

SMARTER CHARTS

for **Math**, **Science** & **Social Studies**

Making Learning Visible in the Content Areas

K-2



ANATOMY OF A CHART

What makes a smarter chart? Lots of things! Like a recipe that needs a pinch of sugar and a handful of flour, charts are composed of a few components that work together in harmony. Instructional charts may not be rocket science, but they use brain science to create high-impact aids for young mathematicians, scientists, and social scientists.

Materials

Like any artist, a chart maker benefits from tools of the trade: chart paper and markers. But there is more—a restickable glue stick and colored copy paper can change charts from wall hangings to living things. Color-coding using colored paper, sticky notes, and markers helps make each strategy clear and distinct, which aids memory.

It's time to play...
...math games!

1. Set up your materials.
2. Decide who goes first.
3. Play until the bell. DING! DING!
4. Put your materials away.

EFFORT GR

By:

Dates:

- fast →
- do first
- no check 8

Language

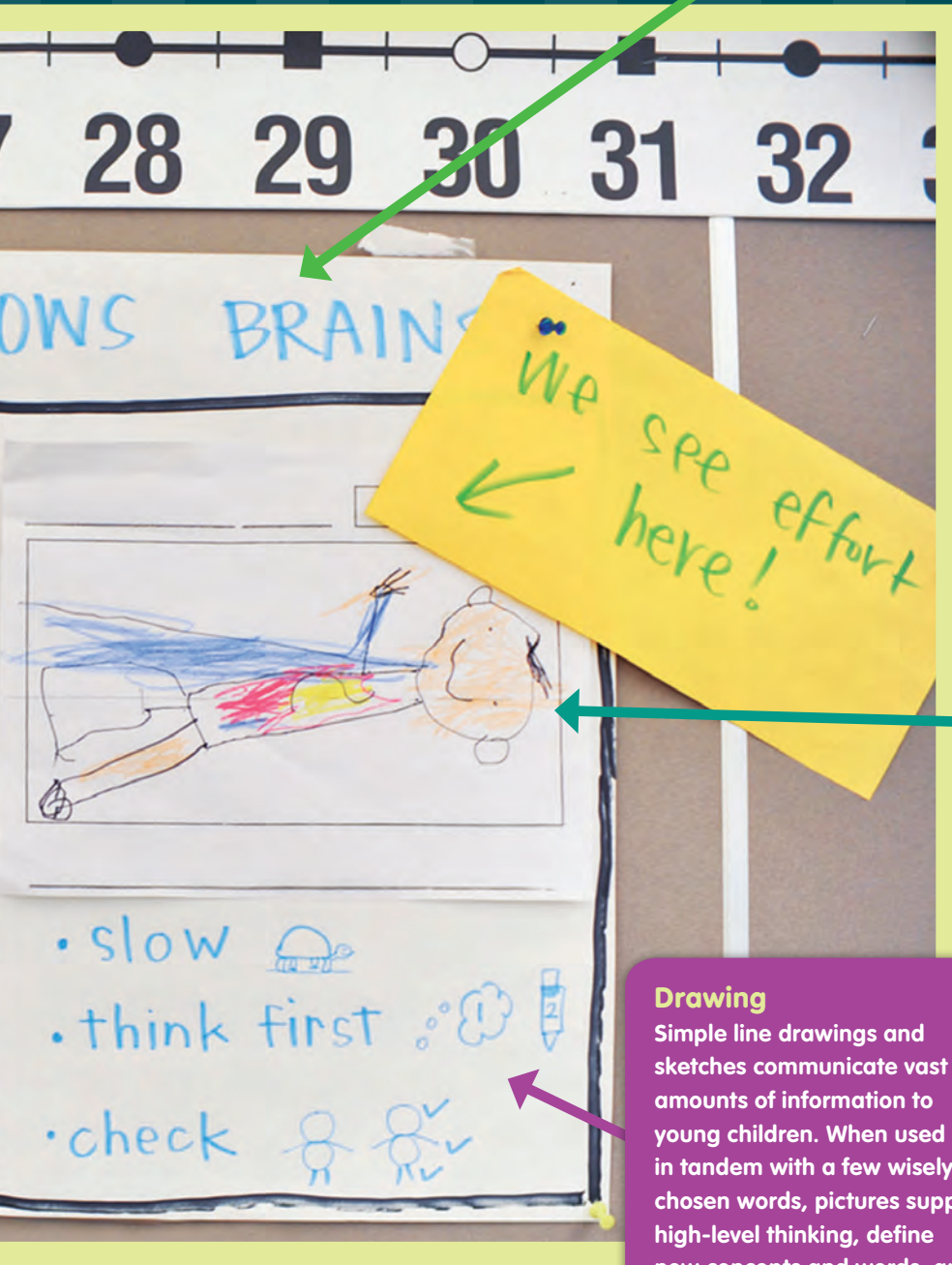
The language on your chart reflects the reading level and language competency of the students you teach. Make it like a billboard; don't write a lot when a little gets the point across. The words on the chart should be easily read and understood by the majority of your students.

Content

Charts take abstract content and represent it in a concrete way to support independence. This chart about effort provides tips for being more thoughtful and aware as children work. It reflects instruction by stating explicit strategies, showing the process of how to do something, or giving examples.

Chart Heading

Headings are the advertisement for your chart. Written large and legibly, they invite thinkers in, name a big skill, and set your students up to utilize the rest of the chart. They grab attention with a strong statement or a question.

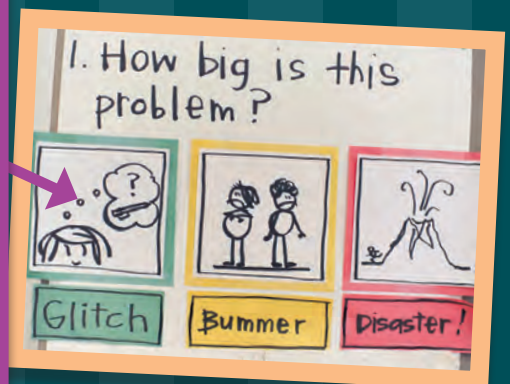


Student Art

The best teachers are often in your classroom—the students and the work they create! There is nothing more engaging to students than seeing their work celebrated and elevated as a mentor for others. Placing student exemplars and examples reinforces expectations and provides models that are within the zone of proximal development of the other students in the classroom.

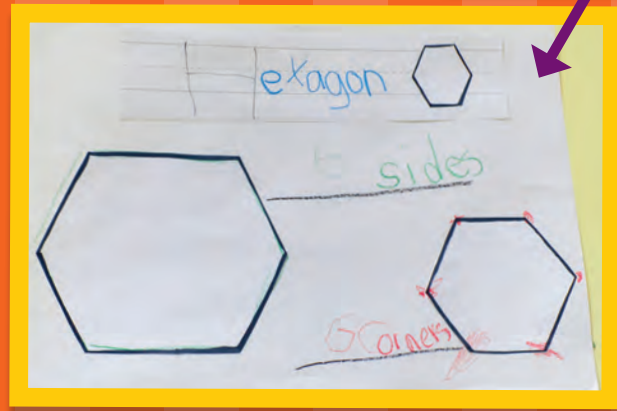
Drawing

Simple line drawings and sketches communicate vast amounts of information to young children. When used in tandem with a few wisely chosen words, pictures support high-level thinking, define new concepts and words, and provide additional information. Drawings make the chart engaging and enhance meaning. Photographs and clip art can also be used effectively.


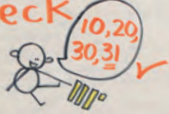



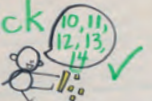
Math Charts

Concept Chart

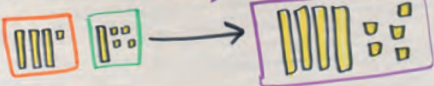


Double-Digit Addition
 $31 + 14 = ?$

Build then check  

Build then check  


How many all together?




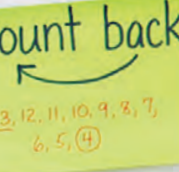
$31 + 14 = 45$


Process Chart

Subtraction Actions!

Draw a picture 

Use objects (manipulatives) 

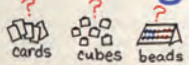




Count back 

Use a number line 

Repertoire Chart

Routine Chart

We are serious about math games.

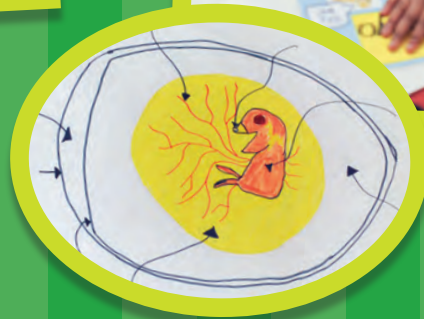
- Decide what to play. 
- Read the rules. 
- Set up the game. 
- PLAY, PLAY, PLAY! 
- Clean up. 

Science Charts

Exemplar Chart

Questions ?	Theories	Confirm OR Revise	How we Know
Why are pumpkins different sizes? 	Different Kinds. Kind #1 Kind #2		
Why do pumpkins have seeds? 	Maybe pumpkins are fruits. Fruits have seeds. 	<input checked="" type="checkbox"/> Pumpkins are a kind of fruit called a gourd	
How do pumpkins grow? 	Maybe they start as a seed. 	<input checked="" type="checkbox"/>	
Why do pumpkins have lines? 	Maybe as they grow they stretch 		

Concept Chart



Scientists Study Photographs

Look part by part



Study Action



Study Attributes

Shape Δ \square \circ \square
Size \bullet \circ \bigcirc
Number 1 2 3
Texture ~ \odot
Pattern 13131



Zoom In
for small
details



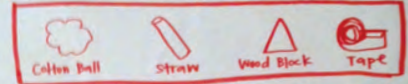
Zoom Out
for the
scene

Repertoire Chart

Routine Chart

Ready, Set ...
EXPERIMENT!

1. Read: Materials

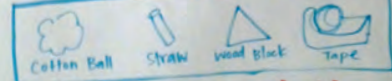


2. Decide: I will get _____

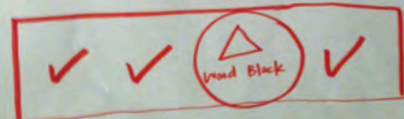
* Be careful!!



3. Reread Materials







4. Check: Did we get it all?



Social Studies Charts

Repertoire Chart

How do we KNOW we KNOW?

- look in A Book 
- ASK an EXPERT 
- observe ~~it~~ it 
- FIND IT ~~HOW~~ on THE INTERNET 

Concept Chart

Ways we can talk about communities...

How many people?

population

Where do

Kind residential

urban

Be STRATEGIC

1. Think



2. Plan



3. Do



Block Pick-Up

1. Decide: what block shape first?



2. Stack the same shape together



3. Match the shelf and put it on



4. Do it again!

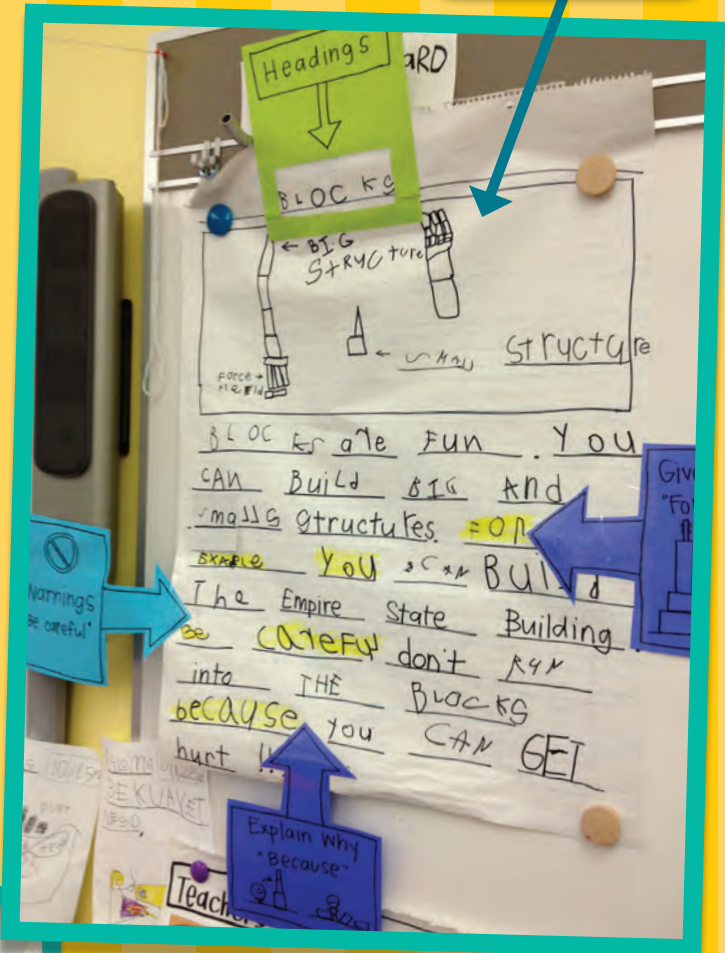
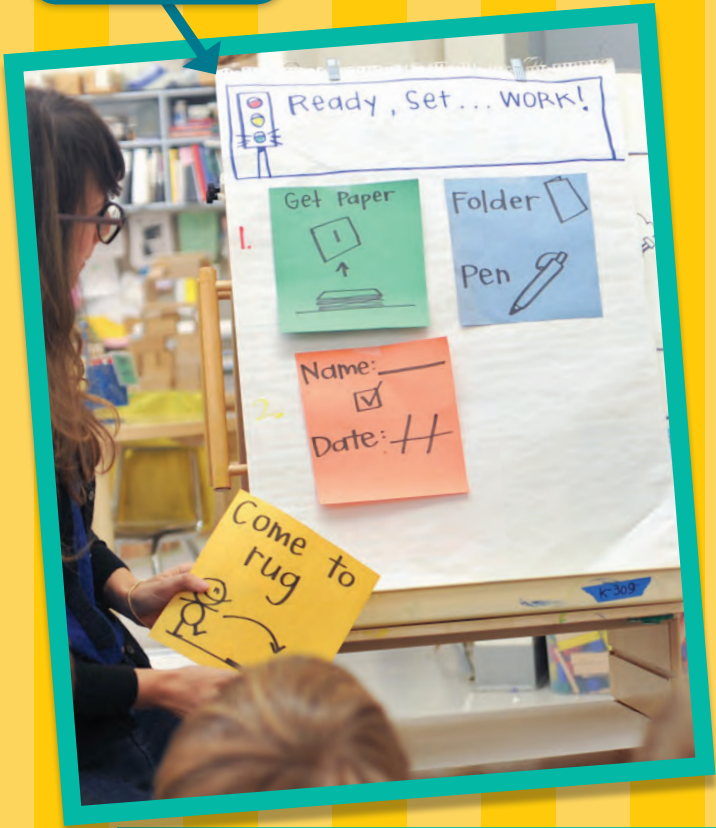
Process Chart

Routine Chart

Literacy Charts

Exemplar Chart

Routine Chart



Process Chart

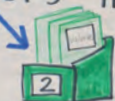


Writers Organize

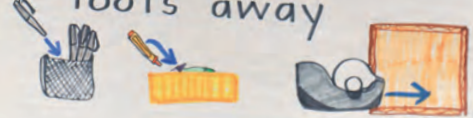
Books in folders



Folders in bin



Tools away



Routine Chart

Social Emotional Learning Charts

Process Chart

Solution Center

1. How big is this problem?

Glitch Bummer Disaster!

2. Say how you feel

I feel _____
because _____

Process Chart

How To Give a Compliment

Say someone's Name.

Look in their eyes.

SAY something Nice.

Repertoire Chart

Use your words

Use iMessage

Apologize

Tell them to stop

Concept Chart

Practice Grows Brains

① First time

② Second time

③ Third time

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for **Math, Science & Social Studies**

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HEINEMANN
Portsmouth, NH

Heinemann

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

Offices and agents throughout the world

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Library of Congress Cataloging-in-Publication Data

Mraz, Kristine.

Smarter charts for math, science, and social studies : making learning visible in the content areas / Kristine Mraz & Marjorie Martinelli.

pages cm.

Includes bibliographical references.

ISBN 978-0-325-05662-3

1. Visual education. 2. Content area reading—Study and teaching (Elementary)—Audio-visual aids. 3. Mathematics—Study and teaching (Elementary)—Audio-visual aids. 4. Science—Study and teaching (Elementary)—Audio-visual aids. 5. Social sciences—Study and teaching (Elementary)—Audio-visual aids. 6. Charts, diagrams, etc. I. Martinelli, Marjorie. II. Title.

LB1043.5.M345 2014

371.33¹5—dc23

2014011075

Editor: Zoë Ryder White

Production: Patty Adams

Cover and interior design: Monica Ann Crigler

Cover and interior photographer: Jesse Angelo

Typesetter: Gina Poirier Design

Manufacturing: Steve Bernier

Printed in the United States of America on acid-free paper

18 17 16 15 14 EBM 1 2 3 4 5

♡ To Valerie, Katie, Mollie, & Kathryn:
Thank you for being passionate teachers
and beautiful souls. The world is
better for having you in it
and for Geoff:
always. forever.



♡ Kristi



♡ For my daughters,
Katherine and Christina
who continue to be my
teachers and my dreams
come true! ♡ Mom



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Introduction

Since finishing *Smarter Charts*, we have been amazed at the ways teachers have responded. We have gotten emails from schools as far away as Hong Kong about the ways charting has changed for teachers. We have heard that kids use the charts more, that teachers see more independence. Though we thank you for sharing your success stories, all the credit goes to you: the teachers who are willing to try and the vision they create for what is possible. And so we began asking ourselves, “What else is possible?” Where else could charting take us? And as always, the children and teachers we worked with showed us the way.

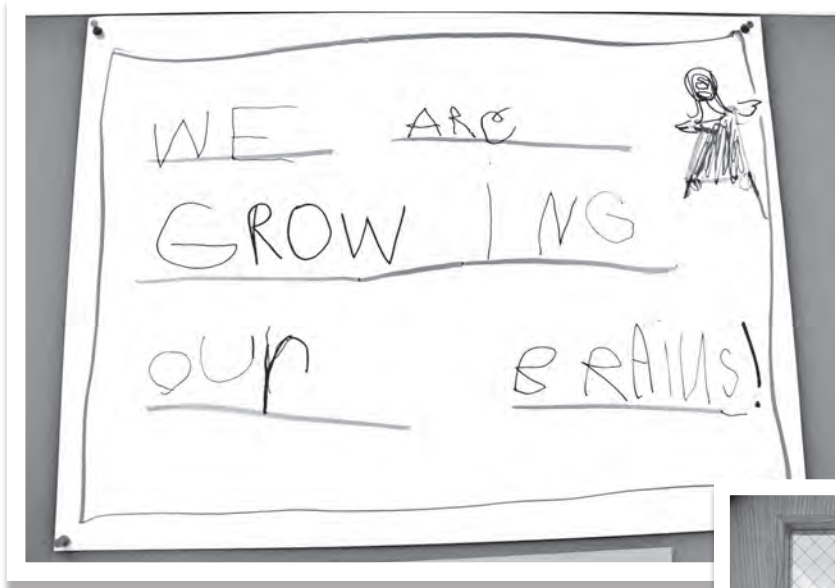


Figure 0.1 We are growing our brains!

Art teachers and music teachers in the schools we worked in asked: “Will this book help me and my charts?” Other teachers asked: “What about in science and social studies?” In some classrooms we visited, we saw daring teachers attempting to change how they were charting math and how they were using charts in areas other than literacy. As we started to dabble in a world less familiar to us, we got stumped. What *does* effective charting look like in math? Social studies? Science?



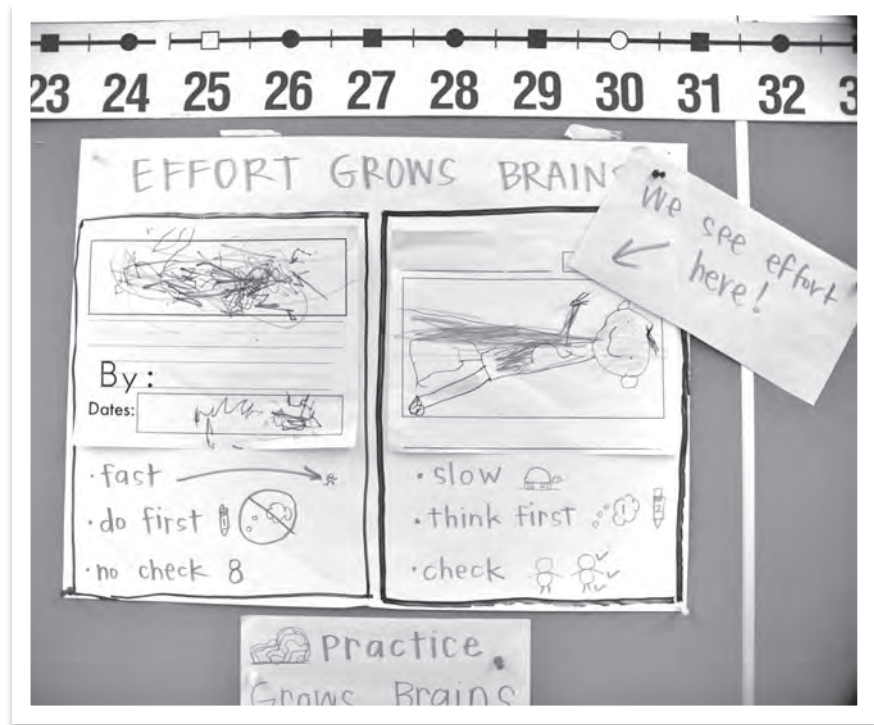
Figure 0.2 The door to an art room.

Charting Our Course: The Questions That Guide Our Process

As we started to think this through, we realized that as teachers ourselves, we did not have the strongest vision of what charts in the content area should look like. We had some thoughts, but we were in no way bursting with ideas. The relative lack of strong, engaging, thoughtful charts in the content areas makes sense in the context of recent surveys of teachers published in the *Report of the 2012 National Survey of Science and Mathematics Education* (2013) which showed that the majority of instructional time is spent on reading instruction (eighty-nine minutes) compared to fifty-four minutes per day on mathematics instruction, nineteen minutes per day on science instruction, and sixteen minutes per day on social studies instruction. When we do things infrequently, they will naturally be more difficult. In short, we were out of practice with teaching in the content areas and out of practice with charting what we taught.

We started to wonder if we could apply all we had learned about literacy charts from exploring brain research, design theory, and the world of advertising to all subject areas. Would the charts teachers found most helpful to literacy instruction and student independence be just as helpful in the other content areas? Could the way we used

Figure 0.3 A chart to support growth in writing.



charting to help clarify our teaching make the teaching happening in other subjects not only clearer, but more strategic? These nagging thoughts became the driving questions that helped us make some discoveries about charting that led us to write this book, *Smarter Charts for Math, Science, and Social Studies*.

What We Have Learned About Charting and Why This Book, Too

Since the writing of *Smarter Charts*, Kristi decided to return to the classroom after years spent working as a literacy consultant alongside Marjorie at the Teachers College Reading and Writing Project. She was happy to find a position in a school known for its commitment to thoughtful and responsive classroom practice, its intellectual and reflective staff, and its wise administration. A few weeks after being reintroduced to the wild lands known as teaching (kindergarten in particular), Kristi received her first bit of feedback from her principal. It was simple, and it was direct: “I can see all the thoughtful instruction happening in literacy from the charts on your walls. What is happening in math, social studies, and science? It is hard to tell what is happening in your teaching in those areas.”

As far as feedback goes, it was dead-on. As Kristi stood and looked at her classroom, the walls near her writing and reading areas were bursting with kindergarten student work, co-created charts, and enlarged annotated pages of mentors that children used as inspiration. Along her math wall, lonely tumbleweeds blew in the barren land below the number line. Was she teaching math? Yes! Shapes and counting strategies and games galore! But where were the repertoire charts? The routine charts? The process charts? The charts that show vocabulary and the charts that show models of how thinking can look? And, looking around further, there were even fewer charts for social studies and science. Talk about a wake-up call!

In Marjorie’s visits as a literacy consultant to schools across the world, she experienced a similar sense of disequilibrium when looking at the charts on classroom walls. Literacy charts were thriving, but oftentimes the only charts to support thinking in any given content area was a sample of a problem or a preprinted poster from a published program. At the chart workshops we presented, people started to ask: “How does this look in math? In social studies? In science? In art or music?” As we sat over coffee on a Sunday afternoon, we knew



Figure 0.4 A chair is its own chart in the music room.



that our work in literacy provided a map and a guideline to these un-“chart”-ed waters, and there was a need to venture forth. And so we began on the journey, which resulted in the book you hold in your hands. We found that when we developed charts to go with math and other content area instruction, some of the thinking we’d done around literacy charts matched this new work exactly. But we also experienced exciting new shifts in thinking and language as we struggled to develop effective, engaging, and empowering content area charts.

Charts Still Build Independence and Increase Cognitive Engagement

When Kristi teaches in small groups or one-on-one in reading and writing workshop, she dons a hat with red on one side and green on the other. When she is on “red,” she is closed for business. This means that as Kristi is working with children in small groups and one-on-one, all the other children can use charts and partners for help with everything short of catching on fire. In short, the charts serve as a way to enable children to solve problems independently. When your mom teaches you a family recipe, you jot down notes so when you go to make it on your own you have support. We believe the same idea holds true with charts; charts provide reminders and examples of your teaching so that new learning is more easily replicated by students.

Our chart work in literacy helped us (and helped the teachers we work with) empower children to make decisions independently while simultaneously teaching the language of reading and writing. Students could refer to charts that held strategies they were using to tackle areas of trouble. They could use charts to remind them of the steps in new processes they were working to make automatic. They could give suggestions to each other based on annotated mentors the class had studied. As we shifted our charting work into the content areas, we kept the same goal in mind: What do we need to make visible to help children be more independent, efficient, and flexible in their own learning?

No matter what area of the curriculum, we found that clear visuals, simple language, and constant reflection on charts, as we first outlined in *Smarter Charts*, were the key to helping children gain independence and agency in their learning. The more we charted, the less repeating



Figure 0.5 Kristi’s “Closed for Business” hat.

we did and more teaching was possible. An uptick in the attention Kristi paid to her content area charting led to an uptick in the independence of her students—she now uses her red and green hat during math and other content area times as well!

The transfer of independence and engagement to the content areas was exciting to watch and experience, but it was not always an easy transition to move our thinking about literacy into other areas. We uncovered some tricky spots, and in doing so, grew more insights and ideas about charts and the teaching they represent.

A Chart by Any Other Name Would Smell as Sweet: Shifts in Chart Names

When Marjorie started thinking about this with teachers she works with, she flipped open to the field guide on the inside cover of *Smarter Charts* and started a discussion: What would each of these types of literacy charts look like in other subject areas? As she and the teachers struggled through the exercise, some new thinking was born.

In *Smarter Charts*, we referred to charts that outline the characteristics of a “genre” for children and called them (somewhat obviously) “genre charts.” In math, social studies, science, and across the day, *genres* didn’t feel like the right word to describe concepts and types of information that children need to learn. Just as genre charts teach specific concepts, we found ourselves wishing for similar charts across the content areas—for example: squares have four corners, a key helps you read a map, an insect has an abdomen. After talking this out with friends and colleagues, we decided to rename genre charts (also somewhat obviously) “genre and concept charts.” The concept chart is the cousin of the genre chart in that they both provide information about something specific to content.



Figure 0.6 Talking charts with colleagues.

As Kristi continued to make charts in her classroom, she drudged up another quagmire: What about charts that present multiple options, but don't really lay out detailed strategies? For example, once Kristi had taught a few math games she made a chart entitled: "When I Think I Am Done. . . ." Much like its related writing chart, this chart gave children options for what to do when they felt like they had completed their work on a math investigation. The options were: check my thinking; add more explaining in pictures and words; play a math game. This useful chart presented a list of choices, but it felt weird and inaccurate to classify this kind of chart as a "strategy chart." We determined that both these types of "option charts" and charts that laid out multiple strategies could be renamed "repertoire charts." These charts outline a repertoire or selection of skills, strategies, activities, and so on, that a child has access to and can choose based on needs and wants.

Kristi's experiences with a new teacher evaluation system based on Charlotte Danielson's work (2007) and Marjorie's work with teachers who were being evaluated drew our attention more fully to the importance of growth and feedback. We found ourselves creating and using rubrics more often. In literacy, whenever we showcased and annotated the best possible version of skills in context, we called it an "exemplar chart." As we created a diverse variety of rubrics (from math responses to science writing), we discovered that rubrics are actually just another form of exemplar chart. In our discussions of exemplars, you will also find a discussion of rubrics. Despite these shifts in names and expansion of their categories, it is still the thinking behind the teaching that leads to the success and quality of any chart.

Teaching Is Still a Process, Not a Program

Both Marjorie and Kristi have some dieters in their lives. Their friend, Tina, has been attempting to lose weight through a diet that gives her a day-by-day outline of what she can eat. One week she can only eat things that are green, for example, and another week she can only eat protein in the form of nuts and twigs, or something equally as complex and confusing. Tina has to stick by the program day by day, and if she skips something or binge eats the leftover cupcakes from a school party, she has to backtrack to day one. Tina is not losing much weight.

Their friend Fran, on the other hand, went to see a nutritionist. The nutritionist asked Fran to keep a food diary before their meeting. They met and talked over the diary, and the nutritionist asked questions like:



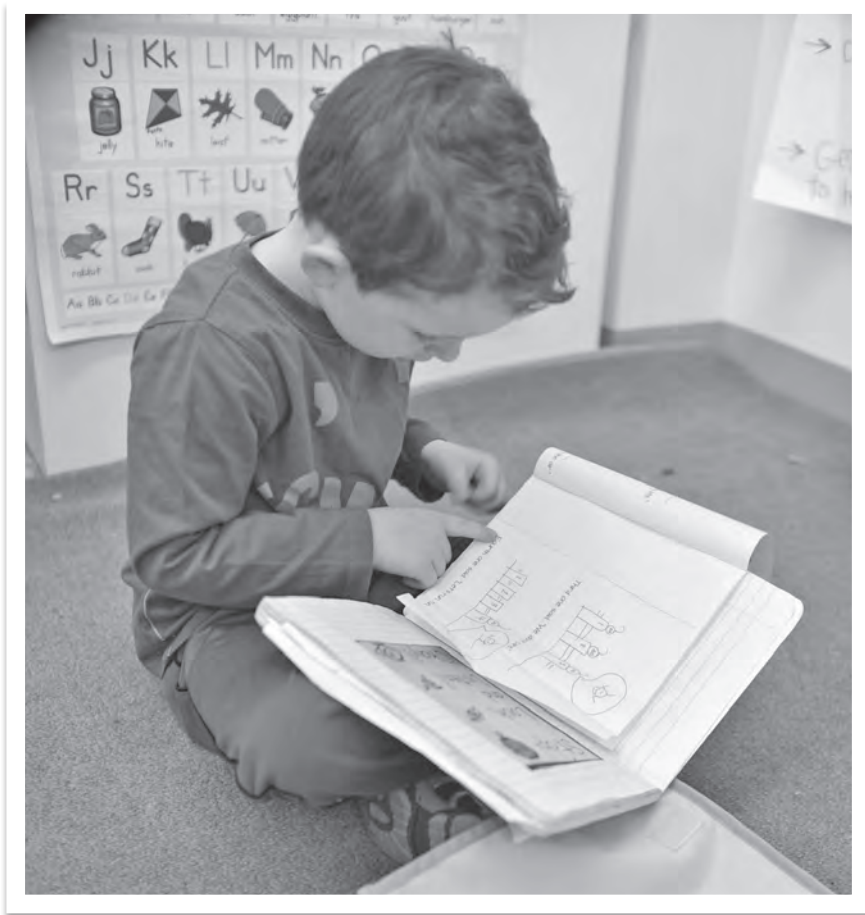


Figure 0.7 This learner does his best thinking on the rug.

“What makes dieting tricky?” “What is your greatest food weakness?” “Do you work out?” Together Fran and the nutritionist developed some guidelines for her eating over the next few months, and Fran made follow-up appointments to discuss how the weight loss is going and look over her newest entries in the food diary.

Tina sees dieting as a program: something you do and then it is done. You do not change your life, your habits, or your choices. You do what the diet says until you lose weight, and then you are done with the diet. Fran sees dieting as a process: you learn how to eat healthy as you diet. It requires knowledge and interaction between the expert and the novice. One plan is not suitable for everyone given that each person is unique with habits and mind-sets that influence everything one does.

We believe that solid teaching is a process. Though you can use program materials, it will not work to follow a program one day after another without reflection, assessment, or responding to the unique students you teach. As Kristi worked through the math materials provided by her district, her math coach gave her this advice: “Start with

the students and select what you need from the program.” This same theory allows you to use this book regardless of the curriculum your district supports. You do not need to use the charts provided in your school’s curricular materials if your students do not need them—rather, investigate what is tricky, teach (and chart) what students need, and reflect on the changes you see.

We do not purport to be experts in the teaching of math, science, social studies, music, or anything else for that matter. What we do have to offer is our ability to translate sometimes complex ideas into kid-friendly visuals and steps to make visual the abstract, to make simple the complex. We believe that thoughtful teachers, with charting tools at their fingertips, can create meaningful examples of visible learning that help children learn strategies, develop an understanding of processes, and refine their own thinking when problem solving and learning new materials.

We, and many of the teachers we work with, have found similar thinking pathways with the advent of the Common Core State Standards (CCSS). For the first time, these standards detail both content children need to know and skills children need to develop and internalize regardless of your district’s program choices.



Charting and the Common Core State Standards

For the first time in our presenting lives, the one question we don’t have to ask is: “What are your standards for this state?” The CCSS provide a common language and also a tool that is removed from the specifics of your program or school that we can use to talk about charts. So rather than referring to a specific program throughout this book (and thereby frustrating any teacher using something different), we will lean heavily on the CCSS for Math, Reading Informational Texts, and Speaking and Listening, as well as some early drafts for Social Studies and Science, as a way to think about charts that support students in different grades. As powerful as the standards are in helping teachers talk about skill development, developing teaching (and charts) to meet them illuminates an interesting issue.

When Kristi and her kindergarten colleagues mined these standards during common planning times, they happened across an interesting phenomena: When the standard named a skill, there were often multiple entry points to that skill. For example, in kindergarten the

CCSS in math say children will “understand addition as putting together and adding to.” Any teacher of addition knows that teaching *one* way to add will not suffice for a classroom of thirty unique students. Underneath the idea of “understanding addition” are multiple techniques: drawing a picture, using manipulatives, writing the algorithm, counting on in one’s head. It was through this work that Kristi came to understand the intersection of teaching as a process (What do *my* students understand about addition?) and the use of programs (Which *ways* will I teach my students to add, and thereby increase their understanding of addition?). At the crossroads is where charts emerge and become useful tools.

Career and college readiness is not limited to meeting academic standards alone; rather there are a host of character traits that enable children to be successful in academics, yes, but more importantly, in life: flexibility, persistence, and resilience to name a few. Charts help grow children as people and thinkers, too.

College- and Career-Ready Is a State of Mind

Many researchers, including Carol Dweck (2006) and Paul Tough (2012), have found that effort over intellect determines one’s success in life. Charts, which make teaching visible, provide an implicit model of the fact that learning requires effort. Charts lay down pathways for children that say: Look, you can do this—just follow these steps!

Charts enable children to remain persistent and resilient in times of learning challenge. Repertoire charts provide multiple avenues to reach a goal, process charts give step-by-step instructions for difficult skills, and exemplar charts show examples of what can be achieved.

When teaching is never made visible and accessible, we communicate an unintentional message: If you don’t get it this time, you will never get it. By teaching with charts, we say: This work is hard and will take practice, but here is a way to do it and it is right here whenever you need guidance.

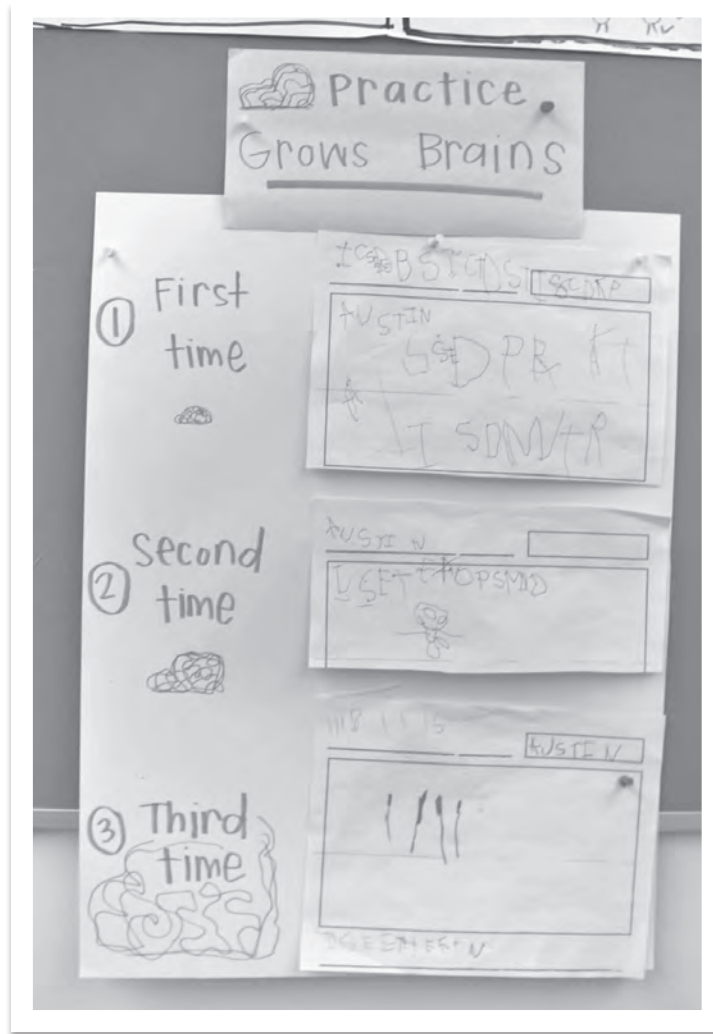


Figure 0.8 Teaching persistence.

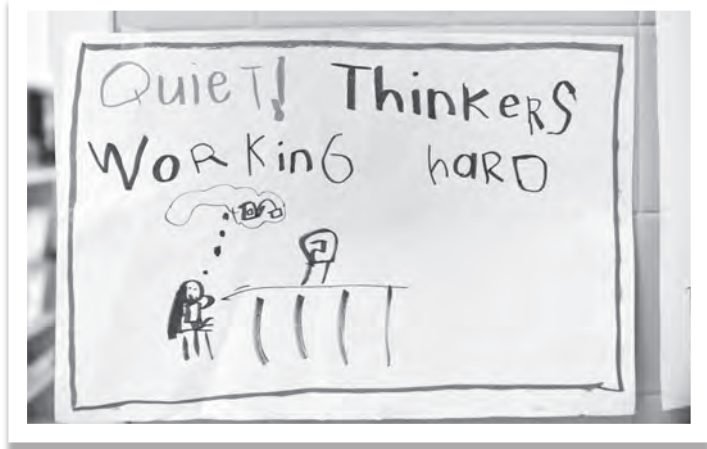


Figure 0.9 The entrance to Kristi's classroom.

Christine Hertz, a third-grade teacher, related this story about the power of charts and persistence. As Christine talked to her class about growth mind-sets, she recorded ideas about what someone with a growth mind-set would say ("I can try again," "Let me think about how to do this better," "I can keep at this") on a chart so children could use the phrases to help them out of hard spots. Midway through a child interrupted her and said, "But don't *all* charts help us out of hard spots?"

From the mouths of babes, right? With each interaction and response, we began to realize that the power of literacy charting we had worked to

name, harness, and articulate in *Smarter Charts* could also empower children to access every subject they needed to learn. This included expected routines, understanding of genres and concepts, concepts of process, strategic actions, and exemplars to use as models. Isn't that what teaching is all about? This was the inspiration for the book you are holding in your hands now, *Smarter Charts for Math, Science, and Social Studies*.

Foundations of Chart Making

This book stands on the shoulders of *Smarter Charts* and continues our dialogue on chart making, including our beliefs about teaching and learning and the questions that continue to guide our process. *Smarter Charts* provided the basics of effective charting: the language of charts (both words and visuals), when to make them, where to put them, how to get kids to use them, and ways to assess their effectiveness. This book assumes much of this knowledge in its references and implications, so we suggest you read that book first. For example, in the Introduction, we explained the research behind the charting such as educational pedagogy, design theory, brain research, and visual literacy, showing the ways this knowledge leads to improved memory and learning. In other words: why charts help learners learn. Then *Smarter Charts* teaches in depth three key aspects of effective charting:

- What do I put on my charts?
- How can I help my students use the charts independently?
- How do I assess the success of my charts?

The first section in *Smarter Charts* highlights the basics of language and visuals that help students read and recall the information being taught quickly and efficiently. The second section is all about when and how to make charts, where to put them, and how to make them memorable. And finally, the third section discusses ways to assess any chart's effectiveness and to get children to actively use the charts to become more independent problem solvers. If you are interested in diving into these ideas in detail, you'll find in-depth information in *Smarter Charts*.

A Note About the Ecosystem Surrounding This Work

With Kristi in her own classroom, and Marjorie working in scores of schools, we had a diverse playing field on which to test ideas. Each of these schools shared a few common traits that are important to identify:

- Workshop teaching: Most schools we work in teach everything (including math, social studies, and science) by first teaching a focused lesson lasting between five and fifteen minutes, then sending off children to pursue work independently, and then reconvening in a share at the end.
- Teaching in units: Units involve a way to group thinking together for children in an organized and sequential way. There is often a return to the concepts in the unit further along in the year.
- An emphasis on small-group work, independence, and agency: All the schools we work in emphasize a work time where children apply what they are learning in a project or activity of their choosing with support from a teacher or partners.
- Authentic instruction: The schools we work in rarely use worksheets—rather, they emphasize designing work that is more closely aligned to that of authentic mathematicians, scientists, and social scientists. For example, rather than fill in a worksheet about a leaf, children might gather leaves and record what they notice in a science or inquiry journal.

Though you do not need to have the same organizational structures in your classroom, it is helpful to know the conditions that existed to make this work possible. For more on workshop teaching, we would suggest you look into the groundbreaking work of Lucy Calkins, Donald Graves, and Math in The City Founder, Cathy Fosnot.

Figure 0.10 A busy workshop classroom.



Directions for the Reader

This book is organized differently from *Smarter Charts* in that each section focuses on one particular type of chart (routine, genre and concept, process, repertoire, and exemplar) and how it might be used across a variety of content areas. First we define the type of chart and explain its purpose—in other words, what it is and why you would make it. Then we describe how each chart is made and used, followed by a “Charts in Action” section that shows a real-life scenario using the chart with kids and includes lots of chart tips along the way. Another new addition to this book is our examples of how each type of chart might be used across several content areas, such as social studies, science, and math. In these sections, we also discuss the rationale behind the chart’s use, choices that can be in the hands of children, and next steps. We also include a focused section called “Beyond the Basics” where you will find more research-based thoughts about charting.

Each section stands on its own so once you have read the book through to learn about each type of chart, you can return to any section based on your instructional needs. For example, if you are looking to see some possible ways to break down a strategy into clear steps, then you will turn directly to Section 3 on Process Charts, where you will find lots of helpful advice and many examples of actual charts that can act as mentor texts for your own charts. We know as teachers that

sometimes all we want is a little inspiration to spark our thinking and to get us on the right track.

We are excited to share our newest thinking about charts with you here and hope to continue this charting conversation with you on our blog, Chartchums (www.chartchums.wordpress.com), and through our Twitter chats via @chartchums. Happy charting!



SECTION 1: Routine Charts

Supporting the Engagement Necessary for Independent Functioning

Clear simple language.

Writers Organize

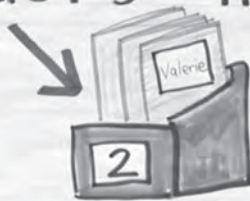
Heading is descriptive of purpose.

Books in folders



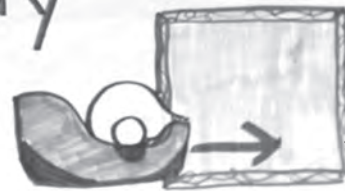
Sequence of events.

Folders in bin



Pictures that support children.

Tools away



What Is It? Why Would I Make It?

Each morning Marjorie wakes up, goes to the bathroom, then heads to the kitchen to make coffee. This is her daily routine and because it never changes she can do each step quickly while half asleep. When this routine is disrupted, like when the coffee tin is empty or the alarm doesn't go off, she must quickly make other choices. She must try something else, like boiling water for tea or skipping the coffee altogether to get out of the door so as not to be late for work. It is only when a routine is disrupted that you appreciate how smoothly routines can make your life go. See Figure 1.1.

In schools, routines have the same effect—they pave the way for the smooth functioning of each day, and they help lots of people work and move together, almost like a beautifully choreographed ballet. But this ballet does not just happen as a result of wishing and wanting it to happen. Every teacher knows that at the beginning of the year, routines must be planned and taught to establish an environment where all children can play and learn without too many disruptions. Our goal is for children to be able to run the classroom without us even being there!



Figure 1.1 Students study a writing routine chart to figure out what to do next in Valerie Geschwind's classroom.

In fact, planning ahead for the times we will not be there to control every movement and moment during a day is crucial. Think about what your students will need to know and be able to do to be productive, positive, and proud throughout each and every day. And think about possible charts that might make these expectations very clear to students and “guest teachers” alike.

When we teach procedures that lead the classroom community to operate smoothly so that tasks can be accomplished safely, expediently, and successfully, routine charts are the artifacts (and reminders) we leave behind. Routine charts show the foundational steps for

doing something—steps that will reduce chaos and lead to a productive use of time so that more active learning can take place. When we wrote about routine charts in *Smarter Charts*, we said their purpose was to teach a routine or behavior to students. Routine charts are often numbered, written like a how-to, include photographs of students in action, and are most often made at the beginning of the year (2012, xxi). The ultimate goal of routine charts is for the behaviors they describe to become internalized so that eventually the charts are no longer needed. See Figure 1.2.

Most important in the creation of routine charts is that children play a role in establishing the routines they describe and they understand the purpose behind each one so that they choose to learn the procedures that will lead the classroom community to function without a hitch. They need to understand the “why” of each routine. This means having honest discussions with your students about why routines might be needed and when they should be put into place. In the book *Drive*, Daniel H. Pink’s compelling book on motivation, he suggests that for routine tasks to be taken on by others willingly and well, we must put three key practices into

place (2009, 62):

- Offer a rationale for why the task is necessary.
- Acknowledge that the task is boring.
- Allow people to complete the task their own way.

In elementary classrooms, the rationale for routine charts is often to reduce chaos and tears. And although most teachers resist using the *B* word (*boring, sh!*), acknowledging that a task is less than exciting



Figure 1.2 Returning books is something that needs support in the beginning of the year.

shows empathy and helps the kids know we're on their side. Whenever we ask kids to do something, we must also remember to be open to their approximations and celebrate how they go about each task.

Routine tasks help with organization and efficiency when setting up and cleaning up. They help children navigate their way around the classroom, learning to use materials and tools with the least mess possible while ensuring safety. Routines teach life skills, showing children how to self-manage and work cooperatively with others. The following is a list of possible routines that might need to be explicitly taught:

- caring for materials
- organizing and planning
- working with others
- solving problems.

Charts take time to make, so when to make a chart and why to make it should be considered thoughtfully. Remember, a chart is not just a thing on the wall: It is an artifact of your teaching and a tool for students to use when learning a new challenge. For example, if you can simply *tell* your students, "Please go to the meeting area with your inquiry notebooks and reread what you last learned," and they all do it, then you won't need a lesson or a chart. However, if you want students to set up in a particular way that they have never done before—for example, bringing their inquiry notebooks and also rereading and reflecting by jotting follow-up questions or new wonderings they have—then you will probably need to model this new behavior. A chart can serve to reinforce your modeling and act as a reminder of these new expectations. When, after repeated practice going through the steps of this routine, you notice that no one seems to need the chart anymore, then you can retire it or make smaller versions to put into their notebooks as reminders should they ever forget. See Figure 1.3.



Figure 1.3 Routine charts can help children learn ways to calm their bodies when coming in from recess.

How Is It Made? How Is It Used?

Vocabulary and word choice are important considerations when planning for any lesson, especially those revolving around routines. If, for example, you want to teach your students how to handle such tasks as pouring and mixing, and you plan to use specific measure-

ment terms like *milliliters* or *centimeters*, then you will want to preteach these terms so your students will understand the directions. Sometimes what seems to us to be the most obvious of routines is not so obvious to young children.

Kristi will never forget the time early in the year when she asked her new kindergartners to come to the rug for a minilesson. She was thrilled that they stopped what they were doing to head for the rug right away, but less thrilled with the way they ran as fast as they could and once there, just hovered around chattering like a flock of wild birds. She thought her words had been very clear, but she could see by the

children's response that they'd been anything but. Her brand-new kindergartners did not know what a minilesson was, let alone how to get ready for it. Once she got them settled, she decided on the spot to create a chart, which broke down the steps into a simple, three-step how-to. The next day she photographed her students as they did each step and later added the photos to the chart. Kids of all ages love being the star of the show, or of the chart in this case. Classrooms of all ages may need support with these small routines that yield big organizational results. See Figure 1.4.

Clarity: Planning the Succinct Steps in Your Chart Before You Teach the Routine

Many of our conversations about charts have been about making our teaching visible so our students understand and use what we are teaching. Developing student independence is a constant pursuit. In other words, charts are for the kids. Right? Of course, you might answer. Who else would they be for? Administration? Parents?

Classroom visitors? Yes, yes, and yes. But after years of launching units, planning and delivering lessons, reflecting on what is working and what is not, we have come to realize that besides the students, the person the charts might be most helpful for is the teacher. Yes, the teacher. And this is why.

A teacher's plate is always overflowing with stuff to do, deadlines to meet, paperwork to complete. Weekends are spent planning lessons for the week ahead. It is enough to keep anyone's head spinning. So to keep from becoming dizzy, we suggest planning the chart simultaneously with planning your teaching, as a way to maintain focus and



Figure 1.4 First-grade teacher Sarah Hang helps a student through the steps of coming to the rug.

clarity. Start by asking yourself, “What might a chart look like that will help my kids know what I am trying to teach?” Thinking about the key characteristics of a good chart will make the planning process much easier and help with clarity and cohesion. See Figure 1.5.

Headings

The heading is key because it announces the big idea or goal of what you are teaching. It can be a question, a statement, or a reminder. Using strong verbs works to send the message that actions need to be taken. Trying out a few possible headings is a good way to check whether you have a clear goal in mind.

“Looking to set up for math games quickly?”

“This is the way a science experiment goes!”

“Don’t forget these three easy steps for taking care of pattern blocks!”

Language

Now, what words to use? Do you want to introduce certain academic vocabulary or use familiar words? Will you use these words in phrases, in sentences, or as labels? What are the reading levels of your students? Then consider how you plan to use the words. If you want to repeat these words over and over so that the children begin to chant them, then short phrases might be best. See Figure 1.6.

Visuals

We often put photographs or drawings up on our charts to give children a picture of what certain behaviors look like, such as sitting hip-to-hip or looking at your partner. Pictures offer children clear examples of the steps it takes to move from the table to the meeting area, or from the table to the door. These are the kinds of charts we often create during the first days of school.

Using charts as a planning tool, no matter what the subject, will help make planning simpler and more effective because it will help you, the teacher, focus and keep your main goals always in sight. See Figure 1.7.

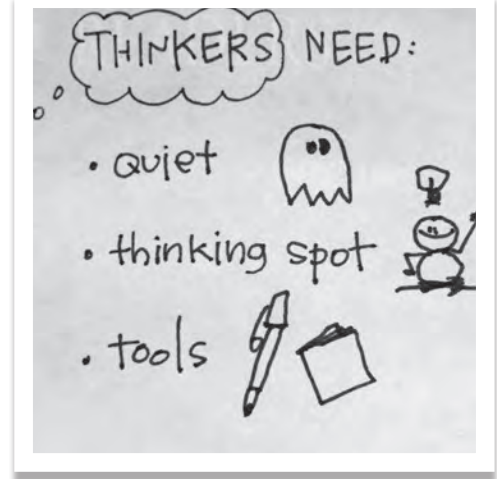


Figure 1.5 Post-its are an easy way to jot down chart ideas in a plan book.

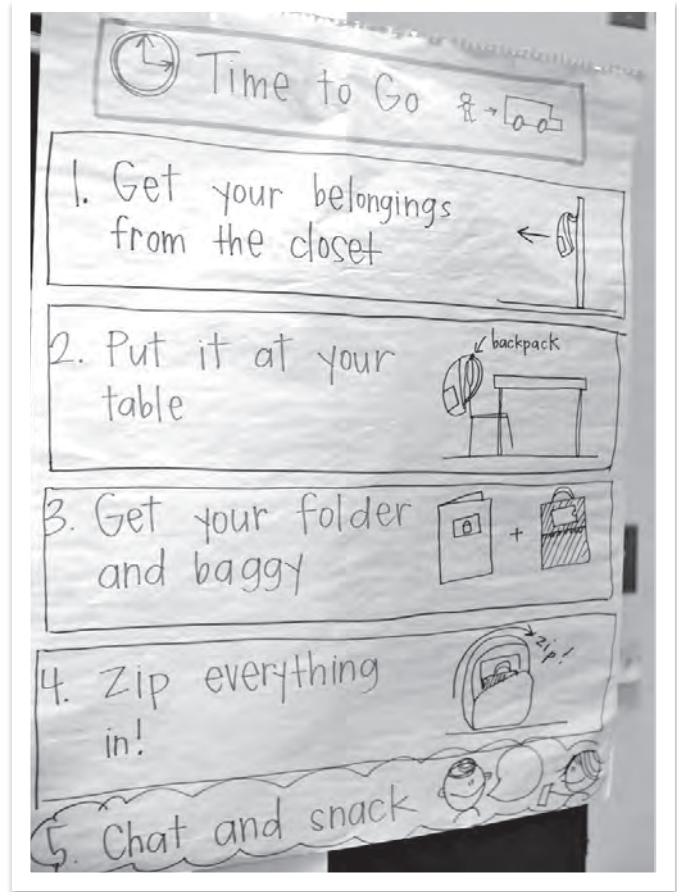


Figure 1.6 This second-grade pack-up chart uses more writing and more sophisticated vocabulary.

Figure 1.7 This chart for fire drills uses simple line drawings.



I'm Done!

Routine charts are needed throughout the year, but they are especially useful early on. "I'm done!" is a typical refrain during the first weeks of school whether children are reading social studies texts, playing a math game, or doing a science observation. Making clear the routine you expect students to follow can help diminish familiar outbursts such as these. For example: two children have finished playing a math game. They sit there for a moment, then begin chatting about what is for lunch or what they plan to do after school. They stop playing the game and don't seem prepared to do any further mathematics.

Teaching children what options they have when finished with the task at hand can allow both teacher and students to accomplish much more. "What do you do when you think you are done?" is a predictable question that will arise each and every year. Planning for possible suggestions and steps that will help each child become more independent is an invaluable aid in making the entire year go smoothly. Putting these suggestions and tips on a public chart will help remind children how they can help themselves when they come across dilemmas such as these and many more. Charts can help every child in your class to believe that they can help themselves solve any problem or answer any question they may have, not just today, but in life.

Beyond the Basics: Technology and Charts

Many teachers use technology, like SMART Boards and iPads, in their classrooms. Charting and technology intersect, but not always in the way people anticipate. The most effective charts are ones that rely less on teacher action and more on student interaction. See Figure 1.8. Charts kept on SMART Boards are usually selected and shown by the teacher; it can be cumbersome to move between charts or show multiple charts at once. For that reason, it makes sense to use technology to make charts in easier and more engaging ways and post them in places where children can independently access them. Some apps and programs that have proven their worth in improving charts are:

- ★ **iFontMaker:** Make and save your own font and drawings to use on any computer. This makes recreating charts in smaller sizes much less time-consuming.
- ★ **Pic Stitch:** Show pictures in sequence within one frame—especially helpful for routine charts.
- ★ **Snap:** Annotate photos before you print them. These make handy reminders for children.
- ★ **Qrafter:** Generate your own QR codes that children can access with an app.



Figure 1.8 Katie Lee teaches a routine for when kids feel “done” in math.

CHARTS IN ACTION: TEACHING THE WHOLE CLASS AN EFFICIENT WAY TO GET READY FOR MATH WORKSHOP

Some routines are osmotic, meaning they pass through the boundaries of subject unhampered by the change. Preparing for any kind of workshop learning is one such routine. Workshops have predictable structures: the class gathers for a focused short study, students go off to work independently or with partners, they return to share findings and thoughts with the group. Reading and writing are two subjects taught in a workshop structure, but so also are math, science, art, and others. This “getting ready” routine is being first taught in math, and then will be revisited in other applicable subjects throughout the day. Because of this, some of the chart language will seem vague, but remember this is happening in the context of teaching and demonstration. Although the chart and routine will travel from subject to subject, the teaching will show the specifics of each. This class has had math workshop for a few days and the “coming to the rug” aspect seems long and full of questions about where to go and what to do. After Kristi teaches the routine, she will then teach a math lesson and the class will have its regular math workshop.

Lesson Focus: Mathematicians prepare to learn by getting their materials ready and getting to the rug quickly every time.

Materials

- **Chart paper with the following heading: “Ready, Set, Work!”**
- **Four 8.5 × 11-inch sheets of different-colored paper (turned into sticky notes using a repositionable glue stick)**
 - **Blue paper, with “Folder and pen” written on it**
 - **Green paper, with “Get paper” written on it**
 - **Orange paper, with “Name and date” written on it**
 - **Yellow paper, with “Come to rug” written on it**
- **Student math folders in bins at the tables**
- **Pens at tables**
- **Paper in the math center**

Lesson

Kristi begins by gathering the whole class on the rug with no materials. She leans in to gather the attention of the children. ***“Friends, we have been in school for five days now and each day has been an adventure! We have been learning all sorts of fun things, but I have been noticing something a little worrisome.”*** Here Kristi

pauses and shakes her head in disbelief. ***“Sometimes it takes so loooooong to get ready that we don’t have enough time for the really fun work! So today I am going to teach you a way that we can get ready quickly, which isn’t the fun part, and instead have more time for all the things we have been doing like solving math mysteries and writing books—which are tons of fun!”*** See Figure 1.9.

Chart Tips

- Remember to state the rationale.
- Use your body and voice to engage.
- Don’t be afraid to acknowledge that routines can be boring.

Kristi points to the heading of the chart. ***“This chart is called ‘Ready, Set, Work!’ Because getting ready is kind of like a game. As a matter of fact, you kind of read it like this: ‘Ready, set . . . work!’”***

Chart Tips

- A playful attitude is always going to work better.
- Be prepared for giggles, emphasize that part of the game is doing the steps correctly.

“Okay, there are two ways to start getting ready and I am going to show them both to you. You get to decide which you want to do first!” Kristi sticks up the blue paper (“Folder and pen”) and then the green paper (“Get paper”) side by side on the chart. Two kids immediately get up to do it and Kristi calls them back with a ***“Not yet! Let’s finish the chart first!”*** She then taps the chart and says, ***“You can start with getting your folder and pen and putting them at your table or you can start with getting your paper from the math center. You have to do both though. Let’s read these two steps.”*** The class reads the words together and Kristi taps her head. ***“Think which one you will do first.”*** See Figure 1.10.



Figure 1.9 Kristi settles the class on the rug to start.



Figure 1.10 The first two items go side by side.

Chart Tips

- Get children interacting with the chart.
- Since these two steps are interchangeable they are side by side and not numbered.
- Preparing the steps ahead of time makes this quick and easy.

“Okay next step!” Kristi puts up the orange paper that reads, “Name and date.” She points to it and says: **“Read it with me.”** The students do, and then she says, **“Once you have done that, come to the rug!”** and puts up the yellow paper. Each of the papers have simple line drawings as a reminder of what each step says. Kristi asks the students to reread the chart with her and as they read she adds arrows pointing down to show the flow of the steps. See Figure 1.11.

Chart Tips

- Color-coding helps children differentiate the steps.
- Color-coding allows for a light prompt: “Check the green one again!”
- Arrows can be a useful symbol.
- Note how much is co-constructed versus how much is prepared.

“Okay,” Kristi says, **“Let’s try this a few kids at a time. We will say the steps out loud as the kids do them, and we can tell them how they are doing. I will snap some pictures that can go on the chart later.”** Kristi calls two rows to practice the

steps. The rest of the children read the steps as the “practicers” do them, and the class gives the practicers feedback about how they are doing. Kristi snaps photos on her cell phone to print later and then the students switch roles.

Chart Tips

- Photos will make this chart feel like it belongs to the students.
- Going in groups reduces traffic flow and also allows for multiple repetitions of hearing the routine.



Figure 1.11 Adding the next step.

Once everyone has had a chance to practice and to give feedback, and once the class is resettled on the rug, Kristi moves the chart to the back of the easel and begins her math lesson.

Chart Tip

- Keep the chart part active and fast so children can settle into the meat of the next lesson.

Next Steps

Practicing once does not provide enough time to learn or internalize something new. This lesson represents the *beginning* of learning a routine, but not the end. This routine will be repeated in reading and in writing, as well as math, over the course of a few weeks. Each time, you’ll scale back on your prompting, and eventually an element of speed will be introduced (“Can you do it before the timer goes off?”). To help children learn the steps, this chart will be reread in shared reading and also put in the take-home notebooks children have for shared reading materials. The routine itself will also be subject to revision over time as needs change in the classroom. See Figure 1.12.



Figure 1.12 A student demonstrates getting paper.

Routine Charts Across the Content Areas

There are more similarities than differences among routine charts across different content areas because they all tend to deal with getting tasks done efficiently, with minimal disruption. They are all designed to encourage students to play active roles in the implementation of the routines they describe. Here we provide a few examples of the types of charts you might see in several different content areas, specifically social studies, math, and science. As you read, we suggest you focus your attention on the similarities to see how easily routines can cross-pollinate, creating a healthy, blooming classroom environment.

Social Studies Focus: Building and Caring for a Classroom Community

Rationale

A chart like the one in Figure 1.13 addresses the issues that come up when a community of people lives and works together. When speaking with children, you might point out that an organized cleanup will not only go faster, but will also make building the next day even easier, since it won't be hard to find the blocks one needs. Cleaning up *can* be as fun as playing, if it feels playful. Put on jaunty music, don hard hats, or whistle while you work. Before you introduce any routine, ask yourself, "What is the reason to do this?" Then explain the reason to children. A little bit of purpose can go a long way.

Decisions That Can Be in the Hands of Children

As mentioned previously, one thing that makes routines more motivating is choice. When building a routine (and its chart), consider what steps children will have choice in. In the previous example, it is choosing the blocks to start with when cleaning up. In a packing or unpacking routine, it could be the order children put things in (or take things out) of their backpacks. Not every mind works the same way, and leaving wiggle room for choice allows children to make sense of the routine in their own way. Remember Daniel Pink's suggestion to allow people to complete each task their own way? Of course, he was referring to adults in the workplace, but we can still provide our children with guided choices that allow them to develop independence.

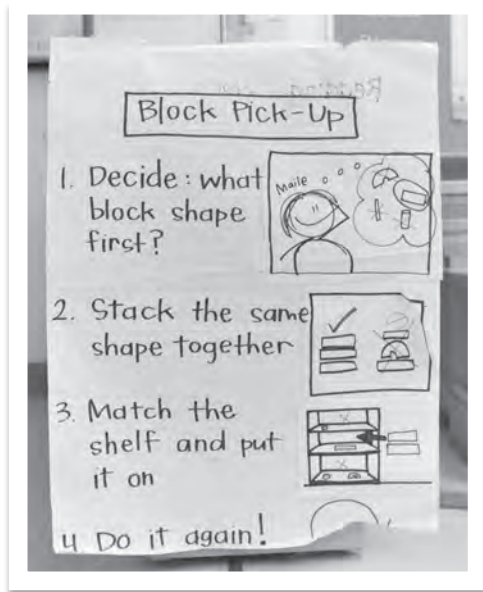


Figure 1.13 A routine for cleanup.

Social Studies Routine Chart Possibilities

- ★ “Field Trip Behavior”
- ★ “Think, Pair, Share Routine”
- ★ “How to Make a Guest Speaker Feel Welcome”

Next Steps

Imagine what a cleanup chart for art, Legos, or math would look like. What is the rationale for doing it the way you envision it? What decisions can children make within the routine to keep them motivated and invested in it?

Math Focus: Playing Math Games

Rationale

Arguably, the most important part of math games is *playing*—and a chart like this minimizes the amount of time spent chasing down lost items and arguing over who goes first. When speaking to children you might emphasize that the game is the fun part, and having a routine helps them get to the fun all that much faster. See Figure 1.14.

Decisions That Can Be in the Hands of Children

In terms of big problems for little children, deciding who goes first is a doozy. Teaching strategies for determining who goes first fairly can help ease this common classroom tension. Allowing for choice in the strategy helps children feel like the situation is fair and increases the chances of each child accepting the outcome. You can easily capture these ideas on a repertoire chart, which we talk about later in Section 4.

Next Steps

Think about other times where children need to interact successfully with each other and materials: science, reading, writing. What will that routine look like? Why should the routine go that way? What choice do the children have?

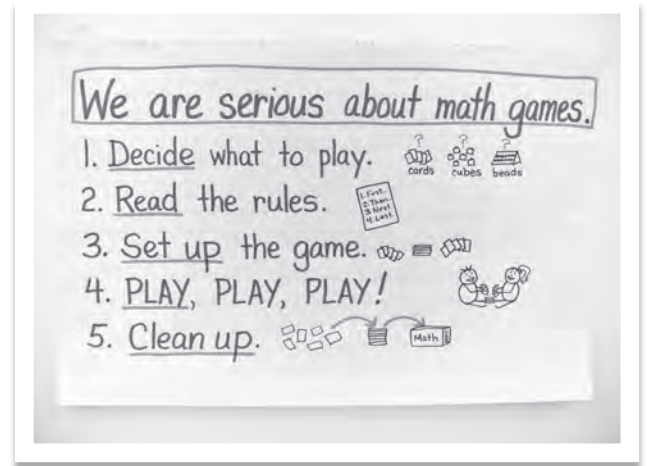


Figure 1.14 Routines for math games.

Math Routine Chart Possibilities

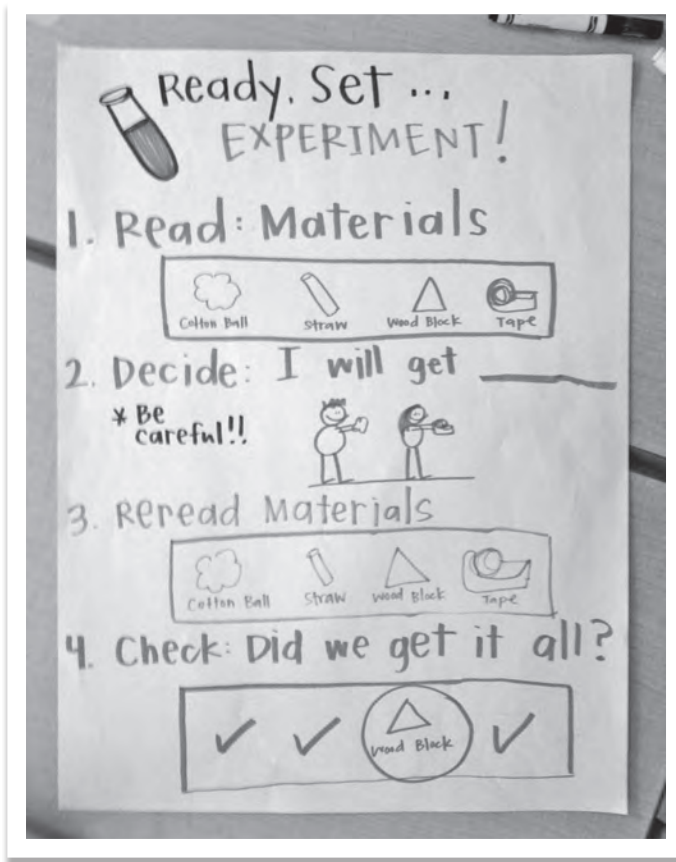
- ★ "Calculator Care"
- ★ "Linking Cubes Fix-Up (Unsticking and Putting Away)"
- ★ "What to Do When Interrupted"

Science Focus: Setting Materials Up for a Particular Procedure

Rationale

When Kristi cooks, there are many "I need *what?!?*" moments midway through. At times, entire recipes have been tanked midcooking by missing ingredients that are nowhere in the house. Science experiments can have similar issues. Especially in science when timing is important, having materials on hand allows for a careful study of the results, instead of a midexperiment scramble. As Marjorie's seamstress mother and carpenter father used to always say to her, "Measure twice, cut once." Help children understand that careful preparation allows for better results. See Figure 1.15.

Figure 1.15 "Ready, Set, Experiment!"



Decisions That Can Be in the Hands of Children

Depending on how you run science in your room, the children themselves may even be deciding which experiment to do. If not, and the whole class is studying the one concept, children can take ownership of who prepares what. If it feels faster to you to distribute supplies or prepare children in groups ahead of time, consider that teaching how to prepare for an experiment actually encompasses a bigger life skill: organization. There is value in doing the small tasks with as much care as the large ones.

Science Routine Chart Possibilities

- ★ "Scales Set-Up"
- ★ "Setting Up Your Notebook Entry"
- ★ "Returning Materials"
- ★ "Checking Out Books"
- ★ "Safety Routines"

Next Steps

Are there other times when children need to prepare for a particular procedure or activity? Is there a way this chart could work in other subjects with a few simple word changes? Reusing the same routines in different areas can reduce chart clutter and emphasize transference. Plus, repeated actions become second nature and go even faster when done across the day.

Common Core Connections

The science standards emphasize *doing* science over just telling kids about science and encouraging student inquiry so they make discoveries and experience those eureka moments most scientists and researchers live for. In other words, helping students become active thinkers and independent problem solvers in their pursuit of understanding; to learn how to work like real scientists and mathematicians do. If we want to hand over more responsibility to our students, then we need to make sure we teach them how to be, do, and act like authentic researchers in our classrooms.

Other Curricular Areas

It is not just elementary education teachers who make charts. Art teachers, music teachers, and gym teachers all have routines and expectations to keep their days flowing smoothly. See Figure 1.16.

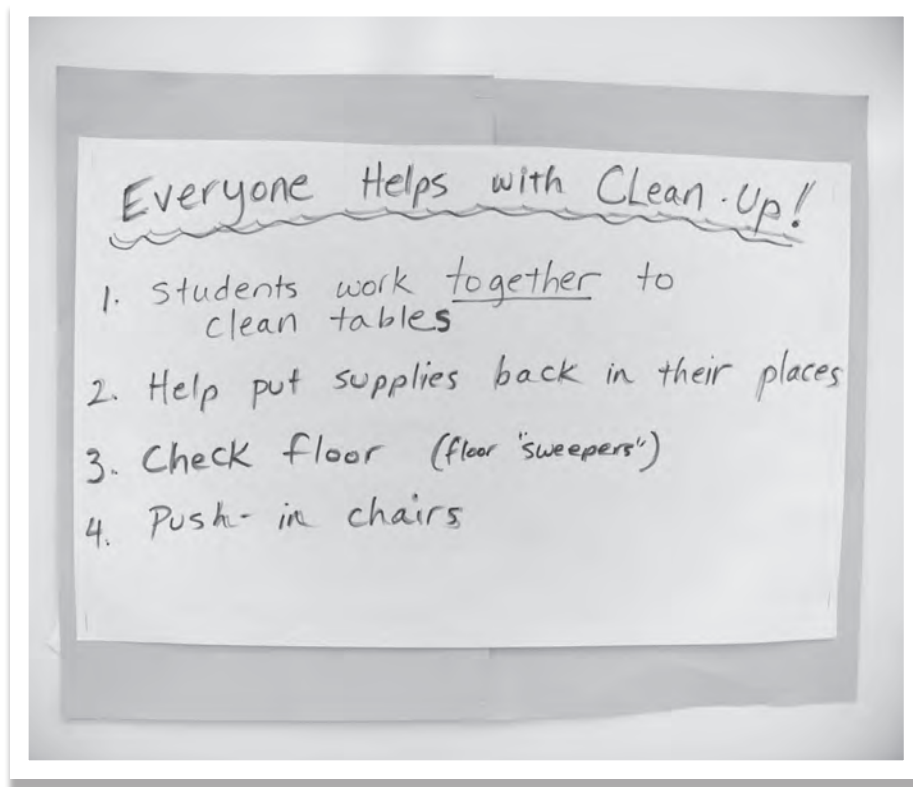


Figure 1.16 This art room chart lays the rules for community cleanup.

Other Curricular Areas

- ★ Art: "Art Studio Basics for the Handling and Care of Materials"
- ★ Music: "The Key to Harmony in Music Class"
- ★ Gym: "Body Be Aware in Gym and Everywhere!"

Last Words


Only when routines get disrupted do we truly realize their value. In thinking through the routines that the classroom needs and engaging children in their creation, enactment, and subsequent charting, we teach children the skill and value of organization. So often we organize things *for* children. Through charting, we can teach children how to organize *themselves* for success in school, at home, and in life.





Appendices


Shapes we know


Shapes to grow


 Square

 Hexagon

 Rectangle

 Trapezoid

 Triangle

 Rhombus

Goals


Quiet Mouths



Raise Quiet Hands



Is it a **PATTERN** book?


Get an idea



Pick a pattern



Connection



Teaching



Watch Me



You Try



Wrap Up



Go do



Thinkers Need...



Tools



Spots

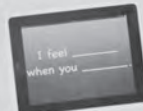
Quiet



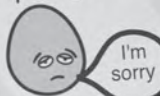
Use your words



Use iMessage



Apologize



Tell them to stop



Unit Planning with Charts in Mind

Unit name:	
Start date:	End date/celebration:
Big ideas and questions of the unit:	
Standards met:	
Teaching to support big ideas/question 1:	Chart:
Teaching to support big ideas/question 2:	Chart:
Teaching to support big ideas/question 3:	Chart:

Figure A.1 Keeping charts in mind can help you plan.