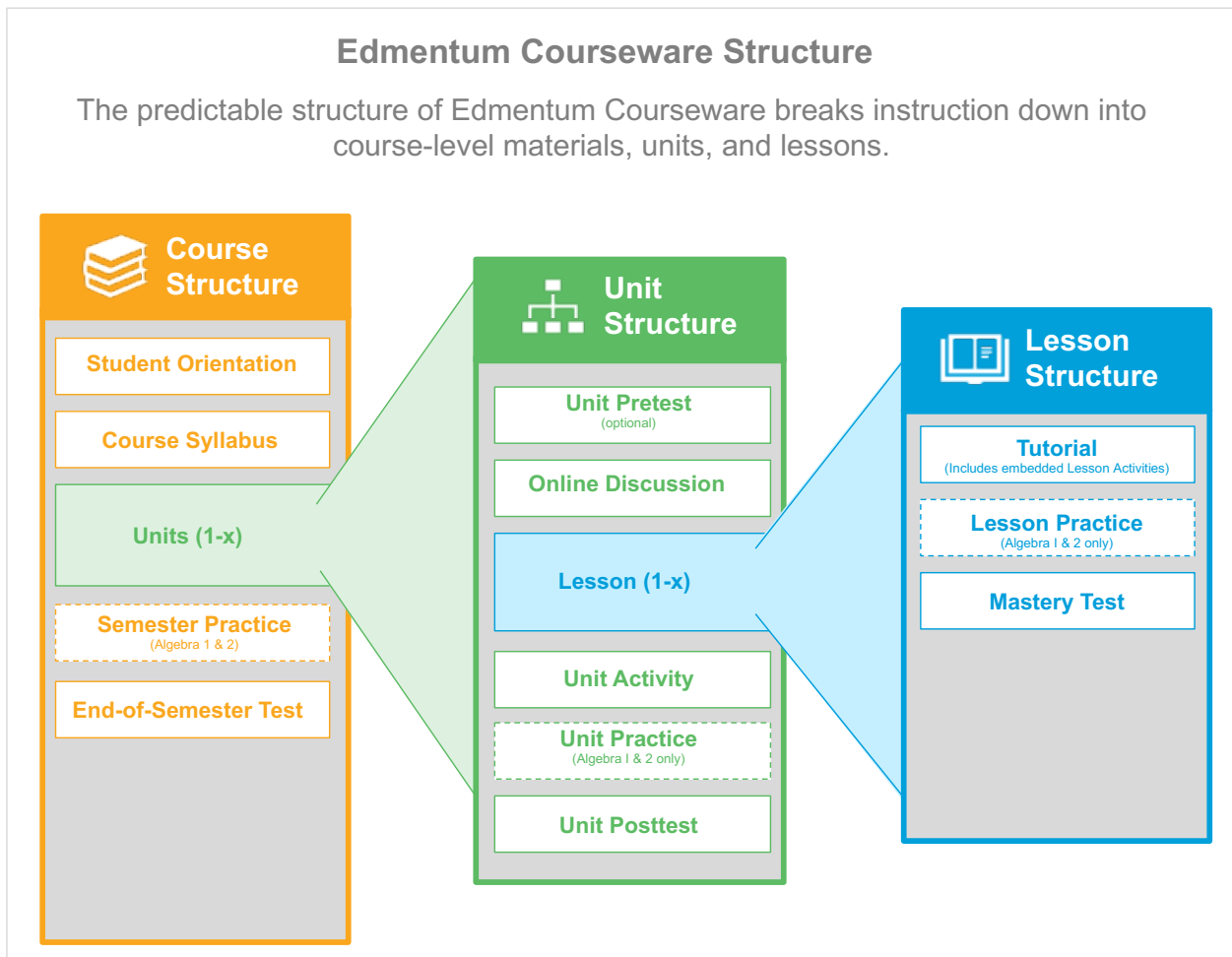
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Appendix: Courseware’s Instructional Architecture

Edmentum Courseware is designed to reside at the intersection of research and best practice, while taking into account the needs of learners and educators. The curriculum and assessment writers are first and foremost educators, and many have personal experience as teachers. Subject matter experts are instrumental in course design. Every new course begins with Edmentum staff conducting meetings where we solicit and utilize educator feedback to make each course better than the last.

Each course includes multiple assessments designed to continually check understanding, measure mastery, ensure knowledge retention, and prepare students for course exams and high stakes assessments. Subject matter experts and item writers are immersed in Webb’s Depth of Knowledge (DOK) framework and content developers utilize technology-enhanced items in tests, which often reflect higher DOK complexity.



Course Structure

- Components of a course include a student orientation, a course syllabus, one or more units of instruction, and assessments.
- The alignment guides for each course comprehensively addresses national and state standards.
- End-of-semester tests measure students' mastery and retention of the instruction in lessons and units in the semester.

Unit Structure

- Components of a unit include unit pretests and posttests, lessons, online discussion, unit activity (and for algebra only, unit practice).
- Unit pretests are optional and can be used at a teacher's discretion before beginning the lessons to determine whether students have already acquired knowledge of specific course information. A show of mastery enables students a chance to be exempted from material they already know.
- The collection of lessons in a unit support the connections between concepts.
- Online discussions allow teacher-to-student and student-to-student discussion and debate about topics covered in the unit. These discussions require students to synthesize knowledge acquired during lesson mastery and apply critical-thinking skills to answer questions, form opinions, express ideas, and respond to the ideas and opinions of others.
- Unit activities offer students the chance to demonstrate higher levels of skill by completing a variety of tasks and submitting the resulting project, paper, essay, data, research, or presentation to the teacher via an online digital drop box.
- Unit posttests measure students' understanding of both the basic knowledge and the higher-level skills within each unit. These assessments help ensure that students are building and retaining knowledge from lesson to lesson throughout the unit.

Lesson Structure

- Individual lessons provide instruction and assessment with carefully-crafted objectives aligned to national and state standards.
- Lesson tutorials are designed to help learners acquire and build knowledge and include a variety of interactive practice activities, such as exploratory timelines and clickable diagrams. Judged check-for-understanding items within the tutorial include multiple-choice, matching, fill-in-the-blank, drag-and-drop, and multistep problem-solving questions.
- For Algebra I and II, learners may choose to complete additional practice items to prepare for success on course assessments.
- Mastery tests conclude each lesson and measure whether students have mastered lesson objectives.