Unit Six – Writing Like Scientists

March/April

Welcome to the Unit

In this unit, you'll rally students to integrate all they know about writing informational texts to organize and display their understanding of science concepts. One main goal of this unit is that children use writing to explore an essential concept of science. The one we've selected to spotlight is properties of matter—liquids, solids, and gases. This decision is grounded in another goal of the unit: that children have opportunities to use writing to engage in the work that scientists do—developing and testing hypotheses, gathering data, and studying information for patterns. It's possible to observe changes in matter in just minutes, so the topic properties of matter is conducive to fruitful, expeditious experimentation. The topic that you and your children study together is your choice and you can easily use the basic outline of this unit to support studies of any topic that you believe will be engaging for your kids and will bring them toward an understanding of one of the concepts that is essential to science.

This unit builds on children's energy and enthusiasm about the world. Prior to now, your first-graders will presumably have been engaged in workshops and some science study, and they will have learned to observe closely, to ask big questions, and to follow procedures to pursue those questions. You will now channel their burgeoning interest in science into writing workshop, showing them that writing need not be an end in and of itself, but that it can also be a tool for learning.

You will want to approach this unit with a grand plan for its overall design. As in other units, children will cycle through repeated "goes" at the work, but this time the work will not be rehearsing, drafting, revising, and editing their writing so much as it will be writing to record, to question, to hypothesize and observe, and finally, to teach others. As children engage in this work over and over, you'll teach in ways that lift the level of what they are doing, so that over time they will use more sophisticated moves in their writing.

Obviously, this unit breaks with tradition in that it is a hybrid—that is, it is science and writing rolled into one. Usually your writing workshops are at least a period long (fifty to sixty minutes) and begin with a minilesson, followed by a big chunk of time for kids to write, and ending with time for children to share their writing with partners. We hope that for this unit, at least twice a week you extend writing workshop so that it is ninety minutes for the hybrid of content study and writing. You will most likely want to break this unit's

writing workshop into two parts. Start with the science portion, during which children conduct a variety of experiments. Some might pour water into different containers to determine if the shape of the container affects how much water it holds, some might melt ice to produce steam, and others might work with different solids to change their shape. Give children clipboards and paper to record their observations and thoughts. Close the science portion of the workshop with a quick share, and then teach your writing workshop minilesson. The second part of the workshop will be devoted to writing. During this half, children will be engaged in the writing processes of recording observations, writing at some length about these, and drawing conclusions.

A wonderful thing about this unit is that it invites children to synthesize information by describing the connection between pieces of information in a text. You'll help children do this through read-aloud and in their independent reading, naming big ideas and then showing them how these big ideas can serve to propel their experiments. As they develop conclusions from their experiments, children may use what they've learned from reading about solids, liquids, and gases to add evidence to bolster their own ideas.

Overview

Essential Question: *How can I write as a scientist does, writing to record observations, to learn about things, and to teach readers?*

- **Bend I: (Scientists Write to Learn about the World, Experiment to Answer Lingering Questions, and Use What They Know about Information Writing to Teach Others)**
  How can I use writing to record everything I observe and learn?

- **Bend II: (Scientists Collaborate with Partners and Record Their Experiments, Raising the Level of Their Non-Narrative Writing)**
  How can I get better at writing with details? When I revise, can I put more information in my books so my readers learn more?

- **Bend III: (Scientists Put All Their Learning Together and Publish Information Books)**
  How can I use all that I already know about science and writing to make an all-about book that teaches people about a science topic that I know well?

Teachers College Reading and Writing Project
Writing Curricular Calendar, First Grade, 2014-2015
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In Bend I, children will study a whole-class topic during a daily science writing workshop and will write, sketch, and jot questions to record and grow their thinking. During this first week, they'll conduct experiments, first as a class and then on their own, writing lab reports and information books about these experiments. They'll write observations, musings, and their own predictions about what might happen and why it might be happening. Students will "participate in shared research and writing projects" (CCSS W.1.7) and "recall information from experiences or gather information" from a variety of sources to explore science concepts" (CCSS W.1.8).

In Bend II, children will launch their own experiments, trying them out and writing them up. You'll build on what children learned to do in Bend I, teaching them new ways to record information, to write more detailed how-to texts, and to explore questions in writing. Children will spend about a week and a half learning to recall and gather information from their experiments and other sources, synthesizing this information to answer questions.

In Bend III, children will compile all the information they have learned through their experiments and through any research they have done and publish information books. In the last five to seven days of this unit, they will teach others about their topics, describe how to conduct similar experiments, and discuss their observations and conclusions. Students may end up writing before-and-after pages, compare-and-contrast pages, and pages with questions that lead to experiments to help answer those questions.

CCSS/LS Standards Addressed in This Unit

Before you begin any unit of study, you will want to collect some data to support your unit planning. A formative on-demand writing piece to support informational writing will help you assess the current needs of your students. If, as laid out in the yearlong curriculum, you are teaching this unit after "How-To Books," then you might already have administered several on-demand assessments for informational writing. But, your students have grown as writers over the last few months, and you will want to see how the work they have been doing supports their work in naming their topic and supplying facts about this topic. We suggest you repeat an informational on-demand before beginning this unit, as described in *Writing Pathways* in *Units of Study in Opinion, Information, and Narrative Writing, Grade 1 by Lucy Calkins and Project Staff (Heinemann 2013).* You'll then want to assess the children's' on-demands using the Informational Writing Learning Progression, also available in *Writing Pathways* and aligned to the Common Core State Standards for first grade writers.

After you administer the formative on-demand assessment, use this data to make plans for the teaching you'll do across this unit. Some children will need more support with structuring their writing to include headings, text features, or introductions. Other students may need more support with elaboration. After your students finish publishing their "lab reports" or information books, you might once again ask them to create an on-demand piece of writing. This on-demand writing piece will serve as a summative assessment that you can use to measure growth. Are students including more elaboration in their writing? Is it more structured? Are students now meeting or exceeding grade level expectations?

Getting Ready

Choosing a Topic

The very first preparation you will do for this unit is to decide on a whole-class topic, preferably one that aligns to your science standards. This is a critical choice. Remember that your class will be living like scientists around and inside this topic for the entire month. We suggest properties of matter because it aligns with first-grade science standards and offers many component parts for students to study. You will, of course, want to consult your library when making a topic choice, because you'll need nonfiction books on the topic to serve as writing mentors and sources of information. The text we've selected to reference as a mentor in this unit is *Solids, Liquids and Gases,* by Ginger Garrett and published by the Ontario Science Center.

Consider choosing a topic about which your children have some prior knowledge or that they can study simultaneously in science workshop. As you consider possibilities, ask yourself, "Does this topic have breadth?" In other words, will you be able to divide the topic up into plenty of component parts for children to study in greater detail over the course of the month? Can this topic accommodate a multitude of in-class experiments? For example, the life cycle of a butterfly might be too narrow a topic for a whole- class inquiry; it is hard to imagine a whole class sustaining enough writing about this topic for the length of an entire month, and even more difficult to imagine the kinds of experiments students would create to explore their questions and hypotheses.

A second thing to consider while choosing a whole-class topic is that the one you select is localized to students' real-life environment or accessible enough to bring into the classroom. Keep in mind that you want children to work as scientists this month, so the topic they study must provide authentic chances for them to make observations, conduct experiments, and note and describe findings. In the end, you want your scientists to be zealous about the act of learning through hands-on scientific work. You want them to

channel their natural sense of play and curiosity into the act of hypothesizing and measuring, heating, melting, counting—in short, into the role of scientist. To that end, plan to teach science in your own classroom or to collaborate with a science teacher and chalk out several possible inquiries and experiments that children might pursue this month on the chosen topic.

Gathering Materials

You'll need books that can serve as mentor texts for the kind of writing children will produce—books to serve as references and books with diagrams and illustrations for children to pore over and study. You'll line these books up around students' work area, engaging your kids in close reading of selected excerpts from these and referencing them as touchstones during conferring and during the demonstration portion of your minilessons.

You won't want to underestimate the power read-alouds will have in propelling this unit forward, exposing your young scientists to a wide variety of nonfiction texts on properties of matter. The work you do in read-aloud will support not only the growing content knowledge, but also the skills of scientific writing. The Common Core State Standards for Reading Informational Texts require children to be able to synthesize information by describing the connection between pieces of information in a text (RI.1.3). You'll help children do this through read alouds and in their independent reading, naming big ideas and then showing them how these big ideas can serve to propel their experiments. For instance, after reading *Solids, Liquids, and Gases,* by Ginger Garrett, you might model some big ideas like "Water isn't created. It's used again and again. Water is important for life. We need to conserve water so that we can live." After growing some big ideas about water in a read-aloud, children might share what these ideas are making them wonder. You'll hear children say things like "I wonder where the water goes?" Then together you may design an experiment to figure it out, such as heating water in a covered container so children see how water vapor turns to droplets. As they develop conclusions from their experiments, children can use what they've learned from reading about solids, liquids, and gases to add evidence to bolster their own ideas, such as "The water doesn't disappear. It just changes into something else."

The FOSS Solids and Liquids module is a possible resource for activities, experiments, and materials to support this unit if you decide to choose the topic of properties of matter. You might also gather books containing science experiments, such as the series published by Pebble Plus: *How to Make Bubbles, How to Make a Bouncing Egg, How to Make Slime,* and *How to Make a Liquid Rainbow,* by Lori Shores. The book *Change It! Solids, Liquids, Gases and You,* by Adrienne Mason, also contains experiments that you might refer to for this part of the unit.

You'll want to decide where your students will do all of this writing. You may decide to have students keep booklets where they can record their observations, sketches, questions, and musings. These booklets will be a place to write with volume and stamina as they study the world around them.

Bend I: Scientists Write to Learn about the World, Experiment to Answer Lingering Questions, and Use What They Know About Information Writing to Teach Others

Immerse your students in the class topic by providing them with materials to observe, as well as booklets to record their observations. Teach them strategies for recording their observations.

Right from the start of this unit, you will want to immerse your children in a topic of scientific study. We recommend that you expose students to just one area of your selected topic in the first bend, narrowing their study to only liquids, for instance, if you select properties of matter, as we have. You'll expose them to far more soon—once they've learned to observe, research, and write like scientists. For Session One, then, you'll spread materials on different tables around the room relating to liquids (or whatever topic you've chosen) and invite kids to experiment with different containers, combine liquids with solids to make things like ice cream, investigate how fast different liquids flow, and so forth. Give your children this first session to immerse themselves in the study of these objects—to play, experiment, and play some more. You'll equip them with booklets and other scientific tools, such as hand lenses, and show them how to record observations and questions about the objects they're studying, knowing that throughout the unit you'll teach children more and more ways scientists use their booklets.

"Today I want to teach you that when scientists conduct experiments to learn about the world, they carefully write down what they notice and the questions they have."

A challenge in this work will be to make sure it supports a volume of writing. The most obvious writing that children will do at the launch of the unit is sketching with labels and captions. You'll want to make this into a big deal. Scientists draw the setup from an experiment and then label it using precise vocabulary and captions that explain the process in greater detail. A glossary may help—one that contains definitions of domain-specific vocabulary. Or, you might want to set up a vocabulary word wall where you can add new vocabulary words (with pictures). Be sure students add sentences to each sketch before moving onto another. It is important to teach them that scientists (and writers) linger. This

means teaching them to add all that they can to their sketches, in both words and images. For example, if a child has drawn a simple sketch of a bottle and water, then you will teach him not just to draw the bottle with water inside, but to draw the precise amount of water in the bottle, the size and shape of the bottle, and how the water looks inside the bottle. Teach this child to label all the parts using the language scientists use (referencing mentor texts and read-aloud texts for this information when necessary) and then to elaborate on those labels by writing captions to accompany them. Students can also write how-to, procedural texts to explain the process as they glean it from books they read.

Teach children to conduct experiments around a shared inquiry. Channel students to then teach others how to do an experiment by asking them to write a how-to text to explain the steps.

As early as Session Two of this unit, you'll be ready to channel all your scientists toward one teacher- led experiment. You'll remind students of all they've learned about the scientific process. You might say, "Remember how in science you learned to ask questions, come up with a hypothesis, make observations, and then make a conclusion at the end? Well, today we're going to do an experiment using the liquids milk and vanilla, and the solids sugar and ice cubes, and we're going to draw on everything we know about the scientific process, together."

In conducting class experiments, students will have the opportunity to participate in shared research to build their knowledge of scientific concepts (CCSS W.1.7). This shared research (and writing) will set them up for the more independent research they'll do a bit later in the unit. Therefore, when you formulate for them the question that drives the experiment on this day, rallying them toward a common inquiry. You'll also want to highlight the fact that researchers always do this when they engage in research. They start by asking a researchable question. Perhaps for this day, you'll say, "Scientists, today we're going to do an experiment where we investigate what happens when certain liquids and solids are combined. Let's all be thinking about the question 'How can liquids and solids combine to make ice cream?' as we do the experiment." Then teach students that before embarking on an experiment, researchers jot down questions and discuss their hypotheses. Teach them also that researchers record the steps of the experiment. Afterward, they jot about their big ideas or conclusions. You might teach children that even after drawing conclusions, scientists often have new questions. For instance, imagine a child's conclusion is "The ice melted, it cooled the milk and sugar, and it changed into a liquid. When we shook the bag it changed the liquid into a solid." That child may also wonder, "What if we used more milk or more sugar? Would it still work?" You might also consider giving your students special paper, or a template for creating their own paper, on which to record the various stages of the scientific process: questions, hypotheses, observations, and conclusion.

After students have conducted this experiment, they will be ready, on the following day, to teach others how to do the same. They can look back at the lab report they made while conducting the experiment or see if they can write it as an information book that teaches others all they've done and learned. Have the experiment materials on hand, because many students will need to reenact the steps of the experiment as they write, recalling each one. "Wouldn't it be fun to teach the kindergartners how to do this experiment?" you might begin. "Let's use everything we know about informational writing and how-to texts to write up this experiment."

Teach students that scientists design further experiments, based on lingering questions.

Finally, in the next sessions, you'll teach children to design their own experiments from their lingering unanswered questions and guide them to gather information from their experiences to answer these questions (CCSS W.1.8). Help your students understand that if they change one variable, the entire experiment changes. They can use their knowledge to form a hypothesis. Gather these questions from those that were lingering after the full-class experiment. For instance, if you have a group of students who wondered if the ice cream experiment would still work if the amount of milk or sugar changed, perhaps you could design an experiment together as a class to test this question. You might decide to run through this second experiment as a whole class, and then, once again, have students write up the steps of this experiment in a how-to book. Or, your students might be ready to work in partnerships or small groups, coming up with experiments based on their own lingering questions, trying out their experiments, recording their observations, and then writing procedural how-to texts to teach others how to conduct the same experiment. This inquiry work and science writing that you'll continue to facilitate across this unit foster the higher-level thinking that Webb describes in the Depth of Knowledge Model—that children investigate larger questions, draw conclusions, and carry learning from across the school year into new content areas (DOK level 4).

"Today I want to teach you that scientists aren't done when they've finished their first experiment! Every experiment leads to new questions. Scientists think, 'I wonder what would happen if ...' and then they try it!"

Bend II: Scientists Collaborate With Partners and Record Their Experiments, Raising the Level of Their Non-Narrative Writing

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Expand the areas of the topic that your class is studying and teach students that scientists propose and make plans for new experiments. Set them up to collaborate with peers.

You'll begin this part of the unit by setting up tables, much like you did at the beginning of Bend I, but this time with a far greater quantity of materials. In Bend I you focused your children on one area of the properties of matter, either solid, liquid, or gas. Now you will give them free reign to explore the many areas of this field. You'll want to pull out all that you have related to this topic and borrow from your science teacher and science kits, as well. Different sized bottles and containers, water, food coloring, ice cubes, Play-doh, and other solids—chances are, once it's all out, children will find more uses for much of this than you ever imagined!

Children will enter this week with new questions and ideas to test out and experiment. As they move from teacher-initiated experiments to self-initiated experiments, you might consider allowing them to collaborate with partners or small groups to discuss which experiments would be best to administer in the classroom, pitching their hypotheses and working together in choosing a project to pursue. They will continue to participate in shared research and collaborate with peers to build and present their growing knowledge of properties of matter (CCSS W.1.7). As children are deciding which experiments to pursue, you'll want to help them consider some of the following questions: "Do we have all of the materials that we need?" "How long will this experiment take?" "Do we have enough time?" "Which experiment will we want to start with?"

Toward the end of this bend, you might consider inviting children to design their own experiments, either alone or with a partner. You'll teach children to think about what materials they might need, what steps they would take, and what they think will happen—their hypothesis. Then they'll sketch a plan for what they will do to carry out the experiment. Once children try it out, they'll write a how-to book describing step by step what they did and the outcome—their findings. For example, if as a class you did an experiment to investigate if water evaporates faster from cotton or paper, some children might wonder what happens when other materials or fabrics are used, so they might design an experiment in which they put droplets of water on different kinds of fabric, such as linen, felt, and canvas, or any other fabric you can find in the classroom.

Have students write elaborated observations and then teach them to sort, classify, and record data.

At this stage, students' booklets will be filling up with the results of their experiments, and you will want to take this opportunity to help them fine-tune and build upon what they're already doing. In this part of the unit, one of your tasks will be to help children understand

that writing plays a vital role in science, helping scientists to question, analyze, record, and teach others. In Bend I you taught students to sketch and label and to write how-to texts that capture their experiments. You will probably want to begin by teaching them how scientists record, in as much detail as possible, all that they observe while exploring properties of matter. They will then return to their sketches and this time write in words, phrases, and sentences what they have seen and sketched. Remind them to use prompts such as "I notice . . . ," "I see . . . ," to elaborate on their observations. One way to ensure that your children are doing this writing in as much detail as possible is to teach them to observe using categories such as color, texture, shape, and size.

Another way that scientists use their booklets is to keep track of data. Teach kids to measure and record their findings or to sort, classify, and record that data. This writing might take the form of a T-chart, picture diagrams with close-ups, or before-and-after diagrams. Children might create a T-chart to compare different kinds of paper. You will want to teach children that when recording data, being exact matters. Teach them to transfer what they are learning in science to the writing workshop. Specifically, you might teach them things like attaching units of measurement to numbers. Then too, you'll want to teach them more ways to expand upon the information they observe and to formulate possible theories or hypotheses. You'll find it helpful to chart several prompts and teach children to use them to develop and elaborate on their ideas. Among others, you'll certainly want to teach prompts such as "I noticed . . . ," "I think . . . ," and "I wonder. . . ."

"Today I want to teach you that scientists try to make their observations as detailed as possible. One way they do this is by look for not just one thing, but many: the color, texture, shape and size what they're observing."

It's important to help children negotiate time spent "experimenting" and time spent writing. Remind students that writing is a powerful tool for thinking, and teach them new ways to record, analyze, and write about information. Draw attention to child-created recording systems and encourage your young scientists to draw on all they know as they branch into this work. You might find yourself saying, "Scientists, writers, I want to show you all what Kevin created. He made a chart that shows the temperature of the ice water and the time it took to change all of the ice into a liquid. It's really helping him organize his data. Kevin has agreed to let us make some copies of his graph paper and add it to our writing center so we all can use it to record our data." Or "Can I stop you all? Sam just came up with a great idea. He realized that the prompts we use to have ideas about our books—'I noticed . . . ,' 'I wonder . . . ,' 'I wonder'—can also help us to have ideas about what we're seeing in our experiments!"

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"Today I want to teach you that scientists don't just ask questions before they experiment, they try to answer them as well! One way you can do this is by writing your question, "I wonder why..." or "How come..." and then quickly jotting down your ideas in your notebook. You might answer your question by writing, "Maybe..." or "Could it be..." or "But what about..."

Teach students to lift the level of scientific writing through the use of mentor and exemplar texts

Children will learn to write or draw in these various ways throughout the unit, sometimes through minilessons, other times through teaching shares or mid-workshop teaching points or while stopping and sketching during read-alouds. Teacher generated exemplar texts will provide clear models for students to study during guided inquiry lessons. You may, for example, focus a teaching share on studying the conclusion section of a lab report. You may have a minilesson where you study a procedural section of a mentor text. As mentioned earlier, this unit is cyclical. That is, children will move through the scientific process again and again across this month, each time learning new ways to write, record, and finesse.

Throughout this bend of the unit, children will develop questions and then harness those musings into plans for their own experiments. Children will write about any of the things they notice during their experiments, the steps of how to conduct the experiments, their findings, or designs for new experiments. They will use the information they gather to check their hypotheses and answer questions (CCSS.W 1.8). All of this will later (in the next bend of the unit) become part of a final published product. As students move through this process, you'll want to remind them that science is about experimentation and that, just like writers, scientists often go back to revise and try again. Encourage partnerships to raise questions, conduct an experiment, and note what worked and what didn't, and then design another new experiment. Once they have discovered a powerful experiment, they'll move to documenting it in a how-to text so others can replicate it.

Channel students to write how-to's that convey information clearly and with detail.

Just as you used storytelling to help writers develop language that more closely matches the language of good storytellers, you'll want to coach students to tell and retell class activities in ways that teach others, thus honing their ability to document experiments with accuracy and detail. (If you have taught the *Writing How-To Books* unit prior to this, then your students will already be familiar with this kind of writing.) Teach them, too, how to use very specific language to clarify their thinking and instructions. If a student explains or writes, "Put the milk and vanilla in the bag," encourage her to verbalize how to do this. If you help her think about how she does it or actually demonstrate the action, she may

decide instead on "Pour 1 cup of milk and 1 teaspoon of vanilla into a small plastic bag and then seal it up."

When students act out their experiments with partners, they uncover the precise actions and language needed for readers to effectively complete a task. Teach children that to write procedural texts, they should envision the steps they go through when they perform a given task. They should see it "like a movie in their minds" and then write each step they see in their movie. Often, children will leave out big steps or assume their readers know more than they do. This is a great use of writing partners. One partner can read her writing aloud while the other partner acts it out. Every experiment leads to new questions! Perhaps you'll decide to start the writing portion of your workshop each day with partner time. Partners can get together and rehearse the steps for the experiment that they are planning to write that day. Teach children how to listen to each other's writing and follow the steps laid out to see if they work. This way, writers can see the effect of their words and steps on a reader and get input that will help them revise their pieces for clarity.

"Today I want to teach you that scientists work with other scientists to make sure that their experiment can be followed, just as they've written it. One way you can do this is by listening to your partner's steps and see if you can follow them just as they're written. Then, if they need to, your partner can add more to their steps to make their experiment clear."

In addition to teaching into the quality of the writing children are doing, both in their booklets and their procedural texts, make sure children are drawing on the information they're acquiring about properties of matter through read-aloud. Show them how to supplement their conclusions with factual information. For instance, students writing about the conclusion that we can't see gas might want to add information they got from reading: sometimes we actually *can* see gas, like when we see steam coming from hot soup. Then too, students will use the information they get from reading to design and imagine their own experiments. After reading about particular information in a text, students may question it: "That doesn't seem true. Let's make an experiment and test it."

You'll want partners to support this work as well, pushing each other to be stronger scientists and writers. Teach them how to compare observations and discuss what they can learn from one another. ("I see that you have all these little details in your picture. Maybe I could make my picture more detailed." Or "When you did that experiment, you found that water evaporated faster from paper, and I found that it evaporated faster from cotton fabric. Maybe we should try again.") The Common Core State Standards ask that first-graders "respond to questions and suggestions from peers, and add details to strengthen writing as needed" (CCSS W.1.5) while also participating in "collaborative conversations with diverse partners about *grade 1 topics and texts"* (CCSS SL.1.1).

Bend III: Scientists Put All Their Learning Together and Publish Information Books

Cull information from old charts and mentor texts.

In this final bend, children will compile all the information that they acquired about their topics and make information books to teach one another. These books might include chapters that categorize the information students have gathered about solids, liquids, and gases: for example, before-and-after pages, compare-and-contrast pages, and cause-and-effect pages. Children may also elect to include pages with questions they had prior to this study and how-to chapters detailing the experiments they created to help answer these questions.

Begin by explaining to children that part of being a scientist is deciding how you'll teach the world about what you've discovered. Remind them of all they know from prior units, perhaps pulling out old charts and mentor texts. Study these texts with your students, as well as the texts that served as mentors throughout this unit, helping your young scientists imagine the final product their research will take. You'll especially want to refer students back to the *Nonfiction Chapter Books* unit, and perhaps flip back to that unit plan yourself. Show children how it helps to sort information out by subtopics, and help them make plans for dividing content so the appropriate information goes onto each page of their books by creating webs or picture/word maps. For example, one part of the book might have information about solids, another part could detail how to do an experiment with water, and yet another part could include the results from one experiment with evaporation. One child might write a book titled "All about Solids, Liquids, and Gases," where one page says, "Water can be a solid, like when it's ice. Water can also be a liquid or a gas, like when it's steam." Other pages might say, "Some solids are easy to change, like Play-Doh. Other solids are harder to change, like a crayon." There may also be pages in this book that detail an experiment, "How to Blow up a Balloon without Blowing Air into It," and list the steps of this experiment. Another page might have a graph that shows the temperature to which water needs to be heated to change into a gas. There might also be additional chapters in the book about solids, liquids, or gases, or students might decide to author another book just about solids and yet another just about liquids. This work supports grade level expectations as specified in the information writing learning progression, asking writers to structure and organize their writing, telling about their topic "part by part" and starting a new part on a new page.

"Today I want to teach you that scientists and writers make sure that their information is organized onto the correct pages. One way you can do this is by making a web or a map to sort out your information."

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Channel students to set goals through the use of student checklists

At this time of the year, your students are familiar with using the informational checklist to set goals and lift the level of their informational writing. Many students may use both the grade 1 and 2 checklist to support their writing when drafting and revising. Students may revisit the structure section of their checklists when developing the table of contents and to create chapters. Students may use their checklists to remind themselves of ways informational writers elaborate in their writing. Remember, we want writers to understand that the checklist is a tool to support independence.

Engage students in revision work to elaborate on and fine-tune information.

Some of the revision work students engage in will come from elaborating on the information they've already written, for example, adding what they notice about size, color, or texture, adding what their observations make them think, or even what they wonder. Other revision work will involve the experiments they choose to include in their pieces. As students perform new experiments, they can include pages that detail how to do this experiment, what the results were, or even new questions they have (CCSS W.1.5). You'll want to assess as your students are writing these texts and use your findings to inform your whole-class and small-group instruction.

You'll also revisit nonfiction procedural how-to texts as a class and use these as guides for teaching children to revise and add features of nonfiction to their own pieces. These books are valuable models for the possible components of a how-to. Some how-to books and manuals include a materials page. Others include cautions or warnings for the reader. Other books are persuasive, trying to get readers to try doing something new: "Haven't you always wanted to . . . ?" or "Did you ever wonder why . . . ?" Children can examine their own texts for clarity, perhaps thinking more about how readers might perform certain steps. For example, a child who writes, "Put baking soda in the balloon," might ask herself, "How? Attach a funnel to the opening of the balloon and hold it in place. Carefully pour one spoonful of baking soda into the funnel. Shake it gently so all the baking soda goes from the funnel into the balloon." Again, if you have taught "Writing How-To Books" before this unit, your students will be familiar with this work.

"Today I want to teach you that writers use all that they know about writing how-to books to make their science writing even better. One way you can do this is by studying your how-to book and seeing what you could add to your information book."

As they revise, young writers can also begin incorporating further conventions of the how-to genre, such as making their pictures teach more by eliminating extraneous details, zooming in close on the part of the picture that teaches, and using labels and arrows in their pictures. They might add warnings or advice that steers readers out of trouble: "Make sure not to rip a hole in the balloon when you stretch it over the bottle." During revision, partners can also ask each other clarifying questions such as "What do you mean?" or "How do you do that?" or suggest possible tips or warnings such as "You should write, 'Do this experiment outdoors,' because if the egg breaks it will make a big mess!" You could also invite students to try an ending that brings everything to a conclusion, just like a lot of the books they are reading. For example, "We need water to live and grow." Children can learn about these kinds of additions through close reading of a text, and they can then add the features they like to their own books. The Common Core State Standards expect first-grade readers to "know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text" (RI.1.5). Using these features of nonfiction can help first-graders not only organize their writing, but also elaborate and clarify information in powerful ways. As described in the learning progression for information writing, this work moves children closer to end-of-the-year benchmarks in information writing.

Additionally, you'll want to encourage your writers to use some of the craft moves that they have been working on all year. They might add speech bubbles or dialogue, include the setting, or use descriptive details to paint a picture in the reader's mind. Children might also try using sound words and ellipses and playing with the size of their writing and capital letters to emphasize what they are saying. Be sure to refer to the charts that you have in your classroom already.

Celebrate children's' writing in a way that allows them to teach others

In each unit of study we have kids celebrate their work in some way that not only honors their hard work and effort, but that also teaches them how to share their information with others. Consider a way to celebrate all that the students have done and give them a chance to teach their learning to someone new. You might consider holding a science fair, where students can set up their experiments, lab reports, and findings, comment on their work, and also conduct live experiments with oral presentations. However you decide to celebrate with your students, be sure to coach them on how to present and talk to a live audience. Teach them to alternate between talking—referring to their documents and materials as they do so—and soliciting and addressing questions from the audience. The goal is that they present their information clearly, conveying what they've learned so that those listening can understand.