How do you know if students are with you at the beginning, middle, and end of a lesson? Can formative assessment offer a key to better teaching and learning during instruction? What if you could blend different formative assessment moves in your classroom, with intention and care for all students, to help make better instructional decisions on the fly and enjoy more teachable moments?

Educators Brent Duckor and Carrie Holmberg invite you on the journey to becoming a formative assessor by encouraging you to focus on these seven research-based, high leverage formative assessment moves:

- **PRIMING**—building on background knowledge and creating a formative assessment-rich, equitable classroom culture
- **POsing**—asking questions in relation to learning targets across the curriculum that elicit Habits of Mind
- **PAUSING**—waiting after powerful questions and rich tasks to encourage more student responses by supporting them to think aloud and use speaking and listening skills related to academic language
- **PROBING**—deepening discussions, asking for elaborations, and making connections using sentence frames and starters
- **BOUNCING**—sampling student responses systematically to broaden participation, manage flow of conversation, and gather more “soft data” for instructional use
- **TAGGING**—describing and recording student responses without judgment and making public how students with different styles and needs approach learning in real-time
- **BINNING**—interpreting student responses with a wide range of tools, categorizing misconceptions and “p-prim,” and using classroom generated data to make more valid and reliable instructional decisions on next steps in the lesson and unit

Each chapter explores a classroom-tested move, including foundational research, explaining how and when to best use it, and describing what it looks like in practice. Highlights include case studies, try-now tasks and tips, and advice from beginning and seasoned teachers who use these formative assessment moves in their classrooms.

In Mastering Formative Assessment Moves, Brent Duckor and Carrie Holmberg elaborate specific instructional moves to help both novice and seasoned teachers deepen their formative assessment practices. Their vision is not to be added on top of other reform initiatives but fits perfectly within equity-focused, ambitious teaching practices aimed at deeper learning. I like that the authors push back against quantitative indicators as the best means for tracking learning progress and offer ways, instead, for triangulating and building upon qualitative windows into student thinking.

LORRIE SHEPARD
Distinguished Professor and Dean Emerita, University of Colorado Boulder

For two full-decades, formative assessment’s prevalence in our schools has fallen short of its proponents’ predictions—particularly given the research evidence supporting its effectiveness. Drawing on their own experiences as practitioner-researchers, Duckor & Holmberg have come up with a marvelous set of implementable guidelines, for both prospective and seasoned teachers, showing how the formative-assessment process can sparkle.

JIM POPHAM
Emeritus Professor, University of California Los Angeles, Graduate School of Education

The authors have performed a rare feat, they explain the ‘why’ of formative assessment at a high level, but Duckor and Holmberg also get into the nitty gritty of actual classroom level practice. Educators, both new and experienced, will find much they can use here.

BEN DALEY
Chief Academic Officer, High Tech High

In the book, the authors encourage educators to use these strategies to create a more equitable and formative classroom environment.
Acknowledgments

Every book is the culmination of years of struggle to broaden the horizon of a topic. The topic of formative assessment is a shared collective passion for many of us, part of a larger conversation that has taken place in many settings, with different participants, over many years.

First, we would like to thank the teacher candidates and graduates from the College of Education at San Jose State University for whom this book began to take shape in EDSC 182 Classroom Evaluation and Assessment as part of their preservice coursework. With their authentic engagement, sharp criticism, intellectual curiosity, and continued patience, we worked out the broad strokes of the argument for *Mastering Formative Assessment Moves: 7 High-Leverage Practices to Advance Student Learning*. To those 182ers who took up the challenge and extended our own thinking on the topic of formative assessment—integrating novice and expert practices in a set of teacher learning progressions which ultimately became their own—we owe a deep debt of gratitude. These former students are now teachers, department chairs, vice principals, and instructional coaches. We are especially thankful to Courtney Arndt, Natalia Babella, Sarah Bass, Andrew Christian, Tim Ciardella, Marco della Maggiore, Paul Durdle, Ally Finch, Kaila Glassburner, Mary Gustafson, Jon Hinthorne, Nick Honda, Chris Johnson, Chelsea Kavanaugh, Erica King, Emily La, Corey Liggins, Sylvia Liu, Maria Mesa, Sarah Michelet, Onette Morales, Carl Ponzio, Russ Ramos, Manny Vasquez, Brett Vickers, Roy Walton, Wen Xi, and Julia Yeager for helping us to think
through different aspects and important turning points in the development of the framework.

We are also grateful to our in-service colleagues in mathematics and science who have allowed us to conduct research in their middle and high school classrooms. Among these are Marie Pink, Mikaela McKenna, Steven Shirley, James Sperry, and Diana Wilmot. Each participated in the public dissemination of the “FA [Formative Assessment] Moves” story in district professional development workshops, state and national conferences, and other public forums.

As we shared our findings and discoveries about formative assessment moves with new audiences, we owe a special thanks to folks in the Pacific Northwest. In Oregon, we were welcomed by several district leaders, including Reta Doland (La Grande Unified) and Melissa Linder (Astoria), and a group of dedicated, tireless teacher-advocates for formative assessment. A special thanks to Cristen McClean and Derek Brown at the Oregon Department of Education for offering us the opportunity to share new tools, approaches, and materials to professional development in their districts and school communities.

In California, we found fellow FA travelers in urban, suburban, and rural school districts. Professional associations and multidistrict consortia, including the East Side Alliance, invited us to join them in a deeper commitment to assessment for learning. A special thanks to Robert Linquanti and Neil Finkelstein at West Ed; Margaret Heritage and her group at the Council of Chief State School Officers-FAST SCASS; Manny Barbara at Silicon Valley Education Foundation; Angelica Ramsey, Cecilio Dimas, and Bernadette Salagrino at the Santa Clara County Office of Education; and David Plank at Policy Analysis for California Education, for offering us the opportunity to tell our story from the vantage point of a large, diverse public teacher education program. At a time when state university systems struggle for resources, visibility, and support, these educational leaders invited us to tell our story.

Of course, we cannot forget how this story began and the people who made it possible at ASCD. The publication of “Formative Assessment in Seven Good Moves” in spring 2014 in Educational Leadership was the basis for this book. Thank you to Marge Scherer, who was EL’s editor in chief, for putting our FA Moves framework in the issue dedicated to “Using Assessments Thoughtfully” and with august company. With this stepping stone, we sought out and began a tremendously important relationship with our editors at ASCD, Genny Ostertag and Darcie Russell, who also believed in us as newcomers. Genny’s broad
experience, inspiring analytic skills, and compassion for our vision, combined with Darcie’s hard eye for what really matters and how to best express it, has made us better writers. Any errors and omissions, of course, remain our own, but we learned from the ASCD team and we thank them for their patience with and concern for us as emerging writers in this genre.

Family, friends, and colleagues are ultimately the unsung heroes of any long-term project. We are blessed to have partners to live through the promise and ultimate joy of producing this book. Without the sustaining love and commitment of our spouses, Barbara Nakakihara and Bob Holmberg, we cannot imagine standing here today with our book in hand. Our children—Sydney, Vivian, and Hazel—have also inspired, cajoled, and pushed us to think more deeply about the promise of formative assessment in the middle and high school years. Many morning car rides, dinner table discussions, and banter along the hiking trails have been spent in dialogue about formative assessment. We are grateful to our children in particular for sharing their passion for formative feedback, and reasons why formative assessment matters to them as learners.

We remain grateful for the ongoing support from Misa Sugiura and Lorri Capizzi, who read versions of the manuscript and provided hope when deadlines loomed and we were overwhelmed by the competing demands of family, school, and work. They reminded us that there are no shortcuts to working in your own voice, and that limited time and resources must never be the enemy of professional integrity and personal truth.

Other friends and colleagues from the university and educational research community kept an open ear as we bounced ideas off them over the years. We are grateful to professors Mark Wilson and Richard Shavelson for their unwavering support for the ideas and principles that animate this book. We have also gathered many insights about teachers and teaching from colleagues over the years including Roberta Alququist, Paul Ammon, Carlos Ayala, Wendy Baron, David Berliner, Tim Boerst, Karen Draney, Mark Felton, Bruce Fuller, Maryl Gearhart, Margaret Heritage, Joan Herman, Carolyn Huie-Hofstetter, Jonathan Lovell, Deborah Lowenberg Ball, Diane Mayer, Pamela Moss, Dan Perlstein, Jim Popham, Joanne Rossi Becker, María Verónica Santelices, Lee Shulman, Deb Sigman, Kip Téllez, Mike Timms, and Mary Warner.

We owe a special debt of gratitude to John Hattie, whose professional generosity and intellectual clarity remind us of the importance of this work and how much more there is to be done. These scholars and education leaders have
written about what is best in public education and what works; none has lost sight of the power of formative assessment to shape outcomes and achievement for all students.
Foreword

This book does something new for its reader. It brings to life—with real world examples drawn from rich engagement with new and seasoned teachers—how to think of one’s self on a trajectory of powerful practices that unite instruction and assessment. The idea of developmental approaches to student learning is not new, but the authors have seized on something with their new framing of the literature, what they provisionally call teacher learning progressions in formative assessment practice. This is not the place to explore the merits of such an approach. Instead, we need to make room for new voices and a new vision that the next generation of scholar-practitioners has brought to the table. This work invites us into a fresh conversation.

For those of us with long memories and the willingness to look across our respective ponds, the debates about the true meaning of assessment have raged for decades in the United States, Australia, and, of course, England. We all have had different ways to communicate what assessment means—to different audiences, in different times and settings. Bob Stake (1976) has said that when a cook tastes the soup to make just-in-time improvements, it is formative. But, when a guest sits down to taste the soup and evaluate the “final product,” it is summative. Formative evaluation occurs during the learning, summative at the end of the marking period. Both are important to schools, teachers, and students.

Surely the point of tasting the soup, while the cook and staff are gathering feedback about its progress, is to maximize the chances that when the guests taste the dish, it will be an excellent result—from multiple perspectives. Viewed
this way, the process of formative feedback leads us to optimal summative achievements. Both purposes of assessment matter, but in different ways.

Today’s evaluation theorists make the distinction between formative and summative very clear, as did Michael Scriven (1967) when he invented the terms 50 years ago. He claimed the difference between formative and summative was related to the purposes, goals, timing, and how information is used in a system or organization. Formative was more to improve and guide stakeholders; summative to provide a set of claims about what has happened, that is, what value we can attach to the target performance or outcome.

Soon after Scriven wrote his work, Bloom “borrowed” several ideas about the role of evaluation in educational settings. The term formative and summative assessments (Bloom et al., 1971) were coined. This move was unfortunate in that it set up a language game we now play, labeling some test instruments formative, others interim, and still others summative. The ostensible type of the instrument—not the purpose, use, timing, and information uses of any instrument—became the decisive factor in our evaluation and assessment discourse. Educational assessment experts never gave Scriven sufficient credit for the invention of the terms and his specific approach to making judgments. Instead, we were left with boxes, categories, and labels for tests—with many unfounded claims about the power of the “summative” test instrument and little evidence for the efficacy of the uses of any particular tool.

For too many students in primary and secondary schools today, assessment has become synonymous with numbers and grades. The principals, school districts, or government officials make a set of summative claims about what students know and can do. They put up charts, color codes, and mark the students’ work as done. Summative assessment has become a powerful signal: learning is over; the grade or number is your “feedback” and it’s now time to see how you stack up against another.

Duckor and Holmberg reverse these claims about “formative” versus “summative” assessment by providing a lens that relies much more on the nature, timing, and use of assessment information during the lessons; much more on the interpretations by students and teachers of so-called “soft data” generated with attention to speaking and listening; much more reliance on understanding the staccato and cycle of learning, where the students are right now and the possibilities for moving them forward.
But the authors do something more: no longer are we stuck in debates about the meaning of the objects—the tests, the quizzes, the homework—in assessment and evaluation. Rather, we can move toward the challenges and opportunities of using all sources of data. In this book, classroom data are generated by subjects (persons) for subjects (other persons) to learn from and interact with during instruction. Rather than focus on *assessment*, which signals a stand-alone event or an alpha-numeric ranking, the authors rightly emphasize the process of *assessing*. Their new language of moves and tangible practices refocus the field toward pedagogical action in the classroom.

In the Introduction, Duckor and Holmberg ask: So, why another book on formative assessment and evaluation—and why now? Hasn't it all been said before? Everyone knows that formative assessment and evaluation in the classroom make a difference in students’ lives and produce better outcomes, right? My provisional reply: Yeah right, so why is there still an overemphasis on summative testing; an overemphasis on providing scores and numbers; an overemphasis on commercial companies pouring out “mile-wide, inch-deep” tests used for accountability purposes to see if teachers are doing their jobs? Why have teachers not been provided with tests aligned with the curricula and their immediate teaching needs that measure growth?

For decades, the research community has known that formative evaluation and assessment stand at the center of effective instruction. My own work (Hattie, 2012), as well as many others’ work, reminds us that assessing during learning makes a real difference in student outcomes. Powerful, tangible results come from teachers who are assessing and reassessing student learning—minute by minute, hour by hour, day by day. But it is the quality of information from this assessing “for learning” that is the focus of this book.

We need to move away from defending the use of formative evaluation in terms of it being better than summative, and, instead, ask how to implement formative thinking to thence maximize the summative impact on students. This means, as this book ably demonstrates, striving for a deeper understanding of instructional decision making, ways of thinking and reflecting before the whole class, and powers of listening well and demonstrating to students that you have listened before offering feedback. The authors further remind us: formative thinking means developing an expansive and flexible repertoire of speaking, listening—and therefore, thinking—skills on behalf of teachers for students.
During my years working in New Zealand I led a team to develop the national assessment scheme for elementary and high schools (e-asTTle). It was based on providing teachers, students, parents, and school leaders with up-to-date information and interpretations about where students were going, how they were going, and where they were going next. The emphasis was on providing assessment information back to teachers about their impact (especially over time)—who had they impacted? About what? And to what magnitude? Our approach to assessment was as much about generating feedback to teachers about their impact as it was for students to gauge growth. Our goal in these systems was to allow formative evaluation and assessment information to provide feedback to teachers about their progress with their students’ and their own development.

The primary function of classroom assessment must be to support learning by generating feedback that students can act upon in terms of where they are going, how they are going, and where they might go next. This involves, necessarily, that students participate in the assessment of their own learning—and that they learn to recognize and understand main ideas and to apply new learning in different ways and situations. The core notion is that students who have developed their assessment capabilities are able and motivated to access, interpret, and use information from quality assessments in ways that affirm or further their learning.

One of the central questions addressed by this book is how to support teachers who are developing classroom assessment approaches that reveal rather than obscure these feedback loops (Sadler, 1989). By reframing the formative assessment and evaluation literature as high-leverage, interlocking, and real-time instructional moves that yield assessment information for teachers and students, Duckor and Holmberg have reminded us of the interconnection between good teaching and good assessment practice. Rather than merely expect that teachers transmit knowledge to students about their status or standing, the authors invite us to see how various classroom-based assessment moves can, in fact, maximize information exchange and flow. Like cooking or dancing or orchestrating “live action,” theirs is a lively, enriching, and optimizing approach to the formative purposes and practices in classroom assessment.

The theme throughout this book is on the depth and use of pedagogical knowledge by teachers; the shift from spotlighting their talking to honing their skills in active and informed listening; the focus on ensuring students understand their feedback; and the critical nature of the moment-by-moment decision
making about the learning. Developing this depth and these capacities—and using them well to advance student learning—is, as they testify, not easily done. Teacher progression in these areas takes commitment, effort, time, and support.

Duckor and Holmberg’s work has implications for teacher development. That is clear. Their work, however, could also influence changes needed in how observations of teachers could help them progress in their practices. Observations of teachers have tended to lead to recommendations about how to change how they teach or what teachers should do. It is much harder to “see” the decision making, the judgments that teachers are making unless we focus on observing the impact of the teacher on the students. Quite a mind shift. Duckor and Holmberg offer language and ideas—a conceptual framework, the seven moves—for classroom practice that can help make what’s hard to see more “seeable” and more discussable. Groups of teachers being able to discuss their practices together through the lens of the moves may be the most powerful impact this book will have.

These formative assessment (FA) moves highlight the importance of teacher listening, seeing learning through the eyes of students, and checking to see whether their feedback has been understood by the students. It is not sufficient to merely give formative feedback, but to check whether the feedback has been understood, and is therefore usable by the student. These are strong messages for teachers who wish to pose questions more strategically, to reduce their talk time, and to use visible pausing and listening procedures, while inviting students to “think aloud” about their current understanding.

The authors also remind us that we must first create high levels of trust so that students can say “I do not know” and seek formative feedback from one another and their teachers. In this moves-based framework, there is a relentless checking for understanding—minute by minute—by probing to see what the student understands and does not yet understand. There is focus on interpreting, categorizing, and evaluating the students’ learning experience (they call this “bining”) so that valid and reliable instructional decisions are more likely. Duckor and Holmberg remind themselves as teacher educators on this journey as much as us the readers: the power of formative is very much in the “not yet.” We all have a role to play to make this happen.

The message that also weaves through this book is on the depth of pedagogical knowledge by the teachers, the move from the talker to the listener, the focus on ensuring students understand the teacher’s feedback, and the critical nature of the moment-by-moment decision making about the learning. Working for over
a decade with novice teachers, Duckor and Holmberg have earned their knowledge of formative evaluation and assessment “in the lab,” so to speak, of preservice credential programs. They find teachers are individuals, working within the norms and code of particular subject disciplines, each struggling to make a move in the mathematics, art, physical education, world language, history, science, English, or the music classroom. As they share the stories of teacher candidates, we see how much harder it is to prime, pose, pause, probe, bounce, tag, and bin than we first thought. It turns out these seven high-leverage practices require a deep respect for the student teacher, what they bring to the university class and clinical placement, how they think and react, their motivations and how to enhance these, and their understanding of what it means to learn to become a formative assessor.

The FA moves framework requires building trust not only between the teacher and the students but among students for them to seek help, expose their misunderstanding, and explore together how to improve. These moves invite teachers to move beyond surface content knowledge to enabling students to make connections and explore the joy and creativity of forming new relations between seemingly unrelated ideas. These moves require the development of so-called expert teachers who are reflective, enthusiastic, passionate, and knowledgeable about the content and understanding of the lesson. These seasoned teachers and those they mentor into the profession need to care to make the difference, preferably caring about their subject matter, and caring about all their students’ achievements.

For those who study and advise teachers, classrooms, and schools, the seven moves are powerful reminders of the expertise required to invoke formative evaluation during the lesson. It is so much easier for educators to keep talking, to pathologize the students as having problems (because of their post-code, their lack of prior knowledge, their deficit motivation, their lack of attention), and to say “I taught but they did not learn.” It is so much easier to announce “Wait, in eight weeks I will give you a test and you can see if you learned anything from this course!” It is so much easier to talk in generalities and “do nows” about formative assessment as if one could separate practice from theory. Duckor and Holmberg ask us to pause, giving us a new grammar of practice and robust theoretical framework, connecting instruction with real-time, embedded assessment.

Years ago, Dylan Wiliam and Paul Black (1996) advised us not to use the terms formative and summative assessment, as their experience in the United Kingdom
was that these terms were too easily misused. Governments started adopting these labels for almost everything they do in hope of providing a cloak of respectability to any measure they advanced! Educational systems and policy makers were also apt to misuse both terms, and justify their “data driven” policies without careful consideration of either the formative or summative claims advanced on behalf of their “metrics.”

In an age obsessed with “big data” and quick solutions, Duckor and Holmberg have given us a rare treat by placing the assessment emphasis back on the work of teachers and students, who are teaching and learning together in a community, and making sense of the assessment information that may be formative or summative depending on its use. More exciting, they have moved the field forward with their focus on the seven ways of thinking and doing FA and they have presented a rich tapestry of ideas and strategies to maximize the power of formative evaluation in today’s classroom. Enjoy.

—John Hattie
Laureate Professor, Director of the Melbourne Education Research Institute
Melbourne Graduate School of Education
Introduction

Why a book on formative assessment—now? Hasn’t it all been said before? Everyone knows that formative assessment (FA) in the classroom makes a difference in students’ lives and produces better outcomes, right?

For decades the research community has known that formative assessment or formative evaluation (as it is called in the United Kingdom, New Zealand, and Australia), stands at the center of effective instruction. Hattie (2012) and others remind us that assessing for learning makes a real difference in student outcomes. Powerful, tangible results come from teachers who are assessing and reassessing student learning—minute by minute, hour by hour, day by day.

If Rick Stiggins (2002) and other educational researchers know it works, and teachers acknowledge its practical uses in classroom assessment, why are we still talking about “assessment for learning” all these years later?

The Challenge

The paradox is that most of the “hard” data we have on the powerful effects of formative assessment on student achievement is built around the unglamorous work and sustained understanding and use of “soft” data in the classroom. We know that exit slips, word webs, gallery walks, peer feedback, quick writes, pair-shares, and a host of other techniques generate the soft, difficult to quantify data needed to make instructional decisions on the fly. Only by carefully attending to this classroom-level data can we hope to provide better feedback to our students.
We wrote this book to raise and address these essential questions: What if the “formative” aspect of classroom assessment isn’t that visible or easy to do after all? What if “assessment for learning” looks a lot like what everyone else calls “good” teaching? What if FA is just another fancy way to talk about “checking for understanding”?

It is true. Deep formative assessment practices blur the line between instruction and assessment. Most people associate assessment with quizzes, homework, and test events: the “stuff” of classroom assessment and evaluation. But assessment for learning occurs during our lessons. FA practices are interwoven into teaching segments and each invites an exchange of information between teachers and students. To those who are unfamiliar with the complexity and intricacies of the dance, it can be hard to know what we are observing in the formative assessment-rich classroom. Moves are invisible; dynamics are undetected. Hence the familiar reply to this literature: “Aren’t we just talking about good teaching?”

Formative assessment—the moves, strategies, and daily tactical adjustments used to check for understanding—seem obvious to those who are effective teachers. The careful, sustained observation of FA “moves” can seem like a black box (Black & Wiliam, 1998) to those who are interested in traditional classroom assessment. It takes a trained eye to know what to look for and how to evaluate and coach formative assessment-driven instructional practices.

In our roles as educators—teaching at the university, supervising clinical placements, and working in professional development contexts—we have discovered through trial and error that the formative assessment story is hard to tell. The basic narrative is that it works, try it, it couldn’t hurt. Although by now extensive research shows that assessment for learning has benefits that accrue to a diverse group of learners, the fact remains: we don’t always know which practices are most effective, when to enact them, and why a particular combination of moves actually worked for a particular student in a particular classroom.

Take the example of feedback, a hallmark of the formative assessment lexicon. We know that best formative feedback practices must be specific, addressable, timely, ongoing, and content-rich (Wiggins, 2012). But many teachers, school counselors, paraprofessional staff, and administrators don’t have a clear idea of what these terms mean or how to best observe them, let alone coach others to improve. Moreover, grading and accountability policies often place competing demands on teachers’ time, energy, and available resources for enacting best practices in classroom assessment and evaluation.
Part of the challenge with the formative assessment story goes beyond finding mutual agreement of terms and definitions or the adoption of a particular expert’s framework. We venture a more provocative explanation regarding the many barriers to becoming a formative assessor. This book takes a look at those challenges and opportunities by breaking down “high leverage” practices, as we dive deeper and explore how different moves are connected.

We hope you will agree: the biggest challenge to assessing formatively during instruction is to recognize a new stance—toward oneself and one’s students. We are all learning to become formative assessors. We each have a stake in moving the work of assessment for learning forward. There is no single correct path on this journey but there is a complex continuum of development and growth—for teachers, by teachers, and with teachers building their professional knowledge and skill base.

**Teachers as Learners**

Our book puts the focus on the development, growth, and journey of those who are learning to become formative assessors, whether new to the profession or not. We honor the prior knowledge of all teachers, that they are struggling to assimilate and accommodate new concepts and information, and that the gap between where they are with classroom assessment routines and where they want to be with formative assessment best practices is real. Of course, beliefs about grading, standards, and testing are also a part of the teachers’ prior knowledge; each conditions how we build new and replace old mental models of classroom assessment. We speculate, after working for nearly a decade with preservice teachers, that what we call “teacher learning progressions” are just as important as student ones (Shavelson et al., 2010).

We have written this book to help you walk the walk and not to merely talk the talk of formative assessment. The formative assessor is not solely a teacher who transmits knowledge to students and this book is not written in the spirit of a sit-and-get session or a step-by-step program to immediate success. Rather, we wrote it to guide you toward the professional vision of being a lifelong learner, thus the emphasis on the journey and becoming (rather than on being) a formative assessor. We want you to feel that sense of aspiration and promise that comes from discovering new skills, powers, and capacities to learn about FA moves.
As you read ahead, we also want you to imagine yourself more and more as a formative assessment “guide on the side” for your students. You are becoming, with a little coaching chapter by chapter, a formative assessment guide who is opening up new worlds of classroom learning and communication, where people exchange ideas, give one another feedback, solve problems, and face difficult subjects with intentionality and care.

We predict that you and your students will feel frustrated, get stuck, and wonder why you can’t just get back to normal routines in classroom assessment (what we call “doing school”). After all, we all know there are times when “doing formative assessment” is a lot harder than handing out a quiz, collecting homework, or administering the unit test. Posing questions is messy. Probing for deeper responses is time-consuming. Tagging student ideas can be risky. Pausing for “think time” may become awkward and counter-productive.

The difficulty of making formative assessment moves can be compounded by concerns, especially when well-regarded strategies and practices fail to bring about an immediate, positive, or visible change in classroom dynamics. Beginning teachers sometimes get uncomfortable and nervous. Mentor teachers and university supervisors are not always convinced about the power of formative assessment. Principals and administrative staff may continue to wonder: Why are you asking why so much? The kids are shouting out and are still too noisy. No one seems to be listening. The room looks and feels chaotic when everyone goes to the whiteboard. Too many want to speak at the same time. Do you really have time to make that word web and call all students to the board to add their ideas with sticky notes?

Part of the challenge is agreeing upon a new frame. In this book, we argue that it’s time to see ourselves—all teachers, school counselors, administrators, and staff—on a continuum of growth in understanding and practicing formative assessment moves. It’s time to address, support, and coach one another—as we make progress—with this highly complex, nuanced set of instructional practices that are also assessment practices. We must move beyond the expert–novice divide that reinforces a deficit approach where some teachers are more literate about classroom assessment than others. Rather, we propose that there are trajectories of moves and progressions of practice in the world of formative assessment. Some known, others not as much. The key is to uncover and discover where one is.

Becoming a formative assessor means finding one’s own zone of proximal development—with students and with colleagues—and embracing the journey.
Toward a New Formative Assessment Frame: One Move at a Time

If formative assessment is a process (not merely an event or tool) that occurs during instruction, then we should be able to map the “FA moves” that bring it to life in our classrooms.

We maintain that how teachers, new and experienced, can grow in their formative assessment practice will depend in part on the coaching, feedback, and adjustments available to guide the teaching and learning experience. As you read along with us, imagine these FA moves are major units of instruction on how to master formative assessment; inside each chapter we’ve offered some lessons, examples, and “do now” activities to support your learning. But you will inevitably discover, along with us, how unique and particular practices fit best into your own classroom and school.

Our teacher-driven learning progressions framework consists of a set of seven interrelated instructional moves, each with its own distinct trajectory, bottlenecks, and occasional pitfalls.

Let’s take a moment and revisit the essential question that drives our story: what makes assessment formative and how do we know when we witness it? Is assessing formatively an impossible ideal in a world of standardized testing? Is assessment for learning an over discussed, passing fad that obscures the real work of mastering the subject and making the grade? Does doing formative assessment well mean we should stop assigning points to quizzes or spend more time collecting exit slips rather than uploading grades each night? Hardly.

Doing formative assessment in today’s culturally, linguistically, and economically diverse classrooms depends greatly on teachers’ and students’ use of academic language—producing language, taking in language, and sharpening language skills (Hakuta, 2013). Some conceptualizations of formative assessment are more explicit than others in their focus on language use. Ours puts a premium back on verbal and non-verbal feedback—real-time exchanges—among teachers and students.

Our concept of formative assessment is based on the notion of teacher learning progressions that are enacted during instruction—a set of FA moves we call priming, posing, pausing, probing, bouncing, tagging, and binning. See Figure 1 for the FA moves a teacher can orchestrate in myriad combinations.

Each FA move lends itself to sustaining a deeper focus on the development of academic language for all students, which is critical to fostering equity in, for example, STEM learning and teaching. Doing FA means teachers initiating and
Figure 1  Formative Assessment Moves for Teachers

- **TAGGING**: Sampling a variety of responses intentionally and systematically to better map terrain of student thinking.
- **BINNING**: Noticing patterns in student responses, categorizing them along learning trajectories, and using them to inform next steps.
- **PRIMING**: Preparing the groundwork; establishing and maintaining norms; acting to acculturate students to learning publicly.
- **PROBING**: Asking follow-up questions that use information from actual student responses.
- **PAUSING**: Giving students adequate time to think and respond as individuals or in groups.
- **POSING**: Asking questions that size up the learner’s needs in the lesson and across the unit.
- **BOUNCING**: Publicly representing variation in student thinking by creating a snapshot or a running record of a class’s responses.
- **PUBLIC**: Asking questions that size up the learner’s needs in the lesson and across the unit.

*Formative Assessment Moves*
orchestrating openings for scientific and mathematical reasoning and investigations (CCSSI, 2010). A primary goal during these FA-driven lessons is to keep the dialogue among the teacher and students flowing, with just-in-time moves that promote conscious, strategic uptake of student thinking that can be used to make instructional decisions during the lesson (Duckor, Holmberg, Rossi Becker, 2017).

Whether teaching elementary, middle, or high school, FA is more than “checking for understanding.” Formative assessment as we conceptualize it helps teachers to learn more about students’ understandings and to productively respond to those understandings (not merely “misconceptions” or “wrong” answers) during class. We think of FA as a dynamic pedagogical process among students and teachers. It requires acts of planning, instructing, and reflecting on soft data to make better decisions.

It will be clear as you make progress through each chapter that our conceptualization of FA moves, like Sadler’s (1989), places a premium on feedback loops in classroom talk, the building up of repertoires of auditory and verbal skills, and providing instructional space for students to use academic language and register as they work together in real-time. Like Shepard (2009), our definition contrasts with those who orient formative assessment toward high-tech products, data mining, and interim testing events. We also agree with Linquanti (2014) and his colleagues that assessing formatively should emphasize real-time instructional processes and the uses of actionable feedback.

For those of you who’ve been at this work for a while, it is worth noting that our moves-based conceptualization of classroom formative assessment relates to Dylan Wiliam’s framework, in particular, how teachers can engineer effective classroom discussions and present tasks that elicit evidence of learning (Wiliam, 2007). We recognize the significance of classroom discourse in laying groundwork for effective feedback, especially how teachers can consciously pose questions that serve various purposes and provide a “window into thinking” (p. 1,069).

These seven FA moves, as we call them, create opportunities for all students to interact productively and persistently with higher-order thinking. In combination with the teacher’s subject preparation and content knowledge, the FA moves can help teachers make sense of what students know, make connections among ideas, and facilitate the process of learning in more transparent, visible ways (Heritage, 2007, 2010).
The Art and the Science of FA

Teaching is the art of balancing lesson planning with improvising, move by move, with your students during instruction. Sometimes it is hard to see that improvising FA moves can yield insight into student thinking about the lesson topic. We forget that re-posing a question, scaffolding a probe with a sentence frame, or reintroducing a think-time procedure in response to students’ verbal and nonverbal action—or inaction!—are assessment strategies that have as much or more power than traditional classroom assessment tools such as worksheets or quizzes.

Although it’s tempting, especially for beginning teachers, to gravitate toward the “test event,” we strongly suggest staying the course with assessment for learning strategies. A sustained focus on posing and re-posing questions, scaffolding probes with visual aids and cues, priming wait-time and sampling procedures, and tagging all student responses publicly will pay off. But it takes time, practice, and a willingness to learn, re-think, and re-adjust one’s “first draft” moves (Lovell, Duckor, & Holmberg, 2015). We’ve noticed a few things working with beginning teachers: they tend to focus on the test or quiz event, the concrete assessment task, the “thing” they can collect, evaluate, and grade.

This should not surprise us. We are drawn to what appears to be hard data, not soft. We like to believe that one type of assessment data is objective, the other subjective. We privilege the numeric score or letter grade over the informal student response or idea shared on the dry erase board. Is it time to flip the model and get better at using all the available (soft, informal, fleeting) data in the classroom? In a word: yes.

Formative assessment for the next generation of classroom teachers will look different from the last. An FA moves framework will necessarily emphasize the role of developmental trajectories and learning progressions—for students and for teachers—on the path to 21st century learning and skills development (see, e.g., Masters & Wilson, 1997; Black, Wilson, & Yao, 2011). It will emphasize trajectories of growth and feedback for teachers. The new FA moves framework will go beyond technique—it will evoke a new mindset.

Bottom line: FA is more than parroting a guided inquiry pedagogical technique or calling more frequently for “thumbs up, thumbs down” during a lesson. The FA moves-based framework requires pedagogical, affective, and cognitive strategies for re-engaging students who say, “I don’t know,” or “Huh, what is a function?” or just shrug their shoulders and stare when they inevitably get stuck.
“Stuckness” is, as we now know, part of the learning process. When we struggle to learn something new, we have to assimilate and accommodate, encode and retrieve, call up old and work with new information. Formative assessors embrace how kids learn, and they prepare lessons to make it happen.

The vision of FA explored in this book asks us to open the flow of communication—in all aspects of our teaching—and to take up the challenge of making moves that make a difference with and for our students. We invite you to join us. Now.

Our Journeys in Teaching and Learning

Brent Duckor

I began my high school teaching career in Hungary in 1989 and continued in New York City in the 1990s. Both U.S. and international educational contexts have shaped my deep appreciation for the role of school systems, public policy, and community values in what is considered possible for students and teachers striving to become active, engaged learners in democratic societies.

At Central Park East Secondary School’s Senior Institute in East Harlem, I taught government, economics, world history, and (later) social entrepreneurship as part of a federally funded school-to-college program from 1996 to 2000. I am forever grateful to the students, teachers, staff, and parents at Central Park East Secondary School who taught me the meaning of assessment for learning (before I’d ever heard the term), while encouraging diversity of thought and academic excellence for all students.

With the pending passage of No Child Left Behind in 2001, it was time to return to graduate school to obtain a PhD in Quantitative Methods and Evaluation at the University of California–Berkeley, to better understand the critical role of standardized testing on alternative assessment systems developed by New American and Urban High School projects that had flourished at the close of the 20th century. The Big Picture Company, High Tech High, and the Coalition of Essential Schools had all supported new approaches to assessment—eventually my perspectives broadened to the historical, public policy, corporate, and technical “purposes” of educational testing and evaluation.

The faculty at UC–Berkeley’s Graduate School of Education intensified and invigorated my commitment to the study of educational assessment—as a lever for classroom change and not merely an accountability tool for policy makers.
Following in the footsteps of my mentors, professors Mark Wilson and Richard Shavelson, the potential link between formative and summative assessment systems continues to fascinate me, though my research has taken a deeper dive into the former practice to explore new ways of conceptualizing teachers’ growth.

Since 2008, I have taught preservice teachers in the Single Subject Credential program at San José State University’s College of Education. In one of the most diverse public teacher preparation programs in the California state university system, we have pioneered a course called Classroom Assessment and Evaluation, devoted to deeper study of research-based assessment practices, and have graduated a new generation of teachers ready to take up the call of assessment for learning. Working closely with language arts, mathematics, physical education, science, art, music, social science/history, and world languages teachers in both preservice and inservice contexts over the years has humbled and deepened my appreciation of the nuance and complexity of becoming a formative assessor.

Looking back on the 20th century innovations in portfolio-based assessments, exhibitions, rubrics, oral examinations, and graduation committees assembled to review student work and to check on standards of excellence—all these educational reforms seem like a distant dream now. What remains for me, in writing this book, is the promise of formative assessment for all. I now see hope in the drive toward a deeper commitment to teaching students to use their minds well, and to create spaces in classrooms and schools for deeper engagement with our students, in part by speaking with and listening to them more than we imagined necessary or possible. At this moment in the history of schooling, the call could not be clearer.

Carrie Holmberg

I taught 9th grade English, Intermediate English Language Development, Advancement Via Individual Determination (AVID), and journalism at a racially, ethnically, linguistically, and economically diverse Title I comprehensive high school of nearly 2,000 students in a K–12 unified school district in Silicon Valley for several years. At Wilcox High School, I learned to work as a member of a highly collaborative, reform-oriented, creative, ambitious English department. Prior to the implementation of No Child Left Behind, I thrived with my students and colleagues as we focused on writing as a process, one-on-one conferencing, reading for pleasure, portfolio assessment, and project-based learning. We may
not have called it formative assessment back then, but we certainly lived assessment for learning with our students.

After having transitioned to work mentoring and inducting new teachers at middle and high schools partnered with Stanford University, I renewed my National Board Certification by “borrowing” a class of junior English Language Arts students at a small charter high school in San José. Nearly all became the first in their families to attend college and that invigorated my commitment to the power of assessment to change lives. Engaging in research projects with the Stanford Partner School Induction Program and the Silicon Valley New Teacher Project, as well as working as a teacher consultant with the Bay Area Writing Project, helped me hone my clinical work with teachers.

I joined the College of Education at San José State University as adjunct faculty in 2011. I’ve been fortunate to work closely with preservice teachers in the Single Subject Credential Program and to teach courses in Phase I student teaching, English methods, and classroom assessment. In June 2014, I enrolled in the doctoral program at SJSU. Under the guidance and advisement of Dr. Brent Duckor, Dr. Joanne Rossi Becker, and Dr. Diana Wilmot, I pursued my dissertation research, which explores teacher learning progressions in formative assessment. My work focuses on posing, pausing, and probing progressions in the context of middle school mathematics classrooms for the purpose of improving “lesson study” feedback to teachers. I will obtain my EdD in educational leadership in 2017 from SJSU.
Bouncing

It was sobering to learn that during the entire period I’d heard from only three students. There are 29 in that class.

_Mirabelle, math teacher_

Focusing on bouncing means taking responsibility for the amount and kinds of information I get—and most important, who I get it from.

_Arturo, physical education teacher_

Everyone in schools is talking about data. Data systems. Data management. Data mining. In an era of accountability and high-stakes testing, we are expected to use more and more quantitative indicators. Some now talk about “big data” and how we can gather more information from students while they are being tested, using a web-based testing platform, or their smartphones to interact with testing companies’ products and services.

Traditional paper and pencil assessments, including online standardized tests, produce lots of data because they take large samples from the student population. These instruments also have a very broad reach and can cover vast swaths of student sub-populations, giving the appearance of equity and inclusion. It is true, as any summative assessor will tell you: standardized tests allow us to summarize trends and to establish proficiency targets for the system.

Scores on benchmark assessments, the number of homework assignments completed, the letter grade earned if corrections are made to a test or
quiz—these “public” numbers give us confidence that something has been measured. In the aftermath of No Child Left Behind, we learned that the data points matter to school administrators and policymakers. These summative assessors prefer “hard, objective” data over the “soft, idiosyncratic” data generated by non-standardized assessment tools and teachers. Exit slips, word webs, quick writes, so the argument goes, are no match for the multiple choice and short answer items designed by experts (Bennett 2011, 2014).

So far, teachers have felt compelled to play this game. But we know that most teachers also value so-called “soft” data and cherish the just-in-time information that can be garnered through rich formative assessment practices. It’s time to speak up for what interests us:

• We want to know how the kids’ energy and concentration levels are affecting this morning’s lab and what we can do now to move things forward;
• We want to know, after using a set of probing questions, which particular hand signals and gestures led to better positioning on the field or which feedback technique worked best with a struggling student in the band room;
• We want to know which specific rubric elements “landed” in the next written draft and which ones didn’t, why, and for which students;
• We want to know who got stuck in the transition from the “I do” to the “we do” portion of the art lesson, who had trouble focusing today on the objective for the group project, and how to re-POSE the guiding question so everyone can make progress.

In this chapter, we introduce the concept of bouncing to increase the depth and breadth of data points available to the formative assessor. Whether we’re talking hard or soft data, there are no shortcuts to sampling from a wide variety of data sources (oral, written, kinesthetic responses) during instruction. A sample of student thinking that is too small, too narrow, and not representative, helps us little in making good instructional decisions—and helps the kids even less with next steps.

That’s where bouncing comes in. Formative assessors know that bouncing moves aim to widen the net of observation so the teacher can get more robust data to use during instruction and the learning segment. Bouncing moves help teachers like Mirabelle and Arturo on their journeys to becoming formative assessors by teaching them to strategically sample evidence of student understanding (and not just focus on the two to three kids who always do the work in class).
Bouncing puts the focus on what students say and do during class time and helps us gain access to more and better information about student thinking during the learning process. Bouncing forces us to examine our data-sampling strategies.

What Is Bouncing?

Bouncing. What comes to mind?

A ball. E-mail. A check. Tigger. Bouncing suggests movement: springing, hopping, ricocheting, rebounding, reflecting, and rallying. Bouncing implies energy, enthusiasm, dynamism, liveliness. Such bouncing does indeed happen in classrooms. But the kind of bouncing formative assessors mean is bouncing that facilitates sampling student thinking.

Definitions and connotations of bounce can help us with key and nuanced concepts related to bouncing in the classroom learning space. Doing a Google search on bounce reminds us that in many contexts, “bounce” is “exuberant self-confidence,” as in, “the bounce was back in Jenny’s step.” Synonyms: vitality, vigor, verve. We certainly do want our students excited about learning, as educational psychologists who study motivation will tell us.

The combinations of potential bouncing moves are also worth considering in this chapter. Person to person, idea to idea, fact to fact, machine to person, person to machine—our goal is to widen the sample of student responses with all permutations of bouncing. Why? To gather evidence in order to make an instructional decision that advances student learning during the lesson. As formative assessors who bounce questions on the fly, we want to know: Can we stop here? Is it time to check for understanding? Should we move on to the next activity? How many of us have grasped the objective? Who needs help making the leap?

Other synonyms that Google lists for bounce—rebound, spring back, ricochet, jounce, carom, and reflect—suggest the motion, challenges, and complexities inherent in the bouncing action of whatever it is that bounces off, bounces back, or bounces around our classroom learning space. Let’s explore some of the features of bouncing knowing that it is a move that requires patience, practice, and a new approach to speaking and listening to our students.

Bouncing Is Intentional, Systematic Sampling

Bouncing moves aim to intentionally and systematically sample a variety of student responses to better map the terrain of student thinking, understanding, and
performance in a class. The goal of sampling—with the aid of bouncing moves—is to help teachers make sound instructional decisions grounded in the best evidence they can gather during instruction. Bouncing moves increase student engagement and bring more voices into the classroom learning environment.

Bouncing commonly happens via a call-and-response routine. During whole class instruction we see the teacher posing a question to the whole class. As the question hangs in the air, the teacher typically selects who gets to answer. Students with their hands in the air—or who aren’t paying attention—often get called on first.

The problem with this common scenario is that the sample size is very small. We don’t learn much about different student approaches to the topic or question when fewer than 10 percent of the students respond. We maintain that

- *How* students get called on—whether randomly, by recognizing the first hand in the air, or by choosing a student who hasn’t participated in a while—matters when bouncing.
- *How many* students are called on matters when bouncing.
- *Which* students get called on—is there a pattern of calling on only the most talkative students?—matters when bouncing.

A more productive alternative to a typical call-and-response routine is the bouncing move “Call and Pivot.” With “call and pivot” bouncing moves, teachers purposefully circulate around the classroom—from group to group, individual to individual. By bouncing themselves around the room, teachers can widen the net of observation, making more student thinking visible. Learning to listen in as students talk and work in groups, a formative assessor can gather valuable information about the depth and breadth of student approaches to an activity or task.

Sometimes the teacher poses a key question to the whole class, invites students to pair and share in response, and then strategically moves about the room, bouncing herself from pair to pair, listening in, and drawing conclusions about the level of understanding. In this example, bouncing helps us move beyond the appearance of learning; it focuses attention on who is stuck, who is moving along with assistance, and who can work independently during the lesson. Moreover, when connected to other moves, bouncing is a major time-saver. It guides the teacher’s strategy for checking for understanding by providing a plan.

The teacher, who has mastered bouncing in group work settings can usually listen to—and perhaps prime, probe, and prime again—more than half her
class’s first-draft thinking in a short time, and do so before she redirects attention to the assignment and deliverable for the day. We maintain that bouncing is a prerequisite for checking for students’ prior knowledge and for delivering on the promise of checking for understanding, day in and day out. Call. Pivot. Walk and Bounce—this is a new routine worth trying out.

**FORMATIVE ASSESSMENT TIPS**

**Becoming a Formative Assessor Means Moving Beyond Old Paradigms**

If we see bouncing through a Sage-on-the-Stage paradigm of pedagogy, the teacher is the center of attention. The sage shines the spotlight, the student responds. Sage comments, then bounces the spotlight to another student.

In the best of circumstances, the teacher bounces the spotlight to several students, attempting to collect a range of student responses with which to make well-informed instructional decisions. In the worst case, the light shines on a few and no one sees a thing.

It’s time to put forward a new paradigm of pedagogy—the guide on the side.

**Why Bounce? For Whose Good? For What Good?**

Some definitions of classroom assessment focus on getting hard quantitative results to teachers, parents, or administrators. The prevailing logic seems to be that the quicker the cycle of eliciting student responses—and turning them into numbers, graphs, and charts—and reporting this data happens, the better the formative assessment information will be to support “data-driven” decision making.

We concede that quantitative results (what appear to us as scores, points, numbers) are necessary in the school system. The question is if those results are sufficiently robust for teachers who need just-in-time qualitative information about student learning as it unfolds in the classroom.

Teachers have a different mandate and set of questions that drive their interests in data. We rightly ask: How does the summative data inform the difficult choices we make as teachers in a particular lesson segment or transition? How does the numeric score inform pedagogical choices such as where to provide specific feedback, to whom, where, and when? What does a percentile or proficiency rating tell me about what to reteach, when to scaffold academic language, or how
to coach, for example, a language learner through being “stuck” with a big idea or intricate procedure?

To get answers to these questions, formative assessors need to refocus on moves that make student thinking visible in real time at grain sizes that are meaningful to teachers. Bouncing moves can help us to gather more instructionally sensitive, soft data about student learning as it unfolds during class.

Teachers want data that can help us make sound inferences and wise instructional choices on the fly. We want data not just about individual students’ thinking and performance—but about group dynamics and school climate that influences our daily lessons. We want data that is representative of each period and each group of students—helping us make connections, see patterns, and be more effective in the next lesson. No matter how someone labels or markets or packages up the term “data,” the formative assessor is most interested in samples that help us differentiate instruction and provide better feedback during a lesson. This takes learning to make bouncing moves—many of them, in all sorts of new and different ways.

**FORMATIVE ASSESSMENT TIPS**

**Maxim:** All else being equal, the better we sample a set of student responses by bouncing strategically and consistently, the better chance we have of getting a representative and more reliable picture of student thinking on the day’s lesson topic.

**Bouncing Sits Within the Interpretation Vertex of the Assessment Triangle**

So far, we have established that formative assessors are intentional in their classroom assessment designs. Borrowing a few principles from a panel of educational assessment experts at the National Research Council (2001), we have agreed that the logic of formative assessment is not that different from other approaches to assessing student learning. The assessment triangle is our guide too.

First, we identify what is worth assessing. We prepare a clear, well-defined set of learning targets to guide our lesson and unit plans. We care about how students learn and which Habits of Mind they bring to bear on authentic learning tasks, problems, and projects in our classrooms. The first vertex—student
cognition/learning—is (and must be) the foundation of all formative assessment practice.

Next, we pair those learning targets and ideas about how students learn with a host of observational strategies, each aimed at gathering evidence of learning. We pose questions, then pause, and probe to elicit, coax, and make the current level of student understandings more visible to all. We set up clear, agreed-upon routines and practices that students come to see as normal, embedded assessments that support both instruction and learning. Our range of questions, prompts, and activities, aligned with specific instructional and curricular goals, are part of the FA toolkit. We purposely scaffold and tailor these routines and practices to maximize opportunities to meet students in their particular zones of proximal development.

We now turn to bouncing (which is also connected to tagging and binning) moves that serve the interpretation strategies/modalities vertex in the NRC’s Assessment Triangle. Whether pulling equity sticks, using a randomizer app, or plain cold calling, bouncing demands that we sample the classroom learning space. To locate misconceptions, to uncover prior knowledge, to identify differences in the current level of understanding—we must widen the response net—and recognize when we have not. To make a reliable and valid interpretation of where student understanding is and where they need to go to next, we must have systematically sampled.

Bouncing moves allow the formative assessor to modify sampling strategies, take stock of the limitations of any given inference about students’ abilities and skills, and most important, check what the evidence allows us to say or do with our soft data. As with all other moves in this book, our goal is to be purposeful, intentional, and aware of the pitfalls that come from being too hasty and rushing to judgment. The key idea in the next chapters is learning how to interpret and validate the data you have on student learning, and when necessary, to return for more.

**FORMATIVE ASSESSMENT TIPS**

Formative assessors are bound by a covenant that places a priority on eliciting student responses that help them gauge learners’ current levels of understanding and their need for support in the actual moment of classroom instruction. Skillful bouncing is needed to make this happen. The testing event is a snapshot, helpful for doing autopsies. Bouncing, on the contrary, works in the living classroom where the action is live.
Systematic, intentional bouncing in the classroom learning space helps us answer these questions: Which students have shared with the class and which ones haven’t yet? What are the major misconceptions and procedural errors in play during this activity? How representative is this particular student response for the class as a whole? Am I dealing with an anomaly or a trend in student thinking with Alice’s response?

Those becoming formative assessors need to be clear about how their bouncing moves link together with the other two major moves, tagging and binning. Each of these aspects of the interpretation vertex of the assessment triangle (Figure 5.1) will require planning, coordination, and practice.

We can’t skirt the facts on the ground: if our bouncing moves do not lead to better tagging and binning procedures and protocols, then our instructional decision making about what to do next will be compromised. No need to worry, though. We will explore a few basic bouncing moves (e.g., equity sticks, gallery walk, pass the stuffed animal) to improve our chances of landing on representative samples of student thinking, one lesson at a time. But first, we delve into what the experts tell us.
What the Research Says

Educational research tells us surprisingly little about the mental models teachers use to determine which students to approach, call on, or not call on. The research focus on asking good questions, using wait time, and probing for more in-depth explanations has come at the expense, it seems, of explorations into teachers’ understanding and use of sampling strategies.

We do know that teachers’ bouncing practices vary. Some seem to effortlessly increase the student response space and sample from it well. Others struggle. Experience, skill, depth of content knowledge (Carlsen, 2015), and disposition likely play roles in explaining why there is so much variation in bouncing techniques. Misconceptions (e.g., cold calling yields insight into most students’ thinking) and p-prims (e.g., cold calling gets the ball rolling) may too. Recall that a p-prim, an intuitive idea stemming from our experience, is more like a preconception than a misconception—we all have them.

Cognitive demands on teachers are high as they work out who, when, and which on the fly questions will drive their lessons. Cognitive load theory (which we explored in Chapter 3 on Pausing) suggests that the working memory of teachers and students is likely to be limited in capacity and duration. As teachers launch, orchestrate, monitor, and adjust a lesson, they will need processing time to make sense of the current levels of student understanding that they are witnessing to guide their next instructional moves.

When it comes to bouncing, tech assists including clickers and vote counting apps may help to reduce extraneous cognitive load. Usually, however, these devices do little to aid in uncovering students’ higher-order thinking or support requests for further elaboration and sense making (Hunsu, Adesope, & Baylyn, 2016; Kay & LeSage, 2009). Too often, these tech devices artificially constrain the response options (with predetermined “choices”). They may also promote the illusion of strategic sampling of student responses by relying upon a random default settings. As we shall discuss, random sampling is not always better or more useful to the teacher interested in equity and diversity.

For students, these tech assists look like another form of multiple choice testing. For teachers, knowing who voted for which answer does not tell us much about why they voted this way. No technology magically provides the cognitive, affective, and social-cultural sense making required for teachers to know what to do or say next when students are stuck. And for formative assessors to “sense
make” in diverse classrooms, they need evidence—beyond polling for opinions by clicking a button. Students need to speak, verbally process, and elaborate on initial drafts of ideas in the classroom.

Research tells us that students’ willingness to speak and how they get “the floor” or “in the zone” to give oral contributions in classrooms is influenced by many factors, including

- physical space and class configuration,
- student groupings (whether by ability or skill),
- socioeconomic status,
- gender, and
- language.

Wollman-Bonilla (1991) found that ability grouping affected the length and quality of students’ contributions to discussions. Hemphill (1986) noted that girls from middle-class and working-class families use conversational overlap differently: either to make a bid to speak, or to show support for the speaker. Although these studies are insightful, we found little research that unpacked how bouncing to these different groups of students affected the quality and quantity of assessment-rich information that teachers might use.

We were surprised to learn that some research argues for cold-calling, a novice move in our eyes. The act of calling on students who do not volunteer is common. Dallimore and colleagues (2012) found that in classes with high cold-calling rates, significantly more students answer questions voluntarily, and the number of students voluntarily answering questions increases over time. Further, they found that in classes with a culture of high cold-calling, students’ comfort with participating in class discussions increases; in classes with low cold-calling, students’ comfort with participating does not change. Although their research findings show that “cold-calling can be done fairly extensively without making students uncomfortable” (p. 305), we leave it to you to decide to what extent these findings might be applicable to your kids, context, and curriculum. You might start by asking: how much do I get out of situations where someone cold calls on me and I am “volun-told”?

Research on typical bouncing strategies shows that they may not be warranted or in the best interests of the community learning. Take one example of the most common discourse pattern in classrooms, the Initiate/Respond/Evaluate (IRE) routine. Wells (1993) has documented that 70 percent of all discourse
in secondary classrooms follows this routine. The teacher “Initiates” a question, a single student “Responds,” and the teacher immediately gives a verbal “Evaluation” to that response (Mehan, 1979; Wells, 1993). In the next chapters we explore better options for uncovering student thinking for those learning to become formative assessors.

More recent educational research in this domain has focused on teachers’ *elicitation* practices—actions teachers take during class to elicit evidence of students’ knowledge and understanding—and “teacher responsiveness.” Pierson (2008) has conceptualized “teacher responsiveness” as the extent to which teachers focus on student ideas in moment-to-moment interactions. Implicit in such observations is the notion of bouncing.

Pierson analyzed teacher talk and categorized teacher responsiveness as “low” or belonging to either of two categories of “high.” The two categories of “high responsiveness” were distinguished by teachers’ main purpose in responding: either to identify students’ ideas with the intention of correcting them (High I responsiveness) or to understand students’ reasoning on its own terms (High II responsiveness). Low-level teacher responsiveness, on the other hand, was characterized by teacher responses that exhibited limited connection to students’ thinking.

As teacher educators interested in development and learning trajectories in formative assessment, we recognize that not every “productive,” “responsive,” or “high level” move by a teacher (however coded by researchers) will be fully captured in analysis of teacher-student talk. We maintain that researchers and practitioners agree on the importance of teachers being able to incorporate elements of students’ ideas and reasoning skillfully into their oral responses to students and that scarcely little research has thoroughly explored how teachers develop these skills—from preservice to induction or beyond.

An exception is the work of Jacobs, Lamb, and Philipp (2010) in the area of elementary mathematics instruction. Jacobs and associates’ study involved teachers who had participated in a professional development endeavor that extended beyond four years, which also contributes to the noteworthiness of their longitudinal research. They found that teachers do not routinely begin their careers with expertise in *attending* to children’s mathematical solution strategies, *interpreting* children’s mathematical understanding, or *deciding how to respond*. Teachers begin developing expertise in the first two of these three skills through teaching experience. Typically teachers get better at *attending* first, then they begin to improve at *interpreting* second.
Jacobs, Lamb, and Philipp also found that teaching experience does not correlate with expertise in deciding how to respond on the basis of children’s understandings. That is, just having taught longer does not necessarily mean that teachers know better how to respond to children in the moment, nor know what “next steps” are likely to help advance children’s learning. Not surprisingly, Jacobs’s team found that professional development that supported teachers’ attending, interpreting, and deciding how to respond to children’s oral or written mathematical strategy explanations did seem to positively influence teachers in developing expertise in all three skills.

Their research has provided the most “nuanced story” of the development of teacher expertise in “professional noticing” of children’s mathematical thinking—by attending to, interpreting, and deciding how to respond—to date (p. 192). Important as this research is, it does not address a critical aspect of bouncing moves, or the broader problem of sampling (error, bias, and fairness) raised later in this chapter.

Ateh (2015) conducted a study that analyzed two high school science teachers’ elicitation practices over the course of an academic year. She specifically chose the two teachers from the participant pool of a larger, ongoing study of science teachers at 10 comprehensive high schools in Northern California because both teachers had stated, while watching video of their own teaching, that they had “used elicited evidence of students’ knowledge to make instructional decisions that enhanced students’ learning” (p. 118)—examples of “substantive” formative assessment practice according to Coffey, Hammer, Levin, and Grant (2011). But Ateh found a “mismatch” between their perspectives of their formative assessment practice and her analysis of what transpired between the teachers and students in class. Ateh found that, too often, these teachers’ elicitation practices were “characteristic of low-level elicitation” (p. 112).

Educational researchers continue to document a hard, generally “known” and accepted truth: effective, “substantial” in-class formative assessment is needed, difficult to do, and still relatively rare in many K–12 classrooms.

That doesn’t mean there aren’t models of good teaching to learn from in experts’ classrooms. Dr. Deborah Loewenberg Ball is widely known for teaching—and her self-study of her own experiences of teaching mathematics with 3rd grade students—in ways that reflected close attention and responsiveness to their thinking. Ball (1993) did not call what she or her students were doing in class “formative assessment” nor did she consciously enact “bouncing” (the
concept and term had not yet been conceptualized nor articulated yet). However, a closer examination of her oft-cited article, “With an Eye on the Mathematical Horizon: Dilemmas of Teaching Elementary School Mathematics,” published in The Elementary School Journal in 1993, through the lens of the FA moves framework presented here gives us insight into the complexities of teachers’ decision making regarding bouncing.

Ball’s article focused on the dilemmas of teaching, including the frequently occurring tough calls teachers make as a matter of course: “Often I must grapple with whether or not to validate [students’] nonstandard ideas” (p. 387). Black and William (1998) would refer to these as “unorthodox responses.” Since we are reading Ball’s research through the lens of the FA moves framework, we view Ball as anticipating and expressing the real challenges of bouncing to better sample a wider range of student thinking. Of the sampling dilemma, she writes:

Sometimes my problem is that it is very difficult to figure out what some students know or believe—either because they cannot put into words what they are thinking or because I cannot track what they are saying. And sometimes, as in this example [the now-famous “Sean numbers” example; “Sean numbers” are numbers that, according to Sean, were both even and odd], students present ideas that are very different from standard mathematics…. Although Sean was, in a conventional sense, wrong—that is, six is not both even and odd—his claim was magnificently at the heart of “doing mathematics” (pp. 387–388).

Ball’s focus was not explicitly on the percentage of students who were reached by her “bouncing” strategies. But we see them as having played a key role in orchestrating and uncovering student thinking during the class discussion about “Sean numbers.” (The class named numbers made of odd numbers of “twos” after Sean in their next mathematics lesson.) Ball did, however, “aim to develop each individual child’s mathematical power through the use of the group” (p. 388).

By our back-of-the-envelope analysis of Ball’s report of the day when as class began “Sean announced that he had been thinking that six could be both odd and even because it was made of ‘three twos,’” 32 percent of her students (7 out of 22 students in her class that year) either came to the board and questioned or explained or vocally weighed in during the first “Sean numbers” conversation (pp. 385–387). Without calling it bouncing, we suspect that Ball thought deeply about “ways to construct classroom discourse such that the students learn to rely
on themselves and on mathematical argument for making mathematical sense” (p. 388). We argue that bouncing as a concept—and an accessible practice—can play an influential role in helping make that happen and that Ball’s research bears our hypotheses out.

Deborah Ball and other expert teachers using “bouncing” techniques are operating at a level well beyond the bouncing moves we typically see novices enact in mathematics classrooms. As an expert teacher, she demonstrates a disposition toward inquiry and self-examination. As a formative assessor who anticipated the power of not merely checking for understanding but exploring student schema and p-prims, Dr. Ball’s work deserves our attention.

**Bounce Smarter, Sample Strategically**

We favor approaches that increase the student response sample taken by setting up visible procedures that take advantage of random selection. Bouncing smarter means sampling on students without intentionally raising affective filters or promoting cognitive overload. There are immediate implications for our advice (alert: we may be challenging your sage-on-the-stage comfort zone).

We say, as gently as we can, no more teachers “pouncing” on students who aren’t volunteering. No deploying “tough” questions as a classroom-management technique. Let’s refrain from using pouncing strategies—like A.A. Milne’s exuberant Tigger—to catch students who are misbehaving or not paying attention. Instead, we favor making your bouncing routines visible, sharing them with your students, and reaching agreements on how to increase the circles of participation. Sampling student thinking strategically means employing moves that feel more systematic and less arbitrary, less “gotcha” and more invitational to all.

We note that strategic, intentional bouncing moves will maximize the purposeful selection and recruitment of volunteers while potentially attending to populations of kids that tend to be undersampled in too many classrooms today. There are many ways to identify these students in your classroom.

Educational psychologists typically bin them into categories such as “quiet,” “shy,” and “introverted” and leave it to teachers as to how to actually approach “them.” Students with IEPs, those from different racial or ethnic backgrounds, or those with language proficiency struggles (what summative assessors call “subgroups”) may need us to bounce more purposefully to support their needs. But let’s not fall into the “us” and “them” labeling trap: “We” are in this together and
we bounce purposefully and with compassion because it helps us all to know where we are and where we want to go next in the classroom.

It is common to rely on a notion of teacher’s intuition when deciding which students to call on and when. However, it turns out this may not always be the best guide. Communications scholar James McCroskey (2015) cautions:

When asked what one should do to help a child that is quiet, the most frequent suggestion of the teachers with whom I have worked is to give [quiet students] more speaking experiences. While this approach may be helpful to some people, it is very likely to be harmful to most. Not all quiet children are alike.

No wonder teachers return to calling on the eager beavers! The pull of feeling like a successful teacher whose students know the correct answers is strong. Sampling silent Sallies and Bobs, who may be stuck or falter—especially when we are being observed and evaluated—is a dangerous move in the eyes of beginning teachers trying to look good. To complicate matters, researchers and formative assessment experts don’t give us much guidance. We ask: And what about bouncing to the cynical Sams or angry Andrews in 6th period? How am I supposed to sample 75 students on track and field? Why should I take the time to have all my students tag their responses to the wall when I can just hand out a quiz and “bounce” to all 37?!

We agree. Good questions. It’s enough to make us want to throw up our hands, too. It can take so much energy to just think about it—and more to actually bounce well.

Some teachers use extrinsic rewards (e.g., tokens or stickers) to increase participation and put a bounce into the classroom learning environment. Boniecki and Moore (2003) found that the amount of directed and nondirected student participation increased while a “token economy” of extrinsic rewards for participation was in place and returned to baseline after removal of the token economy. It is difficult to tease out the causes and long-term effects of these sorts of positive reinforcement regimes. But most agree that various bouncing strategies influence students’ behavior differently. Armendariz and Umbreit (1999) found that students’ disruptive behavior decreased dramatically when response cards were used and increased again when conventional hand raising was reinstated.

One thing is clear: the “business as usual” approach to sampling student responses is not working for “underachieving students, whether male or female”
Bouncing (Myhill, 2002, 2006). Finn and Cox (1992) found that students who are not active participants in classrooms are at greater risk for dropping out of school. Common sense tells us that being invisible, sitting in the back of the room, having the teacher pass us by each day because we take too long to say what we think is going to have an effect. The case for bouncing to increase students’ active participation while building up a better picture of the current levels of our students’ understanding during the lesson is strong on its own merits. Let’s now explore the problems, issues, and orientations necessary for smarter bouncing.

**Going Deeper With Bouncing**

We agree that increasing students’ active participation in classes is a critical feature of democratic education. Bouncing helps students find their voices in our classrooms, but the bouncing moves outlined in this book need to be about more than “just” engaging students. The *sampling* aspect of bouncing, which underpins the interpretation vertex in the assessment triangle, is of core importance to teachers who are learning to become formative assessors, and thus make better instructional decisions based on sound classroom assessment evidence.

Going deeper with bouncing requires we explore the issues and challenges of sampling that are particular to the classroom learning space. We need to do the following:

- recognize and work with sample bias, measurement error, and unreliable observations;
- explore the drawbacks and limitations of common bouncing patterns;
- take action to establish new patterns and “course correct” when routines falter; and
- think about and act wisely on the limits of inferences made from on-the-fly observations.

First, let’s talk about the role of sample bias in the classroom learning space.

**Sample Bias**

Intuitively we know that sample bias happens. When an organization conducts a survey of public opinion, let’s say on predicting U.S. election results, but only uses one social networking site such as Twitter to do so, clearly the range of responses depends on who has an account with the company. Though Twitter
accounts are certainly popular and are widespread in the United States, the “American public” in this survey sample is not well represented, in part, because the survey is restricted to account holders.

Now let’s pretend the organization, after conducting its survey of Twitter account holders, says “According to our exhaustive survey, the people in the United States believe that…” or “Overwhelmingly, we found that U.S. citizens favor…” or “People in the United States feel…” Would you trust these statements? Would you agree with the sampling methodology? Would you wonder—even just a little—how the polling organization controlled for bias before reporting their results?

It turns out that sampling bias happens in the classroom learning space, too. We may sample the prior knowledge of only students who raise their hands, a parallel to the Twitter users example above. We may sample only students who respond to our questions nearly immediately. (Even if we have the intention to check back in with students who need more time to respond, we don’t always.) Perhaps, while circulating during group work time, we may sample only students whose nonverbal body language communicates to us, “I’m open to conversation right now.”

---

**TEACHER VOICE**

**Beginners on Pros and Cons of Bouncing and Wait Time**

I’ve found that bouncing can be the easiest formative assessment move as well as the hardest.

It can be the easiest if the classroom is primed right. Students have to know what procedures to expect. Students need to understand we really are going to ask questions of everyone. Bouncing in a class that is not primed brings lots of blank stares.

Wait time with bouncing gets into the hardest part of bouncing. During wait time, I used to get students pointing out that other students were ready. “Call on them.”

So many students are used to sitting in class without being called on. They’ve been able to wait teachers out. Some students, it seems, will do anything to not talk in class.

Bouncing is a culture you have to build in class. And if you don’t do it right, it’s like pulling teeth and taking prisoners.

—Don, preservice U.S. history teacher
How aware are we of the different types of classroom sample bias? We know from experience that it is easier to call on students who volunteer, are verbally facile, are extroverts, communicate interest in the topic, respond quickly, give responses that are easy to understand, ask questions, or emanate positive energy.

These characteristics describe the eager beavers in our classrooms, those kids who make it easy to create and sustain feedback loops. No wonder sample bias often skews toward these kids’ experience of the lesson!

Formative assessors, however, need samples that are more representative of their entire classroom population. Checking in with only the “Twitter users” will influence the inferences we can soundly make about the whole class. Instructional decisions based only on responses from those students “with accounts do not have the opportunity to be as robust as instructional decisions that are based upon more representative samples. So, what’s a formative assessor to do?

One answer: try the stratified random sampling approach.

---

**FORMATIVE ASSESSMENT TIPS**

**Stratified Random Sampling**

As formative assessors, we need a wide and diverse range of student responses. We can carry out bouncing strategies that aim to get us a more “representative” representative sample. How? By identifying which students, by groupings, need to be a part of our sampling design.

In a modified stratified random sample response design, the teacher checks for understanding with a sharper focus on students from particular populations such as English language learners (ELLs), special education (SPED), or accelerated (GATE). For example, she might have a few cups to store the equity sticks in different groupings/configurations. Each day, depending on her purposes and her choice of focus students, the teacher pulls names at random from the different intentionally configured cups.

There are no predetermined limits on which groups the teacher chooses to sample or which techniques for sorting and calling she uses in her classroom. The point is to gather data or responses, from each of these cups. With this more representative sample, based on differentiated student needs, teachers can make instructional decisions grounded in smarter data.

What might the different cups or buckets be—beside the familiar ones based on well-known categories? That’s your decision. Maybe you want to start with just one of your classes for a particular unit? Or maybe with the shy students? Or students taking the class for a second time or struggling with different modalities of verbal communication?
Continued

Gathering responses from one or two stratified buckets is probably better than having a one-size-fits-all approach to bouncing, but each teacher has to make a move that regularly gets them student response data from all the buckets they deem important for a particular unit and class.

Measurement Error and Unreliable Observations

Summative assessors who work in the standardized testing world know that measurement error happens. When we use score data, the evaluation of any student’s true ability, skill, and capacity is always compromised. Testing experts use the concept of reliability to express the degree of uncertainty about the dependability of these observed scores. We teachers do the same every time we question: Is this really Juan’s best performance? Are we getting an accurate indication of what he really knows and can do? Did Jackie’s mood, energy, lack of sleep, and missed breakfast interfere with her best efforts on the test this morning? Was Bikram’s first draft on the lab really his best work?

As well-intentioned as we are, whether as professional test makers or classroom assessors, we will miss data points that fill out a picture of true ability and skill level—whether it’s a picture of an individual’s performance or of the entire class’s. All sets of observations—standardized or not—will contain a degree of measurement error, which leads to a degree of mischaracterization about our students.

To complicate matters, the questions, prompts, and tasks we use to assess our students can succeed and fail for reasons having little to do with students themselves. Poorly written questions, confusing instructions, and language laden with cultural and linguistic assumptions can push us into the shadows from what we truly hope to evaluate in the classroom. Too many classroom assessors hide behind those shadows, perpetuating the myth of the accurate score, the reliable GPA calculator, and other so-called objective grading practices (Guskey, 2002; Winger, 2005).

Most of us try to construct fair tests, reasonable homework assignments, and unbiased questions and tasks for class activities; however, measurement error still happens. Our points, check marks, and grades are an attempt to approximate
the true score assigned to each and every student; we presume these numbers represent the actual level of student understanding. But we never know the true score. Ask any expert. Formative assessors, like summative assessors, must admit that our judgments about students’ current level of understanding are at best provisional. Sometimes we have a degree of confidence about those true scores, other times not so much.

**It’s Hard Work to Establish New Patterns (Or, “How I Took the Risk and Let Go of Old Patterns”)**

Cold calling seems to work. It’s a pattern we know and see all the time in classrooms. Despite the potential pitfalls with this bouncing move, we notice that most teachers (beginning and experienced) use the question-as-flashlight approach to shine light on the eager beavers, and to wrestle control back from the lesson “haters.” Cold calling and other teacher-directed bouncing techniques seem to satisfy a need to dominate the classroom learning space. Before getting ahead of the how-to-sample-better story, let’s examine the traditional Q&A model more closely and explore a few of its problematic characteristics.

**“For Volunteers Only” Is Inequitable and Leads to Skewed Results**

First, many teachers are in the habit of making participation in their classrooms voluntary. Only a small group of students deeply and actively participate, soaking up the offerings of the learning environment in the process. This results in two significant problems: the teacher’s evidence base for decision making is much smaller than it could be; and there are many other kids who could be engaged more directly but become invisible as the lesson proceeds. The majority of student ideas and beliefs recedes as volunteers take up more and more space in classroom discussion.

You are probably familiar with the sobering implications of this imbalance of student engagement. Others have referred to it as the multiplier, or Matthew Effect (Gladwell, 2008). The deeper, more direct engagement of a few kids often leads to their greater success as compared to their quieter, less engaged classmates. This comparative success—and attention from the teacher—leads to greater effort (often from both the teacher and those students), which leads to still greater success—a small reinforcing feedback loop that could, with some changes, include many more students.
Missing Misconceptions and Chasing Missed Opportunities

Second, even when student participation is not voluntary, but proceeds in a random fashion, a few good eager beavers can still soak up the action. Now, it is the randomizer app that cold calls on students. In this traditional Q&A model teachers still tend to elicit responses only from a few students. Hence, these technologies consistently misrepresent the full range of student thinking on a topic. This means, inevitably, that teachers miss out on finding misconceptions or digging deeper into preconceptions.

You have probably experienced what’s problematic about not uncovering misconceptions or procedural errors or firmly held opinions early in a unit. Failing to bounce out the gate, to sample across the classroom, to “pass the stuffed monkey” to more than 10 percent of the class means that students’ thinking goes undetected—for hours, days, or even weeks. Before you know it, lots of students are failing quizzes and unit tests. You are handing out zeros and Fs. Now becoming a formative assessor takes on a whole new meaning. Bouncing is a new habit that breaks up old cycles and brings about opportunities for early intervention.

Good Intentions Are Not Enough, Nor Is the Quest for the “One Best Answer”

The third problem with the traditional Q&A model for sampling is too often the result of good intentions. In an effort to connect with students and lead them toward a learning target, the back-and-forth among the teacher and students frequently takes on a “guess what’s on the teacher’s mind” quality. If not an outright guessing game—which we have observed many times and have played on occasion in our own classrooms—then at least a situation where the teacher is working for a predetermined response. A response. One. Not the wide range of responses formative assessors need in order to make valid, sound inferences on the current levels of understanding to meet students where they are.

Becoming a formative assessor means becoming aware of when this search for the one best correct response is happening, having other bouncing options at your disposal, and trying out routines that improve your sampling odds. Improving bouncing moves requires self-regulation and a metacognitive stance toward your teaching practice. A professional development conversation with your colleagues about how and why teachers sample the classroom (for whose good and for what good) could make student thinking more visible in your classroom and school.
Surfacing Misconceptions Early in the Unit

Earlier we gave the example of a physics unit focused on buoyancy and specifically the question, “Why do things sink and float?” Research on misconceptions about buoyancy (Yin, Tomita, Shavelson, 2008) reveals that students typically think that big, heavy things sink and small, light things float; that hollow things float; and that sharp edges make things sink. Similar work on facets of understanding in physics (Minstrell, 1992, 2000) have been worked out, as have new breakthroughs on student learning progressions in math (Clements & Sarama, 2014; Lehrer & Kim, 2009). These findings can guide our choice of observational strategies, but we must still attend to the mode of interpretation based on good samples of student thinking.

If we know that major misconceptions related to concepts of mass, volume, and density exist for this topic, but we constrain our sampling to only one or two students’ responses, we may miss the opportunity to surface these beliefs and hence address these misconceptions across the classroom. Bouncing well matters.

To make good instructional decisions for students on the fly, teachers need good information on the current level of understanding of the group. So after asking students why some things float and others sink, the teacher needs to bounce the question across the room to pick up more responses. She can widen the net by probing and bouncing: “So who thinks things float because they’re hollow? Can you say why? Take two minutes to explain what you think to your table partner and then write down two to three sentences explaining why. We will share these responses out on the document camera to look for patterns.”

Mastering FA moves allows us to go deeper and wider with samples of student thinking at the same time. We think that a mix of lesson openers, quick writes, and exit slips can move the formative assessor toward more evidence-based decision making in the classroom. But first, we will need to think through our bouncing moves to employ sampling strategies that help to form a clearer, more reliable picture of what most students know and can do.

Assessment for learning demands no less.

We argued in Chapter 2 on Posing and Chapter 4 on Probing that formative assessors are in the habit of planning, enacting, and reflecting on the questions, tasks, and prompts they use to elicit student thinking. Unless you are the undisputed expert in your field and able to retrieve questions and size up every student’s needs on the spot, however, we suggest taking the unheroic route by
preparing a few questions in advance of lessons. Questions that are planned in advance of the unit, that are aligned with visible learning targets in the Cognition vertex of the assessment triangle, and that spiral back throughout the semester are most likely to help your students learn to use their minds well.

Planning for bouncing, as for posing and probing, can also help prevent mishaps that result from teachers’ well-intentioned, often improvised efforts to engage students. Students, like most humans, do not like to experience learning in the form of surprise attacks, swarming probes, and inchoate, seemingly random queries that demand an immediate answer. When we skip the planning phase, our bouncing quickly descends into pouncing, and the students know it.

For those committed to mastering formative assessment moves, priming for bouncing requires us to plan lessons that anticipate where particular groups of students will likely fall down and when particular individuals are likely to freeze up as we bounce questions and thoughts around the classroom.

---

**TEACHER VOICE**

**My Efforts to Focus on Bouncing**

I started out strong. I started using equity sticks for my bouncing for the first few weeks. But as the semester progressed, I got lazy with continuing to train myself to use equity sticks every time. Pretty soon, once-in-a-while turned into never.

I’ve renewed my commitment to using equity sticks to bounce even though the kids groan when I take them out. I think it’s because they know there is actually a chance they will be called on. Too bad. I think they’re getting used to it. But even if we get stuck—or I forget—I don’t want to stop with the equity sticks. I know to bin well, a teacher needs to bounce well. For me, using equity sticks is key to bouncing better.

—Aaron, social science teacher

---

**Recognizing and Working with Limits of On-the-Fly Observations**

Let’s be honest. Even when we try to sample around the classroom, in the theater, in the gym, or on the field, our capacity to capture, record, and study even most, if not all, student responses is limited. Too little student thinking is made visible by the idiosyncratic and inconsistent nature of our sampling strategies.
Despite our good intentions, we may be searching in the dark for clues about our students’ abilities, skills, and capacities. On-the-fly observations suddenly don’t seem so cool, fair, or useful.

Going deeper and getting smarter with bouncing requires recognizing—and working productively with—the limits of the inferences we can draw from our on-the-fly observations.

**FORMATIVE ASSESSMENT TIPS**

**FA Fact:** Poor sampling leads to poor inferences. We can’t know what’s next if we haven’t figured out the current level of understanding.

How can we make valid or reliable inferences about Javone’s current level of understanding when we spent 55 minutes talking to Hannah, Alexis, and Noah? How can formative assessment be formative when it fails to obtain a sample of what the kids are thinking about a topic through a class brainstorm or word web that checks for prior knowledge? How can we claim the student response space has been represented without being explicit—and intentional—about our strategies, procedures, and checks for who shared and who didn’t? There is an old adage in educational measurement circles, “Garbage in, garbage out.” Is poor sampling on student responses any different? Not for the formative assessor.

To make these points a little clearer, let’s put two sampling strategies and stances toward bouncing into sharper relief. The one stance is depicted by the Q&A **bouncer** who mostly uses pouncing techniques to get it done and tends to move on after a few correct answers are supplied. The other stance is the **FA bouncer** who is working on new moves, and different configurations for sampling a wider response space to better understand student thinking. Figure 5.2 helps us imagine these two types of assessment stances in action.

The question for all of us on the formative assessment pathway is which type of bouncers are we—on our best days, worst days, and the ones in between? We will freely admit to switching stances ourselves. Somedays, it just feels easier to play the Q&A role and say to the class “get it done.”
Linking Bouncing to Other Moves

Bouncing is integral to tagging; both moves can lead to more valid and reliable binning (we will get to tagging and binning moves soon). So if we fail to bounce, we actually reduce the sample space of student responses, which reduces the tagged response data available for interpretation. With this “restriction of range” (i.e., number of student responses heard, seen, read), our binning strategies become compromised. It’s hard to interpret misconceptions when you haven’t detected them. It’s difficult to talk about students’ prior knowledge and experience with a big idea or conceptually difficult material if you have not yet sampled it. Put another way: we can’t make good instructional decisions or figure out our next steps in the lesson when we don’t have credible soft data. Working on your bouncing moves can go a long way toward making your students’ thinking visible enough to learn from it.
Getting Beyond Pouncing: Moving the Ball Around the Court

Let’s learn to pass the ball. By visualizing our classroom questioning strategies as a basketball court, maybe we can better see the need to bounce the ball from player to player. No one likes it when someone hogs the ball and fails to bounce it around the court, mostly because it rarely leads to a win. A few superstars on any team are welcome. But a good basketball game, like successful classroom teaching and learning environments, depends on teamwork. Each player has a role in bringing the game to life. The ball must bounce around the court—lots of times, to many players—before we identify the winners.

Formative assessment, like a good basketball game, is not just about racking up points or celebrating the number of slam dunks in a classroom time period. It’s about the movement of the ball (good questions, rich tasks, smart probes) across the room to better coordinate learning for all.

Beginning teachers often pounce on the first hand raised in response to their questions. It is exciting to see that you can command and control the audience with a query. “You mean they will answer my questions if I just ask them?!” It’s a powerful feeling. Teachers crave attention. We like having a captive audience. It feels good that someone “got it.”

Many novice formative assessors are initially content to experience the Q&A routine with a few eager beavers. The eager beavers are fun and usually cannot wait to participate. They are willing to risk a public response. They gladly supply a raised hand or excitedly blurt out an answer. They keep the ball moving, pass it back to the teacher, and give us the impression that “we got game.”

Teachers who work to elicit the correct answer from their students seem to have an unbreakable bond with the few willing students who have that answer. Too often, the symbiotic relationship leads to a false sense of feedback. When asked after a lesson, “So who seems to understand the objective of the lesson?” beginning teachers typically recall the answers that the hardworking, engaged students supplied.

Beginning and experienced teachers who are on the formative assessment journey need ways to broaden the circle of inquiry. We offer tips and procedures, of course, but let’s refocus on why we bounce. The most important reason is to increase your sample size. Formative assessors can use equity sticks, index cards, or other tools to generate responses from individuals and groups throughout the classroom. Those who are learning to become formative assessors can make notations on a seating chart to widen the net and keep track of patterns...
of participation. By increasing the breadth and depth of student responses, the teacher is better able to draw meaningful conclusions about the current levels of student understanding, including the bottlenecks, pit stops, and places we all get stuck.

Without consistent procedures and visible practices related to bouncing, or spreading questions throughout the classroom, there’s not enough evidence that the majority of students in a class have actually engaged in thinking through a topic. We know from research on academic language and English language development that providing opportunities for students to articulate their thinking—in a variety of productive modes—is essential (Abedi & Herman, 2010; Abedi, 2010). This practice also makes it more likely that all students will feel included in classroom conversations (Zwiers, 2007a, 2007b).

**Principles, Procedures, and Practices**

Because bouncing strategically supports making valid inferences and sound instructional decisions, make it your mission to know why you’re bouncing as you do. Bounce with intention and awareness. Don’t let your moves reflect only happenstance or old habits you picked up from “doing school” (Lortie, 1975).

Try “bouncing yourself” through the classroom to listen to at least half of your students as they pair-share in a group work activity. Try just listening—not coaching. Try getting to every area of your classroom, especially those hard to reach pockets. Listening can be a good way to sample vulnerable or shy students’ talk without shining the spotlight on them (yet). Try bouncing by *snaking* (turn-taking “snakes” through the seating arrangement), *whipping* (student responses “whip” around the room), or *popcorning* (students decide when to speak, so responses can “pop” from anywhere). Experiment with the upsides and downsides of each method for various poses and probes and the kinds of sampling you want to achieve. Does the unit get harder at a particular point? Are there well-documented p-prims, preconceptions, and misconceptions in this topic? How can you quickly spot check who is struggling with the big idea or discrete procedure? Which sampling strategies make the most sense at which turns of the lesson?
**IN THE CLASSROOM**

**Do the Math to Maximize Student Response Space**

In the complex world of bouncing moves, we are listening for and trying to capture the maximum number of responses to widen the student response sample size. Like we found with pausing, a main purpose of bouncing is to increase the sample of responses for any given question or task. By bouncing systematically, we increase the likelihood that more students can and will add their voice to the classroom.

Let’s go back to our pausing example from Chapter 3. We imagined we had 36 students. We said that on a typical day, Devi, Christy, and Alex will respond within a fraction of a second and raise their hands, which led to 3 responses out of 36 possible student responses. We noted that in this scenario only 1 out of 12 students in the classroom respond. Of those three responses, two were correct and one was a misconception. The problem is (and yes, there are many problems in this scenario) we still don’t know how many other students shared that misconception. More than half? Less than half? Was it precisely that misconception? Or slightly different?

If this is too complicated, then let’s simplify. A little technology should help. We hear the teacher say: “Okay everyone, please use your clickers now. Vote if you agree with (A) Devi’s solution, or (B) Christy’s, or (C) Alex’s. I see from the results on my computer that several of you still haven’t voted. I’ll wait. Okay, it looks like Devi’s solution is the most popular.”

In the best of all worlds, the kids can self-diagnose accurately, they do not guess, and they can explain why they voted for Devi on a principle other than she always gets it right. It turns out Devi had the misconception this time (she confused the word *materials* with surface area and volume). But the students who voted for her solution may or may not have shared her misconception. They may know that she usually gets things right and has an A+ in the class. Technology can mask bouncing problems as much as reveal them.

For a low-tech option, what if the teacher had three coffee cups and she polled the kids instead? After asking Devi, Christy, and Alex to explain their reasoning at the document camera (if a visual is necessary) and assigning a coffee cup to each answer, the other students are asked to drop their popsicle sticks (identified with their names) in the cup that corresponds with their answer.

Based on the results, the teacher pulls a stick and asks a randomly chosen student to explain his or her reasoning and how it supports the solution. Not only has the response rate improved by bouncing more systematically, but the students now have the opportunity to elaborate on each solution and explore its strengths and weaknesses, which can help them to meet Standard 3 of the Eight Standards for Mathematical Practice, “Construct viable arguments and critique the reasoning of others.” (CCSSI, 2010).
Bouncing strategies like these and others in this book are intended to feed many birds with one seed. These moves

- Address the use of academic language and the practicing of particular registers of mathematical/specialized subject matter discourse, which are learning targets and criteria for success.
- Take the advice of experts on the need for wait and think time.
- Connect to the real world and standards by inviting students to collaborate, discuss, and weigh options to solve problems.
- Help create classroom learning environments that support equity and inclusion, but also demand engagement with high-order skills from more than the eager students while still sharing the floor with them.

Try Questioning Your Beliefs About Why You Bounce as You Do

We invite you to think about how improving bouncing often takes adjusting not just our practices, but our beliefs as well. Fortunately, trying out new practices can help us to examine beliefs—and test them against experience.

Trying new bouncing practices might challenge and dislodge unhelpful and potentially harmful beliefs: The shy ones don't want to speak. This one doesn't know the answer and always gets it wrong. That one didn't do the homework and always falls behind. These kids are too lazy to share or when they do, I can barely hear what they are saying.

Rather than overgeneralize and play to your worst fears, try on a new bouncing practice, reflect with your students on its worth, tweak the procedure as needed, and rededicate the class to having everyone participate. Tell them what's bothering you about pouncing. Show a picture of Tigger (not Professor Kingsfield). Ask your students “What is to be done?” We predict you'll be pleasantly surprised at what you and your class discover together.

Some of your students will be delighted to be included in the FA-driven classroom where dialogue is at a premium and bouncing is prolific and productive. Others, not so much. You will get through the unease, however—together. Remind your students: no pain, no gain. Bouncing is like pumping iron. Feel the burn.
FORMATIVE ASSESSMENT TIPS

Celebrate victories among the inevitable setbacks with your students. Ask them to reflect on specific bouncing practices that are working well for them. Remind them that as they get better and better at bouncing, they are growing up and getting ready to go out on their own. Make connections to the worlds of work, college, and life. Doctors bounce medical opinions to their colleagues. Construction workers bounce ideas off structural engineers. Retail sales people bounce different products and services to their customers, explaining the benefits and costs. In society, we need to hear from everyone to make good decisions. Bouncing helps to create feedback so people can be heard. Our democracy may depend on our citizens being able to discern the difference between pouncing and bouncing.

What time is it? It’s time to persevere, to try new social skills, to speak up and listen better. It is the 21st century and global communication skills and capacities are at a premium. Try making your learning community’s stance toward bouncing explicit, intentional, and public. Show how bouncing is connected to all sorts of exchanges and that to be players in a democracy and the global economy we have to step up.

Post positive statements of these values and beliefs around the classroom. We all need reminders. Colorful images can support class agreements.

Here are some sample class agreements about bouncing.

- We agree that it’s okay to pass the ball (or the stuffed monkey)
- We always return to a person if he doesn’t want to answer right away
- We seek new opinions and more voices daily
- We avoid hand-raising until a peer is finished speaking
- We believe everyone has a voice, and make it true
- We take turns
- We understand that listening well takes time and effort
- We check: Did everyone have a “say” today? Who’s next?
- We acknowledge that bouncing helps everyone exercise their right to a good education

Orchestrating bouncing moves in your classroom can feel like directing traffic, hosting a dinner party, mediating a conflict, and navigating a maze—all at
once. Having sentence starters ready for a variety of bouncing routines can help you be present for teachable moments. Planning for bouncing means you can put your cognitive powers (attention, memory, effort to encode and retrieve information) on other moves such as probing or tagging when you need them most.

Ultimately, your attention needs to be on making sense (what we call Binning in Chapter 7) of student responses. But before you can start tallying, noting reactions, making connections, inferring patterns, and improvising your own responses to student responses, you need ways to quickly increase the sample size.

Supports for Bouncing That Include Your Students’ Needs

**Priming for bouncing before the unit begins:**
- As your teacher/mentor, I really need to know what you all are thinking in this unit. If you don’t understand or aren’t sure, I need to hear your voice so we can improve.
- How will I know you’re ready to share when things get tough or we get stuck? Can you give me a signal? Should we “check in” at the end of each week?
- Thank you for all your effort and contributions this week. Your enthusiasm is wonderful. Let’s see if we can get others to be this enthusiastic next week. Who hasn’t had a lot to say yet? What can we do as a class to help you share your ideas more next class?

**Priming for bouncing during class time:**
- Before I select someone to answer, I’m going to give everyone more time to think.
- For this challenge problem, we’re going to hear from everyone.
- I want to hear from someone in this part of the room now.
- Let’s hear from someone who hasn’t spoken yet today.
- There’s probably a range of opinions on this. We can find out by checking in. To do that, first we’ll ____________.
- Who is thinking something different?
- I’m not sure what is meant by ____________.
- What are some other possible ideas?
• Let’s have some folks add to that.
• This could be a good question for the class. Let’s get the whole class in on it.

**Involve the Already Active and Vocal Students to Support New Voices**

Got an eager beaver? Talkative or easily bored student? Assign her as scribe (more on this in the next chapter on Tagging). We say take students’ energy and passion and harness it. Differentiate with subtasks that engage the students who tend to talk a lot. Focus your energy on bouncing to those students who are not yet in the habit of speaking up and still outside the response space. Widen the loop as you reposition those who have already added to the discussion. Enlist the eager beavers into the process of expanding the discussion outward.

**Try Keeping Records**

How could you be bouncing differently to get better, more robust classroom data? A good place to start is by collecting all the soft data available in each lesson. Focusing on this treasure trove of observations (from daily word webs to exit tickets) will help you answer this question.

Are your “go-to” bouncing routines yielding what you’d like them to yield? How do you know if you can trust the evidence? Is your memory of the student responses from the popcorn exercise that good? Without running records of the streams of soft data to examine, review, and look over, how can you determine to what extent a bouncing routine is working to uncover student thinking and increase your understanding of where the kids are today, yesterday, and the day before?

Before we go further, keep in mind that bouncing will look different depending on your reason for bouncing. Bouncing to check that students understand instructions is one thing. Bouncing to uncover prior knowledge on the concept of *ratio* or *thesis* is another. When reflecting on a choice of sampling strategies to capture the soft data, it may also help to note the differing contexts and purposes for bouncing based on research. Bouncing at a particular juncture in a well-established learning progression may require a different approach than for the more generic levels on a taxonomy. Again, it all comes down to the cognition vertex and the path a formative assessor takes to respect and honor important learning targets that form part of the assessment triangle.
CASE STUDY

Bouncing: Sydney’s Case

For bouncing, I often use equity sticks. For each class, I’ve got a cup of wooden tongue depressor sticks, one with each student’s name. Using equity sticks helps me—helps us—hear from students who, given a choice, won’t volunteer. I’m a big believer in Students need to talk to learn, and A teacher’s job is to help students listen to, respond to, and learn from their classmates’ ideas. It’s important that the ways we bounce help me to sample, probe, and get students talking with one another and with me.

The students can’t see it, but I put small color-coded dots on one end of the sticks: yellow for English language learners, light green for students with IEPs, orange for so-called “middle achievers” with no diagnosed learning issues, and light blue for students who consistently give strong responses no matter the topic.

Of course there’s overlap. I’ve got English learners who are really strong in math, and so on. Still, the dots remind me that to get a good read on where a class period’s understanding is, I need to sample from all kinds of students. The coding helps me be strategic, purposeful, and systematic in my bouncing.

There’s another benefit to using equity sticks (the physical, actual sticks versus an anonymous, hand-held randomizer app on my smartphone): the sticks support a good visible routine, which is pose, pause, pull a stick from the cup, and probe. I’ve used index cards, too. I like when the students see what I am up to.

When I open a lesson or make a transition to an activity, often I pose the question, protect silent think time, and have everyone pair-share. Then I shake the cup of sticks. The noise grabs their attention and says, wordlessly, “Come on back from your pair-share, we’re about to hear from several of you.” I find the physical presence of the sticks does this better than any app. Whenever I can signal, lead transitions, and reinforce norms without talking, I do. I use my air time judiciously.

When I’m pulling equity sticks or cards, there’s always the option to pass. (I don’t really like the “volun-tolds” cold-call game.) But students don’t often pass. I think it’s because our class is a safe place for tentative or “trial balloon answers” as we call them.

As a math teacher, I focus on how students have arrived at an answer, not just what the answer is. I bounce to hear explanations [of their thinking]. They know that. It’s how we do math class together. I make a point to affirm and build on students’ contributions. My kids see that. What they say gets used in class, respectfully. I think this also plays a role in the “pass” option getting exercised less often than it otherwise might.

I probe too. When equity sticks are part of bouncing, I’m careful about probing since the fact that I’m using equity sticks means I can’t know whether the student in the spotlight would have volunteered. This matters. In general, I think that students who
have volunteered to respond are more at ease with public probing than students who have not volunteered to respond. But it’s hard, maybe impossible, to know for sure.

I bounce differently for different purposes. I use the equity sticks when that kind of entirely random or partially random selection (when I use the color coding) makes sense. My decision often depends on where we are in a lesson.

Sometimes I decide ahead of time which students I’m going to call on and in what order—for example, when I’m having students come up to the document camera or dry erase board to demonstrate how they solved or approached a problem. In these cases, I’ve already gone around the room as students were working. I know who has solved the problem and how. It wouldn’t make sense for me, and wouldn’t match my purposes for the students’ learning, to pull names at random. Since I’ve already sampled student thinking, how I bounce at this point in the lesson is more for the students’ benefit, not my own. I want all the students to see the different ways the problem has been approached and for us to begin to make sense of this together. As students demonstrate and we discuss, I count on all the other FA moves to help us.

We usually build from more common, concrete operational solution methods to more abstract or uncommon solution methods. My 6th graders are transitioning from arithmetic to algebraic thinking. How I bounce in this part of the lesson is supposed to serve all my students in interacting with and being able to link these different ways of thinking about and solving math problems.

Whether the students are passing the class dolphin, or I am using the sticks in a cup—the larger point is the same and my students know the routines by now. We all get sampled for our ideas, solutions, and strategies. Making sense of mathematics as a class is as important as individual growth and progress.

Prioritize your bouncing moves—one routine at a time. Your professional goals are your own. You know best where and how you could best spend your energy for next steps. New teachers in particular do well to focus on bouncing effectively regarding students’ understanding of content. This helps them build their pedagogical content knowledge (PCK). PCK is specialized knowledge experienced teachers have for their subject matter and the knowledge and skills they have in relating content to their students’ learning (Shulman, 1986, 1987).

PCK is not only a thorough understanding of a subject’s fundamental principles, but also an understanding of the kinds of difficulties students might encounter, and having the creativity to address these difficulties in ways that deepen student learning. The better new teachers bounce, we contend, the faster
they can build PCK. This book reminds us again and again that there are no shortcuts to uncovering and supporting student learning. A focus on mastering FA moves and integrating them with PCK can make a big difference.

**FORMATIVE ASSESSMENT TIPS**

**Think Local, Go Global**

Got bouncing problems in a humanities curriculum? Make it a social issue inside your educational world. Use your classroom to illustrate the significance of the “silent majority” for societies and governments. Look up at the Habits of Minds poster on the wall. Point to Connections and Conjecture. Re-pose: What happens to a society when only a few speak? Who decides for all when only a few go to the microphone? What kind of governments come to power by drowning out the voices of the people? Maybe it’s time for a pair-share and quick write: what is the connection between how we behave in school and the kind of government and society we can expect to live in? Or an exit slip: are we training to be powerless in this classroom so we can train ourselves how to be “good” citizens for others? Address the challenge of silence, apathy, and disinterest—no matter which subject you teach. The students are waiting on the adults to get real.

**It’s Your Turn to Reflect**

Bouncing ideas, exchanging opinions, and exploring student thinking are core principles of the FA moves framework. In a society increasingly unable to engage with people from the other side of the fence, we need to recommit to the values and norms of formative assessment for our children. Take a moment and examine your own beliefs and attitudes toward bouncing. Is it natural and normal for you? Is it awkward and strange for you? Are you a Tigger who loves to pounce on Pooh? Were you a silent Sally or Bob in your school? Which classes made you want to be an eager beaver and which ones made you slink to your seat and hide in the back while hoping to be saved by the bell?

We have offered suggestions for smart bouncing, but you and your colleagues are in the best position to come up with and customize bouncing practices for your context. What works in the art classroom or on the dance floor may not work in a science lab or mathematics class (Mewborn & Tyminski, 2006). You’re familiar now with the principles behind bouncing and how sampling strategies
relate to the logic of assessment design. As you innovate bouncing procedures with your colleagues, we encourage you to widen the circles involved and help one another learn from the range of suggestions and ideas bouncing back and forth among you.

**Misconceptions and Challenges**

⚠️ **Misconception Alert: Bouncing and Revoicing Are the Same**

A lot of teaching assumes that revoicing what students say in the classroom provides a bounce to the discussion. By amplifying student voices, the teacher is trying to increase the confidence and effects of individual responses to a question. Like an echo chamber, what a student just said gets bounced by the teacher—and perhaps added to and amplified—for everyone to hear. Revoicing is good practice, but we wish to distinguish it from sampling strategies aimed at gathering more and better student data on the fly.

Bouncing moves (and tagging moves, which we discuss in the next chapter) look to improve the representation of classroom responses, so as to identify more patterns in how students are approaching the material. Bouncing puts a premium on increasing the sample while including a representative range of student thinking—not merely restating what this or that student said about a topic.

How are bouncing and revoicing related? Bouncing is not revoicing, but a teacher can choose to revoice what a student says while bouncing. Researchers O’Connor and Michaels (1993) drew on Goffman (1974) and his concept of **animation** to identify a strategy they named **revoicing**. Revoicing is when a teacher gives students an “expanded voice” by saying out loud to everyone what the student has said. In the process of bouncing, it may help to animate and amplify students’ voices, but we need to move the ball around the court regardless.

⚠️ **Misconception Alert: Bouncing Only Works for Motivated Students**

One of our quieter teacher candidates observed that bouncing seems connected to motivation. He noticed that it’s hard to bounce in part because classroom preps differ, by grade level and curriculum track. In his case, the difference in motivation and engagement was acute. He told us:

To give everyone an opportunity to participate, I announce to the class that I want to hear from those students who have not yet spoken. What follows
is that the eager beavers stay quiet and eventually a quiet student speaks up. This procedure, however, does not work in every class. It may work for my seniors who are AP students and do all of their classwork, readings, and homework, but not with my 7th period sophomores for whom school is not one of their top priorities in life. They just don’t seem as motivated as the others.

Let’s unpack the word “motivated” for a moment. Do we mean “motivated students”? “Motivated teachers”? Both? What is motivation, anyway? And what “causes” motivation? In other words, where does motivation come from, for whom? Part of the misconception about effective bouncing depending on high levels of motivation is due to an unexamined assumption.

Motivation is an effect, as much as a cause, of student participation. Cognitive behavioral therapists, such as David Burns (1980), contend that motivation comes from action, not the other way around: motivation does not come first, action does! You have to prime the pump. Then you begin to get motivated, and the fluids will flow spontaneously. It works like this:

First: Action
Second: Motivation
Third: More Action

Beginning teachers see differences in their students’ willingness to share publicly. They ascribe these differences, often without being fully aware of it, to personality types and noncognitive indicators. Beginners are keenly attuned to what experts call “grit,” “locus of control,” and “self-concept” in the students they are called to teach. In these teaching placements and internships, our candidates don’t perceive lots of examples of perseverance or positive academic mindset. The teacher candidates become frustrated when their students’ affective dispositions and noncognitive orientations seem to get in the way of their best efforts.

What these new teachers do not see (yet) is that these behavioral differences are more often the result of conditioning than intrinsic qualities of kids. The students, in many cases, are mirroring the behaviors, norms, and attitudes of the school system itself. They feel “batch processed” and they act that way toward their managers. Different ways of “doing school,” it turns out, are also related to different tracks in the curriculum. The AP seniors are on track for college and
they are operating from a different frame of reference. Hence, they may react to different behavioral cues and signals than those “for whom school is not a top priority.”

Differences in age and maturity must also play a role in the “motivation” to participate in bouncing moves. Naturally, even “the same” bouncing procedures will unfold differently when used in different classes and contexts. Experienced teachers often meet this reality with a “can-do” orientation, without subscribing to the misconception that “bouncing only works for the motivated.” A reason for this is that experienced teachers are accomplished at adjusting and repositioning a practice. They tweak off-the-shelf “solutions” and avoid one-size-fits-all strategies for their particular students.

It’s common for beginning teachers who are learning to formatively assess to think something is not possible due to their own apprehensions of the challenge. Novices tend to believe bouncing fails because they

- Have not seen a bouncing move work with their particular students.
- Have unrealistic expectations that a new procedure should meet success immediately for all under differing conditions.
- Have not yet acquired skills in how to set their students up for success by instantiating and adapting new practices to changing circumstances.
- Have limited notions of what bouncing is and how it relates to their own perceptions of student traits and dispositions.
- Have difficulty seeing the general challenges associated with sampling student responses (e.g., restriction of range, measurement error, reliability, and bias).

We never shame or blame novice formative assessors for these beliefs or preconceptions. It is, so to speak, their current level of understanding formative assessment. Nor do we pretend that a teacher who rises to the top of a learning progression will never fall back on old habits or have difficulty maintaining a particular level of sophistication with a move. As contexts, kids, and the curriculum change, we can expect the formative assessor to change, too. Rather than look down on the beginner and celebrate how much further along we are as experienced teachers, let’s open up new avenues and vistas for seeing the problem of bouncing from the new lens of sampling strategy and design.

To address these and many other common p-prims, it’s time to go back to the drawing board. All formative assessment-rich classrooms need procedures and
practices to widen the net of participation so we can better understand all students’ beliefs, opinions, and ideas.

Revisiting the FA toolkit is part of our advice to a novice classroom assessor. The other part of our coaching strategy is to explore teachers’ reflection on their moves-based practice. One student teacher during his Phase II placement in a high school serving predominately Latino/Hispanic students wrote:

Let he who is free of pouncing cast the first stone. Although bouncing is the ideal, we are all guilty of pouncing. Taking this class has made me aware that we need to be prepared with a set of questions to lead classroom discussions, and to call on students as equally as possible, instead of allowing the same 3 or 4 students to respond to the questions. This is sometimes difficult to handle, especially if you want to move on to the next step on your lesson plan; it is always easier to have the same students respond to your questions in order to move on.

We know this student teacher and many others like him well enough to realize he cares deeply about students who are at risk. He is a first-generation college student interning at a high-needs school. He, too, felt ignored by and invisible to his instructors. He has a commitment to social justice but knows that pouncing works for now. Classroom management is central at this juncture in his development; formative assessment less so.

Rather than become embarrassed for or frustrated with those teachers that still pounce, or hold up the “best practices” baton to correct their behavior, we choose to offer formative feedback:

- Perhaps next week’s unit presents a fresh start. Let’s try to generate a loop with a solid opening question. Ask the kids which method they’d prefer: stuffed monkey, “equity” sticks, or popcornning.
- We get it. So what does it take for you to persevere with bouncing when you lose motivation? Does blaming the victim of pouncing seem fair? What’s the deeper issue here?
- Remember when we modeled using sentence starters in class. What if you primed for bouncing first? Maybe start by asking the eager beavers to take the lead, ask for volunteers and scribe?
- Let’s make a plan. First, a list. Which actions in the classroom propel you toward feeling more confidence with bouncing? Second, let’s observe the kids in another learning space: in the gym, in the science lab, or in band
practice. Can these same students bounce a ball on the court? Or share ideas with an experiment? Or play in a band after school? What might it take for them to do the same in your classroom?

Bouncing happens everywhere. Your students know how to use social media (Twitter, Instagram, YouTube) to bounce all sorts of things. It's just a matter of making it happen in your world—with them—one day at a time.

The Change Is Big and Necessary

Priming for bouncing is not easy with a bevy of students used to hearing the few and ignoring the many. Students know from years of experience that teachers are in the habit of pouncing on the first hand up in the classroom. The majority of students are in the habit of letting the minority of eager beavers “do school” for them. Yes, posing “the right question, the right way” matters and implementing a “no hands” policy may work in the short run (Wiliam, 2014). But we need to push more on the meaning of bouncing moves and go a little deeper with research. The truth is we still don’t know that much about breaking the chain of a few students providing cover for the many.

We ask the formative assessment experts and educational researchers: Who will undo all the years of conditioning that shuts down the feedback loops in our classroom before the bell rings? How can a group of disenfranchised people socialized to shut up suddenly open up? How is the educational system designed to reinforce rather than reset the dynamics of tracking and delivering “just enough” freedom to some so they (or their parents) can speak out and move up? Why should children trust a teacher enough to speak up, and why should they believe that adults are actually interested in what they have to say when they finally feel able to speak?

These are tough questions. We do not pose them to mystify or shirk our responsibilities. But let’s be clear which habits we are inviting and which ones we are undoing. The FA moves framework is a beginning. It can clarify our stance, but school structures and priorities must support rather than impede the democratizing stance inherent in the FA moves framework.

Just as we introduced the posing moves in Chapter 2 that help you to focus on learning goals, curriculum targets, and the stuff that is worth knowing about your subject, we now need to introduce bouncing moves that any beginning
formative assessor can try while acknowledging that they may fail to widen the circle of inquiry beyond. For now.

Posing and probing moves in your classroom are useless if no one takes the ball to bounce ideas, solutions, first draft responses, and runs with them.

Those students who sit there quietly in their seats—the silent Bobs and Sallies—are harder to reach than the FA experts imagine. Is this a Goldilocks quest where we hope for the “just right amount of participation”? Can we really strike a balance and achieve the golden mean where all students, including those at each extreme and in the middle, can play a role in sharing their thoughts? Are bouncing moves just another flight of fancy whipped up by the academics and corps of professional development specialists? Maybe “bouncing” is just the latest flavor of the month in the endless cycle of “reforms” (Cuban, 1990) that are abandoned once the new one arrives?

Time will tell. For now, we note that there is so much attention on the outliers in these discussions about how to best engineer exchanges. Yes, we know a vibrant, thoughtful, rich exchange among teachers and students, students and students, even administrators and students when we see them. We have a few examples, mostly from STEM subjects, of classroom formative assessment in action (Ball, 1993; Furtak, Ruiz-Primo, Shemwell, Ayala, Brandon, Shavelson, & Yin, 2008; Franke & Kazemi, 2001; Hammer, 1997; Lampert, 2003; Warren, Ballenger, Ogonowski, Rosebery, & Hudicourt-Barnes, 2001; Warren & Rosebery, 1995). But many of these bounce-rich exemplars are taken from the elementary and middle school years with less attention on how sampling across a wide range of students occurs in the high school classroom. The fact is we don’t know very much about the middle range students who have learned to play the game of doing school. The majority of our students, who are neither eager nor silent, just slip through the cracks.

Educational reformer Ted Sizer (1984) referred to this phenomena in Horace’s Compromise, a book that describes classrooms and schools dedicated to the path of least resistance, where teachers (and students) complacently accept the fact that learning is about learning to do school. Sizer and his colleagues at the Coalition of Essential Schools challenged us to care about the forgotten middle. One way to take up this challenge is to rethink how we assess—for whose good, for what good. The trick is not to become cynical about reaching more students or to fall back on being a summative assessor to catch those who don’t play your game.
If putting a pedagogical bounce into your teaching practice is too much to ask, then we should not be surprised when Jenny and Raymond tune out, get kicked out, and eventually drop out. For those of us formative assessors who want our students to get excited about learning, and know we can assess better, it is time to increase the sample size and raise the volume on those hard to hear voices.

**Learning to Look Back: Reflections on a Just-Taught Lesson**

Our teacher candidates are steeped in the basics. They know the tricks of the trade when it comes to describing classroom learning environments that are inclusive and equitable. By the time they get to our course, they’ve heard of equity sticks in methods courses. They have learned about popcorning, snaking, and other strategies for increasing participation in their multicultural, language literacy, and educational psychology courses. A few of our advanced candidates have tried these tactics in their teaching placements. A few are “in the zone” with the sticks, the cards, and marked-up seating charts. We get to hear their war stories and their personal variations on the bouncing theme.

But others sit quietly next to these budding formative assessors and are not so convinced. By the end of the credential program, having run the gauntlet of preparation courses, a few student teachers feel safe enough with (or exhausted by) their university professors to push back.

“Hold on, I am not so sure about what you are calling bouncing. It hasn’t worked for me. My mentor doesn’t do it. What’s the evidence it really works?”

At this point in the classroom evaluation and assessment course, we know things are working because push back is a form of engagement. The Habits of Mind are in gear. Our beginning teachers are moving up Bloom’s Taxonomy. It’s one thing to know a fact or procedure related to instructional methods. It’s quite another to apply those methods to different classroom contexts, curriculum, and kids. And it is quite another thing to begin to think strategically about which formative assessment moves to experiment with and for which students—and to think about when things fail, why and what can be done next time.

By now it should be clear that the purpose of reflecting on the just-taught lesson is to “re-experience” and rethink what is actually addressable and actionable. Using the FA moves framework, we can guide your attention to what matters for the teacher learning to become a formative assessor. We present the concept of sampling strategies under the umbrella of bouncing moves. It gives us all,
as Pamela Grossman calls it, a “grammar of practice” to share and play with as teacher educators (Grossman & McDonald, 2008).

Before moving forward, let’s breathe. To be clear: sampling student thinking is not easy. It requires making difficult instructional decisions. There are trade-offs and compromises with listening to some, but not others. Not everyone can or must be heard at every moment of the lesson. We hear our beginning teachers. Growing pains in this profession are real.

Being purposeful and skeptical is critical to gaining traction on any learning trajectory—for teachers, too. In the parlance of educational psychologists, a few of our student teachers are moving beyond declarative knowledge about what sampling means and procedural knowledge of how to use equity sticks effectively; they are also applying schematic knowledge of the entire FA moves framework and strategic knowledge in deciding which strategies are likely to work depending on the context, student needs, and curricular demands. These teacher candidates are moving through the formative assessment realm, making connections, and seeing how it is all related back to the bigger picture.

Once you have some traction in a discipline, it’s good to ask: “Wait a minute. Why should I use a quick write during my science lab when I can use that activity to warm up the concept of ‘diffusion’ at the beginning of the lesson, and circle back at the end of the period with an exit slip?”

Recently, we invited Maria, an English major who was placed at a fairly affluent suburban school in Silicon Valley, to reflect on her just-taught unit on personal narrative. Maria decided to focus on more purposeful sampling strategies, based on an observation she made early on:

In the past I have had trouble trying to include bouncing in my lessons. Unless I am actively thinking about it in the moment or put it into my lesson plan, I tend to forget. Lately I have been experimenting with using a plush toy as a means of getting my less willing students to talk. I toss the toy to one student who speaks and then throws it to another student, and so on. So far it is working nicely with my freshman class, who tend to be very vocal and all want to share at once. It’s adding more structure to the discussions, and students are now becoming more respectful of their peers.

The discussions have become much more student-centered and less teacher-centered, and I am happy to see that they are beginning to feel comfortable posing their own deeper questions for the rest of the class to answer. It’s also serving to bring out answers from my ever-so-quiet girls. Both of my classes have a majority of boys, and the boys tend to drown out the girls.
The plush toy is forcing the girls to give an answer, and to speak loudly and clearly, forcing the boys to listen to what they have to say. I hope that this succeeds in building confidence in the girls in my class, as well as helping the boys be more patient with responses and response times.

Maria has taken the bouncing challenge. She is playing with a sampling method that we discussed earlier in this chapter. Though Maria probably doesn’t describe it this way to her mentor teacher, what stands out for us as her university teachers is her sense of the need for equity. Bouncing moves are no longer an academic abstraction; Maria can actively use sampling techniques to address the need for a plurality of student responses. In a diverse public school classroom, we can expect different students will feel empowered to speak. Others will hang back and watch the action. What is to be done: get out the tin buckets, coffee cups, plush toys, or stuffed monkey. It’s time to put a bounce back in our steps and move a little closer toward the goal.

Teachers like Maria who are aiming to master formative assessment moves will design a sampling strategy to widen the net. They may focus on gender identification or language or ability groupings for a particular class period to balance participation. They might tackle sampling challenges around specific learning targets (such as students’ reading, writing, oral communication skills) with their colleagues. Or, they might consult with school counselors, paraprofessional staff, and after-school providers about students who seem stuck and unable to bounce, and ask what seems to work best for these kids.

In department meetings and professional learning communities, these formative assessors are not content to play grading games. They fight for the time, resources, and attention needed to advance student learning. This means standing up for assessment practices that uncover more student voices and help us to get a better, more reliable picture of student thinking during instruction. These classroom assessors are united in a struggle for making learning visible, in part, by resisting technologies that hide that learning or merely box it up into tidy, neat packages.

By focusing on the interpretation vertex of the assessment triangle and starting to see the importance of having a classroom sampling strategy, Maria is thinking more and more like an action researcher who is studying what works and what doesn’t to widen the net. She is acknowledging the limits of her evidence and looking for a firmer basis to develop instructional next steps.
We want all teachers to gain a more representative, balanced view of their students’ thinking—to move beyond chalk and talk, question and answer, and pouncing routines that skew what teachers know and can do with soft data. To do that, we have to adopt Maria’s stance toward her own pedagogical practice.

We could, of course, inquire into the buckets or cups that Maria chose to use this semester in Phase II student teaching. As part of lesson debriefing we might ask her and her mentor teacher about the equity sticks: Are you ready to explore other buckets (e.g., ELL, Latino, kinesthetic learners) to hold these sticks? Are there any connections between these students? Do their learning styles and issues overlap? How do we ensure that all students feel safe and no one feels singled out when you pull the sticks and cards?

Knowing that Maria is at a particular level of pedagogical development with her bouncing practices allows us to better serve as guides on the side. We do not need to dominate the conversation during her reflection on the lesson. Nor do we see it as productive to demand she bounce to this or that student, in this or that group, with this or that designation or label. Rather, we see her bouncing moves on a continuum of professional growth, and we note her progress with breaking down the sampling, looking at ways to widen the student response space, and connecting her concerns for social justice and equity to her teaching practice (Guitérrez & Rogoff, 2003; Noguera, 2008).

Like many of our credential candidates, Maria has learned that part of becoming a formative assessor is changing up our game and the familiar routines we take for granted. She is experimenting with configurations and groupings of FA moves to see if she can learn more about her students’ thinking. She wrote at the end of the semester: “I am hoping that by bouncing in this way, the girls in the class will be able to find their voices easier, and that our discussion will also become much more student centered. We’ll see how it goes!” That sense of hopeful expectation and the attempt to shift to a student-centered pedagogy is a big step in her teaching career. The utterance “we will see how it goes” is what we formative assessors live for.

**Putting It All Together**

As we’ve just highlighted, deep bouncing moves are intertwined with other moves. It’s complex and often quick paced. We can make a move, start dancing, then trip and fall before the music is over. Falling down is inevitable. Getting up is the real challenge.
As teacher educators, we want beginning teachers to learn. This means, as Piaget and others remind us, we can expect teachers who are learning a new craft, skill, or concept to go through a process of assimilation and accommodation. The constructivist approach to learning recognizes the need to move beyond concepts such as assessment for learning with novices and to start building scaffolds and supports toward deeper pedagogical practice. Experience is key. So is patient coaching.

We’d like to know those teachers learning formative assessment moves are trying out new ideas, making mistakes, and reengaging bouncing moves through practice. Only by applying what they have learned in their efforts to get better at sampling student thinking—and knowing that they are supported by mentors when things go awry—can teachers improve in the domain of formative assessment.

To build up a mental model (new schema) for bouncing, those learning to become formative assessors need time, experience, and guided practice. That’s how all people learn.

The real challenge for anyone seeking to master formative assessment moves is to develop a mental model or schema for sampling and widening the student response space. Bouncing is a placeholder we use to build up new connections in this FA domain for beginners. If there is going to be a deep shift in classroom assessment practices, we need a new language to describe these new practices as we slowly replace the old ones.

But on our journey we shouldn't get lost in the narrow pursuit of technique to the point that we leave the road to broader understanding. Bouncing presents more to think about than meets the eye.

**Checks for Understanding**

The following questions, prompts, and tasks can help you broaden and deepen your bouncing. Remember the point is to examine your sampling strategies for gathering student responses (oral or written). The following questions, prompts, and tasks are designed to help you advance your bouncing skills and take the ideas and thoughts in this chapter a few more steps forward. You can use the prompts in Warm-Up Prompts as self-checks and ideas in Try Now Tasks as conversation starters and exercises for self-study or group work.
Warm-Up Prompts:

- Why bounce?
- What are the consequences of skipping over the priming-for-bouncing phase of formative assessment?
- Who seems to thrive on pouncing vs. bouncing in your classroom? Who does not? What are some ways to accommodate these differing participation styles productively?
- What bouncing agreements have to be in place in your classroom to maximize the number of student participants? What is your personal goal for the number or percentage of student responses? How can you monitor that goal?

Try Now Tasks:

1. On the first day of a new unit, jump right in to this activity with no lead-in or fanfare. Write the word bouncing in the middle of the board. Ask, “What comes to mind?” In 30 seconds or less, write down all responses on the board.
2. On the second day, explain to students that it’s time for a word web. Remind them that word webs are warm-up tasks that help us to start thinking about a topic. Put the word bouncing in the middle of the board. Ask your students to write on a sticky note what bouncing brings to mind and then to place their responses on the board (can use other media, if preferred). Take approximately 2 minutes.
3. On the first day of the next week, pair students up to discuss their responses before writing to the prompt “We bounce because...” Have a student from each group state one reason/agreement. Appoint a scribe to capture these reasons/agreements on the board, poster paper, or shared software such as Google Doc. Give up to 5 minutes.
4. Give an example of a bouncing move you made this week. What worked? What didn’t work so well? For whom? List 1 or 2 next steps to better prime for bouncing.
5. Are bouncing and pouncing compatible? Discuss.
6. Ask teachers to gather into Four Corners, connected to themes related to “bouncing back” (resetting expectations, making agreements, what to do when things fall apart). Focus on:
   - Corner 1: Warm-ups and icebreakers
   - Corner 2: Tools, scaffolds, and technologies
Corner 3: Statements and sentence starters
Corner 4: Values and beliefs

Each group assigns a speaker and a scribe, then creates a list of examples related to its theme and ways to support bouncing moves. Share out and, as a whole, reach consensus on a department or school-based plan about how and when to check back in on bouncing agreements and ways to assess progress. (Note: This task can be used with students as well as teachers.)

Challenge task: Have one person in the group explain why a particular procedure may support more effective priming for bouncing in the classroom. Allow another person to “push back” and say why these moves may not work—for whom and why it matters? Pick a focus “student” and use a fishbowl approach to discuss the challenges and ways to work on them.
Traditional formative assessment in K–12 classrooms includes do-nows, polling technologies, and even quizzes. But FA is more than an interim assessment event or another high-tech tool for more efficient grading.

Throughout this book, we’ve heard from teachers who demonstrate that planning for, making, and reflecting upon FA moves is at the core of becoming a formative assessor. Formative assessors rely on verbs over nouns when thinking through classroom assessment practices. They can be seen launching, orchestrating, and eliciting student understanding in real time during the classroom period. They fully engage their students in speaking and listening routines, seeking collaboration and shared understandings in the classroom learning environment.

Formative assessors use the repertoire of moves to uncover prior knowledge, check for understanding, and delve deeper into misconceptions rather than to try to merely correct them. Formative assessors anticipate bottlenecks in the curriculum and welcome when their students get “stuck” in conceptually difficult material. They see the FA moves framework as a powerful way to make learning visible, especially in culturally, linguistically, and economically diverse classrooms.

Formative assessors are optimists and realists. FA moves require teachers to see the potential in all students for being able to deeply understand content and the potential in themselves to guide students to understanding. Teachers on the path to becoming formative assessors know that by consciously enacting multiple combinations of moves—over time and with practice—they get better at doing FA, and consequently at improving student learning outcomes.
Next Steps, Moving Forward

The FA moves can be stitched together in a multicolored patchwork quilt that becomes uniquely your own over time. Each patchwork block—a potential repertoire of moves—represents the possibilities for learning envisioned by teachers and students in a particular classroom, in a particular unit of instruction, with a particular lesson. It is up to you to design, assemble, and weave these moves together for maximum effect.

No one can prescribe or predict what your journey will be with the FA moves or what it will look like when you enact them each day in your school. Rather than tell you what to do, we have tried to share what we have learned so far on our journey with teachers, mentors, and colleagues.

Formative assessment will always be entwined with good teaching. It will be a part of positive, open, equitable classroom learning environments. It will draw from educational psychology and the science of learning. And it can be an integral part of your growth as a teacher if you commit to practicing the moves over time.

Where We Stand

Paul Black and his colleagues (2003) wrote, “Overall teachers seem to be trapped in a ‘no-man’s land’ between their new commitment to formative assessment and the different, often contradictory, demands of the external test system” (p. 21). He presciently added, “Their formative use of summative tests had enabled them to move the frontier significantly, but further territory seemed unassailable.”

We believe that there are new assessment and learning possibilities on the horizon. There is no reason to get stuck in no man’s land—or between the worlds of formative and summative assessment. We are not condemned to cycle through stages of optimism, hypocrisy, complacency, and cynicism as we learn to cope with the gap between authentic assessment for learning and the reality of high-stakes testing. The cult of point spreads and the worship of normal distributions and benchmark bar graphs is ubiquitous. So-called better, faster, cheaper grading technologies and “assessment solutions” are proliferating across the educational system. But these trends need not exhaust our imaginations nor our efforts as educators committed to student learning in our classrooms.

There are many ways to deal with the demands of social and political forces that pressure our schools. Rather than get cynical or complacent, the message of
this book has been to remind ourselves of the real work ahead: make a move and
don’t give up.

Part of the reason the book ends with the chapter on binning is to remind
everyone that the power of formative assessment lies in generating and sustaining feedback for learning. We argue that binning for grading and binning for feedback is something we do every day, and to that extent, it is something that is within our immediate sphere of influence. For those who learn to do both well, finding the balance will be the challenge, and we hope this book aids in that quest.

Unfortunately, the literature on building, nurturing, and sustaining a formative assessment culture in today’s classrooms is thin. We need more progress maps tied to teacher and student learning trajectories, more case studies about the nuance and flavors of each move during encounters with different subject matter content, and more stories from and testimonies by teachers about growth over time in these high-leverage practices.

There is more work to be done. Much to learn about teachers and teaching. And that is more than half the promise of becoming a formative assessor—on your terms, in your time.

**What’s on the Horizon**

We promised at the outset of the journey to becoming a formative assessor not to inundate you with “how to” lists and magic formulas. So rather than tell you what to do or try, we instead shared some findings from our work with different teachers, in diverse subject disciplines over the years.

Employing a teacher learning progressions framework, we educators and researchers have a choice of where to direct attention and effort. When teachers shift from lamenting what their students can’t do to focusing on changing their own thoughts and actions, they make leaps and bounds in their growth as formative assessors.

Let’s agree as we go forward that our journey in becoming formative assessors has just begun, there will always be ways for us to go deeper and get better at a particular practice, and we can model for our students how we, too, learn daily as professionals.

Incremental change is good. Sustained commitment to improving our pedagogical practices, lesson by lesson, is even better.
What if your formative assessment-driven lessons were just like first drafts? What if beginning to improve your formative assessment practice required others in the community (teacher educators, school administrators, educational policymakers) to acknowledge your ongoing development toward becoming a professional educator in your school? What if all the stakeholders in education started seeing teachers ("expert and novice" or "experienced and newbie") as potential formative assessors who can benefit from positive, specific, timely, and content-related feedback on possible next steps for revising lessons? This paradigm shift might change the conversation and remind us what is ultimately worth fighting for—teacher and student growth.

Formative assessment is a systematic process to continuously gather evidence about learning. Labeling teachers as "novice" or "ineffective" or "needs improvement" is unlikely to produce much insight or improvement in the practices we’ve outlined in this book. We should use data on teachers as learners—not for summative evaluation but to improve teaching—to identify a teacher’s current level of learning (about each of the FA moves) and to help the teacher reach the desired learning goal in concert with others.

Mastery of the formative assessment moves is a worthy professional goal for teachers, one grounded in evidence-based research on what makes a difference in student outcomes. In a formative assessment-rich school culture, teachers are active participants with their mentors and colleagues. They willingly share professional learning goals and understandings about how their own learning is progressing, what next steps they need to take, and how to take them in a community.

We follow Sadler’s insight that the true purpose of formative assessment is to narrow the gap between where, in this case, teachers currently are with a particular move, where they can go with coaching and support, and how to narrow the spread between what is actual and what is possible “at the next level.” Following Vygotsky’s lead with the notion of the zone of proximal development, Sadler (1989) presciently writes of all students:

If the gap is perceived as too large by a student [teacher], the goal may be unattainable, resulting in a sense of failure and discouragement on the part of the student [teacher]. Similarly, if the gap is perceived as too “small,” closing it might not be worth any individual effort. Hence, to borrow from Goldilocks, formative assessment is a process that needs to identify the "just right gap." (p. 130)
To close the just-right gaps in your own teaching and learning, you must now take the leap in your classrooms and incorporate the moves into your practice. Throughout this book, serving as guides on the side, we have explored pathways to uncovering student thinking, to realizing the power of student ideas, beliefs, and feelings, and to unlocking the secrets of learning. The rest is up to you, to become what you know you can be, a formative assessor.
Brent Duckor, PhD, is an associate professor in the Department of Teacher Education at San José State University. He taught government, economics, and history at Central Park East Secondary School in New York City in the 1990s before returning to the University of California–Berkeley, to study educational measurement, testing, and assessment with the passage of No Child Left Behind. Brent’s research on teachers’ understanding and use of formative assessment in the K–12 classroom and validation of teacher licensure exams in state, national, and international contexts seeks to integrate a developmental perspective on teachers’ growth in the profession. He has coedited several international journals including Psychological Test and Assessment Modeling and Pensamiento Educativo. Brent’s most recent scholarship has appeared in Teachers College Record, Journal of Teacher Education, Mathematics Teaching in the Middle School, The English Journal, and PhiDelta Kappan. He can be reached at brent.duckor@sjsu.edu.
Carrie Holmberg is a lecturer and preservice teacher educator at San José State University. She taught at a Title I comprehensive high school in Silicon Valley for nearly a decade and has extensive experience mentoring new teachers. A National Board Certified Teacher and Bay Area Writing Project teacher consultant, Carrie earned a Bachelor of Arts in English from Stanford University and a Master of Arts in education from the Stanford Teacher Education Program. In addition to supervising teacher candidates, coauthoring articles, and writing a book, she is pursuing her doctorate at San José State University in Educational Leadership. Carrie is committed to researching, developing, and celebrating educators’ knowledge, skills, and professionalism. She is an enthusiastic ambassador for teachers, educational leaders, and the people and systems that support them. Carrie lives in Silicon Valley with her family. She can be reached at carrie.holmberg@sjsu.edu.