WHAT YOUR COLLEAGUES ARE SAYING . . .

The Attention Gap is a timely guide for today's highly distracted world, where sustaining student focus has become a prevalent barrier for educators. Michael McDowell's interval-based routines provide tangible ways to build the learner and build the learning, striking a balance between genuine engagement and appropriately challenging learning. This book equips educators with strategies that move classrooms beyond compliance and toward authentic student learning and growth.

Christine Hanley, instructional coach

The Attention Gap is a crucial resource created for teachers to help establish the often-overlooked rhythm of the classroom. Pulling from research in the fields of cognitive psychology, exercise science, and attention theory, Michael McDowell lays out practical strategies for lesson pacing, which will lead to greater student engagement. I cannot emphasize enough the importance of this book for this generation of learners.

Susan Barber, high school English teacher and co-author of
The Norton Guide to AP Literature and *100% Engagement:*
33 Lessons to Promote Participation, Beat Boredom,
and Deepen Learning in the ELA Classroom

Michael McDowell's work clearly articulates what most teachers know and experience daily. That is, our learners are passive passengers in class, lacking motivation and agency. Michael provides us with a suite of tools and strategies to shift this so that our learners are active protagonists of their own learning.

This text is punchy, research- and evidence-based, and provides tools that every teacher can implement tomorrow. Michael reminds us of the value of intentionality, actionable habits, and consistency. The tools in this text are sure to move the needle in student achievement.

Michael's new text reminds us of the needs of contemporary learners. It is insufficient to focus only on recalling declarative knowledge. We must provide opportunities for our learners to transfer their learning to relevant contexts. Michael shows us clearly how to do this.

Joanne Kirby, Assistant Principal,
New Ambitions and Innovation

At Legacy Magnet Academy, we've seen firsthand how Michael McDowell's work equips teachers to capture attention, sustain engagement, and deepen learning. *The Attention Gap* distills those ideas into a clear, actionable framework. It's a must-read for educators who want practical routines that build both student focus and learner agency.

Jennifer Harrison, EdD, Principal,
Legacy Magnet Academy

Once again, Michael McDowell has brilliantly captured the educational zeitgeist and connected the dots to bring us a book that is accessible, sensible, immediately relevant to leaders and teachers—and deeply resonant with the larger struggles around capturing people's attention in our distracted society. Michael practices what he preaches: He is a lifelong learner who scans the research and practice landscape *and* looks deep inside himself, allowing his own work to grow and evolve. The book is an invitation to readers to do the same.

Jane Feinberg, Founder and CEO,
Power of Place Learning Communities

Michael McDowell's *The Attention Gap* offers invaluable insight into boosting classroom engagement. The clear, research-based ideas empower educators to elevate focus and deepen learning. The emphasis on student voice—fostering ownership, curiosity, and authentic participation—is impactful for readers. This book is a new must-read for educators committed to meaningful student-centered instruction and lasting academic growth.

Rosalia A. Tierno, Assistant Principal,
Academic Culture and Student Activities,
Tottenville High School

Too often, students go through the motions of school without true engagement. *The Attention Gap* demonstrates how educators can spark curiosity, build competence, and cultivate habits of mind, transforming classrooms into learning environments where learning is purposeful, rigorous, and engaging.

Megan Pacheco, Executive Director,
Challenge Success

The Attention Gap

To my wife, Quinn.

You see every flaw, challenge every excuse, and never let me settle.

You push me to grow, to keep going, and to be better, always.

Thank you for loving me unconditionally, not in spite of who I am, but because of it.

This book, and the work behind it, carries your fingerprints everywhere.

The Attention Gap

Instructional Routines That Heighten Focus,
Boost Engagement, and Deepen Learning

Michael McDowell

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online
resources

Visit the companion website at
https://companion.corwin.com/courses/AttentionGap
for downloadable resources.

ABOUT THE AUTHOR

Michael McDowell, EdD, was a public school educator for 18 years, serving in the roles of classroom teacher, academic and athletic coach, school principal, assistant superintendent of personnel and instruction, and superintendent. During his tenure as a superintendent, his school district received state and national accolades including the National Blue Ribbon Schools award, which recognized their work for student performance and mental health and well-being in the midst of the COVID-19 pandemic by the U.S. Department of Education.

Dr. McDowell serves on educational boards, served as a college professor, and has worked for nonprofit organizations to enhance student learning around the world. Over the course of his career, Dr. McDowell has authored best-selling books, created professional learning programs and workbooks, provided keynotes and workshops, and provided practical tools and resources for thousands of teachers and leaders on almost every continent around the world.

He is the author of several books with Corwin including *Rigorous PBL by Design: Three Shifts for Developing Confident and Competent Learners* (2017), *The Lead Learner: Improving Clarity, Coherence, and Capacity for All* (2018), and *Developing Expert Learners: A Roadmap for Growing Confident and Competent Students* (2019).

Dr. McDowell co-founded Hinge Education and offers keynotes and executive coaching to heads of school around the world, where he partners with educational leaders to implement high-leverage strategies that will enhance teaching and learning in classrooms, schools, and systems.

ACKNOWLEDGMENTS

Before I thank the many individuals who supported this work, I want to begin by acknowledging the quiet risk-takers, educators who, like the most courageous public servants, work daily in the margins of visibility to serve the public good. Michael Lewis shares the stories of Arthur Allen, an oceanographer whose drift models have quietly guided countless successful Coast Guard search-and-rescue missions, and Heather Stone, an Food and Drug Administration analyst who took the bold step of bringing rare disease treatments to light, ensuring that doctors across the country could access critical information often overlooked by medical journals that rarely spotlight single case studies. These public servants didn't chase recognition; rather, they acted with skill, urgency, and care, knowing the risks of inaction were far greater than the fear of failure. Educators do the same. Whether adjusting a lesson to meet a student's need, standing up for meaningful change in a system resistant to it, or staying late to call a parent no one else has reached, these moments aren't always visible, but they are heroic. This book is written to acknowledge those in public service including the teachers and leaders who show up every day not for applause, but because they believe every student matters and act like it—not through risk for risk's sake, but through quiet risk-taking that manages the desire to innovate the discipline to ensure impact.

To the teachers and leaders across New York who continue to show what's possible when we focus on what matters most, thank you for your relentless commitment to improving learning for every student. To the visionary leaders in Idaho and Arizona who have built systems of innovation grounded in impact rather than intention, your work is both bold and necessary. I'm especially grateful for the ongoing collaboration with Power of Place outside Boston—your belief in partnership and long-term innovation is a model for all of us. To the dedicated educators across California and Australia, your recognition that interdependence between students and teachers is not an option but a starting point continues to guide my thinking. I'm honored to work alongside the incredible team at The Core Collaborative and deeply inspired by the teachers in Missouri—your commitment, creativity, and care are at the heart of what this work is all about.

I am deeply grateful to the authors, researchers, podcasters, journalists, teachers, and innovators who continue to ask hard questions, challenge assumptions, and push our species forward. Your relentless curiosity, moral clarity, and creative problem-solving inspire not only this work but the collective pursuit of something better. Thank you for valuing interdependence over individualism, for seeing systems instead of symptoms, and for constantly seeking new ways to improve our world. Your voices shape the conversations we need, and your ideas help illuminate paths we didn't know were possible.

Lastly, I also want to acknowledge the coaches in my life, those who pushed me to become a better person and a better performer. Their influence lives in the way I approach everything I pursue. I still seek that kind of challenge and clarity in all areas of my life. We are living in a time when the seriousness of getting better at learning, at leading, and at simply being good humans is a question we need to spend more time on. That is what this book is about: the pursuit of getting better at getting better—and, in doing so, improving real outcomes for students, so they can be more competitive, more curious, and more kind in the future we are shaping together.

PUBLISHER'S ACKNOWLEDGMENTS

INTRODUCTION

I've never liked icebreakers.

If you're like me, you've probably sat through your fair share. It's not that I don't value connection; we all do. But the strongest relationships, especially in schools, are forged in the work, not in getting-to-know-you games or in what Tom Sherrington (2017) calls "cheesy posters" about growth mindset.

The same goes for students. We often try to teach social and emotional skills in isolated spaces: advisory periods, hallway chats, reflective journals. Or we scramble to tack on writing at the end of a class period or drop an important thematic question as students are packing their bags rather than integrating it throughout the unit. But those lessons don't stick unless they're forged in the work as well—practiced in the actual struggle of learning.

It's a bit like coaching a pitcher on how to handle pressure when they are waiting in the dugout rather than where it matters most—on the mound, ready to pitch. In the same way, we as teachers have spent a long time separating "learning" from "becoming a better learner." I've done this. I've seen it done in schools I support. And I've seen the consequences: students who can talk about grit but struggle to apply it, who can recite the success criteria but struggle to meet them. We coach students on perseverance and collaboration outside the very moments they need it most, like when writing an essay or tackling a math problem. We reference learning intentions and success criteria on the board, but students struggle to connect them to drive their own progress.

In our classrooms, we can do both. We must.

We don't have to choose between academic content and student development. Of course, doing both doesn't mean always giving equal weight to both. Too often, we bet the farm on clarity, confidence, and habit-building, and lose time ensuring students are learning the content they should be clear about. It's not clarity *or* content. It's the choreography of both.

That's the first challenge this book takes on: helping us rethink how we build the learner *within* the learning.

The second challenge is one we all feel: In too many classrooms, students are watching school happen rather than living it. That's not because they're lazy, distracted, or addicted to TikTok. It's because of a collision of pressures. If you're like me, you probably jump in to rescue students when they struggle.

I used to be a lifeguard, and that instinct carried into my teaching. Add to that the urgency we feel to cover large amounts of content for students who aren't fully prepared, and it's easy to end up doing the thinking, the regulating, and the reacting *for* them.

Students get used to observing and recording *our* thinking by writing down what we tell them to and tracking our steps instead of engaging in their own. It becomes a habit of learned compliance, reinforced by systems that prioritize order over ownership. Interestingly, these habits are hard to detect when teaching as thinking is largely invisible until we stop what we are doing and check and respond to their understanding (Coe, 2013; Nuthall, 2005).

This, of course, can be shifted. We can reclaim student attention by reintroducing the right habits into our instruction.

We often think of attention as something students either have or do not. But research by Gloria Mark (2023) and others reminds us: Attention is cyclical, not constant. Students disengage not because they're broken, but because they're not being asked to engage in the kinds of actions that spark learning, or the kind of rest, reflection, and reinforcement that sustains it. We've tried to stretch attention like a rope, when we should be pulsing it like a muscle or viewing it like a metronome swinging between effort and recovery. Engagement lives in the rhythm of a well-designed lesson, where students move between cognitive stretch and emotional anchoring, between modeling and making meaning, between teacher leadership and student ownership. When we combine *engagement* and challenge through intentional design, students stay in the work longer and deeper. Because when students act mentally, emotionally, and behaviorally, they begin to own their learning. And when we design for that kind of action, we're not just teaching for compliance; we're teaching for capacity.

Engagement isn't a vibe. It's shared action. Of course, not all actions are created equal. James Clear (n.d.-a) says it best: "Motion feels like progress. Action is progress." And in many classrooms, we see plenty of motion. Students filling out packets. Copying slides. Sitting through well-intentioned instruction. They're doing what's asked, but not always what matters. They're practicing *compliance*, not *competence*. We need to shift the pattern so students don't just attend school; they inhabit it.

That brings us to a third challenge, one that is harder to name but just as real: rigid pedagogies that turn preferences into prescriptions.

As a former math and science teacher steeped in problem-based and project-based learning, I believed deeply in student-centered inquiry. But I also felt the pressure of doing things "the right way," the progressive way. I hesitated to use strategies like modeling or direct instruction even when I knew they would help students, because I feared they didn't fit the mold. Sometimes I applied those methods stealthily.

What I've come to believe is this: Great teaching doesn't live on one side of the pedagogical aisle. It lives in our ability to match the right strategy to the right moment, for the complexity of learning we expect of students. It's not inquiry *or* modeling. It's knowing when and how to use both, because they each have a place when our goal is student learning, not just teacher ideology. But even more importantly, we must be actively *causing* learning across different types of complex tasks. Tasks that are rigorous.

Rigor, which has been a source of angst for educators since the dawn of time, is not a hierarchy of "higher" or "lower" levels of tasks, but a balance. As Biggs and Collis (1981) describe, surface, deep, and transfer learning all matter. Knowing things, connecting things, and applying things—these aren't steps on a ladder; they're all part of a learning process.

That's where the **Interval Instruction Approach (IIA)** comes in. Inspired by what we know from sports, music, and performance-based fields, this method is built on alternating between two core aims: building student competency and building student habits. In short, it's about designing lessons that pulse between learning the content and growing as a learner. Sometimes those intervals last a few minutes. Sometimes longer. But always, they are intentional.

By alternating challenge with recovery, direction with ownership, we create the rhythm students need to stay in the game and grow while levering emerging research in attention and engagement. This book offers a practical, classroom-tested and research-anchored path to do just that. It's about moving from blank stares to active contribution. Let's begin.

FROM THE POOL TO THE CLASSROOM: WHY INTERVALS MATTER

Before I ever thought about teaching students, I was coaching swimmers. And before that, I was a swimmer myself.

As a teenager, I trained hard. I put in the hours. I swam lap after lap, believing, as many of us did, that grinding through nonstop sets was the only way to get stronger. But it wasn't until I started working with a coach who introduced me to interval-based training that everything shifted. *Interval training* combines short bouts of high-intensity exercises with low-intensity activity. Think of one

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minute of jumping rope followed by a two-minute walk. In the pool, we transitioned from simply swimming longer to swimming smarter. Instead of powering through fatigue, we paused. We'd push hard for a few minutes, then shift to drills that allowed our bodies to recover and detect minor errors that we could discuss at the wall. Then we'd go again with more focus and more force.

Those rest periods weren't breaks. They were a significant part of my learning as an athlete. My coach helped me recognize what I'd done well, where I needed to adjust my technique, and how to approach the next interval with a clearer purpose. In time, those intervals helped me become not only a stronger swimmer but also a more thoughtful and resilient one.

The same thing happened when I coached. My swimmers' best gains came not from the longest sets but from the transition between sets of rest and recovery and then action. Over time, I realized we weren't just building endurance. We were building capacity. Through rhythm, reflection, and intentional action, they got better.

Through data about how the human body and mind work best in rhythm, researchers are now confirming what I experienced in the pool, on the deck as a coach, and as an educator in classrooms and schools. The Mayo Clinic, a top-ranked research hospital, has found conclusive evidence that interval training is one of the best ways to improve overall fitness (Hahm, 2023). Finding a cadence between work and recovery has multifaceted benefits, including increasing your body's ability to consume oxygen by making your heart and lungs stronger, increasing the efficiency of your body's energy systems, promoting preservation of lean muscle while promoting fat loss, and shortening the length of your workouts by producing the same output in a shorter amount of time.

How does this approach to exercise apply to the classroom? Just as interval training alternates periods of intense activity with periods of lower-intensity recovery, effective classroom instruction intersperses bursts of focused, challenging learning with repetitive loops of review, reflection, and reinforcement. These intervals lead to maximized engagement and retention (Martella et al., 2024).

> **The human brain learns best in intervals.**

This news is timely. Contemporary research shows that attention levels of all humans, not just students, are dwindling to unprecedented lows (Mark, 2023). Mark (2023) shares that attention is largely driven by engagement and challenge, and we appear to be losing both elements at dramatic levels. This is especially critical in our classrooms, as student engagement is a key to improving academic success. Wolf (2023) shows that engagement is positively correlated to student success in both academic and professional settings. While her studies were in nursing, several studies have shown a similar relationship in the K–12 educational context (Akey, 2006; Connell & Wellborn, 1991).

TEACHERS FEEL THE ATTENTION GAP

Think about your classroom. How many students show up physically but seem somewhere else mentally? They're in their seats, but they're not really in the learning. Maybe they're silently completing the assignment but asking no questions. Maybe they're staring at the board but not making sense of the material. Maybe they're checking out more often or simply not showing up at all. If you've been teaching for some time, it may feel like you're seeing these signs more than ever before.

If any of this sounds familiar, you're not imagining it. Teachers across the United States have felt a quiet but growing shift: Student engagement is not what it once was. The problem gets worse the older students get; researchers have found that engagement tends to peak around fifth grade and then steadily decline all the way through high school (Hodges, 2018).

Students felt it too. In one study, students reported significantly lower enjoyment in their schoolwork, especially during remote and hybrid learning. Many admitted they weren't putting in the effort they once had. Even parents noticed changes. In Washington state, most parents said their children were spending less time on schoolwork than they did pre-COVID (Kwakye & Kibort-Crocker, 2021). National data confirm these shifts in attention and engagement. According to the latest National Assessment of Educational Progress report, eighth graders in 2024 reported engaging in fewer science inquiry activities than in 2019, and fourth graders were less likely to be asked to write extended responses that require focus and persistence in reading and writing. These results reveal that across disciplines—reading, writing, science, and mathematics—students are engaging less deeply and achieving at historically low levels, with only 22% of twelfth graders scoring at or above proficient in math, the lowest level ever recorded since the current version of the test began (National Center for Education Statistics, 2025). In other words, what teachers and students feel in their classrooms is now clearly reflected in national trends. But let's be clear: This didn't start with the pandemic. Long before COVID-19, educators and researchers were warning that students were doing the work but not doing the *right* work. In *The Opportunity Myth* (TNTP, 2018), a multidistrict analysis revealed that while 7 out of 10 students successfully completed classroom assignments, only 3 were doing work at grade level.

And that's not just one piece of research. In a national study of over 6,000 students, Conner and Pope (2013) found that while most students described themselves as "working hard," very few felt challenged or valued their schoolwork. Not one student in the sample reported experiencing both appropriate challenge and meaningful engagement. Imagine that. Six thousand students. Zero who said, "My schoolwork is both hard and meaningful." It's no surprise then that engagement and attention are

fraying, especially for students in underserved communities, who are more likely to face low expectations, repetitive tasks, and limited access to rigorous instruction (Hattie, 2023).

Students are busy but not challenged. They're compliant but not engaged. Often, they're watching us work. **Have you ever watched a student copy down your learning target perfectly and then sit unsure of what to do next?** We see that surface-level participation but no deep understanding or transfer. **One teacher I worked with told me, "My students know the routines for metacognition. But they don't know how to do it when they are learning."**

Now we are seeing the downstream effects. Chronic absenteeism is up. Students and families are questioning the relevance of school altogether. As Mervosh and Paris (2024) reported, more and more parents are treating school as optional. Some simply don't believe meaningful learning is happening there.

But we can change that using what we now know about intervals. By structuring instruction around intentional, alternating intervals of teacher input and student action, we can maximize attention, deepen learning, and build learner agency.

Research from fields like exercise science, cognitive psychology, and attention theory all point to a common insight: We need rhythm. Periods of challenge followed by moments of reflection. Spurts of intensity balanced by space to rest, process, and reset.

If our goal is to reengage students and reignite their capacity to learn, we must stop pushing through and start designing with rhythm in mind. That is the key to the Interval Instruction Approach, and the starting point for a new way forward.

Before we get into the approach, let's define what it's based on: true engaging, meaningful instruction.

CRITERIA FOR ENGAGING AND MEANINGFUL INSTRUCTION

What makes a lesson or unit not just stick, but also deepen understanding of core content, strengthen student agency, and boost engagement?

Emerging research in attention science, habit formation, instructional design, and student agency has given us more than just theory; it's given us tools that we can use to help students move from disengagement to deep learning, and from compliance to ownership.

Using this research, I've developed a set of practical criteria for designing learning experiences that are both meaningful and manageable. They help us design lessons that build both the learner and the learning.

These four criteria are the following:

- **Activation**: When teachers and students move beyond preparation and into purposeful action together, learning becomes more powerful and participatory.

- **Rhythm**: When instruction intentionally alternates between building academic knowledge and strengthening learner habits, it boosts attention and deepens reflection.

- **Challenge**: When tasks are appropriately complex and instructional supports meet the moment, students rise to expectations and make meaningful progress.

- **Self- and Social Empowerment**: When students track, manage, and reflect on their learning, both confidence and agency grow.

Let's explore each criterion.

Activation: Maximize Teacher and Student Interactions

In James Clear's (2018) book *Atomic Habits* he argues that humans possess two types of habits: motion habits and action habits. Motion habits are routines we use to prepare for an activity that will later produce a result. Action habits are routines that then produce the result. Some examples: A motion habit is creating an essay outline, while an action habit is writing the essay; motion habit: writing a grocery list, action habit: shopping for the groceries; motion habit: signing up for a gym membership, action habit: lifting weights at the gym. Humans are much more comfortable with motion habits and tend to stick to them.

> *Ensure that students engage in action-based habits that produce results.*

This dynamic shows up in classrooms too. When instructional methods create an imbalance between teacher-led activity and student action, student outcomes tend to suffer (McDowell & Eisberg, 2024; McDowell & Miller, 2022). For example, a student might spend time copying notes, reviewing sample essays, and drafting outlines, only to repeat the cycle of reviewing and redrafting. While it may look productive, the student remains in constant motion without ever shifting into the more impactful habit: actually writing the essay. Hattie (2023) reinforces this point, showing that learning practices without deliberate, action-based habits produce minimal, and sometimes even harmful, effects on student growth.

The most effective classrooms are those where both teachers and students are actively engaged in doing the work of learning. When students and teachers act together, learning sticks (Hattie, 2009, 2023). In these settings, guided instruction plays a central role. For example, a teacher models the most complex steps of a process, then asks students to try the simpler parts out loud. The teacher calls on students at random to explain their thinking, compare answers with classmates, revise their work, and describe what they changed and why. These moments of action, where students are thinking, applying, and adjusting, are what move learning forward.

There are two key reasons these action moments matter. First, they help teachers see what students are thinking. Researchers like Coe (2013), Nuthall (2005), and Willingham (2021) have warned that teachers often rely on signs like eye contact, quiet behavior, or participation to judge learning. But those behaviors can be misleading. A student might seem engaged, but unless they are thinking deeply, learning may not be happening.

Second, these habits help teachers *cause* learning. Rosenshine (2012) found that the most effective teachers spend more time guiding students as they practice new material. That's because guided practice connects what students are doing with how they are thinking. The impact is powerful. When done well, approaches like direct instruction and problem-solving lead to more than a year's growth in a year's time (Hattie, 2023).

Rhythm: Create the Right Instructional Cadence

Attention and instruction function best when paced with intention. Marzano (2017) and Mervosh and Paris (2024) note that alternating between challenge and recovery promotes confidence, emotion regulation, and motivation.

In practical terms, this means looping between two types of tasks:

- "Building the learner" tasks foster reflection, repetition, and habit (e.g., cognitive games, prediction activities, metacognition routines).

- "Building the learning" tasks demand focus and complexity (e.g., academic discourse, evaluating evidence, solving novel problems).

> *Strategic alternation between reflection and focus builds motivation, attention, and achievement.*

Teachers who deliberately vary the pacing and nature of student tasks reduce **working memory** load, increase motivation, and promote sustained engagement. Students need to learn across surface, deep, and transfer learning, as the next section discusses. Creating this **learning cadence** supports all three.

Challenge: Build Learning Through Ensuring Purposeful Instruction

Great teaching is about knowing when and how to adjust your strategy based on what students are learning. In other words, it's a "know when to hold them, know when to fold them" approach. If we want to keep students engaged and improve outcomes over time, we must align our instructional choices with the complexity of the learning.

Content complexity refers to students learning facts and skills, connecting them in meaningful ways, and applying them in new situations. These three levels, surface, deep, and transfer learning, require different types of support and instructional strategies (Biggs & Collis, 1982; McDowell, 2024). Surface learning helps students build foundational knowledge. Deep learning pushes them to relate ideas and concepts. Transfer learning challenges them to apply what they know in unfamiliar contexts.

To support all three, we must be intentional about how we teach. Research by Hattie and Donoghue (2016) and Marzano (2017) shows that the effectiveness of an instructional strategy depends on the level of learning. A strategy that supports surface-level understanding may not work when students are expected to transfer their learning to a new setting. That's why our strategies should be responsive to student needs and purposefully selected based on whether we are targeting surface, deep, or transfer learning.

> *The best instruction is carefully designed and implemented to ensure students learn across surface, deep, and transfer learning.*

Wiggins and McTighe (2012) emphasized the importance of scoping and sequencing. Teachers need to plan how each level of learning builds on the next. When we match our instruction to the complexity of the learning goal, we help students think more deeply, make stronger connections, and use their learning in meaningful ways.

Self- and Social Empowerment

Ensuring that students have the time, resources, and instruction to routinely learn student agency is critical for student ownership over their learning. When students track, study, and reflect on their progress and plan next steps, their motivation and belief in their ability to succeed increases. For instance, Marzano (2010) illustrated that students tracking their classroom progress over time was critical to developing ownership over their learning (see Figure 0.1). Students must have some say in their learning.

FIGURE 0.1 EXAMPLE OF A STUDENT TRACKING PROGRESS OVER TIME

Name: *Josephina L.*

Goal: *Increase my pre-assessment score in biology vocabulary from 70% to at least 80% in one month, moving toward a goal of 90%*

Specific action steps: *Create flashcards for 15 difficult biology vocabulary words and quiz myself for 10 minutes, 3 times per week. Track which words I consistently miss and revise the list weekly.*

Learning Progress: Vocabulary Growth

When students are given meaningful roles in their learning and can see their growth over time, they are more likely to find purpose in what they're learning. This sense of
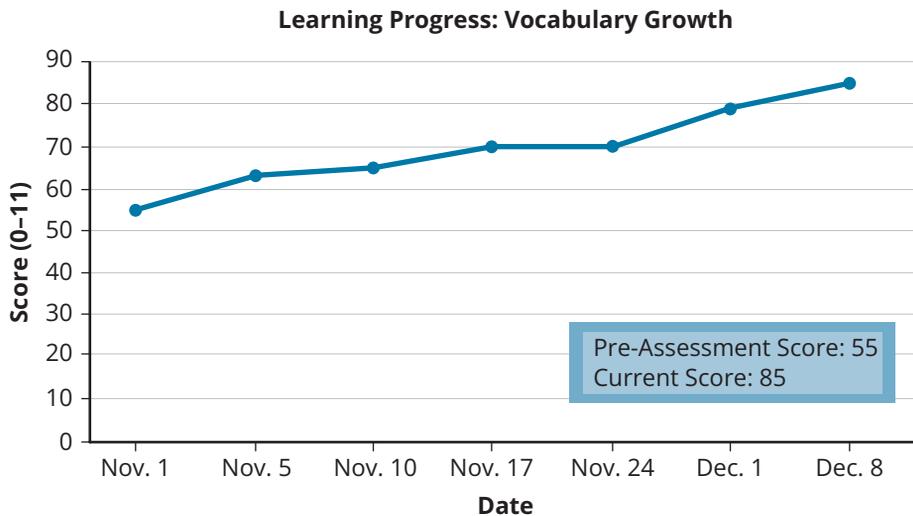
> ***Students must learn how to learn, reflect, and lead their own growth.***

ownership becomes even stronger when the content feels relevant and applicable beyond the classroom (McDowell, 2024).

BRINGING THE INTERVAL INSTRUCTION APPROACH TO LIFE IN THE CLASSROOM

How do we bring these criteria to life in our K–12 classrooms, in a manageable and sustainable way? How do we create the right balance for students to deeply learn and recharge and reflect on their learning to attend to future learning? The Interval Instruction Approach (IIA) presents a simple yet powerful solution.

Over the past two years, I've had the opportunity to prototype this approach in schools around the world and across an incredible range of contexts. From primary classrooms in rural New South Wales, to high school Career

Technical Education programs in suburban California, to middle school humanities classes in urban New York City, the IIA has consistently led to stronger student engagement, renewed teacher enthusiasm, and measurable gains in student achievement.

In one high school math class in Missouri, for instance, a teacher used short reflection bursts between problem-solving intervals. Students who once passively copied down solutions began to justify their reasoning and revise based on peer feedback. In a primary writing class outside Boston, alternating between teacher modeling and student quick writes helped young writers stretch their ideas without becoming overwhelmed.

What we're seeing on the ground reflects what the research suggests: Engagement and attention increase when instruction is rhythmically structured, cognitively challenging, and grounded in habit development (Hattie, 2023; Mark, 2023; Martella et al., 2024). The brain is built for rhythm. And when we design our instruction to match that rhythm, students respond.

IIA is a research-informed teaching model that alternates between the two key types of instructional intervals we defined earlier, *building the learning*, focused on surface, deep, and transfer-level understanding, and *building the learner*, focused on metacognition, self-awareness, and social-emotional habits, within a single lesson or sequence (Figure 0.2).

These intervals are intentionally designed to sharpen attention, deepen thinking, and foster the habits needed for long-term learning. Instead of one extended period of teacher input followed by student work, the IIA loops between the two multiple times, creating a rhythm that sustains energy, enhances focus, and increases engagement.

Rotate Between Building the Learning and Building the Learner

By shifting between short intervals of instruction and student action, the IIA maintains high levels of student engagement and active participation throughout the lesson. The frequent transitions and variety of tasks prevent disengagement and decrease boredom. In this way, tasks assigned to students should vary in their level of cognitive demand. The IIA alternates between "building the learner" routines, which are often more straightforward or consist of repetitive tasks that reinforce skills and allow time to replenish cognitive energy, and "building the learning" routines, which focus on more complex tasks requiring sustained focused attention and higher-order thinking skills.

Instead of lengthy lectures or explanations, this method focuses on providing concise instructions or modeling in short bursts, typically lasting no more than a few minutes. Correspondingly, instead of significant time for group work on projects, the method uses mini-lectures, guided practice, and

FIGURE 0.2 THE INTERVAL INSTRUCTION APPROACH MODEL

Build the Learner by introducing short, targeted practices that spark engagement, lower the barrier to entry, and strengthen the habits and dispositions students need to grow.

Build the Learning by teaching transfer early and often, engaging students in meaningful problems that not only require them to apply existing skills but also prompt them to seek out and use new knowledge as effective learners.

Build the Learner with more engaging, approachable activities that allow students to reinforce new learning, check in on their progress, and bring their attention back to the task.

Revisit **Build the Learner** routines to help students solidify learning and recharge their attention.

Build the Learning by creating a rhythm that balances surface understanding with deeper thinking through intervals that blend the right level of challenge and engagement, ultimately preparing students for transfer learning.

Check student understanding and respond in real time by interrupting the flow when needed, adjusting timing, sequencing activities, or refocusing attention so that instruction serves learning rather than routine.

Launch Interval (Transfer)

Cognitive Snacking

Cognitive Snacking

Pattern

Breaks

Cool Down

Content Intervals (Surface and Deep)

checks for understanding in short bursts prior to student independent action. This ensures that students are working with high levels of precision in inquiry-based periods of time. The intervals of instruction and student action can be adjusted based on the complexity of the content, the needs of the students, and the pace of the lesson. You can extend or shorten the intervals as needed to ensure optimal learning and engagement.

You might think, "This sounds chaotic. Doesn't learning need long, uninterrupted stretches?" We'll get to that. But for now, just know this: Students don't build endurance by running marathons on day one.

There are, of course, times when longer periods of student or teacher action are required, and these "endurance" sessions are spaced out with plenty of time for students to engage in deeper-level tasks that require complex discussions and problem-solving. As Newport (2016) argues, the ability to perform deep work is becoming increasingly rare and increasingly valuable in a world of growing digital distractions. Those who cultivate this skill will thrive. These endurance sessions are critical, yet they are only impactful if students have established daily routines and learning practices to engage in extended deep learning tasks.

> *The IIA alternates between "building the learner" routines, which are often more straightforward or consist of repetitive tasks that reinforce skills and allow time to replenish cognitive energy, and "building the learning" routines, which focus on more complex tasks requiring sustained focused attention and higher-order thinking skills.*

Increase Interaction

In these intervals, teachers can ensure that students are routinely engaging in short discussions, addressing questions, solving routine problems and application-based problems, and receiving feedback. These short bursts of student action increase the frequency of understanding checks and guided practice prior to student independent action. Even during longer cycles of instruction, teachers can use questioning techniques and small-group instruction to place students into action.

Select and Sequence Instruction Strategically

Intervals require teachers to select the right "building the learner" tools and the right "building the learning" tools to successfully impact students. A variety of instructional approaches have a high impact when implemented in the right place at the right time. This requires careful planning, testing, and inspecting.

Overall, the IIA process of breaking instruction into shorter segments, interspersing each interval with fluctuating task challenges, and increasing students and teachers' action habits allows students to process information in smaller chunks and apply it immediately, reinforcing understanding. Additionally, the fluctuations between rote tasks and more challenging

activities maintain students' interest, reduce fatigue, offset forgetting, and promote deeper levels of thinking and problem-solving.

IIA is often contrasted with traditional lecture-based or teacher-centered approaches, where students may passively receive information for extended periods before practicing or applying the concepts. This process is also contrasted with inquiry or student-centered learning, where teachers are typically facilitating the learning process. The IIA focuses less on a pedagogical framework and rather on the appropriate amount of action necessary by both students and teachers to ensure high levels of learning.

In most classrooms, the way teachers engage with students tends to reflect one of two approaches: They are either activating learning or just facilitating activity. In a landmark synthesis of over 800 meta-analyses, John Hattie (2009, 2012, 2023) found that teachers who act as activators—those who provide clear instruction; ask a range of purposeful questions; support high-quality reading, writing, and discussion; and check for understanding during lessons, consistently help students achieve more than one year of academic growth in a single year. In contrast, teachers who rely primarily on facilitative methods, where students are left to navigate learning with minimal guidance, produce less than half a year of growth. When this gap plays out over the course of a student's K–12 experience, the long-term impact is significant. The difference is not just academic; it shapes opportunity and long-term success.

Activation is a purposeful approach to teaching that prepares students' minds, challenges their thinking, and ensures they are doing the mental work needed for learning to take hold. Teachers who activate learning do three things well:

- They *notice* learning that might otherwise remain invisible.
- They *cause* learning by engaging all students in meaningful instruction, giving timely support, and helping students strengthen their ability to learn.
- They *sustain* learning by using consistent daily routines that focus on thinking and understanding, not just task completion.

NEXT STEPS

This book will walk you through how to design and deliver instruction using the Interval Instruction Approach (IIA). We'll break it down into five manageable strategies, each relating to a different part of the process:

- **Spark and Sustain Clarity**—Warm up and maintain attention and prime the brain.
- **Teach Transfer Early and Often**—Spark curiosity and purpose.
- **Design a Rhythm Between Surface and Deep Learning**—Connect facts to ideas in small, powerful intervals.

- **Check and Respond to Student Learning in Real Time**—Use minute-by-minute evidence to guide instruction.

- **Consolidate Learning and Recharge Attention**—Build reflection, retention, and readiness for next time.

Let's unpack these chapters a bit more before we start our journey.

Chapter 1—Bridging the Attention Gap with Interval Instruction: Find the Right Cadence of Challenge and Engagement

How do I create lessons that not only challenge students, but keep them engaged and coming back for more?

The opening chapter discusses the *engagement criteria introduced in this introduction* and the core challenge many of us face: Students are either overwhelmed by complexity or underwhelmed by busywork. You'll learn how to craft a cadence of instruction that moves beyond defaulting to guided practice and instead uses rhythm, cognitive science, and habit-building strategies to sustain attention and spark motivation.

The chapter culminates in the exploration of the IIA, transforming the *engagement criteria* into practical classroom action. You'll see how intervals of building the learner and the learning, combined with responsive learning loops, allow students to build agency, purpose, and long-term retention. A spotlight on an actual interval sequence brings the model to life, setting the stage for the rest of the book. We'll also answer some common questions and misconceptions about the IIA.

Chapter 2—Cognitive Snacking: Spark and Sustain Clarity

How can I launch each class in a way that prepares and sustains students to engage both cognitively and emotionally?

This chapter builds the learner by focusing on how to spark attention, establish clarity, and prime students for learning through routines like *cognitive snacking*. These short, intentional activities warm up the brain, regulate attention, and foster habits of curiosity and focus. You'll explore how to structure the start of class to reduce ambiguity and create momentum for learning and how to continue these short routines during a lesson, across units, and throughout the school year.

Chapter 3—Launch Interval: Teach Transfer Early and Often

How can I design instruction that helps students apply what they know, right from the beginning?

This chapter focuses on building the learning by showing how to start units and lessons with high-level thinking, even before students have mastered all the surface-level details. By introducing transfer-worthy challenges, authentic contexts, and Driving Questions early, you can build relevance and demand for deeper learning. You'll also explore how to incorporate knowledge-building in ways that feed directly into student transfer.

Chapter 4—Content Intervals: Design a Rhythm Between Surface and Deep Learning

How do I alternate between foundational skills and complex thinking in a way that keeps students engaged and learning?

This chapter focuses on the rhythm of instruction; looping between *building and relating knowledge and skills*. You'll learn how to sequence lessons that shift across different instructional and feedback strategies, all while keeping attention and understanding high. It's about building the learning by finding a teaching rhythm that mirrors how students learn best—through variation, reflection, and challenge.

Chapter 5—Pattern Breaks: Check and Respond to Student Learning in Real Time

How do I know if students are getting it—and what do I do if they're not?

This chapter centers on the *core of the model: checking and responding to students' understanding.* You'll explore how to gather actionable insights during instruction and adjust without pausing momentum. Whether it's through curiosity, content, or clarity checks, you'll gain tools to match instruction to student responses in real time, making teaching more responsive, equitable, and effective.

Chapter 6—Cool Down: Consolidate Learning and Recharge Attention

How do I close a lesson in a way that reinforces learning and prepares students for what's next?

Returning to *building the learner*, this chapter focuses on consolidating key takeaways and recharging student attention. You'll explore how to close lessons with intention, through reflection, agency-building routines, and metacognitive strategies that solidify learning. These moments strengthen student ownership and sustain the habits that support learning beyond the day's lesson.

Chapter 7—Systems That Stick: Implement Interval Instruction Across Your Classroom and School

How do I integrate the IIA into my daily practice, and do it with others?

This chapter zooms out from the intervals and shows how schools and teams bring the IIA to life across classrooms and grade levels. Through examples of *teacher learning communities*, instructional coaching, and *lesson study*, you'll see how teachers can build routines, grow together, and adapt the IIA rhythm to fit elementary, middle, and high school contexts. The goal: collective impact through shared practice.

INTERVAL ROUTINES

Look for this box throughout the chapters for practical routines, activities, and strategies that you can use in your lessons.

IF YOU'RE STILL READING . . .

Steven Johnson (2010), in his work on innovation, describes the idea of the adjacent possible: the space just next door to what we currently believe or know how to do. Not a revolution. A reachable evolution. Thinking between boxes rather than inside or outside of them. This book lives in that space.

But getting to that space requires something uncomfortable: suspending judgment. Not discarding your assumptions but simply examining them instead of rushing back to our respective corners of pedagogical ideology. I'm asking you to question what you believe about rigor, about engagement, about what it means to differentiate and challenge students at the same time. You will need to park your cynicism at the door and bring your skepticism to the table.

If you're a teacher who feels stuck on how to engage students in the age of TikTok and lowering math scores . . .

Then this book is for you.

If you're a leader trying to help your staff respond to learning gaps without lowering expectations in a manageable way . . .

Then this book is for you.

If you're a system builder looking to build stronger learners and learning instead of checking a box . . .

Then this book is for you.

It's a call to rethink the work by reshaping what's already on our plates. Through interval-based instruction, routines that build both the learning and the learner, and high-leverage strategies drawn from habit science, attention science, and cognitive research, we'll explore a way to make classrooms the kind of place where all students can improve not just in effort or engagement but in actual growth.

Let's get to work.

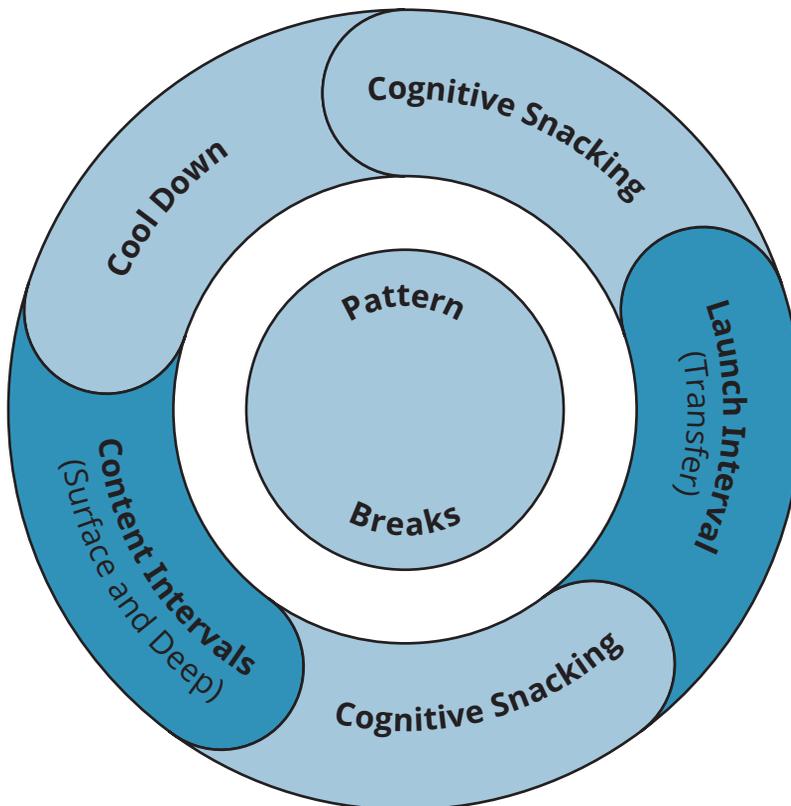## IF YOU REMEMBER ONE THING FROM THIS INTRODUCTION, LET IT BE THIS

▶ To reclaim student attention, build agency, and grow deep thinkers, we must rotate between the habits of learning and the habits for learning on purpose, with purpose.

CHAPTER 1

....

BRIDGING THE ATTENTION GAP WITH INTERVAL INSTRUCTION

Find the Right Cadence of Challenge and Engagement


> "In schools around the country, the smiling, enthusiastic faces of first graders often give way to the blank stares of high school seniors."
>
> —Jerusha O. Conner and Denise C. Pope,
> "Not Just Robo Students" (2013)

Forty-seven seconds. That is enough time for a pitcher to throw three balls in Major League Baseball, or for the average American to watch two commercials on TV, and the average recommended time it takes to brush the upper teeth in your mouth. Forty-seven seconds is equivalent to the average time it takes an adult to read one to three paragraphs (Brysbaert, 2019). Turns out 47 seconds is also the approximate time that adults shift their attention from one task to another (Mark, 2023). As such, there is a good chance that by the time you finish the third paragraph of this chapter, you have diverted your attention elsewhere.

In her book *Attention Span: A Groundbreaking Way to Restore Balance, Happiness, and Productivity,* Gloria Mark (2023) illustrates that our ability to sustain attention has dramatically declined over the past 20 years (see Figure 1.1). Much of her research focuses on how long individuals remain focused on a single screen-based task before shifting to something else. This decline in attention is driven by a range of factors, including the rise of social media, the increasing presence of artificial intelligence, the constant demands of digital communication in the workplace (such as email), and evolving cultural expectations around work and school.

FIGURE 1.1   AVERAGE ATTENTION DURATION ON A SCREEN-BASED TASK OVER 20 YEARS, IN SECONDS
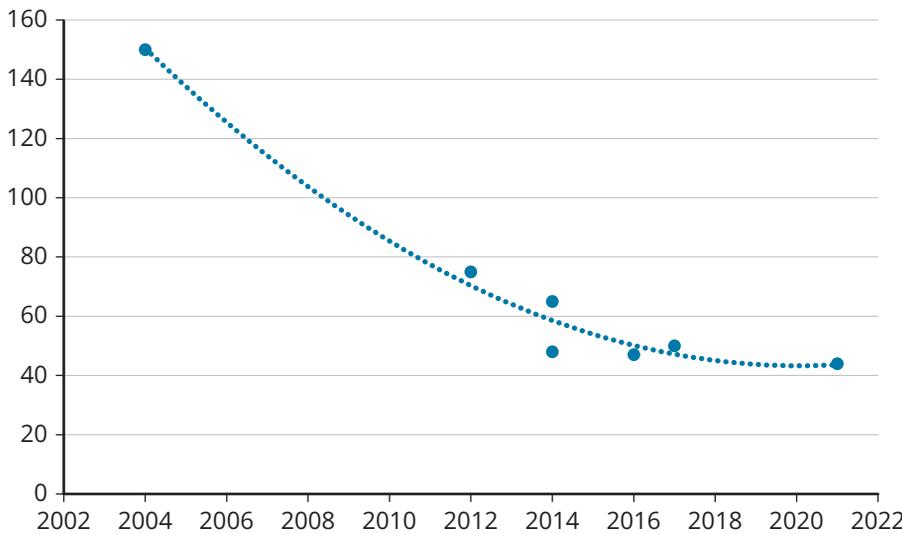
Adapted from Mark, G. (2023). *Attention span: A groundbreaking way to restore balance, happiness and productivity.* Hanover Square Press.

Part of the challenge of the **attention span gap** is related to popular myths that our culture holds about attention. One key myth leads us to believe that focus is like a light bulb, and we must keep the light turned on all day or, at the very least, throughout the work or school day. This pernicious idea of keeping sustained focus to maximize productivity and efficiency causes cognitive burnout. As Mark (2023) argues, "We can't be experiencing continued mental challenge nonstop all day using cognitive resources

in the same way that we can't be challenged to lift weights nonstop all day using our physical resources" (p. 85).

WHAT DOES ATTENTION LOOK LIKE?

Attention is not like a light bulb that shuts on or off, but rather like a tide that ebbs and flows between different states of boredom, frustration, rote, and focus. Each state serves a valuable role in our lives, and each appears to be related to the level of energy we expend on cognitive resources in various tasks. Those states are defined in further detail as follows.

- **Focused attention:** A state of mind where we deeply process material. For instance, an employee may create a marketing strategy for a new product and meet with various stakeholders to learn about their needs and interests. In school, students build the learning during this phase of attention. This may take the form of conducting a text analysis of two books, solving quadratic equations, or exploring missing perspectives and voices in their social studies textbook and presenting them to the principal. This is a place of significant learning and tremendous effort, high engagement and high challenge. As a result, our cognitive resources are exhausted.

- **Rote attention:** A state of mind where we are engaging in effortless practice or activity. This is a place of reinforcing past learning, of high engagement and low challenge. In work, this may include going for a brief walk and checking in with colleagues on client recruitments. In school, this is all about *building the learner*, which centers on students taking time to identify current progress in learning, identifying their current progress toward goals, and determining next steps in their learning. A core part of this time is finding ways to recharge their attention by taking quick quizzes, engaging with a short crossword puzzle, or completing a simple worksheet that covers previous learned material.

- **Boredom:** A state of mind where our cognitive resources are underutilized. This is a place of low engagement and low challenge. In the workplace, this may be filling out expense reports or listening to long lectures with little engagement with the speaker or colleagues. In school, this may include multiple redundant worksheets or listening to a lecture with little engagement with the teacher or peers.

- **Frustration:** A state of mind where the degree of challenge for a task is overwhelming and the engagement level is low. For example, an employee who is directed to create a new strategy by a short deadline but has not been provided adequate training or information to better understand the initiative may be frustrated. In school, students may feel frustration when they are given tasks to complete but have not had enough **guided practice, positive feedback,** and **scaffolding** to effectively meet expectations.

The amount of time someone remains in each attentional state is heavily influenced by levels of challenge and engagement (see Figure 1.2).
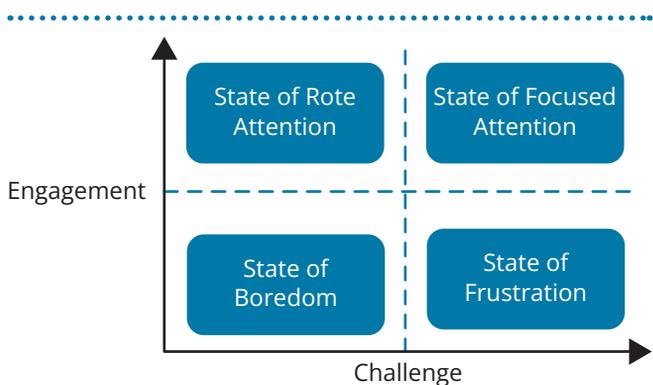
Adapted from Mark, G. (2023). *Attention span: A groundbreaking way to restore balance, happiness and productivity*. Hanover Square Press.

Rather than viewing them as sequential or causal, this model illustrates a more dynamic relationship between challenge and engagement. It emphasizes the idea that effortful engagement often arises from confronting and embracing challenges, while effortless engagement with a task or goal can occur through low difficulty.

However, before we go any further, let's unpack a few of these terms.

Defining Engagement

For starters, what is **engagement**? Engagement is like making a good argument; it is multifaceted. Where arguments contain ethos (appealing to an author's credibility), pathos (creating an emotionally resonant message), and logos (appealing to an audience's reasoning), engagement includes cognitive, emotional, and behavioral factors (Pilotti et al, 2017).

Cognitive engagement involves students asking questions, paraphrasing comments, and solving problems. In other words, cognitive engagement occurs when students are working on tasks across complexity levels of learning. Consider a student in Ms. Yu's class who is working on defining, relating, and then applying the terms *supply* and *demand* to better understand the idea of scarcity and monopoly. The student accomplishes tasks that correspond to the different levels of complex learning (i.e., defining, relating, and applying). The tasks themselves include taking notes, engaging in a peer-to-peer discussion on an article about supply and demand, and then predicting trends and patterns of different products with peers.

Emotional engagement includes a student's excitement, boredom, and anxiety within and between activities. For example, prior to the unit on supply and demand, Ms. Yu asks what students are interested in purchasing (e.g., type of clothing, video games, phone applications), as well as areas of the economy they are curious about (e.g., ego inflation, monopolies, cryptocurrency), then uses this information when teaching the supply and demand unit. She then goes further and gives students a nongraded preassessment on supply and demand so that she can scaffold the unit to meet her current students' needs. In this example, the teacher is focused on tapping into students' emotional engagement and ensuring they don't move to the extremes of frustration (i.e., too much challenge) or boredom (i.e., too little engagement).

Behavioral engagement is focused on a student's actions, such as meeting expectations like listening to the speaker, taking notes, and completing a worksheet. Behavioral engagement is enhanced when expectations are co-constructed with students. For instance, many teachers start the school year by collaborating with their class to set norms for how students will act when someone is speaking or how to interact with each other during small-group work.

Defining Challenge

Mark (2023) defines **challenge** as the amount of mental effort or cognitive resources involved in completing a task. Nottingham (2017) showed that high challenge is the distance between a student's current ability and potential ability, and that low-challenge or rote tasks exist in the subconscious ability. Figure 1.3 shows where focused attention—what Nottingham refers to as the "learning zone"—and rote attention—the "practice zone"—tasks fall, in what he calls the Teaching Target Model.

Mark (2023) argues that to enhance attention, people need to rotate between these zones, between rote and focused attention. She states, "We also have the power to control how we switch attention states, and we can try to tap into that innate need to achieve an inner balance, to recover and replenish cognitive resources, which rote, mindless or even boring activity can do" (p. 85). Students need to move across the line between focused and rote attention frequently. When they spend too long in rote attention, they face boredom, but when they spend too long in focused attention, they face frustration.

FIGURE 1.3 THE TEACHING TARGET MODEL: EFFECTIVE TEACHING BALANCES THE LEARNING ZONE (FOCUSED ATTENTION) AND PRACTICE ZONE (ROTE ATTENTION)
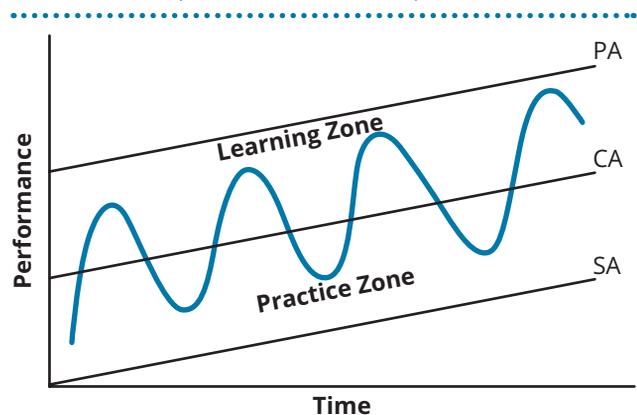
Note: PA: potential ability; CA: current ability; SA: subconscious ability

Nottingham, J. (2017). *The learning challenge*. Corwin.

The question, then, is how we create the right mix of challenge and sustained high engagement.

Creating the Right Balance

The solution? Simply toggle between **dispositional development** routines (e.g., reflecting, regulating focus, and planning next steps, as well as engaging in routine practice) and **competency-based learning** routines

(i.e., surface, deep, and transfer learning). Like the use of high-intensity and low-intensity sets in a workout, instructional intervals allow learning to flourish.

> *Intervals drive learning by rotating routines for building the learner and the learning.*

Early implementation of the Interval Instruction Approach (IIA) may start with one or two intervals of each type. As you grow more confident with the method, you'll be able to layer and loop between these rhythms more fluidly, creating an interval of dispositional and competency-based habits.

ENGAGEMENT CRITERIA

To maximize student learning, teachers need criteria for success that span the fields of attention and engagement, cognitive science, **habit science**, curriculum and instruction, and student **agency**. The following four criteria serve as a framework for maximizing ideal attention, student competency of core content, and dispositions.

Criterion 1. Activation: *Use Habit Science to Drive Intention Into Action*

In his article *The Mistake Smart People Make: Being in Motion vs. Taking Action*, James Clear (n.d.-b) argues that we are often engaging in routines called **motion habits** that require effort but don't necessarily produce a result. He states,

> We do it because motion allows us to feel like we're making progress without running the risk of failure. Most of us are experts at avoiding criticism. It doesn't feel good to fail or to be judged publicly, so we tend to avoid situations where that might happen. And that's the biggest reason why you slip into motion rather than acting: you want to delay failure.

As a result of this fear of failure, when we are engaging at high levels of engagement and challenge, we often struggle with taking the necessary **action habits** to perform these significant tasks. We spend time planning, outlining, scheming, and strategizing—in motion—in lieu of being in action (Clear, 2018). However, when we engage in rote, or low-challenge, activities, we engage in action routines much more easily. We usually don't struggle with watching cat videos, playing the latest *New York Times* game, or looking up a great recipe. The threshold to move from planning to acting on these rote tasks is extremely low. Problems arise because the threshold to act on high-engagement, high-challenge tasks is much larger. As we increase challenge, we increase the need for planning and the chance of failure, and our mind can sometimes trick us into thinking that planning substitutes the actual action.

This aspect of habit science transfers to classrooms. In John Hattie's 2009 and 2023 landmark *Visible Learning* studies, he found that practices that place students in action yield more growth in learning than those that place them in motion. For instance, teaching exclusively through lecture has a negative effect on student learning, yet explicit **direct instruction** can yield more than 1.5 years of growth in 1 year's time (Hattie, 2023). Direct instruction includes lectures, but it also includes promoting active student responses and providing immediate feedback (Mason & Otero, 2021). The main difference is that in lecture the teacher is in action and the students are in motion, whereas in direct instruction both teacher and students are engaging in action together. The same can be said for methodologies such as discovery-based learning, which places students in action and teachers largely in motion, and problem-solving teaching, which requires both students and teachers to be in action.

Criterion 2. Rhythm: *Design Learning Intervals That Maximize Attention and Retention*

Mark's (2023) research highlights that attention works in rhythms, not long stretches of unbroken focus. When teachers organize activities that rotate between "building the learning" focused tasks and "building the learner" rote tasks, they positively influence student maintenance of cognitive resources to engage in surface-, deep-, and transfer-level tasks while simultaneously becoming stronger learners.

Martella et al. (2024) show that students engaged in interspersed intervals of instruction and active learning (as short as 3–6 minutes) outperformed peers on surface, deep, and transfer tasks. These rhythmic cycles reduce cognitive fatigue and improve emotional engagement.

Students who experienced interspersed instruction, where teaching was broken up with active learning moments, outperformed their peers across all question types: surface, deep, and a composite of surface and deep learning. They also reported the highest levels of confidence and emotional engagement, illustrating that regularly pausing instruction to let students think, discuss, or respond leads to stronger understanding and **retention** across the board.

Criterion 3. Challenge: *Match Learning Strategies to the Right Level of Complexity and Engagement Between Students and Teachers*

As students engage in the learning, they typically cross between different types of complex learning. These categories of learning are typically associated with taxonomic frameworks such as Bloom's taxonomy (L. W. Anderson & Krathwohl, 2001), Webb's Depth of Knowledge (Webb, 2002), and the SOLO (structure of observed learning outcomes) taxonomy (Biggs & Collins, 1982). A modified version of the SOLO taxonomy integrates three specific

types of learning: surface, deep, and transfer (Hattie, 2009). A description of each categorical level is as follows:

- **Surface learning** is best described as learning core concepts, definitions, and procedures. Without these foundations, students lack the raw materials required for higher-order thinking. Yet an overreliance on surface learning can lead to a very shallow and fragile development of comprehension.

  For instance, let's go back to Ms. Yu's unit on supply and demand. In this category of learning, students are learning specific vocabulary and the placement of supply and demand on the x- and y-axis to illustrate supply chains and demand curves, as well as equilibrium price. For an elementary school scenario, consider Mr. Garcia's third-grade unit on multiplication. At the surface level, students are learning core **vocabulary (factors, product, array), facts** (3 × 4 = 12), and **procedures** for solving multiplication problems. They practice using repeated addition, drawing equal groups, and using number lines to understand how multiplication works. These foundational skills are essential, but if instruction stops here, students may struggle to apply multiplication in real-world situations or explain their thinking in deeper ways.

- **Deep learning** is best described as forming an understanding of underlying principles, analyzing information critically, and making connections across domains. Here students connect rote learning into meaningful concepts.

  In Ms. Yu's supply and demand unit, students are focused on relationships between the two constructs and extracting the meaning of the relationship. Furthermore, they are working to predict what happens when changes occur. Take, for instance, that the point of intersection is the equilibrium price. When supplies increase and demands are stable, the equilibrium will drop. In Mr. Garcia's class, students begin to focus on helping them see the **relationships** within multiplication. Students explore the **commutative property** (e.g., 3 × 4 = 4 × 3) and begin to make connections between multiplication and area models. They analyze patterns in multiplication tables, compare strategies for solving word problems, and explain why different approaches work. For example, a student might notice that 5 × 6 is the same as 5 × 3 + 5 × 3 and explain how they decomposed the problem using the distributive property. This level of learning pushes students to reason, justify their thinking, and build a flexible understanding of multiplication.

- **Transfer learning** represents the application of knowledge and skills in novel situations whereby students solve complex problems. This mode of learning focuses on comparing contexts or situations and differs from deep learning, which compares different aspects of content.

  Teachers may provide a variety of scenarios for students to begin applying across contexts. For example, in one activity, Ms. Yu had students act as the CEO of an imaginary tech company releasing a new

virtual reality product that everybody wants. As the CEO, students determined next steps for pricing and future product development. In Mr. Garcia's class, students move into transfer learning when they apply their multiplication knowledge to solve unfamiliar, multistep problems. For example, students might be asked to plan seating for a school assembly by figuring out how many rows of chairs are needed if each row has 8 seats and there are 184 students attending. They must decide which operation to use, estimate first, and explain their process—often combining multiplication with division or addition.

One of the most persistent myths about learning taxonomies is that the levels represent a hierarchy of value, where some types of thinking are more important than others. You've likely seen the classic pyramid visuals from Bloom's original 1956 taxonomy and its 2001 revision, which reinforce this myth by unintentionally suggesting that surface learning is "lower" and transfer learning is "higher" (L. W. Anderson & Krathwohl, 2001; Bloom et al., 1956). As a result, some teachers may undervalue surface learning, while others may focus almost exclusively on it. In reality, each level— surface, deep, and transfer—plays a critical role in rigorous learning. As Dylan Wiliam (2023) reminds us, "Bloom and his committee proposed a taxonomy of educational objectives, not a hierarchy." Students should be routinely engaged in all types of learning, not treated as if they must "master" one level before moving to the next. Rather than framing thinking as lower or higher order, we should focus on cultivating thinking across levels: helping students build knowledge, make connections, and apply learning in new and meaningful ways.

> *Rather than framing thinking as lower or higher order, we should focus on cultivating thinking across levels: helping students build knowledge, make connections, and apply learning in new and meaningful ways.*

Criterion 4. Self- and Social Empowerment: *Build Habits That Help Students Take Initiative, Set Goals, and Reflect on Their Learning Process Individually and Collectively*

To successfully engage in action-based routines, students need habits that help them *take initiative* (like choosing and applying a strategy when they're stuck), *set goals* (such as improving on a math problem they missed), and *reflect on their learning* (such as by asking, "What worked? What didn't? What should I try next?"). These habits allow students to monitor their progress and deepen their understanding across surface, deep, and transfer learning. As Guy Claxton (2021) notes in *The Future of Teaching*, effective learners display "an honest and self-aware attitude towards evaluation of progress; and organizing and resourcing [their] own learning" (p. 78). These are not just good habits, they are essential to building ownership, resilience, and long-term success. In fact, Hattie (2023) found that when students regularly reflect on their progress, set personal goals, and act on feedback, they can achieve up to two years of growth in a single year.

Claxton (2021) reminds us that effective learning habits are not just about *having* a skill; they're about knowing *when* and *how* to use it. For example, if a student is given a repetitive task, do they know how to reframe it? Can they recognize that it's meant to reinforce fluency or build stamina? Or do they disengage, mistaking repetition for irrelevance? Helping students develop this kind of self-awareness allows them to navigate routine tasks without sliding into boredom or frustration.

This is where dispositional habits, what we call building the learner, come into play. These habits guide students to regulate attention, ask for the help they need, reflect on their effort, and support peers who may be struggling. They help students engage at the right level of challenge; not too easy, not too overwhelming.

To grow these habits, we embed three simple but powerful questions into daily routines:

- **Where am I going as a learner?**

  Helps students clarify the purpose of the task and set goals.

  "What am I trying to learn, and why does it matter?"

- **Where am I now?**

  Encourages students to monitor progress and check their focus.

  "Do I understand what I'm doing? What's getting in my way?"

- **How will I get there?**

  Promotes planning, resourcefulness, and feedback-seeking.

  "What's my next step? What or who can help me move forward?"

> *By activating purposeful habits, establishing a rhythm of learning, and aligning strategies to complexity and student agency, teachers can create classrooms where attention, challenge, and empowerment thrive.*

When these questions become part of the classroom rhythm, students learn to think and act with greater purpose—both for themselves and alongside others. That's how we build real, lasting agency: by developing the habits that help students take initiative, reflect with clarity, and grow together.

Importantly, agency encompasses both personal and social habits. **Social empowerment** means that students learn how to work with others, not just by themselves. This includes giving and receiving feedback, navigating group challenges, and asking for support when needed. As Marzano (2017) explains, students who develop habits like collaborative problem-solving and productive struggle tend to grow faster and learn deeper. When students are encouraged to think together, reflect together, and take shared responsibility for learning, they become more confident, resilient, and empowered.

To help you put these criteria into action, the **rubric** in Table 1.1 offers a way to ground the criteria in the classroom.

TABLE 1.1 ENGAGEMENT CRITERIA RUBRIC

|	EXEMPLARY (4)	PROFICIENT (3)	DEVELOPING (2)	EMERGING (1)
Activation *Use habit science to drive intention into action.*	Skillfully incorporates student involvement within teacher-led demonstrations (e.g., checking for understanding) and student-centered practice (e.g., probing questions). Provides ample opportunities for guided practice and provides direct and independent practice based on just-in-time student assessment data. Intentionally plans for when motion and action habits are appropriate in a lesson across surface, deep, and transfer learning.	Partially incorporates student involvement within teacher-led demonstrations and student-centered practice, but implementation is inconsistent. Provides opportunities for guided practice, but direct and independent practice is not clearly based on student assessment data. Plans for when motion and action habits are appropriate are somewhat intentional but lack cohesion across surface, deep, and transfer learning.	Inconsistently incorporates student involvement within teacher-led demonstrations and student-centered practice. Provides some opportunities for guided practice but misses opportunities for direct and independent practice based on student assessment data. Inconsistently plans for when motion and action habits are appropriate across surface, deep, and transfer learning.	Does not primarily incorporate student involvement within teacher-led demonstrations or student-centered practice. Minimal or no guided practice, leading to an abrupt transition to independent practice. Does not intentionally plan for when motion and action habits are appropriate.
Rhythm *Design learning intervals that maximize attention and retention.*	Skillfully incorporates a variety of high-engagement activities that allow for flexibility, rotating between dispositional development and rote activities and sustained focus tasks. Maintains an optimal balance of tasks that begin and end with transfer-level learning. Intentionally varies the pace and intensity of activities to maintain student engagement.	Includes a mix of dispositional routines, rote activities, and sustained focus tasks in the lesson plan. Attempts to strike a balance between repetitive practice and more demanding cognitive tasks. Tries to vary the pace and intensity of activities to sustain attention.	Includes some dispositional and rote activities and sustained focus tasks, but with limited variety. The balance between repetitive practice and tasks across surface, deep, and transfer learning is somewhat uneven and disconnected. Struggles to maintain an optimal pace and intensity, leading to lapses in attention.	Relies heavily on either dispositional or rote activities or sustained focus tasks, lacking balance. Fails to incorporate a sufficient variety of attention-grabbing activities and fails to sequence or meet surface, deep, and transfer learning. Maintains a monotonous pace and intensity, leading to disengagement.

(Continued)

	EXEMPLARY (4)	PROFICIENT (3)	DEVELOPING (2)	EMERGING (1)
Challenge *Match learning strategies to the right level of complexity and engagement between students and teachers.*	Consistently employs a rich variety of instructional strategies that effectively target surface, deep, and transfer learning. Strategies are purposefully selected and seamlessly integrated to build conceptual understanding, higher-order thinking, and real-world application. Units and lessons are structured to begin and end with transfer tasks that require students to apply their learning in authentic, meaningful contexts.	Employs a range of instructional strategies that address surface, deep, and transfer learning, although some areas may receive more emphasis than others. Strategies are generally appropriate and effective in promoting conceptual understanding and real-world application but may occasionally lack coherence or alignment. Units and lessons often incorporate transfer tasks but may not consistently begin and end with these authentic applications.	Employs a limited range of instructional strategies, with a primary focus on either surface or deep learning, while neglecting the other or transfer learning. Strategies may be ineffective or misaligned with learning goals, resulting in gaps in conceptual understanding or real-world application. Units and lessons may include some transfer tasks, but they are often disconnected or supplemental to the main instruction.	Relies heavily on a narrow set of instructional strategies that primarily target surface learning, with little emphasis on deep or transfer learning. Strategies are ineffective or inappropriate for promoting conceptual understanding or real-world application. Units and lessons rarely, if ever, incorporate transfer tasks or authentic applications of learning.
Self- and Social Empowerment *Build habits that help students take initiative, set goals, and reflect on their learning process individually and collectively.*	Consistently demonstrates a proactive and purposeful approach to evaluating progress toward goals. Consistently engages in thorough planning, strategizing, and anticipating potential challenges before undertaking tasks or learning experiences. Actively seeks resources and support to maximize success.	Often demonstrates a proactive and purposeful approach to evaluating progress toward goals, but implementation is uneven. Often engages in planning, strategizing, and anticipating potential challenges before undertaking tasks or learning experiences. Sometimes seeks resources and support to maximize success.	Sometimes demonstrates a proactive and purposeful approach to evaluating progress toward goals, but the approach is inconsistent. Sometimes engages in planning, strategizing, and anticipating potential challenges before undertaking tasks or learning experiences, but efforts are limited. Rarely seeks resources and support to maximize success.	Rarely demonstrates a proactive or purposeful approach to evaluating progress toward goals. Rarely engages in thorough planning, strategizing, or anticipating potential challenges before undertaking tasks or learning experiences. Does not seek resources or support to maximize success.

EXEMPLARY (4)	PROFICIENT (3)	DEVELOPING (2)	EMERGING (1)
Consistently monitors progress, adjusts strategies as needed, and persists through challenges. Actively seeks feedback and makes constructive adjustments to improve performance and learning.	Often monitors progress, adjusts strategies as needed, and persists through challenges. Generally, seeks feedback and adjusts to improve performance and learning.	Sometimes monitors progress, adjusts strategies as needed, and persists through challenges. Occasionally seeks feedback and adjusts to improve performance and learning.	Rarely monitors progress, adjusts strategies, or persists through challenges. Seldom seeks feedback or adjusts to improve performance and learning.
Consistently engages in deep, honest, and critical self-reflection on strengths, areas for growth, and the learning process. Actively seeks opportunities to apply insights and make meaningful improvements.	Often engages in deep, honest, and critical self-reflection on strengths, areas for growth, and the learning process. Sometimes seeks opportunities to apply insights and make meaningful improvements.	Sometimes engages in deep, honest, and critical self-reflection on strengths, areas for growth, and the learning process, but efforts are limited. Rarely seeks opportunities to apply insights and make meaningful improvements.	Rarely engages in deep, honest, and critical self-reflection on strengths, areas for growth, and the learning process. Does not seek opportunities to apply insights and make meaningful improvements.

FROM ENGAGEMENT CRITERIA TO INTERVAL INSTRUCTION

To bring engagement to life in the classroom, the IIA uses a purposeful rhythm—rotating between routines that build the learner (dispositional habits) and routines that build the learning (competency-based thinking). These instructional intervals cycle through strategies that support attention, self-regulation, and reflection, while also advancing students through surface, deep, and transfer levels of learning. Figure 1.4 shows a lesson that applies intervals through specific classroom routines and activities.

FIGURE 1.4   A LESSON PLAN THAT IMPLEMENTS INTERVALS THROUGH SPECIFIC CLASSROOM ROUTINES
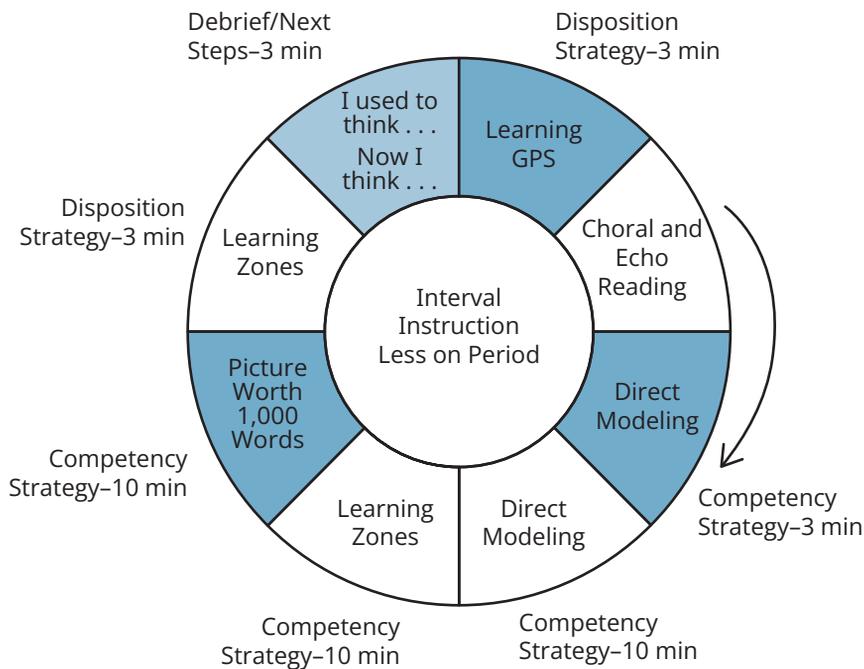
This figure illustrates a third-grade lesson focused on animal adaptations. The day begins with a Learning GPS routine where students reflect on the learning goal (e.g., *I can describe how animals adapt to survive in their environments*) and rate their current level of understanding using a simple red–yellow–green scale. This dispositional check-in builds student agency and helps them set personal intentions, such as *I want to learn new words about animal bodies* or *I want to write clearer sentences*.

Next, the class moves into choral and echo reading, a surface-level competency routine designed to build fluency and reinforce vocabulary using a

high-quality informational text about Arctic animals. Following this, the teacher shifts into direct modeling, where they break down how to identify and interpret text features. After this model, students pause for a learning zone check, a brief attention-awareness routine that prompts them to consider if they're in the focus zone, drift zone, or recovery zone—and adjust accordingly.

The rhythm continues with another round of direct modeling, this time at a deeper level. The teacher uses sentence frames to demonstrate how to construct a compare-and-contrast sentence: *"The Arctic fox and the snowshoe hare both have _____, but only the _____ has _____."* This routine bridges students from surface facts to relational thinking—moving them into deeper understanding.

Students then apply this skill during "Picture Worth 1,000 Words," a transfer-level competency routine where they use visual prompts to craft original, descriptive sentences about animal adaptations. This collaborative task pushes students to apply what they've learned in a new context, solidifying learning through creativity and challenge.

Before wrapping up, students return to the learning zone check to self-assess their engagement and attention. The lesson concludes with a **reflection** protocol, using *"I used to think . . . Now I think . . ."* to help students make their conceptual shifts visible. One student might say, *"I used to think all animals change color in winter, but now I think only some do, like the Arctic fox."*

Across the intervals, the teacher deliberately alternates between dispositional strategies (reflection, goal-setting, attention monitoring) and competency-based strategies (reading fluency, modeling, sentence construction, transfer tasks). At the same time, the learning tasks progress in complexity from surface to deep to transfer, creating a rhythm that matches cognitive demand with attention cycles.

This structure not only helps students move from planning to action, but also supports sustained focus, meaningful reflection, and ownership of learning. By intentionally rotating between building the learner and building the learning, the IIA transforms engagement from a moment into a habit, and ensures that every student grows in both skill and agency.

This process helps students move from planning to action, aligning instructional rhythm with attention cycles and levels of cognitive demand. It strengthens student ownership and builds habits of reflection and self-direction. While the timing of each interval may vary depending on the depth of dispositional or competency-based work, what matters most is that teachers intentionally weave in surface, deep, and transfer learning. These are not steps on a ladder but essential dimensions of rigorous learning each equally important, each worth revisiting.

USING THE IIA TO ENSURE CHALLENGE

The Opportunity Myth (TNTP, 2018) delivered a powerful wake-up call: While 71% of students can successfully complete the tasks they're assigned in class, only 17% are working at grade level. Most state and national standards demand more than surface-level knowledge. Students are expected to analyze, synthesize, and evaluate information. That is, students must recognize patterns, connect ideas, and draw meaning across concepts. This is the essence of *deep learning*. If we're only offering surface-level tasks, we're holding students back from the very cognitive work that builds understanding.

The IIA model naturally scaffolds challenge:

- Surface learning is supported through brief modeling and recall.
- Deep learning arises through elaboration and pattern recognition.
- Transfer learning is tackled through application, creation, and critique.
- Table 1.2 provides examples of how each layer of learning can be applied throughout intervals in the classroom.

TABLE 1.2 SURFACE, DEEP, AND TRANSFER ROUTINES THROUGHOUT INTERVALS TO PROMOTE CHALLENGE

	SURFACE: BUILDING KNOWLEDGE	**DEEP: MAKING MEANING**	**TRANSFER: APPLYING UNDERSTANDING**
Interval 1 Warm Up 5 minutes	Short quiz with mixed practice of previously learned material	Students construct a three-sentence summary of the learning from yesterday.	Students write down takeaways, take-backs, and tensions after evaluating multiple scenarios to address a real-world problem.
Interval 2 Content Interval 10 minutes	Teacher uses direct modeling on how to effectively label a food chain and use random checks for understanding early and often (or high frequency). Teacher uses backward fading of the food chain. Students construct a food chain using the model provided.	Students conduct a Four *A*'s protocol on the first third of an article on food webs in both terrestrial and aquatic environments. The Four *A*'s protocol is a structured reading protocol that requires students to work in groups to answer the following four questions: (1) What *assumptions* does the author of the text hold? (2) What do you *argue* with? (3) What do you *agree* with? (4) What do you *aspire* to?	Students individually construct analogies of food chains and food webs in other disciplines (e.g., supply chains) or other aspects of the field of biology (e.g., animal taxonomies, matter cycling via photosynthesis and cellular respiration). The teacher outlines the key criteria that should be transferrable across disciplines or contexts.

	SURFACE: BUILDING KNOWLEDGE	DEEP: MAKING MEANING	TRANSFER: APPLYING UNDERSTANDING
	Students complete a short response quiz: *What is the name of the organisms that create their own energy and are noted as producers?*	Students individually engage in a Semantic Webbing activity connecting all vocabulary and then sharing with peers for feedback. The teacher places a dot on students' work that indicates either successes or challenges to their constructed webs.	Students work together to evaluate the analogies they individually constructed.
Interval 3 Recharge 3 minutes	Students participate in an activity that requires them to predict future information using a slow-reveal graph and then compare their predictions to the actual information.		
Interval 4 Content Interval 10 minutes	Direct modeling of how to label a food web	Students engage in a short conversational protocol, such as the Three-Interval Turn and Talk—a paired collaboration protocol where students engage in three short conversations: (1) connect two ideas, (2) restate using an academic term, and (3) expand with a conjunction, a subordinating conjunction, or an appositive.	Students generate hypotheses on how to solve a real-world problem (e.g., introduction of an invasive species).
Interval 5 Recharge 3 minutes	Students engage in a trivia game or crossword on previously reviewed material.		
Interval 6 Content Interval 10 minutes	Revisiting cloze activities to integrate surface and deep learning	Students repeat the Four *A*'s protocol.	Students receive feedback from peers on hypotheses based on success criteria and understanding the problem context.
Interval 7 Cool Down 5 minutes	Reflecting on dispositional habits (e.g., intentionality)	Students reflect on dispositional habits in working with peers (e.g., self-regulation and correction).	Students reflect on dispositional habits in working with peers (e.g., self-reflection).

While there are certainly days when you might exclusively focus on surface, deep, or transfer learning, work to frequently design intervals where students are engaging across levels to ensure development of surface, deep, and transfer learning.

Let's look at an example from an eighth-grade classroom, illustrated in Figure 1.5.

FIGURE 1.5 EXAMPLE INTERVAL INSTRUCTIONAL APPROACH SEQUENCE WITH CHALLENGE INTEGRATION IN MIND
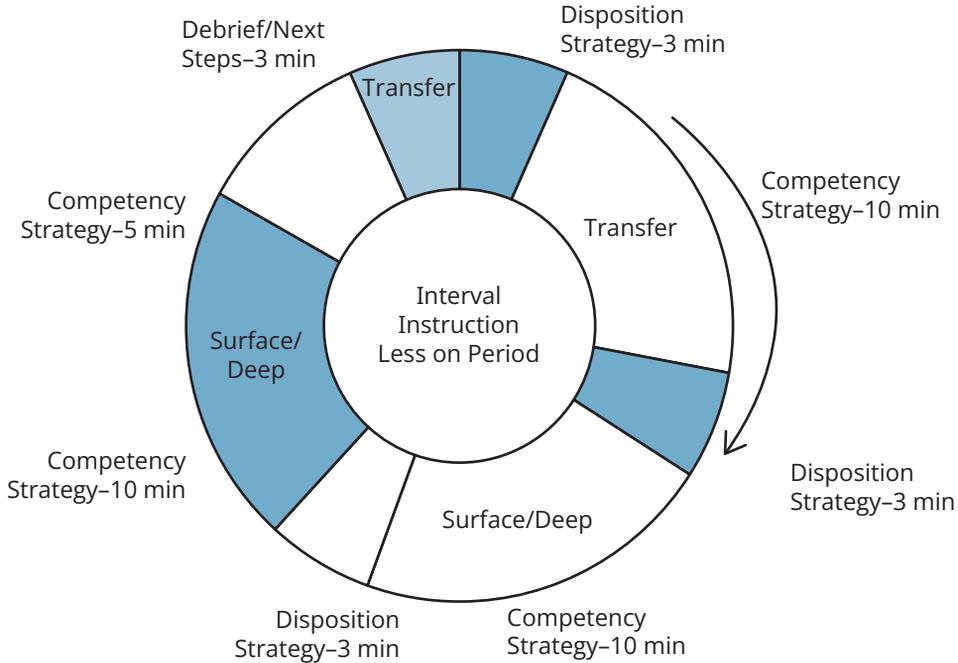
Students are tasked with understanding the interconnectedness of ecosystems and the impact of human activities. Their goal is to apply their knowledge of ecological relationships to propose solutions to a real-world problem. Table 1.3 outlines a sequence of instructional intervals designed to unfold over one to two days. (Additional examples of full interval lessons are provided in Chapter 7 and the appendix.)

TABLE 1.3 DETAILS OF AN INTERVAL INSTRUCTION LESSON FROM AN EIGHTH-GRADE CLASSROOM

CYCLE	DESCRIPTION	INSTRUCTIONAL ROUTINE(S)
Interval 1 5 minutes	Students will write a summary (3–4 sentences) reflecting on what they learned about food chains and food webs from the previous lesson. They will highlight what they found surprising (S), interesting (I), and troubling (T) about these concepts. This activity encourages critical thinking, personal connection to the content, and retention of key ideas through concise reflection.	Summarize the Story So Far S-I-T Protocol

CYCLE	DESCRIPTION	INSTRUCTIONAL ROUTINE(S)
Interval 2 3 minutes	Students revisit the Entry Event of their unit by reviewing their "Know" and "Need to Know" lists, focusing on protecting organisms. A "Know"/"Need to Know" list is a simple tool students use to track their learning. On one side, they record what they already understand about a topic; on the other, they note questions or gaps in knowledge that still need to be addressed. Teachers use it to spark curiosity, guide inquiry, and make student thinking visible throughout a unit or project. This process helps them reflect on their current understanding and identify gaps in their knowledge. By revising these lists, students set a clear direction for their research and learning objectives.	Entry Event "Know" and "Need to Know" Lists
Interval 3 12 minutes	Students participate in the Tea Party protocol to build and relate new academic vocabulary. The teacher distributes index cards to students, each labeled with one of the following terms related to marine ecosystems and species: - Populations - Leatherback turtles - Jellyfish - Blooms - Predator - Prey - Temperature - Ecosystem - Fisheries - Calories - Cnidocytes - Nematocysts - Climate change - Habitat - Endangered - Extinction - Polyps - Surface area - Runoff - Reproduction - Venomous - Gillnet - Keratin Students predict what their term means and then share their terms, trying to determine what they will be learning about as well as making connections between concepts as they interact. Next, students watch a short TED-Ed (2023) video that explains why jellyfish populations are booming worldwide and what this reveals about the health of our oceans, and then share in small groups what they learned about their words and how close they were on making accurate predictions. Following the To and Through protocol (e.g., asking students, "Do you know what you're learning *to* do?" and "Do you know what you're learning *through* this task?") allows them to learn content through a familiar context (e.g., jellyfish and leatherback turtles) to better understand the core idea, such as predator–prey relationships.	Tea Party To and Through Pop Quizzing

(Continued)

CYCLE	DESCRIPTION	INSTRUCTIONAL ROUTINE(S)
	Finally, they engage in a brief pop quiz and are asked what they are learning and what they are learning the content through (i.e., the context).	
Interval 4 6 minutes	Students pair up in mixed groups using their Tea Party vocabulary words to craft complex sentences. Using the Three-Interval Turn and Talk protocol, they incorporate conjunctions, subordinating conjunctions, and appositives to create more detailed and connected ideas. This activity encourages collaboration, deepens vocabulary understanding, and enhances sentence structure skills. Next, students take a one-question quiz and share their answers in the class.	Three-Interval Turn and Talk Pop Quizzing
Interval 5 6 minutes Recharge Interval	Students participate in a Two-Box Induction game to recharge their energy and practice identifying similarities and differences across previously learned material. Working in established teams, they examine the contents of two boxes to uncover the pattern or connection, earning team points for each correct guess. The activity is low in challenge but highly engaging, fostering teamwork, curiosity, and critical thinking in a fun, interactive format.	Two-Box Induction
Interval 6 12 minutes	Students complete fill-in-the-blank sentences using the complex sentences they previously created. Next, they engage in Semantic Webbing, connecting multiple sentences to reveal broader relationships between ideas. Then, using the Five-Interval Turn and Talk, a paired collaboration protocol where students engage in five short conversations, they (1) connect two ideas, (2) restate using an academic term, (3) expand with a conjunction, subordinating conjunction, or appositive, (4) add a comparing or contrasting connective, and (5) conclude with a summary statement. Afterward, they take a quick two-question pop quiz to check content understanding and clarity. Finally, students refine their skills by using the To and Through protocol to create new complex sentences, incorporating transition words and concluding statements to enhance their writing.	Cloze Activity Semantic Webbing Five-Interval Turn and Talk Pop Quiz To and Through
Interval 7 5 minutes	Students reflect on their learning by completing a sentence frame *"I used to think . . . Now I think . . ."* to articulate how their understanding has evolved. They then revisit their "Know" and "Need to Know" lists to update what they've learned and identify remaining questions. This process deepens reflection, tracks progress, and sets the stage for further inquiry.	I Used to Think . . . Now I Think . . . Reviewing "Know" and "Need to Know" Lists

This approach contrasts sharply with traditional lessons, which often follow a more linear and uniform pacing that doesn't account for the natural fluctuations in student attention and engagement. Traditional lessons might dedicate extended periods to direct instruction or independent work, leaving students either overstimulated by prolonged cognitive demand or disengaged by repetitive, low-challenge tasks. In contrast, the interval instructional process intentionally varies the pace and structure of activities, strategically alternating between high-challenge, high-engagement tasks that push students' cognitive boundaries and lower-challenge, engaging activities that recharge their focus.

Furthermore, intervals ensure sustained cognitive effort while seamlessly integrating surface, deep, and transfer learning levels. For instance, the instructional design described in Table 1.3 begins with reflective writing (Interval 1), fostering critical thinking and personal connections to prior knowledge, which lays a solid foundation for deeper exploration. Many lessons fall short of consistently embedding surface, deep, and transfer learning as a routine practice for students. Interval instruction offers a practical and effective framework to achieve this integration.

Finally, the dynamic pacing of interval instruction works like a battery recharge, providing students with the bursts of energy they need to stay focused and engaged while preventing the cognitive drain that often occurs in traditional lessons. Just as a battery functions best when it's charged regularly instead of left to fully lose power, students' attention and energy are sustained by alternating between high-challenge tasks that push their thinking and lower-challenge, engaging activities that allow them to recharge. This balance maintains a steady progression through surface, deep, and transfer learning while avoiding burnout. By embedding moments for reflection, collaboration, and active problem-solving, the approach ensures that students remain energized, attentive, and ready to tackle each new task. The deliberate pacing of these intervals not only optimizes cognitive engagement but also creates a learning experience that is both responsive and highly effective, enhancing overall comprehension and long-term retention.

Finding the Right Interval

There are certainly times when longer instructional cycles are beneficial to enhance student learning. For instance, in a chemistry class the teacher may be interested in developing a student's knowledge and skill in understanding solutes and solvents and may want students to pursue a lab that requires a full class period. At the same time, the teacher may want to use shorter intervals to reinforce foundation skills of dimensional analysis, promote conceptual understanding of kinetics, or solve real-world problems around radioactive decay. Meanwhile, a middle school English language arts teacher

may combine longer intervals for students to complete a close read with shorter intervals to complete a Socratic Seminar or time to write and receive feedback on an essay.

Combining **short and long instructional cycles** maximizes student engagement and cognitive development. This approach, analogous to high-intensity interval training and endurance training in physical fitness, addresses varying attention spans and learning needs while promoting comprehensive understanding across surface, deep, and transfer learning levels (Table 1.4).

TABLE 1.4   COMPARING SHORT- AND LONG-CYCLE INTERVALS

TYPE	SHORT-CYCLE INTERVALS	LONG-CYCLE INTERVALS
Style	High-Intensity Style	Endurance Style
Duration	3–9 minutes	9–18 minutes
Description	• Introducing new concepts • Reinforcing key ideas • Quick skill practice • Maintaining high engagement	• In-depth exploration of topics • Extended problem-solving • Collaborative projects • Development of complex skills
High School Example	• Teacher demonstrates balancing chemical equations • Class works together on two or three equations • Students individually balance one or two equations	• Students conduct a lab experiment on reaction rates • Quick review of safety procedures and predictions • Students analyze results and draw conclusions
Middle School Example	• Teacher models identifying literary devices in a poem • Class collaboratively finds devices in a new stanza • Students independently analyze final stanza	• Students engage in guided close reading of a short story • Quick discussion of initial impressions • Students write a brief analysis of theme and character development
Elementary Example	• "I do": Teacher demonstrates multidigit multiplication strategy • "We do": Class solves a problem together on the board • "You do": Students solve one problem independently	• Students work on multistep word problems in small groups • Break: Quick share-out of problem-solving strategies • Groups present their solutions and reasoning

Engaging in alternate short and long rotations will boost students' engagement by meeting their current attention spans while building focus and endurance and creating enough variety to prevent long-term boredom or frustration and mental fatigue. Short cycles maximize surface learning by reinforcing fundamental knowledge and skills while also providing students with routine exposure to deep and transfer learning. Meanwhile, longer cycles promote conceptual understanding and connections with people and content.

By thoughtfully rotating between these short and long instructional cycles, we create a learning experience that is both challenging and engaging. This approach not only maintains high levels of attention but also ensures that students develop a comprehensive understanding of the subject matter, from basic facts to complex applications, meeting the needs of all our students.

FAQ: WHAT INTERVAL INSTRUCTION IS—AND ISN'T

As with any shift in instructional design, the IIA may prompt healthy skepticism. You might wonder whether this model will create confusion, compromise rigor, or limit autonomy. These concerns are essential to test our current ideas as well as new proposed solutions. What follows are five common questions I'm asked about the IIA and how those concerns play out in the classroom.

Question 1: Does Interval Instruction Lead to Chaos?

Concerns I've Heard: *"If I'm constantly switching between teacher input and student practice, I'll spend half my class just managing transitions." "This sounds like a choppy lesson plan that doesn't allow students to get into flow or sustain deep thinking."*

In the Classroom: Like a well-timed workout, intervals are intentionally designed to provide rhythm, structure, and momentum. Some intervals last 3–4 minutes, others 10–15. The key to an interval is purpose, not brevity. With clear routines and predictable structures (like "looping protocols" and timed check-ins), transitions become smoother and more meaningful over time. Attention science shows that human focus is inherently cyclical. Intervals work with the brain, not against it. This does mean that we need to have routinized transition routines that are executed with consistency and precision.

Question 2: Does Interval Instruction Harm Endurance?

Concerns I've Heard: *"We're switching too much—how will students build the stamina to focus on long tasks or succeed on high-stakes tests?"*

In the Classroom: Just like athletes don't start with marathons, students don't build cognitive stamina by being flooded with long tasks too early. Instead, interval teaching offers short bursts of progressively challenging work to condition attention, effort, and mental agility. As students grow, intervals expand in length and complexity. Over time, this leads to greater endurance, not less.

Question 3: Does Interval Instruction Diminish Student Autonomy?

Concerns I've Heard: *"This feels too teacher directed. Where's the space for student voice, choice, or inquiry?"*

In the Classroom: The IIA doesn't diminish agency; it scaffolds it through routine practice within challenging content. Just as effective inquiry requires a base of knowledge and clear expectations, high-agency tasks thrive when students are prepared and supported. The IIA rotates between direct instruction and high-agency experiences like debates, problem-solving, and creative applications. Structure should be viewed as the launchpad or ecosystem for student-led learning, not its nemesis.

Question 4: Does Interval Instruction Oversimplify Complex Content?

Concerns I've Heard: *"You can't break rigorous learning into small chunks; it takes time to wrestle with big ideas."*

In the Classroom: By strategically sequencing tasks that build across surface, deep, and transfer learning, teachers help students access and retain complex concepts. Each interval becomes a manageable step that builds cognitive momentum. This makes rigorous learning sticky.

Question 5: Is Interval Instruction Just Another Trend?

Concerns I've Heard: *"Isn't this just **gradual release of responsibility** with a new name?" "What's really different here?"*

In the Classroom: The IIA is an evolution of what works, fused with what research now tells us about how brains focus, learn, and sustain effort. While it builds on familiar elements like modeling, guided practice, and independence, the IIA emphasizes timing, rhythm, and responsiveness of dispositional and competency-based routines—allowing teachers to shift, return, and resequence instructional moments based on real-time student needs across building learning and the learner. It's a framework that makes room for both the science and the art of teaching. As we move forward, look for nuance rather than complete novelty. Most innovations are built off of small deviations of the past, not complete breaks from our previous work.

See Table 1.5 for a summary of the five most common concerns about interval instruction.

TABLE 1.5 CONCERNS AND REALITY RECAP

CONCERN	REALITY
Intervals create chaos	Intervals provide rhythm and clarity
Intervals reduce stamina	Intervals train endurance through structured reps
Intervals remove agency	Intervals prepare students to own their learning
Intervals oversimplify content	Intervals scaffold complexity, not shrink it
Intervals are just a trend	Intervals reflect the latest in attention and learning science

By addressing these concerns head-on, we open the door to possibility: a model that respects teacher expertise, honors student diversity, and reflects how learning happens. Interval instruction isn't about changing everything; it's about making what we already know work even better.

PUTTING IT ALL TOGETHER

Chapters 2–6 each describe a specific interval type and how to implement it in your classroom:

- Spark and Sustain Clarity: Use *cognitive snacking* to start strong with routines that ignite student focus and keep clarity alive from bell to bell.

- Teach Transfer Early and Often: *Launch* early into meaningful, real-world applications to show students why the learning matters.

- Design a Rhythm Between Surface and Deep Learning: Loop students through *content intervals* that balance foundational skills and deeper thinking to build lasting understanding.

- Check and Respond to Student Learning in Real Time: Implement *pattern breaks* to check for understanding as learning unfolds—and pivot with purpose.

- Consolidate Learning and Recharge Attention: Use short, intentional *cool-down intervals* to reset attention before the next push.

Cultivating powerful learning experiences requires an integrated approach from insights drawn from attention research, habit science, and studies aligned to instruction and student dispositions. By thoughtfully layering surface-level content acquisition, deeper conceptual understanding, and opportunities for transfer, we can craft a learning experience that captivates students' attention while ensuring complexity of academic learning.

Interspersing these levels with dispositional strategies that foster a mindset of student agency further amplifies engagement and perseverance.

The upcoming chapter delves into priming students for engaging in interval learning. Recognizing that focused attention is a finite resource, the chapter advocates beginning with highly engaging yet low-challenge activities. This progressive on-ramp not only enhances learning outcomes but prepares students to engage in sustained attention in later intervals.

IF YOU REMEMBER ONE THING FROM THIS CHAPTER, LET IT BE THIS

▶ Attention needs rhythm. Not all silence is golden, and not all busywork builds brains. But when we rotate between building the learner and building the learning, we impact student learning one success at a time.

REFLECTION QUESTIONS

1. **Attention and Engagement:** How can we leverage insights from attention research to design learning experiences that effectively capture and sustain students? What strategies can we employ to maintain an optimal level of engagement as we escalate the complexity of content and concepts?

2. **Habit Formation and Dispositional Development:** In what ways can we apply principles from habit science to cultivate positive dispositions and mindsets among our students?

3. **Balancing Surface-Level, Deep, and Transfer Learning:** How can we effectively balance the acquisition of surface-level content knowledge with opportunities for deep and transfer learning? What instructional strategies can we employ to ensure that students not only gain factual knowledge but also develop the ability to apply and extend their learning in meaningful ways?

4. **Integrating Complexity and Dispositions:** As we escalate the complexity of content and learning experiences, how can we simultaneously integrate dispositional strategies that support students' ability to engage with and persevere through challenging tasks?

5. **Aligning Interval Learning With Current Practice:** How can we effectively align the principles and processes of interval learning with

our existing instructional practices and routines? How can we effectively integrate and leverage all four levers (shifting our instructional cadence, defaulting to guided practice, purposeful instruction, and building agency) in a cohesive and mutually reinforcing way? What potential challenges or trade-offs might we need to navigate when implementing these approaches simultaneously within a learning environment?

NEXT STEPS

1. Here are potential steps to take based on what you've learned about the engagement criteria in this chapter. This action plan has been aligned to the Need It, See It, Start It, Show It process outlined as follows.

The Need It, See It, Start It, Show It Process

- **Need It**

  Identify a clear learning challenge or opportunity based on student data, classroom observations, or teacher reflection. This stage builds urgency and purpose.

  Example: *"Students are completing work, but not demonstrating deep understanding or engagement during independent tasks."*

- **See It**

  Clarify what success looks like by reviewing models, videos, routines, or walk-throughs that illustrate the practice in action. This stage supports shared understanding and builds teacher clarity.

  Example: *"Teachers observe or analyze a lesson segment where students are using attention check-ins and learner reflection routines during instruction."*

- **Start It**

  Take a small, concrete step to implement the strategy or routine. Focus on one class, one routine, or one learning interval. Build consistency before scale.

  Example: *"Start each math block with a 3-minute Learning GPS check-in where students clarify the goal and rate their readiness."*

  (Continued)

(Continued)

- **Show It**

  Collect and share evidence of progress, reflection, or impact. This might include student work samples, teacher reflections, video clips, or classroom observation notes. The goal is to make learning and growth visible for collaboration and celebration.

  Example: *"Students share end-of-lesson reflections using 'I used to think . . . Now I think . . .' to show conceptual change."*

Need It—What does your classroom need most?

Self-assess your classroom's current placement on the engagement criteria rubric (Table 1.1). For example, identify areas where students may be losing focus or engagement due to an imbalance in the pacing or rhythm. One way to do this is to observe and analyze how students' attention and engagement levels fluctuate during different types of learning activities and at various points throughout a lesson or unit. Identify moments when attention wanes, and brainstorm strategies from attention research that could help sustain engagement (novelty, movement, storytelling, etc.).

See It—After reading this chapter, what would be an observable difference for you and your students in the next few weeks?

Identify tangible shifts in student practice in three weeks in one of the four key areas of the engagement rubric. For instance, you may want to enhance student agency in the next three weeks. Determine what those changes would look like and sound like in the classroom.

Start It—What would be one small and doable strategy to get a quick win?

After reviewing your current placement on the rubric, select an approach to enhancing student learning that meets the following criteria:

- Start small—*make it manageable*. What is something small and doable that you can implement tomorrow with students?

- Sustain—*make it routine*. What is something small and doable that you can implement daily?

- Stack—*link it to current practice*. How will you link this practice with something you are already doing?

- Shelter—*don't add more*. How will you not add more to these practices?

- Sprint—*test your idea with a small sample*. How will you pilot this work with one class, section, or discipline rather than trying this out with everyone all at once?

- *Share*—measure your impact and determine next steps with others. How will you know your impact?

You might also select an upcoming unit of study and intentionally redesign the learning sequence to incorporate short intervals of instruction and include student practice. Experiment with different ways to balance complexity and purpose throughout the unit. In addition, evaluate the balanced mix of surface-level content acquisition, deeper conceptual understanding, and opportunities for transfer and application. Seek input from students on how to make the learning more meaningful and relevant to their lives.

Show It—How will you present your learning in a way that enables high support and accountability?

Carefully plan and implement learning experiences that leverage these approaches in a cohesive manner. Collect evidence on student engagement and learning outcomes to inform future iterations and wider implementation.

2. The following template provides a basic structure for classroom intervals. Use it to begin drafting your own interval lesson. Jot down any initial ideas you had while reading, or add any routines you currently do that might fit into these intervals. As you go through the rest of the book and learn more about each interval type, return to build and revise this simple template.

Scan this QR code to access a digital version of this template that you can download and fill out.

qrs.ly/oygwlbe

CYCLE	DESCRIPTION	ROUTINE
Cognitive Snacking *5 minutes* Spark and Sustain Clarity	*To start the class with clarity and focus, we will . . .*	
Launch Interval *3 minutes* Teach Transfer Early and Often	*To engage in transfer-level learning early, we will . . .*	
Content Interval *12 minutes* Design a Rhythm Between Surface and Deep Learning	*To ensure looping between surface and deep learning, we will . . .*	
Cognitive Snacking *6 minutes* Sustain Clarity	*To ensure clarity and recharge attention, we will . . .*	
Content Interval *12 minutes* Design a Rhythm Between Surface and Deep Learning	*To ensure looping between surface and deep learning, we will . . .*	
Cool Down *5 minutes* Consolidate Learning and Recharge Attention	*To consolidate learning and recharge attention, we will . . .*	
Pattern Breaks Check and Respond to Student Learning	*To respond to student learning in real time and adjust teaching throughout the lesson, we will . . .*	