HARVEY "SMOKEY" DANIELS

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with sketchnotes by Tanny McGregor

10 Structures for Teaching with Student-Directed Inquiry

US

Classroom

HEINEMANN Portsmouth, NH

ation about this Heinemann resource, visit http://heinemann.com/products/E08990

Heinemann 361 Hanover Street Portsmouth, NH 03801–3912 www.heinemann.com

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Inquiry Approach Versus Coverage Approach: From *Comprehension and Collaboration: Inquiry Circles in Action* by Stephanie Harvey and Harvey Daniels. Copyright © 2009 by Stephanie Harvey and Harvey Daniels. Published by Heinemann, Portsmouth, NH. All rights reserved. Heinemann currently publishes a second edition of *Comprehension and Collaboration*.

Acknowledgments for borrowed material continue on p. 198.

Cataloging-in-Publication Data is on file at the Library of Congress. ISBN: 978-0-325-08990-4

Editor: Tobey Antao Production: Vicki Kasabian Interior design: Suzanne Heiser Cover design: Lisa A. Fowler Cover photograph: Alyssa Zaffiro Typesetter: Kim Arney Manufacturing: Steve Bernier

Printed in the United States of America on acid-free paper 21 20 19 18 17 VP 1 2 3 4 5

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In our inquiry classrooms, we are less frequently playing the boss/expert role. Instead, we are acting more like a lead learner, a coach, a facilitator, or, some days, a research assistant. Today's students urgently need to see as many thoughtful, curious, resourceful, and critical adults as they can. So we model our own curious lives for kids.

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Introduction

Welcome to Student-Directed Inquiry

This is a book about teaching with inquiry, which means building instruction out of children's curiosity, rather than from a curriculum guide, a standard textbook, or a handed-down unit. It means kids investigating and exploring, instead of just sitting and listening. It means an active, lively space where children make choices and take responsibility for their learning. It means classrooms where teachers flow between their role as an expert and their job as lead learner and facilitator of research. Inquiry means children partner up to gather information, build knowledge, and then teach the world, together.

Inquiry is an exciting and energizing way to engage kids' hearts and minds and to cover content and meet standards. It holds important rewards for our students and delight for the adults working with them. But inquiry also requires some courage and some adjustments from us. The two biggest questions I hear from teachers are:

- 1. How do you find the *time* to try out kid-driven inquiries? I have my hands full trying to cover the official curriculum.
- 2. What are some quick and safe *structures* for getting started? I want to start small, dip my toe in the water, see how it works, and make sure my kids can handle it.



Glenwood students kept a timeline of an eagle family from first eggs to spring fledgling. The next two hundred pages address those concerns with specific and practical strategies, lessons, and models. Together, we will work our way up a ladder of student-directed learning that shows how to make room for inquiry in our schedules and to use that time well. By the end of this book, after you have tried out some of its ten major structures, I hope you will say two things:

"I never knew my kids were capable of working at this level."

and

"This is the most fun I have ever had in my teaching life."

But to begin, let's visit a classroom where inquiry is already in progress.

On this warm spring day, I am visiting Eason Elementary School, just west of Des Moines, Iowa. I step into Micki Schumacher's colorful first-grade room, where the kids are in the middle of "mini-inquiry" research projects on topics of their choice. A few minutes ago, Micki modeled how she pursues a curiosity question of her own ("Is our school in 'Tornado Alley,' and what does that mean?"). Then, on a big chart, she scribed a list of questions suggested by the kids.

Now the kids have been released to research their own questions, using laptops, their Wonder Notebooks, and a partner, if they want one.

I circulate through the room, sitting in briefly with kids who are investigating questions like these:

- Why do zebras have strips [stripes]?
- Who is puntsutawney [Punxsutawney] Phil?
- How can you make someoun's [someone's] day?
- How do animals communicate?
- How are gummy bars [bears] made?
- What causes a shooting star?
- Why isn's evering [isn't everything] free?

When I come over to Jenita and Audrey, I see their topic neatly typed on the laptop in front of them: "Why is Pluto no longer a planet?" As an astronomy enthusiast myself, I tuck in to hear what they're up to. As with almost every other activity in this book, laptops or tablets are not *required*. Jenita and Audrey could just as well have jotted notes about their Pluto inquiry on paper. But when a piece of technology really amplifies the learning, I'll mention it for consideration.

The girls are looking at a Kids Discover page that explains how Pluto was demoted from planethood for not being big enough. The problem was that other, significantly larger objects had been detected beyond Pluto's orbit. During a lull in the conversation, Audrey looks at me as if I am supposed to contribute something.

"I am really interested in the solar system, too," I offer. "In fact, I just read an amazing article in a magazine called *Scientific American* that says there might be another big planet in our solar system that we haven't even discovered yet. The astronomers are calling it Planet X."

The kids seem interested, so I add, "They think it would be a lot like Earth, with a rocky surface and maybe a little bigger. But much further out from the sun." Lucy and Avery, two girls working across the table, have now looked up from their screens to listen in. At this point, Jenita turns to me thoughtfully and asks: "How did the universe begin, anyway?"



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Jenita asks some big questions.

My mind is going: "This is the greatest question I have ever heard from a first grader." But outwardly, I demur, saying something like, "No one is completely sure. Scientists have been working on this for centuries. We'd all be famous if we could settle the debate."

Now all four girls stare at me with a look that says: "We haven't got all day, man; what's the deal?"

So I launch into the Big Bang theory. I explain that we can infer there was an initiating explosion because astronomers have shown that the universe is still expanding outward. I pause to ask, "Do you guys know what *infer* means?" Jenita just nods and says, "Sure, we infer every day in here."

The kids lean in as I dive deeper into the concept of an ever-expanding universe. I catch myself and laugh. "You know, we are doing college-level physics right now." No one but me seems to find this particularly noteworthy.

Something that fascinates me, as a teacher of many decades, is that I have finally found a moment in which *giving information* can be an effective teaching method: when kids have chosen their own research topic, dug deeply into it, and then run up against an information deficit. This is the mother of all teachable moments.

These six-year-olds seem to be in a "flow state." They are hanging on my every word. They listen as if I am recounting a trip to Disney World.

Looking back a few weeks later, I'm not sure how much astrophysics Jenita, Audrey, Lucy, and Avery remember from our time together. But I do know this: those girls were seized by curiosity, hungry to build knowledge, and fully in charge of their own learning. And those experiences, those *habits of mind*, will serve them for the rest of their lives.

These lucky kids are attending an inquiry school in a district that has committed itself to honoring kids' questions and teaching them how to find answers for themselves. Every morning, Eason's children roll off the bus brimming with wonders—and eager to put their adults to work helping them investigate the burning questions that surge through their minds. Over in the teachers' parking lot are more smiling faces, the school's "lead learners" toting in armloads of books, rolled-up charts, bulging book bags, random props, and, balanced in there somehow, drippy Starbucks cups.

Realities

Before we get too starry-eyed here, let's check some facts. The teachers at Eason School have a mandated curriculum, standardized tests, and district-adopted programs to deal with, just like the rest of us. They don't necessarily have wizard-level technology or bulging bookrooms. And they are just as likely to have thirty kids each with his or her own perspectives, needs, and strengths—as we are.

What's different is that they have flipped their thinking. Where these educators used to worry about covering the material, they now plan how to evoke kids' curiosity. When they once focused on assigning and assessing finished products, they now teach *thinking*: problem posing, researching, vetting, corroborating, analyzing, criticizing, and presenting. They have two watchwords:

- 1. Honor kids' own questions.
- 2. Make the required curriculum into questions kids can't resist investigating.

This casual-sounding "flip" wasn't easy here at Eason, or at Glenwood, Duke, Burley, or any of the other schools we'll visit in this book. They all started small. They sure didn't plunge directly into full-scale, year-round inquiry units.

Instead, these teachers began with short, well-structured lessons that they used to test the kids' capabilities—and their own comfort level—with inquiry. And before they even took that first step, they *subtracted* something from their day. For example, if a teacher had a standard morning "bellringer/worksheet" regime, she'd suspend it for a while to make time to experiment with inquiry.

Many set the stage by giving five-minute lessons during which they shared their own curious lives with kids, modeling how they had hunted down the answers they sought. This could be as simple as telling about a book or article they had read, or more complex, such as sharing a personal investigation they were undertaking outside school. Megan Dixon had her second graders transfixed for weeks over her growing family's agonizing decision whether to buy a minivan and thus become "uncool forever."

Other teachers dipped a toe in the water by opening their mornings with "soft starts," swapping fifteen minutes of whole-class teaching for a quiet time when each student could choose something to learn about. When they saw that kids could handle that freedom, they set up wonder walls to capture and honor students' questions, returning to them for a few minutes later in the day or the week.

As kids proved their trustworthiness and teachers gained confidence, they tried longer and more complex inquiry structures. They found that if they set up a weekly Genius Hour, students were not just exercising their own need to know, but also covering heaps of standards along the way. Whatever topic they had chosen, kids were closely reading nonfiction text; conducting web research from reliable sources; working in collaborative teams; having respectful debates with classmates; and representing their thinking in writing, drawing, and speech.

When big, required curricular units came along, teachers would first ask kids: "What questions do you have about _____?" (e.g., insects, weather, community helpers, native peoples, Wisconsin history, and so on). They would build the instruction around kids' questions, which, lo and behold, usually covered and exceeded the official learning targets. And, as kids repeatedly demonstrated their capability, teachers felt comfortable to build more and more inquiry into their calendars.

As teachers became more fluent with inquiry, and their students mastered its procedures, these classroom communities could better handle the problems and crises that invariably come up over the span of a school year: a class pet dies, a classmate has a house fire, there is scary news on TV. As inquiry-ready kids, they could not only discuss and examine an issue but also turn to action: building awareness, advocating, or offering comfort and aid.

The Inquiry Trend

As I write this, the moment is auspicious for inquiry and curiosity. After a decade or three (depending how you count) of test-driven, data-obsessed school reform, we are enjoying a course correction. More flexibility and choice have returned to the states with the 2015 signing of the Every Student Succeeds Act. Working with teachers and schools in nineteen states this year, I have been hearing big sighs of relief as teachers feel the gradual return of their professional autonomy in the classroom.

Several ongoing conversations in education today combine to favor the development of more inquiry-based, curiosity-driven teaching.

Factors That Favor Inquiry Teaching

Research on Curiosity and Interest

Our teacher guts have always told us that kids learn more when they are curious about or interested in a subject. Now, a slew of brain research validates our instinct. Studies show that curiosity is a measurable mind-state during which learners not only hoover up information about a topic, but will also remember extraneous or accompanying events. In other words, we seem to have a "curiosity switch" that, when flipped, can juice up powerful learning (Strauss 2012).

Takeaway: Inquiry activates kids' curiosity.

Creativity and Innovation

Ask anyone from another country what makes America different and they'll usually answer that it's our innovation or our creativity. We Americans think differently—sometimes in very valuable ways. Unfortunately, with its obsessive focus on math and reading test scores, our recent cycle of school reform inadvertently suppressed the development of our number one national asset. The business world is already addressing this creativity gap and generating ways to better nurture original thinking. Daniel Pink's work is all about tapping people's intrinsic motivation to unleash innovative ideas and to enhance organizations (2009). Emma Seppala's research at Stanford offers a formula for making time, room, and space for unpressured creative thinking, both at work and in schools (2016).

Takeaway: Inquiry unleashes children's creativity.

Available Models

There is a fast-developing world of structures, tools, and materials that support inquiry teaching. The Buck Institute's Project-Based Learning continues to offer the field useful publications, events, and models (2016). Expeditionary Learning (now called ELS) has grown quickly in recent years, but maintained its principle of helping kids "have wonderful ideas" (2015). Responsive Classroom offers

high-quality support for the collaboration and climate that inquiry classrooms require (2016). Our own research group has specialized in student-driven, rather than teacher-planned, inquiry units (Harvey and Daniels 2015; Daniels and Ahmed 2015; Daniels and Steineke 2014).

Takeaway: We now have plenty of tools and supports for inquiry teaching.

Technology

Visiting schools these days, it sometimes feels like a technology festival. Symbaloo, Padlet, Kiddle, Edmodo, Google Classroom—and those are just the old ones! After decades of unfulfilled promises, an age of truly powerful tech-enabled learning is finally upon us. Today, kids can do things that were never possible before, reaching out to the world to investigate, build knowledge, and teach others. As these new tools and platforms are introduced, teachers are skillfully differentiating between the steak and the sizzle, focusing on the apps that aren't just gimmicks, but that genuinely amplify good teaching (Muhtaris and Ziemke 2015).

Takeaway: Inquiry gives kids a real purpose for using the latest technology.

Work World Ideas

The business community is always a source of ideas for schools, from the assembly-line model that we are still trying to outgrow, to some more promising ideas circulating today. Google's now sadly abandoned policy of giving employees one full day a week to pursue their own projects has spurred a school version we often call Genius Hour (Kessler 2013). And today's more progressive STEM programs, the ones that emphasize play, doing, trial and error, teaming, risk taking, and real-world applications, are feeding useful ideas to inquiry-based learning.

Takeaway: Inquiry learning parallels the workplace innovations and procedures.

Climate and Collaboration

We have an acute recognition that bullying, discrimination, and violence too often mar our school communities. Now serious action steps and alternatives are being developed and disseminated. There is an urgent recognition that we can (and must) explicitly teach friendliness, empathy, collaboration, and social-academic skills (Daniels and Steineke 2014).

Takeaway: Inquiry provides social-emotional learning through teamwork, empathy, and shared responsibility.

Engagement

Sometimes school is boring. This is not news to students, but the adults seem to have just gotten the message. Suddenly there is talk everywhere about student engagement. Bill Gates is even researching galvanic skin response bracelets (using essentially the same technology as mood rings) that could monitor kids' "engagement" in class (Strauss 2012). On the more hopeful side, researchers are showing that "engaged" doesn't necessarily mean *happy*. Students may tackle certain work out of mere compliance or under coercion, but this is not the same self-sustaining dynamic that curiosity offers. The questions now under debate: Are we setting too low a standard for kids' frame of mind in school? Should we be talking not just about obedience, but about joy, passion, play, fun, flow, and awe (Seppala 2016)?

Takeaway: Inquiry makes school feel worthwhile.

Social-Academic Skills

We are having a great debate about student motivation, self-regulation, and persistence. It is often argued that students, especially those from poor, urban, and minority communities, fail in school because they lack "grit," defined as a passion for long-term goals combined with strict self-discipline. Others argue that this exculpates the school by placing the blame on the student. Grit is not a character trait, they argue, but more an aspect of the tasks you are asked to do. If you are required to gut and clean a thousand fish every day (or do a hundred oddnumbered math problems as homework), a little grit might well come in handy. But kids who face the challenges of poverty, of systemic racism, or of inner-city urban life prove that they have grit just by getting to school every day. Students show motivation in class when the work is interesting and worth doing.

Takeaway: Inquiry promotes children's effort and persistence.

Heritage and Research

Inquiry learning is no fad. It has a deep history of research and practice in American education. The century-old contributions of John Dewey and William Kirkpatrick built a strong foundation, but other key contributions have come over the past seventy years. Spurred by development of constructivist learning theory and social psychology, the discovery learning movement was born in the 1960s, led by figures like Jerome Bruner. A breakthrough finding of this research was that traditional learning theories could not explain how children learned their native language. Normally developing children invent language structures *they have never heard from adults*: Daddy goed to work, I have two feets, and so on. This showed us that learners don't just receive but actively construct knowledge by sampling and actively manipulating the information around them. Not surprisingly, given a hundred years of such study, we can now document improved academic achievement in a variety of settings and grade levels where inquiry-based approaches are in place (Buck Institute 2016).

Takeaway: Inquiry has a cohesive learning theory and a strong evidence base.

Try This

Stop reading this book for a moment (I know that will be painful, right?) and think back to a time you were really curious about something. This could be during your childhood, outside of school, or today in your adult life. Use these "symptoms" of curiosity to help you locate such an experience in your own life.

Felt energized Got totally involved Lost track of time Was highly focused Couldn't be distracted Stuck to it Found extra time to pursue it Felt pleasure or delight Kept having more questions Remembered what you learned Later shared your learning with others

Got one? Great. Now consider these questions. If you are reading this book with a study group, by all means discuss them out loud.

What was the topic or activity? How did you get hooked? Where did this happen? Was anyone else involved as a mentor or partner? How did you feel emotionally? How would you describe your state of mind?

As you recollect these conditions, compare them to your own classroom today and think about possible changes.

When I have worked through this exercise with teachers, most of them are struck by the power of curiosity to drive learning, engender persistence, and unleash accomplishment. What a great reminder that we can work from kids' own questions backward to the required curriculum, not always the other way around.

How Is Inquiry Different from "Tell and Test" Instruction?

Because inquiry sometimes seems so hard to define, Steph Harvey and I created this chart to highlight the contrasts (2015). Notice that we do not label old-school teaching as "traditional." That's because progressive, student-centered, and inquiry-based learning is just as strong a strand in the American tradition (think John Dewey, Jerome Bruner, Francis Parker) as the skill-and-drill paradigm that has dominated the last three decades.

Obviously, these two paradigms are not new. They represent profoundly different views of childhood, and have been competing for centuries in Americans' school culture. Today, after a long dominance of coverage instruction, inquiry is resurgent because it fits our newer conception of children, learning, and the national interest.

Inquiry Approach Versus Coverage Approach		
Inquiry Approach	Coverage Approach	
 Student voice and choice Questions and concepts Collaborative work Strategic thinking Authentic investigations Student responsibility Student as knowledge creator Interaction and talk Teacher as model and coach Cross-disciplinary studies Multiple resources Multimodal learning Engaging in a discipline Real purpose and audience Caring and taking action Performance and self-assessments 	 Teacher selection and direction Required topics and isolated facts Solitary work Memorization As if/surrogate learning Student compliance Student as information receiver Quiet and listening Teacher as expert and presenter One subject at a time Reliance on a textbook Verbal sources only Hearing about a discipline Extrinsic motivators Forgetting and moving to next unit Filling in bubbles and blanks 	

What Is Student-Directed Inquiry?

So what is this book's student-directed inquiry approach, and how is it different from other project-based and inquiry-oriented teaching models? Here's a quick sketch of what student-directed inquiry looks like:

- We believe that all students can and must conduct their own research projects at every age level. We recognize that students are being *held back* if they are not supported to conduct their own short investigations from the earliest grades on up.
- We co-plan learning along with students, rather than plan solely as adults and then lead kids through our set plans later. Even when we have a required curriculum, we make room for kids' questions before, during, and after the mandated material.
- Our aim is always to provide the largest possible degree of student voice and choice in every part of the school experience.
- We plan from kids' interests, not just from standards, benchmarks, targets, tests, and the "data desires" of people outside of schools. We build curriculum from kids' wonders and then back-map projects to the relevant standards.
- We respect kids' attraction to relevant, authentic topics they choose for themselves. Inside of mandated units and topics, we seek out the elements that are most interesting to kids, and start with those.
- We start small and build kids' inquiry muscles with lots of practice. Some of our projects are short, lasting five minutes, twenty minutes, an hour, a couple of days. Some topics require far more time than others, so we tailor the schedule to fit the subject. We give kids plenty of chances to build their research skills and strategies through countless smaller, shorter inquiries before we try long inquiry units.

- We actively honor kids' curiosity all day long. We welcome the spontaneous emergence of children's questions. We'll often interrupt an ongoing lesson and make time to honor, capture, and, when possible, investigate a child's wonder.
- Inquiry thrives in a collaborative climate, so we use knowledge from social psychology and group dynamics to create a climate of genuine friendship, support, and collaboration. Partnering and teamwork are an integral part of an inquiry operating system.
- Before asking children to undertake a new activity or strategy, we explicitly model it ourselves.
- We take on new, nonexpert roles in the classroom, such as lead learner, research partner, coach, and facilitator.
- We encourage students to share their inquiry findings with interested audiences. We occasionally will host public events where parents or community members are invited. More often, sharing with the class or with just a few other students provides a suitable and efficient way for kids to go public.
- Our assessment efforts aim to help kids become their own planners, record keepers, goal setters, self-monitors, and reflectors. This includes banking topics for future investigations. As the year moves on, we look to see kids taking on more of this responsibility.
- Individual academic achievement and skill development are not the only important goals of inquiry projects—or of an education. With every investigation, we also want kids to develop their humanity, empathy, and sense of justice. In student-directed inquiries, our kids are constantly looking out to the wider world and asking, "Where do we fit in?" and "What can we do to help?"

Jumping into Inquiry

Something about inquiry makes it seem hard or risky to many of us teachers. Maybe that's partly because we didn't experience much project-based learning when we were kids in school. And in our teacher training, we mostly learned how to teach the regular curriculum the regular way: telling and testing. Once on the job, thanks to No Child Left Behind, many of us were doing scripted lessons and test prep for years, so we never even got a chance to try inquiry approaches. Indeed, we now have many young teachers in the profession who have *never* had a chance to hand over choice and responsibility to kids in the form of an inquiry unit.

And then there is the control issue. Often teachers are proud to say, "I run a tight ship in my classroom." And it's understandable to worry about mutiny among the crew when you suddenly add new or unfamiliar practices. We worry that the kids may come unglued, act out, or misbehave. But inquiry is *not* loose. As you'll see in this book's ten structures, inquiry is a highly planful, orderly, and organized kind of instruction. It's still plenty tight, but it's a different kind of ship.

How Do We Assess Student-Directed Inquiry?

The kinds of inquiry projects in this book don't match up well with traditional assessment tools like worksheets, quizzes, and multiple-choice tests. To begin with, some of the simpler models are so short—taking only five, ten, or twenty minutes—that they scarcely need any formal assessment at all. For example, when you spend five minutes to model your own curiosity, you may be observing kids for their engagement, attention, and perhaps their follow-up comments or questions—but certainly not making a rubric or giving them a grade. But then, as the projects get longer and there's more substance to assess, inquiry learning requires subtle, thoughtful, and varied forms of assessment.

The next pages show some principles that can help us select the most helpful and relevant assessment practices in inquiry-based classrooms.



This chart comes from a book called *Best Practice: Bringing Standards to Life in America's Classrooms*, which I wrote with my partners Steve Zemelman and Arthur Hyde (2012). In this resource, we talk in depth about teaching and assessment K–12, and across the curriculum. The Best Practice Assessment chart here offers some ways we might put these basic principles into action. For every one of these suggestions, there are myriad variations, choices, and styles. Try out options, talk to colleagues, consider digital alternatives, and make it your own.

Tools for the Assessment of Inquiry

Keep your own journal or notebook, including these sections:

- 1. Your own wonders, questions, and learnings from inside and outside of school. These are topics from your curious life that can be shared with kids.
- 2. Several pages for each student, where you can jot down what you gradually learn about each individual. This definitely includes personal and out-ofschool information in addition to academic insights. As Donald Graves reminded us: until you know ten things about a student, you are not ready to teach that child.
- 3. Dedicated space to jot teaching notes, save scraps and artifacts, reflect on your lessons, and noodle ideas for future activities.

This kind of log will fill up fast and may need to be replaced periodically.

Set Kids Up to Self-Assess

One of the great strengths of student-directed inquiry is that kids are explicitly asked to take steadily increasing responsibility for their own learning—which also means keeping their own records.

- Help students create journals, logs, notebooks, or idea books where they can save their own wonderings, learnings about classmates (parallel to your journal section for kid notes), research findings, and personal goal setting. Filling all these functions may require multiple volumes or storage spaces.
- 2. Help students to set up portfolios (paper, digital, or hybrids) where they can save finished or ongoing work. Periodically hold portfolio maintenance sessions for review, reflection, and updating. Use portfolios as the evidence base in student-led parent conferences.

Document Student Work

1. Hold frequent student conferences about both inquiry procedures and recent findings. Worried about "saying the right thing"? Just try these three prompts: *What are you working on? How is it going? How can I help?* Probe

kids' thinking and decision making; help them set goals for their next investigations. Keep track of any goals they set so you can follow up later.

- 2. Take pictures and videos of work in progress and of culminating events or artifacts (posters, murals, live reports). Use these images for classroom displays as appropriate, and have kids save copies in their portfolios.
- 3. Collect artifacts of kids' learning. Save writings, artwork, lists, posters, charts, and sticky notes containing students' thinking or their comments on others' work.

Observe Students at Work

Inquiry teachers can often be seen with a clipboard or tablet in their hands, practicing narrative assessment—writing down in natural, not numerical, language what kids are thinking and doing.

- Practice kid watching. Look over students' shoulders, interview them, watch from a distance. Write down what you see them saying or doing. For example: While circulating through the room, use sticky notes to jot what you notice about kids' learning, and stick them in the appropriate student's folder when you swing by your desk. Some teachers like to pick five different students each day for more focused observation.
- 2. Use simple checklists to keep track of where students are in inquiry projects (question posing, searching, sifting sources, discussing with partners, creating a presentation). In longer small-group inquiries, we sometimes have kids create written plans or contracts, and these become a natural tool for assessing progress.

Rubrics and Grading

Many of us work in schools where any extended activity needs to be not just assessed but graded. In those circumstances, the best solution is often a rubric. A scoring rubric, which can be co-created with students, *defines the ingredients of a successful performance on a given activity*. Usually a rubric is constructed

by identifying a few critical ingredients of the target activity, and then by defining some levels of performance. Take a look at the general rubric for kids doing mini-inquiries.

Generic inquiry rubric for the mini-inquiry process				
Can the student	Yes	Developing	Not Yet	
Pose a question or topic of curiosity?				
Locate information about that topic from different sources?				
Evaluate and choose relevant information?				
Synthesize learning from multiple sources?				
Collaborate on research with others when needed?				
Go public with learning using varied representations?				
Attend to, respond to, and ask questions about classmates' research?				

Here we have seven criteria, each with three possible score levels. If you need to translate this to a grade, you can average and convert students' high, middle, and low scores into your school's grading system. In general, I'd resist the trend toward highly elaborate rubrics with dozens of criteria, standards, targets, levels, cells, descriptors—and hundreds of possible scores. Such hyperdetailed assessments can saddle teachers with long preparation times and unnecessary complexity, with few (or no) additional benefits for students. For some valuable tips and cautions on designing rubrics, see Rick Wormeli's excellent article in the *AMLE Magazine*, "Calling for a 'Timeout' on Rubrics and Grading Scales" (2015).

My extended professional family of teacher-authors has written a good deal more about the assessment of inquiry projects. To look further into these progressive practices, check out *Assessment Live* by Nancy Steineke (2009), *Subjects Matter* by Steve Zemelman and me (2014), and *Amplify* by Katie Muhtaris and Kristin Ziemke (2015).

How to Use This Book

This book offers ten practical ways of starting small, evoking kids' curiosity, and trying out quick investigations. The chapters provide a ladder that leads to more comprehensive and extensive use of inquiry approaches when you are ready.

These structures are

- 1. Demonstrate your own curiosity
- 2. Investigate ourselves and our classmates
- 3. Capture and honor kids' questions
- 4. Begin the day with soft starts
- 5. Check your news feed
- 6. Hang out with an expert
- 7. Pursue kids' own questions with mini-inquiries
- 8. Address curricular units with mini-inquiries
- 9. Lean into a crisis
- 10. Learn from partners and pioneers.

Each of these approaches has been tested and proven by teachers around the country. Some of these structures you may have heard of before or already dabbled in yourself. Others may have you scratching your head, at least for now. If you are already an inquiry enthusiast, some of these structures may help you expand your repertoire even further.

Each chapter includes three or four lessons from real teachers' classrooms, both primary and intermediate. In these "lesson stories," you'll hear step by step how a teacher tried out the strategy, what kids did and said, what adjustments were needed along the way, and what the outcomes were. As you read, you can be alert for lessons you could adapt to your own classroom—and then give it a try.

The ten structures are arranged roughly in order of increasing complexity and time commitment. The earlier ones take just a few minutes and retain a healthy degree of teacher control. Then, as you move up through the alternatives, they take a bit more time, offer more challenge and complexity, and hand over more responsibility to students. That being said, start anywhere. The main mechanism here is to give kids a chance to show you how trustworthy they can be and how hard they'll work when their curiosity is engaged. Take whatever moments your school days give you and dive in. Even better, find some colleagues to take this journey with you!

Here are some of the features you will consistently find in each chapter.

Point Outs: In the margins, you'll often see quick notes from me, intended to show how you can translate what the teacher on that page is doing right into your own classroom.

Try This: Once in each chapter, I'll encourage you to pause and ponder (alone or with colleagues) how your own thinking works when you are teaching or learning.

Sketchnotes: Each chapter ends with a beautiful and thoughtful sketchnote by my friend and fellow Heinemann author Tanny McGregor. This burgeoning form of graphic note taking is taking the school world by storm, and Tanny is one of its foremost practitioners. As you'll see, her sketchnotes are not linear chapter summaries, but creatively represent one person's real-time journey through a text. As such, they offer plenty to interact with as you sort out your own takeaways from a chapter.

Web Resources: Researching and writing this book provided too much wonderful material to fit between covers. At hein.pub/CuriousClassroom you'll find additional classroom stories, reproducible handouts, links to video clips, and more photos of kids and teachers at work.



Come along! Let's start small.



Individual academic achievement and skill development are not the only important goals of inquiry projects—or of an education. With every investigation, we also want kids to develop their humanity, empathy, and sense of justice. In student-directed inquiries, our kids are constantly looking out to the wider world and asking, "Where do we fit in?" and "What can we do to help?"

Demonstrate Your Own Curiosity



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When you regularly mention what you are reading, watching, following, or investigating, you show kids that you are an engaged learner in your "real life."

"Let me show you something I have been wondering and reading and learning about. Here's how I have been investigating my topic. Any questions or comments?"

We Might Say to Kids



Two to ten minutes; revisit daily, weekly, or throughout the year. hen I was a kid in school, seeing your teacher out in public was a mind-blowing shock. Is that her? Right here in the grocery store, buying pickles? *She eats pickles? She eats?*

These blessedly rare encounters did not square well with my assumption that as soon as we students left the classroom, Mrs. Barnard folded up into a small, tidy box until we returned.

As inquiry teachers, we want to present a very different persona to our kids. Instead of impersonating a fold-up robot or a faceless functionary, we want to be real flesh-and-blood (and grown-up appropriate) people. I quoted Donald Graves earlier for famously advising: "You are not ready to teach a child until you know ten things about her life outside of school." As in: Tara has a cat named Chester, she likes butterscotch cookies, her mom is a nurse, she has been to the ocean many times. . . .



Figure 1.1 Jessica Lenz uses a whiteboard to share her personal alligator inquiry with kids.

And maybe kids are not ready to be taught by us until they know ten things about *our* real lives (Figure 1.1).

We have of course all been warned that as teachers we should not be "friends" with our students, and that some distance must be maintained to preserve our authority. We know not to play "truth or dare" with our students. But in our inquiry classrooms, we are less frequently playing the boss/expert role. Instead, we are acting more like a lead learner, a coach, a facilitator, or a willing research colleague. An impersonal, authoritarian stance is less useful in this kind of relationship; indeed, it calls for something like the opposite. Social psychology research has long shown that true authority comes not from your job

Try This

Having a hard time surfacing your own inquiry questions? Feeling short on curiosity? You're not. Just take a few minutes and think through this list of prompts that I often show to kids or teachers. Jot down any questions that get triggered as you think. I guarantee you'll recover at least three questions from the back burner of your brain. (This activity is also great for a workshop or faculty meeting.)

- An "idle" question
- A book or author you are reading
- A place you have always wanted to visit
- A topic you are wondering about
- An item you saw in the news
- A person who has puzzled you recently
- The last thing you googled
- If I had a bucket list, _____ would be on it
- An issue you're investigating to solve a problem
- A purchase or investment you're pondering
- A student question that stuck in your mind
- A topic from your childhood
- Whatever happened to . . .
- Something you have always wanted to explore

See, you are just brimming with inquiry topics. Pick one that might interest your students, open up your head (metaphorically), and show it to them.

We can share aspects of our own lives any old time, just to deepen our acquaintance with kids. But our own experiences can also enliven curricular units. As a fourth-grade teacher in Wisconsin, Daniel Argyres is required to teach a unit on immigration. One of the centers he creates for kids is about Ellis Island, and among the artifacts on display are the authentic immigration papers and photos

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of his grandfather, Emmanuel Leonidas Argyriades (shortened to Argyres) as he emigrated from Greece to America through Ellis Island on May 29, 1927. (Amazingly enough, Daniel also has the records for his *great-grandfather*, John Konstantakopoulos, shortened to John Kondos, who also emigrated to America through Ellis Island on January 8, 1904.) All these documents reveal powerful details of the journey through the strangeness and the bureaucracy of American immigration in the 1900s. Daniel is a scholar of his ancestors, his family, and the Greek culture. Kids who study immigration with him are getting it up close and personal, not from the watered-down textbook "coverage."

Coming up, you'll see how teachers from all corners of America let students in on their curious lives, sharing their reading habits, their personal challenges, their risk taking, and even how they learn along with fellow teachers.

SHARE YOUR OUT-OF-SCHOOL LIFE My terrible feet

Megan Dixon, second-grade teacher at Glenwood School

To build positive relationships with students and promote classroom community, Megan Dixon tries to learn one new thing about each of her students every week (meaning she must discover something new about five or six kids a day). Like Aerianna loves everything about San Francisco. Lukas is fascinated with cars and engines. Isaac's favorite band is the Decemberists. And Alana is absolutely terrified of chickens.

For her part, Megan tries to share something about herself from the first day of school to the very last. Just think: 180 pieces of Megan's identity that she steadily offers up to connect more and more deeply with kids. Sometimes, this modeling just entails talking about a book she's currently reading, a new strategy she learned from a teacher magazine, or the antics of her own rambunctious and stubborn six-year-old, who will put on a dress or skirt only when riding her scooter or bike, but definitely not on holidays or special occasions. While much of

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Megan's personal sharing takes place during class meetings, at other times it comes up naturally in response to—or as part of—a lesson, investigation, or read-aloud.

At one particular class meeting, Megan shared a personal breakthrough. As she explains: "I have always been an athlete. I pounded the pavement in high school basketball and in high school and college tennis. I have always been very active, but my joints got so bad that I had to give up running, one of my favorite pastimes. My narrow, high-arched feet were causing numerous knee and hip problems, several months of physical therapy, new shoes and foot inserts, and finally a new exercise routine. This was a huge loss to me. So my news today, something I was eager to share with my class, was that I was finally feeling healthy enough to start running again after years."

Now it made sense to the kids why Mrs. Dixon *never* wore fancy shoes, was sometimes spotted walking around barefoot, and often complained about her terrible feet. Megan told the kids how nervous and excited she was to begin running again, after two years. She showed kids a website she had used to find the best shoes for her troubled tootsies. Then she shared an article about setting up a running regimen.

As Megan described these resources she'd accessed, the students were genuinely interested, encouraging, and supportive of her efforts. Seizing the moment, Megan brought out a calendar and in front of the students set a goal to run at least three times a week and work up to a ten-minute pace for four miles. Then, she hung up the calendar in a spot where all students could see it and check up on her every day.

The chart held her accountable to herself—and the kids. It was common to hear students ask, "Hey, Mrs. Dixon, did you run this morning?" or "Are you on track to meet your goal?" and to gently chide her if she missed a day. Enrique, one of the first students to arrive each day, checked in on a daily basis. Frequently, he would look at the calendar to make sure that his teacher had updated the morning's mileage. Knowing she had a difficult time running in the evening after being on her feet all day, he would say, "Mrs. Dixon, you know if you don't run in the morning, you won't do it!"

Every day she ran, Megan wrote the time and distance on the calendar, coming closer and closer to meeting her goal. One day in the middle of her

running project, she labeled a place next to her calendar with the heading "What's *your* goal?"

When you are modeling a bit of your own curiosity, it doesn't have to be a solo performance. You can always invite kids to come along on a parallel inquiry with you, as Megan does here.

Without prompting, students began placing sticky notes with their own goals (see Figure 1.3). Some were out-of-school activities, like Megan's:

- Help mom more with the baby
- Play outside one hour each day
- Get better at swimming by doing the length of the pool nonstop
- Walk four miles with my mom

Others were academic; the kids' excitement spread to any type of goal:

- I will read 30 minutes at night.
- I will finish the Magic Tree House series.
- I won't be a "log" during book club.

Not surprisingly, students asked if they could have their own blank calendars so that they could begin tracking their progress toward their goals.

These kid goals then became another topic at daily meetings and a venue to encourage and support each other. Megan concludes the story: "It was not uncommon for students to write each other encouraging notes and leave them for each other in their mailboxes. The kids and I celebrated each and every goal met. When I finally hit my running target, a student wrote a note saying, 'We are all



Figure 1.3 Nevy's goal was to help her mother with the baby for one hundred days.

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Figure 1.4 Megan's workout calendar at the end of her training

proud of you for working so hard to reach your goal' and had the whole class sign it. Noel gave us daily updates on her walking goal with her mom. We gave her a rousing round of applause when she reached ten thousand steps! What started as my own quick share turned into a model of living a curious life, goal setting, supporting each other to achieve goals, and problem solving. And I'm still running, carefully." (See Megan's completed workout calendar in Figure 1.4.)

TALK ABOUT YOUR READING What are you reading, Mrs. McG?

Tanny McGregor, teaching in a third-grade class in Withamsville-Tobasco School

Tanny McGregor, who has taught for twenty-eight years, now works as a classroom consultant and coach for her Ohio district. When I asked Tanny to tell how she shares her reading life with kids, she immediately thought of this lesson:

It is always a pleasure to have Rachel Ryba on my coaching schedule. She's always up for new ideas, and her students mirror their teacher's love for learning. One morning in May, I climbed the steps to Rachel's classroom, typical lesson materials in hand: some photographs, a piece of text to explore, a few sheets of chart paper, colored markers. I had a plan. And the plan was to stick with the plan.

I had barely crossed the classroom threshold when a grinning boy greeted me, offering to help me carry my things over to the meeting area. A few other kids soon joined us on the rug. They were continuing the conversation that had been going on while they waited for me to arrive, talking about books they'd read lately and what they planned to read over the summer break.

As if not wanting me to feel left out, that same helpful boy looked up at me and asked, "So what are you reading, Mrs. McG?" That question always makes me smile. I answered quickly. After all, I had a lesson to teach. "I'm reading historical fiction, the story of a little girl who hunted fossils." I set up my teaching area, easel to my right, markers at the ready. "Her name was Mary Anning."

I called the other students over to the large group area, and proceeded with the minilesson. I honestly don't remember what the skill or strategy focus was that day. What I do remember is that as soon as the lesson ended, the same small group of kids surrounded me as I packed up. "Did she find any fossils?" "How old was she?" "Where did she live?" I answered their questions, promising to bring my copy of *Remarkable Creatures* when I visited next.

Later that day I began thinking about what had happened. Not so much a reflection about the lesson, but about what happened *before* and *after* the lesson. These kids were curious. They were intensely interested in what I was reading. They were asking questions. They were talking about books. Wasn't this exactly what we always say we want kids to be and do? These thoughts faded as I started planning for my next visit to Rachel's class.

But, luckily, a copy of *Remarkable Creatures* by Tracy Chevalier was tucked into my backpack as I returned the next day. As soon as the lesson was over, I said, "Hey, if anyone is interested in hearing about the book I'm reading, stay on the carpet a little while longer." Everyone stayed. I shared how Mary Anning, a ten-year old girl and budding paleontologist in Lyme Regis, England, collected "curiosities" (later known as fossils) to sell. She had to make money for her family since her father had died. Over time well-known scientists from London heard about Mary's expertise uncovering and identifying these bones. When she was twelve she discovered the remains of an Ichthyosaur. "These things really happened!" I told the students. "I am so curious about Mary now, I've been doing my own research. So many facts are woven into this story." I held the book in my hands, showing everyone how I still had quite a bit to read. Questions and connections came pouring forth. No surprise, since passion is contagious. "Was she the first girl paleontologist?" "She was just a little older than we are." "Did she become famous?" "Is she ever mentioned in science books?" "Maybe it was hard for her to become a scientist back then since she was a girl."

Finally I began to awaken from my lesson plan stupor. C'mon, Mc-Gregor! What are you waiting for?

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Even when we are teaching a required curricular lesson, we should always keep our ears open for great kids' questions that we can capture and come back to later, when we have time.

These kids are genuinely interested in learning about a child from long ago who changed the scientific history. They are using strategic thinking, and they are primed and ready to investigate. Get out of the way and let it happen!

The next class was different. I brought in several picture books and articles about Mary Anning's life and discoveries. We read about, talked through, and searched for answers to our questions. We even stumbled upon a song by the band Artichoke that detailed Mary's story, reading the lyrics closely while the music pulled us in. Everyone so engaged. Everyone so curious.

I later learned that these students had recently been studying about fossils in science class. Did their curiosity stem from new content knowledge? Perhaps. I'd like to think so. But maybe the reason isn't so important. What matters is that we were reading and talking together, collecting curiosities like Mary Anning did more than two hundred years ago.

A whole-class inquiry started with one student's question: So what are you reading, Mrs. McG?

SHOW HOW YOU TAKE A RISK Carolynn, are you going to cry?

Carolynn Klein Hageman, first-grade teacher at Duke School

First-grade teacher Carolynn Klein got up early one school day and noticed a one-quart Pyrex measuring cup left out on her kitchen counter. She reached up to put the glass vessel back where it belonged, on a high cabinet shelf. Later on, Carolynn reflected that she might not have been quite awake enough for such a risky operation. But in the moment, the measuring cup fell right back off the shelf and hit her smack on the forehead. The cup didn't break, a testament to its sturdy design, but it did put a pretty nasty cut in Carolynn's right eyebrow as it bounced off her face.

A certified tough cookie, Carolynn put the cup away securely, stanched the blood flow with paper towels, and then drove off to do her job at school. The first colleague to spot her in the teachers' work room said, "Whoa, that's quite a wound you've got there," and insisted on getting her a butterfly bandage.

Right about then, a student's dad, dressed for his workout at the local gym, walked through to drop his daughter off for school. Since Dr. Ryan Lamb was an emergency room physician at the local hospital, Carolynn asked him what he thought of her wound. "That definitely needs stitches," he advised.

Carolynn shook her head, concluding, "OK, thanks for that info. I guess I'll get someone to cover my class while I go and get this sewn up."

"Don't do that," he said. "I'm off today—let me go grab my bag and I will come back and stitch you up."

"You mean here?"

"Sure, just let me run back home and get my doctor bag and I'll see you in ten minutes."

"Wow, OK, great," Carolynn thought as the doctor drove off. Now she wondered where and how this procedure would take place, when it suddenly occurred to her: this was the mother of all teachable moments, especially since her class was in the middle of a health unit. Talk about sharing your curious life with kids! Carolynn could get her stitches right in front of her six-year-old students.

She considered the downsides: some kids might be frightened by this "too real" spectacle, so there had to be an easy way for the queasy to opt out. On the plus side, many kids had already bragged about their own accidents, cuts, and stitch-ups.

You don't need to share something *this* personal just to prove to your kids that you're "real"! Always select a level of self-disclosure that's comfortable for you and the children.

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And a recent expert visitor had been a local surgeon who showed kids how to sew up a wound, and even had them practice with needles and thread on torn burlap. Carolynn, who always tells kids her personal motto is "go with the flow," decided to go for it. Just to be on the safe side, she checked with the school's curriculum director, who grabbed a camera by way of assent.

Dr. Lamb returned with his bag. As the father of a classmate in this small school community, he needed little introduction. Before Carolynn lay down on the rug (normally used for gentle read-alouds and class meetings), she and the doctor told the kids exactly what was going to happen. They explained that anyone who didn't want to watch could sit in the very back of the room and continue their independent reading. Three boys immediately retired (they crept back when the action started). Most of the other kids pulled in close for a better view.



Figure 1.5 Carolynn receives stitches on the classroom floor as kids ask questions.

Soon Carolynn was comfortably laid out on the rug in her classroom, swaddled with comfy blankets and pillows. (See the patient in Figure 1.5.) The doctor knelt at her side, his black bag standing open. He pulled out the instruments he would need and showed each one to the class, explaining how he was going to use it.

One of the kids blurted out: "Carolynn, are you going to cry?" (Kids use teachers' first names at Duke School.)

"Well, I could," she answered. "But I don't

think I will. I've had stitches before and I know it only feels like a tiny pinch. I also know that Dr. Lamb has lots of experience giving people stitches."

The children began peppering him with questions too:

- What's the most stitches you have had to give someone?
- What is the most common reason people get stitches?
- How many people do you stitch in a day?
- What part of the body gets the most stitches?

- How much time do you have after an accident to get the stitches done?
- How do you know a cut needs stitches and not just a bandage?
- What is the worst reason someone has had to get stitches?

The doctor patiently answered all of their spontaneous questions as he got ready. He inserted his syringe into a bottle of lidocaine, explaining every step as he made several small injections. Next, he showed how he threads the curved needle. He proceeded with the stitches—one, two, three. He talked about how he ties the thread and how Carolyn should care for her stitches after he's done. Carolynn assured the kids that she was feeling no pain, just a little pulling sensation.

In the literacy world, when an adult models and vocalizes her thinking during a complex activity, we call it a "think-aloud." Usually, we practice this strategy while reading a book or writing a story, but the procedure turns out to work just as well for first aid. The world's first "stitch-aloud." Who knew?

DEMONSTRATE INQUIRY AS A FACULTY TEAM *There's a virus inside us*

Amber Ankrom, Annie Gentithes, Becca Woolridge, Claudia Michelman, Elaine Cameron, Meghan Morris, Michelle Reich, K–8 Faculty at Duke School, Durham, North Carolina

We teachers don't just have to model our *individual* curiosity for students. In this example, seven faculty members from Duke School conducted an inquiry and took their learning public with the whole school community.

In early December last year, many of our students and teachers were out of school with a miserable flu. Most of us, children and adults, had dutifully gotten our flu shots, but we were all getting sick anyway. Our attendance was decimated. As a faculty, we were concerned and wanted to know more about the problem we were noticing. Our (uber-fantastic) librarian Elaine rallied

faculty members to use this as an opportunity to model our own curiosity and collaboration.

Driven by the initial question we had been pondering over the preceding weeks—why are so many of us getting sick?—we each investigated an aspect of the flu epidemic that was of personal interest to us. Teachers investigated a range of topics, such as treatments, symptoms, strains, and vaccines, learning from print and Internet resources as well as by interviewing experts within the community.

These teachers are inventing something rarely seen in our schools—a teacher team inquiry with a product displayed for students. What a fantastic way to model the collaborative, smallgroup investigations that are the basic formation for so many student inquiries.

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Michelle called her pediatrician and asked her if this year's flu shot would afford partial protection, even if the strain in the vaccine is incorrect. Becca studied the CDC website and found out the difference between the shot and the nasal spray. Elaine researched the different flu strains and how researchers pick which ones to include in the vaccine each year.

Each teacher not only investigated a different question, but also represented his or her findings in a unique way that made sense. We created a large display right in the campus library, so passing students from all grade levels could stop and have a look. There were graphs, drawings, statistics, and narrative representations. [See Figures 1.6 and 1.7.] We reprinted some key articles we had read, highlighting in yellow the passages that helped us answer our big research questions. Annie drew a diagram to help her visualize the respiratory system. Elaine surveyed every class to compile statistics on absences and displayed the information in a graph.

We wanted our postings to be just as diverse as the inquiry work we aim to do with students all year long. Talk about going viral! Our display demonstrated the power of collective curiosity, the value of wondering, and the importance of bringing our community together. To top it off, it was fun!



Figure 1.6 Faculty learnings chart about viruses



Figure 1.7 Visualizing influenza and how it infects us

We teachers have been shy to reveal much about our personal lives to our students (and in some categories, we are probably wise to do so). And maybe we are not quite ready to lie down and receive medical treatment on the floor of our class-rooms. But the teachers at Duke, Glenwood, and Withamsville-Tobasco schools found it fun and satisfying to model their own thinking for kids. I think they felt the magnetic attraction of "getting real," of occasionally dropping the teacher/ expert persona, and of just being a learner on a team with others. Today's kids, no matter what kind of community they come from, urgently need to see as many thoughtful, curious, resourceful, and critical adults as they can. Even if some of those people have terrible feet.

