

CHAPTER three

Quick Writes

Easy Writing-to-Learn Strategies

In This Chapter

1. Writing Break
2. Exit Slip
3. Admit Slip
4. Brainstorming
5. Drawing and Illustrating
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Got two minutes? That's how little class time some of these activities will take, and yet they can deepen students' thinking, create more engagement, and spark lively discussion in your classroom. Is time tight in your teaching day? Got lots to cover? These simple ideas are the place to start. Try a few strategies and see if writing to learn helps students understand, remember, and use the content you are teaching this week.

Writing Break

What It Is

A teacher friend of ours puts it bluntly: "Writing breaks are a reminder to me to just shut up every once in a while and let the kids think." While we often feel pressured to talk till the bell—to pack as much content as we can into a class period—we also know that kids don't remember as much when they are overwhelmed. As we said in Chapter 1, less content can be more, if more is actually *retained*.

We already previewed this simplest of all writing-to-learns a couple of pages back. And the title says it all. At specific points during class, students stop and reflect in writing on the activities happening or information being presented. Some quick sharing either with partners or the whole class usually follows this writing.

When to Use It and Why

Remember that kids recall between 10 and 30 percent of what they read, hear, and see? Now think of our most common classroom activities: in-class reading, large-group discussion, teacher lecture, film or picture viewing. All of these certainly focus on covering content, yet alone they often leave students remembering far less than we would like. By incorporating *writing breaks* at regular intervals, about every ten to twenty minutes, you can really kick retention up a notch because writing and then talking about it moves the sticking rate into the 70 to 90 percent range.

Play by Play

Getting Started

Before starting your presentation, film, activity, or in-class reading, decide when students are going to stop and write. For a lecture or large-group discussion, you'll probably want to stop about every ten to twelve minutes since that is the maximum attention span adults have for focused listening (and perhaps optimistic for teenagers). For a film, it might be every fifteen or twenty minutes or after a key scene you want the students to zoom in on for further thinking. For examining a textbook illustration, slide, or transparency, students should study the graphic for a minute or two and write about what they see. For in-class reading, students might respond in writing at the bottom of each page or at a designated heading.

Once you've determined the breaks, decide what topics you'd like the students to explore in their writing. Your prompts might be general:



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these sim-
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k.

The best way to get students to use this informal writing is to follow with some pair sharing. Once the writing time is up, have students trade papers with their partner and read silently. Next, invite them to continue the conversation out loud, commenting on each other's ideas. After the partner talk, call on two or three pairs for a quick summary of their comments. This large-group part is very important because it creates accountability. If students know they might be asked to share, they will talk about their writing versus what happened at last weekend's party. Quickly clarify any questions that arise and then move on to the next segment.

Putting the Writing to Work

When you pause and students write, cruise the room and read over their shoulders. Besides offering the kids a moment to process the information before moving on, this writing time gives you a chance to see if students are stuck or confused anywhere. Even if they are not writing about their confusion, a struggle to write anything is a tip-off as well, indicating an unclear grasp or a possible lack of engagement. Either way, wouldn't it be great to recognize a learning gap ten minutes into the lesson rather than two weeks later, on the unit test?

Working the Room

Just before you launch into the lesson, form students into pairs for today's writing breaks. They need to be sitting near their partner, each should have a blank piece of paper ready, and they should understand that this exercise depends upon clear, legible handwriting.

- ≡ What piece of information stands out and seems really important? Why?
 - ≡ What are you thinking about right now?
 - ≡ What does this remind you of?
 - ≡ What questions do you still have?
 - ≡ Rate your understanding of the material on a scale of 1 to 5 (1 low, 5 high).
 - ≡ What makes sense? What's confusing you?
- Or your prompts might be specific to the content:
- ≡ Which character's actions surprised you the most?
 - ≡ What would you do if you faced this problem?
 - ≡ What might have happened if Theodore Roosevelt had not overseen construction of the Panama Canal from France?
 - ≡ How would you describe the relationship between tRNA and RNA?

Textbook Connections

Almost all modern textbooks have some questions that go beyond the standard factual-recall, skim-the-text-for-the-answers questions. Why not use some of those high-order-thinking questions for some of your writing break prompts? Modify them so that students respond in writing to these big ideas as they read. And, as mentioned earlier, have the kids look more closely at the charts, drawings, and pictures, the text features that students typically ignore as they read. After all, if they're going to carry around a fifteen-pound textbook for each class, they might as well start making use of those extras that are contributing to the added bulk!

What Can Go Wrong?

Any new strategy takes practice. Writing breaks require students to put thoughts down on paper quickly and clearly. In the beginning, make your prompts specific. That way the kids will be able to narrow their thinking and get something down instead of sitting and staring at the blank page. Also, after you've done writing breaks a few times, have students evaluate their writing with just a few criteria:

- ☞ Did I write for the entire time?
- ☞ How well did I support my ideas with specific details?
- ☞ How well did my writing create some interesting discussion with my partner?

At certain points, collect the writing breaks and give them a stamp, a check, a few points, a comment, something that shows this writing is important to the class. Also, collecting them from time to time will give you useful instructional feedback, plus some samples you can use as models with next year's class.

Example

In a history class, students were asked to examine a rather propagandistic 1860 newspaper drawing depicting Native Americans attacking homesteaders. In her writing break, Christina wrote about what she saw, based on three cues built into the teacher's prompt:

Clothing: The woman is wearing a long blue old-fashion style dress. The Native Americans are wearing loincloths and headaddresses. The guy on the ground has his sleeves like he was working.

Things: Hills, a cabin, tree stumps, a river, a shovel, knife. These things say that the settlers live and work a lot outdoors. The Native American holding the knife is attacking the man on the ground.

HISTORY

Feelings: The settlers are scared for their lives because the Native Americans are trying to kill them. The Native Americans are mad because the settlers have moved onto their property. The woman in the back is on the ground begging for her life.

After students wrote for a minute or two, they shared with a partner and then compared their observations with the rest of the class. The kids found that different people noticed different things. No two people interpreted the illustration, something that students viewed as a pretty straightforward exercise, exactly the same.

Variation

A longer-range use for this kind of WTL is to help kids prepare for a test. After having students reread their writing breaks from the unit, ask them to discuss and list what else they remember. Once again, if you notice a certain topic seldom gets mentioned, that's the information to hone in on in your review, giving it the time it needs and not wasting valuable moments on concepts the students clearly control.

Exit Slip

What It Is

One of the simplest ways of dipping your toe into the waters of writing to learn is to save the last one to five minutes of class time and ask kids to quickly jot a response to the day's lesson on an index card. Then you read these notes later on and use them to help plan the next class session. Sound simple? It is.

In her American Studies class, Nancy's students are just finishing some small-group discussions about the first chapter of *Bury My Heart at Wounded Knee*. Now, just before the period ends, Nancy gathers everyone back together. She asks kids to write for just one minute: "What was the best discussion question you brought to your group?" The kids' exit slips cover a range of topics:

How do you think the Indians felt when they saw all these white people coming over and taking their land?

Why was Andrew Jackson called Sharp Knife?

Why do you think it turned out that the whites did not obey the Indian territory law?

Why would the Spaniards teach each other how to torture people if they always spoke of peace?

Why would Samoset give up the land that came from the Great Spirit?

As the bell rings, kids file out, handing their exit tickets to Nancy. The next day, she will begin the class by reading some of these aloud, initiating further discussion, and making distinctions between "skinny" factual recall and fat, inferential questions.

Play by Play

Getting Started

To implement exit slips, all you have to do is remember to stop whatever else you are doing toward the end of the period, before kids start stacking their books on the desk and eyeing the clock. Make sure they have paper and a pencil available, and then offer a simple, open-ended prompt like the ones in Figure 3-1. You can offer students just one prompt or let them pick from several options. We prefer to keep exit slip topics very open and simple. With more choices, there's a better chance of tapping more kids' burning issues. OK, maybe smoldering.

So now the bell rings, you are standing there with a stack of twenty-five note cards in your hand, and the kids have scattered off to gym, science, or home. What do you do

Putting the Writing to Work

When you first start doing exit slips, you'll need to tell kids to use the whole time for writing—no fair dashing down a quick "It was boring" and putting the pen down. With exit slips, like all writing-to-learn activities, we write informally but steadily, pushing ourselves to come up with more reactions, comments, and questions. Most teachers have kids put their names on the cards for accountability's sake (ten points per card is OK with us), though this isn't actually necessary to get good value out of the activity, as you'll see.

Working the Room

Figure 3-1 Exit slip topics

- What did you learn today?
- How is this unit going for you?
- What was the most difficult or confusing idea we learned today—and why?
- What were the three most important ideas we learned today—and why?
- Pick one quote from today's class discussion or readings and comment on it.
- What are some questions you have about today's lesson? Where do you think you can get the answers to those questions?
- Predict what we will need to learn next in this unit and why. (Not just from the textbook contents page, please.)
- What would you like me to review in class tomorrow and why?
- If you were going to teach this to someone else, what would be in your notes? Show me!
- If you were going to make up an essay test question based on today's class, what would it be (and what would a good answer look like)?
- What do you need to concentrate on to finish this unit successfully? What goals can you set for yourself?
- What would be some good review questions about this material?
- What can I do to help you learn better in the class? Please be specific.
- Summarize today's lesson in twenty-five carefully chosen words. Try to get everything in.

with these things? The ultimate goal is to use them to help teach the next class with these students. But now, all you have to do is read them. No matter what your prompt was, you are about to get some very interesting feedback on your curriculum and your instruction. Maybe you'll get some cards like this:

Class today was really great. I'd been having trouble with this stuff. But I really get the algorithm now—I think it was that example with the chocolate bars that made it work for me. Thanks, see you tomorrow!

MATH

Notes like that will make you feel happy and accomplished. But you may also see six exit slips like this:

Man this part B stuff is really hard. I don't get it and I don't think anyone else does either. Can you please go over it again.

As you can see, exit slips are highly *diagnostic*—they can tell you a lot about what students are understanding, what their misconceptions might be, and what their attitude is toward the subject. Many times the feedback from exit slips is much more honest and complete than what we get when we gaze around the class and ask, "Does everybody understand this?" Really, what kid is going to open his mouth and say: "Not me!" under that kind of public pressure?

So you read the exit slips and start figuring out how they'll help you teach the next lesson. The good news is you don't have to grade them—indeed, you must not! If you get tangled up in trying to differentiate a B+ exit slip from an A– specimen, you're sunk timewise; you're never going to use this activity very often if it saddles you with tons of homework. No, what you do is scan them for content, for themes, and for unique comments or questions. If seven kids didn't understand the last two problems, you're going to want to go back and review those. Deal the cards out in stacks. If three kids have raised interesting questions that could feed five or ten minutes of whole-class discussion, place those together. And if one student has written a funny or insightful remark, flag it, too. Then gather together the ones that point toward a needed reteaching.

The payoff comes next class period. At the very beginning of class, pull out the cards and read aloud just one or two from each topic you want to raise (with or without announcing the authors' names). You might say:

Last night when I was reading all your exit slips, I noticed that about a third of you wrote about having trouble with problem 13. One student wrote . . . [and here you read the card aloud]. Another put it this way . . . [read aloud]. So I'm thinking we'd better loop back and work on that operation one more time today. But before we do, a couple of students raised really interesting and bigger questions about this

unit that I think we should talk about. One student wondered . . . [read card aloud]. What do you think about that? Who agrees or disagrees?

And your class is off and running. Some kids hear their cards read aloud, so everyone knows you are taking this seriously. If you are shrewd enough to read aloud a couple of funny or unique ones, kids will start competing to get their exit slips aired. And you've just hooked them on participating.

What Can Go Wrong?

Other than outright defiance, it's hard to see what could go wrong with exit slips. Hmm . . . go wrong . . . go wrong. It's just three minutes. Most of the kids will probably comply right away, and the ones who don't will join in the second or third time, when they have seen that you really honor the writing by using, not grading, it.

Variations

Some teachers make a point of having exit slips be submitted anonymously, to encourage really honest feedback about the content and the class. We don't know about you, but we usually recognize kids' handwriting pretty well by the third week of school (lots of writing, y'know), so that secrecy thing is a little dubious. And we've found that anonymity will invite the couple of truly grumpy kids in your class to give you a cheap shot. If you've got thick skin, go for it. We prefer keeping the names with the ideas and encouraging intellectual courage all around.

You can use exit slips to address class *processes* as well as subject-matter content. After Nancy's students first joined in small-group discussions (on articles about the war on terrorism), Nancy prompted: "What did you notice about how your discussions went?" The kids' exit slips gave plenty of diagnostic information:

- ☞ Once somebody started a topic in our group, everybody jumped in on it and said what they thought.
- ☞ We need to talk and bring more information to our group instead of just sitting there listening to one person speak!
- ☞ None of us are interested in this topic. If it related more to our sixteen-year-old lives, we could get into it more.
- ☞ For the most part, my group had a good discussion. We talked a lot about what's going on in Iraq. But it would probably help if we all had better posture and eye contact.
- ☞ Not all the members of our group participated. Most are preoccupied. Not enough questions asked to keep the conversation going.

The next day, Nancy used the kids' own positive and negative responses to further refine the small-group discussions.

You can also use exit slips for class management and discipline issues. During the first week of school last fall, Nancy's second-period class was setting a new world standard for off the wall. So, as part of the taming process, she assigned an exit slip asking, "What kind of teacher do you think Mrs. Steineke will be if the class acts respectfully?" The kids mostly got the drift:

≡ Nice. We will do fun group-oriented activities.

≡ You'll trust us; we might go on a field trip.

≡ Laid back class, do more group activities, teacher will be happy.

Want more variations and wrinkles on exit slips? More are coming right up in the next section, which is about *admit slips*. What a lovely couple exits and admits make!

Read on.

Admit Slip

What It Is

Admit slips, though seemingly a bookend activity to exit slips, are actually a little more complicated. Here's the deal. Admit slips ask students to bring a short piece of writing to class *the next day*. It can be written on a note card, in a learning log (see page 65), or on a handout that actually looks like an admission ticket to great event. (Let a creative kid have fun designing this for you. For example, "One admission to Mr. Duffy's Third Period World History Class, Row 1, Seat 12" with a big blank center for writing.) Some teachers call these special ducats *entry tickets* or *startup writes*, and we'll comment on some variations later.

So what's the assignment? Typically we have students reflect upon the previous evening's reading assignment or something that happened during the last class meeting. (Most of the examples in Figure 3-1 work well for admit slips as well as exits.) When the kids arrive with their admit slips, we use them to start the next class period, much the way we do with exit slips. The major difference is that we haven't yet had a chance to read them. That's no problem, though, as you'll see.

Play by Play

Getting Started

First of all, you are going to need a just-right prompt or topic for your admit tickets. You can use open-ended ones like those in Figure 3-1 or you can design subject-specific ones along the lines of our suggestions in Figure 3-2. You'll quickly learn how to cook up your own admit slip topics, based on what's happening in your class right now. For example, a Kentucky math teacher devised this prompt:

Want to Jump Around?

How can you tell whether two sets of data vary directly? How can you tell if a line is the graph of a direct variation?

At the next class session, students appeared with responses like these:

Two sets of data vary directly if the value of y divided by x is the same for all corresponding data. A graph of direct variation always goes through (0,0).

Are you thinking, "I can't trust my kids to bring in thoughtful admit slips quite yet"? Then head straight to the "What Can Go Wrong?" section on page 43 and learn about a surefire alternative, *start-up writes*.

Figure 3-2 Sample content topics for admit slips

<p>Social Studies</p> <ul style="list-style-type: none"> • How would the United States have been different if FDR lost the election in 1932? • Of the three main causes of the Civil War, which do you think is most important and why? • Do you think the use of atomic bombs in World War II was justified? Why or why not? • Name three qualities of a good president and why they matter. <p>English</p> <ul style="list-style-type: none"> • What do you think this character would do if x happened? Why? • If you could submit some questions to the author _____, what would you ask? • After reading the poem _____ aloud a few times, comment on the poem's rhythm and rhyme patterns. • After reading the scoring guide for informational speeches, what elements will you need to work on to perform well next week? <p>Math</p> <ul style="list-style-type: none"> • How could this formula be applied in a real-life situation? • Find some examples of math or numerical evidence being used in the media and explain. • Pick one problem on page x and write down in words the steps you'd take to solve it. • Make up a problem like the ones we have been doing and bring it to class. <p>Science</p> <ul style="list-style-type: none"> • Make a drawing of a plant in or near your house and explain how its structures are similar to some in the textbook. • Explain the advantages and disadvantages of indicators versus meters. • On page x, the textbook says that global warming may be caused by human activity or may be part of a natural, random cycle of variations. Which theory do you believe and why? • Some of the chemical reactions we have been studying also happen in your home every day. Name two and explain. • Using the genetics we have learned, comment upon the patterns of eye color in your own family tree, as much as you can. 	
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Putting the Writing to Work

So many choices! So many ways to use admit slips, and many of these are analogues of the exit slip activities described just a few pages back. Here are just a few.

So now what? What do you do with admit slips like these? As the kids enter the room, you collect the admit slips and use them to get the class session rolling. The options are very similar to those for exit slips.

If the ratio of each value in one set to its matching value in the other set is the same then the data vary directly. A line is the graph of a direct variation if the ratios of x and y are equal. (from www.wku.edu/3kinds/dmaesexam5.html)

Figure 3-4 Sample admit ticket

05321

THIS TICKET IS GOOD FOR

Did you know Gregor Men del failed his science exam twice?

NAME: Gregor Men del

DATE: 2/27

05321

Figure 3-3 Sample admit ticket

05321

THIS TICKET IS GOOD FOR

My question: How many books did he actually write that got published? I thought that Louisa May Alcott proved that women were good at doing things that men did instead of just doing housework. She proved that by writing so many books + getting them published.

NAME: Jessica

DATE: 2/27

05321

The gentler, sideways approach works too. We suggested in the Jump Around box on page 40 that there's an alternative form of admit slips called start-up writes. Instead of requiring students to bring an admit ticket with them to class, simply set aside the first five minutes for them to write one while sitting in their seats. Here, you basically have the bookend of exit slips—the kids are all in class, there's no forgetting to bring

centive to not coming prepared, and they forget only rarely. With Wayne peeking out the door and telling them to hurry up. His students see no in-between the kids *love* to be in the hall, making trouble." But they *don't* love it, especially when they hear this story, some hard-bitten teacher friends of ours say: "Yeah, and I stand or sit outside in the hall and do her admit slip before she can get in the door. arrives without her admit ticket, she isn't admitted to Wayne's classroom. She has to all his social studies classes, from basic level to Advanced Placement. And if someone Our friend Wayne Mraz is fully frontal. He assigns admit slips almost every day to

There are two ways to address this, frontally and sideways. situation, you may enjoy nearly total compliance. With at-home work, not so much. them do exit slips right in the room, during the last three minutes of the period. In that get it done and remember to bring it to class. That's a taller task than when you have slips, kids are doing their writing to learn as homework—and that means they must We said at the outset that admits were a little more complicated than exits. With admit

What Can Go Wrong?

- The teacher collects all the admits, quickly scans through them and reads one to three promising discussion starters aloud, inviting class members to then chime in.
- The teacher finds two opposing or different takes on the topic, reads each aloud, and elicits discussion.
- The teacher does not collect the admits but simply asks volunteers (or calls on students) to read their card aloud.
- The teacher shuffles the cards and passes them out randomly; students anonymously read them aloud to spur discussion.
- The teacher has students pass their admit slips to the third (or fifth) student (down the row, around the circle). Then, the receiving student writes a comment on the card and passes it three more students along, for another round of comment. Then discussion starts when volunteer students read the three entries on their card.
- Students pass their cards as in the previous example, but each card returns to the student who made the initial entry.

something, and you can guide and monitor their creation of a worthwhile observation. Otherwise, the types of prompts and the uses in class discussion are just the same as for homework admit slips.

While many teachers begin using start-up instead of admit slips for these management reasons, there's no need to see this variation as a step down. In fact, some thoughtful teachers prefer the in-class version. They use the start-up write as a "sponge" activity that puts kids immediately to work when they step into the classroom. They put the day's admit slip question in a special spot on the blackboard and train kids to look for it upon entering the room and start jotting their responses right away.

Variation

Because exit and admit slips so effectively structure both class time and kids' thinking, many teachers use both of them daily. Steven Gabbard, a math teacher at Jackson County High School in McKee, Kentucky, says, "A good lesson is sort of like a story. It needs an opener, a plot, and a closing element. One way to accomplish this is through the use of admit and exit slips."

An article about Gabbard's classroom on the Education World website parallels the regular uses of admit and exit slips that we see in many content-area classrooms around the country:

Gabbard uses [admit] slips as a class opener to focus the students on the topic of study, to provide direction for the period, and to review important skills needed for the lesson. His "openers" set the tone and offer background information for the "plot," or lesson. "Class openers provide immediate feedback as to the readiness of the class as a whole for the lesson or skills needed for the lesson," Gabbard said. "These are usually problems that are representative of the previous day's lesson that provide a tie-in to the lesson being taught that day. Particular problems that I like to use include 'find the error in the work,' puzzles, riddles, or a real-world problem." At the other end of the period, Gabbard assigns exit slips. He says that they "make evident if a student has *got it*, or grasped the concepts of a lesson that has been taught." (Battie 2004)

Admits and exits are among the rare strategies teachers say they'll never give up once they start using them. The diagnostic value and the class activities they spark are too great to ignore.

MATH

Brainstorming

What It Is

Did you ever wonder how the Shoebox division of Hallmark comes up with its snappy greetings? The writers brainstorm incessantly. *Brainstorming* is the fancy word for coming up with lots of ideas in a short amount of time. When you ask students to brainstorm, you are really asking them to take a quick inventory of what they know or think they know about something, writing down everything that comes to mind, even if they're not sure it's correct. The goal of brainstorming is quantity over quality. Students often stop after they've listed the most obvious ideas, but the harder they keep digging without judging, the more likely something interesting will surface. A big list needs to be created first before the revisions and corrections can take place. And if you were wondering, one Shoebox writer estimates that in eighteen years he's brainstormed about eighty thousand ideas; seven thousand of them eventually became cards.

When to Use It and Why

Written brainstorming is a quick and useful tool that can be applied at almost any point in a lesson or reading assignment. It's an excellent way to get kids started on a new topic by tapping into their prior knowledge. In the middle of a lesson, it can be used much like a writing break: take one minute and list every important idea, concept, or detail that you can remember. As a concluding activity, students can return to an earlier list, revising incorrect items and adding new pieces of information. Also, besides dealing directly with content, brainstorming is an excellent tool for examining the multiple solutions for any problem—real or fictional.

Play by Play

Getting Started

Beforehand, determine the topic to be brainstormed, when this activity will occur in the lesson, and what the brainstorming goal is. For example, it might be to inventory prior knowledge, review material, connect content to events outside the classroom, or correct previous misconceptions. Then give students the topic and a minute or two to brainstorm individually. Next, have them share with a partner, extending their list by writing down items they hadn't already thought of.

Want to Jump Around?

For a more complex and extensive brainstorming activity, see the section on KWLs on pages 101–105.

LANGUAGE ARTS

One challenge in all content areas is the voluminous specialized vocabulary. Rather than having kids look up thirty words in the glossary, pick out a few of the key words, those absolutely essential to understanding the reading. Give students the definitions and then have them brainstorm scenarios from their own lives where these words might apply. For example, in British literature, a reader is never going to follow Sir Arthur Conan Doyle's *Hound of the Baskervilles* unless she has a clear mental picture of a moor. The definition of a moor is a swampy area that can look deceptively firm. The

Textbook Connections

- What inaccuracies do you notice in your original lists?
- On a scale of 1 to 10, how much more do you know about this subject now than when you began?
- What's one important item you would add to the list now that was completely overlooked earlier?
- Of all the items listed, which three are the most important based on what you know now?

Brainstorming before reading gives students a specific purpose as they head into the text: affirming previously learned information, surfacing misconceptions, and watching for new ideas. As the kids move into their reading, they should have their lists right at hand. It is also important for them to return to the lists later in the unit for reflection or further brainstorming. Just have the kids reread their previous lists and discuss a couple of questions, first with their partners and then with the large group:

Putting the Writing to Work

As always, roaming the room during the process will help keep the kids on task. Also, pay close attention to the partner sharing. Make sure the kids actually talk about and clarify their ideas rather than just silently copy off each other's paper. Remind students that both partners will be expected to be able to explain the thinking behind all items on their list, not just the ones they personally thought of.

Working the Room

Finally, create a class master list on chart paper or transparency. Go around the room and have one pair at a time share something off their list. While you (or the designated note taker) jot down the comments on the master list, the students should follow along, checking off items they already have and jotting down new items. Writing together as a class, after all, is still writing, and as long as it's helping students learn your subject material, it's serving the purpose, whether the effort is individual or collective.

Brainstorm question: What places have you been that fit this description? Kids might brainstorm places such as the following:

- ☞ the swamp at LaGrange Road and 95th Street
- ☞ wetland behind my subdivision
- ☞ the peat bog at summer camp

What Can Go Wrong?

First, in order to brainstorm, students need to have some prior knowledge on the topic, so it stands to reason that this won't work very well if the topic is completely unfamiliar to students. In that case, you'll need to provide the background information and save the brainstorming for later in the unit when students have more to work with. Second, when students are brainstorming background information, misconceptions and inaccuracies are bound to appear on their initial lists, so it is very important for students to return to those lists and make corrections later on. However, correcting at the time of initial brainstorming can backfire because it will make students second-guess everything they write down, resulting in very short, predictable lists.

Example

Before reading an excerpt of Columbus' diary as well as accounts of how Columbus' colonization of the West Indies affected the indigenous people, one American history class brainstormed a list of ideas about Columbus. Though mostly accurate, the list revealed a superficial knowledge and showed that the upcoming readings would offer plenty of new information for these students.

- discovered America 1492
- three ships: *Nina*, *Pinta*, *Santa Maria*
- explorer
- thought he was landing in India
- Chicago World's Fair in 1892 called the Columbian Exposition
- king and queen of Spain paid for Columbus' travel
- he was the one that coined the name *Indians*
- brought foreign foods to Spain
- brought European diseases to Americas

HISTORY

Drawing and Illustrating

What It Is

Students make quick drawings, sketches, or diagrams to illustrate ideas, events, science experiments, real-world situations involving math problems, and so on, in order to help themselves and others understand something they are trying to learn. These illustrations usually include words in the form of explanations, labels, or arranged lists of terms and ideas. And they needn't be highly artistic renderings; in fact, it is important to steer students away from such expectations, so those who feel they are all thumbs understand that their sketches are simply tools for thought and communication, and not entries in an art competition. Drawings can be of many types—stick figures or abstract representations of ideas, as well as illustrations of actual scenes or objects.

When to Use It and Why

Drawings help most students, especially the more visually oriented, to understand complex ideas. When any of us reexpress an idea in a different mode than we first encountered it, we notice different aspects and are led to self-monitor, to notice the parts we do or don't understand. More basically, though, taking the time and effort—even if it's just a brief couple of minutes—to make a sketch or complete a diagram often leads students to digest and remember a concept, when a passive hearing or reading didn't sink in. Science teacher Jeff Jones, at Andrew High School in Tinley Park, Illinois, has found that drawings make a distinct difference in students' learning. After students were required to include drawings in a longer assignment—student-made booklets tracing the history of theories about the atom—Jeff polled three of his classes and found that 93 percent of the students asserted that the drawings helped them learn things they hadn't previously understood. Eighty percent felt certain that creating the booklets and drawings resulted in higher scores on their unit tests. Here's how various students put it:

- ≡ I got a better understanding of all of the models [of the atom] because I recreated them myself.
- ≡ Being able to visualize what happened made me understand it even more.
- ≡ It gave me a better idea of the models than just from reading about them.
- ≡ Drawing Thompson's and Rutherford's experiments, along with Einstein's Brownian motion, really helped me understand the concepts.

☞ Since we had to draw the pictures, I studied the experiments, and it helped me understand them better.

Play by Play

Getting Started

Rather than use drawings and diagrams as tests of students' learning, Jeff integrates them into his everyday teaching and learning. Often he'll have students complete

quick sketches at the start of class, focused on topics he plans to teach or review immediately. Kids use their diagrams to contribute to a whole-class version on the overhead, which allows Jeff to correct misconceptions or add further ideas the students may have missed.

Working the Room

While students are completing their own quick drawings or diagrams, Jeff moves steadily around the room, just to get quick glimpses of their work, to see if they are getting it. This allows him to plan his next steps, depending upon whether the kids appear to be on the right track or to need more help.

If students do not correctly understand a concept, particularly in science or math, completing a drawing might further engrain their misconception. This is one reason Jeff skims around the room, looking over shoulders while the kids are working. For Jeff this is where the whole-class drawing is especially useful. Often, if he has spotted a misconception, he'll later ask the student to contribute to the drawing, after which another is likely to comment, "Well I have that on the other side of my chart" (Jeff takes time to instruct his students on respectful ways of disagreeing or correcting one another). This gives Jeff the opportunity to very naturally and supportively explain the concept correctly. When he sees that a misconception is more widespread, Jeff will have small groups compare their drawings and resolve their differences before contributing to a whole-class version, so that the students who get it are able to help those that don't.

Writing the Writing to Work

Jeff also helps his students think more broadly about learning and how such techniques can strengthen it. After the students completed and shared their booklets on the atom and discussed how drawings helped them learn, he pointed out the general value of the strategy. "If they worked well for you this time, they will also help you learn more and get better grades next year in biology, whether your teacher assigns

☞ Want to Jump Around?

Turn directly to "Mapping" on page 60 in this chapter, to compare drawings with more conceptual illustrations.

Figure 3-5 Student booklet on the history of the atom and drawings of a famous experiment continues

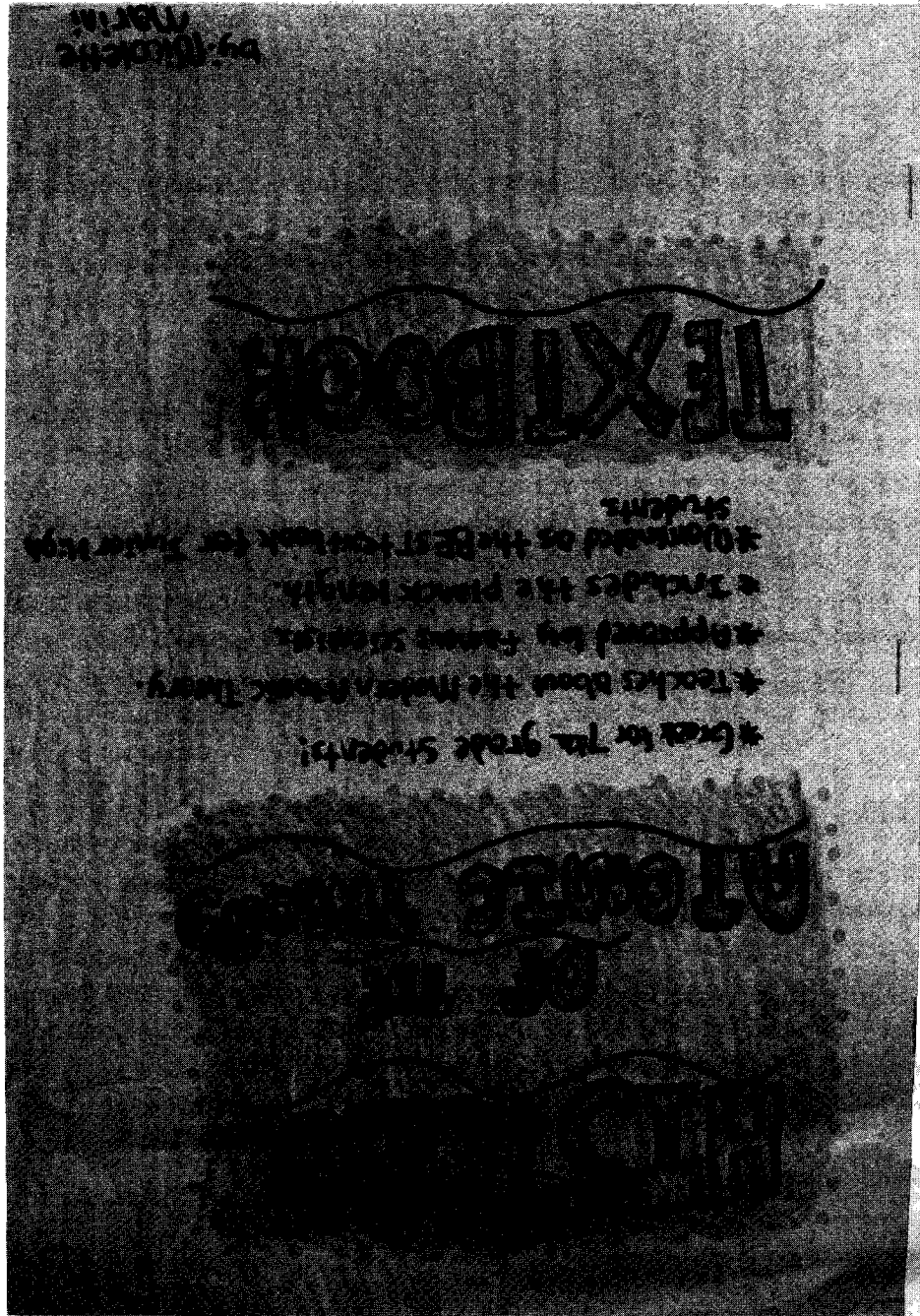
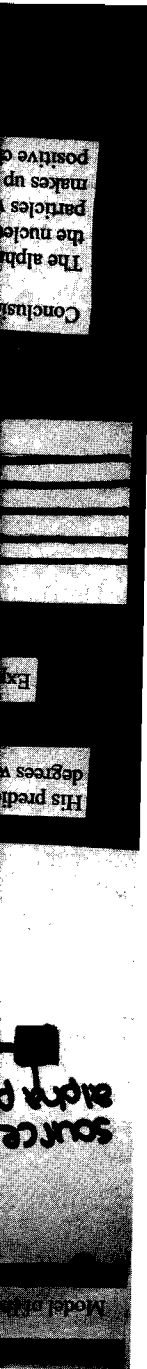
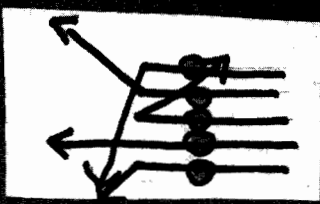


Figure 3-5, continued

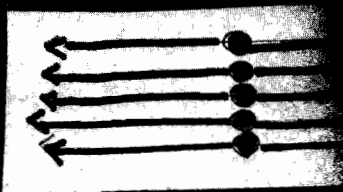


3-5, continued

Conclusion:
 alpha particles were deflected by another charged object. Thus he discovered the nucleus of the atom. Rutherford proved that the negatively charged alpha particles were deflected when they came into close contact with the nucleus which has a very small part of the atom. Thus he discovered the nucleus that has a positive charge.

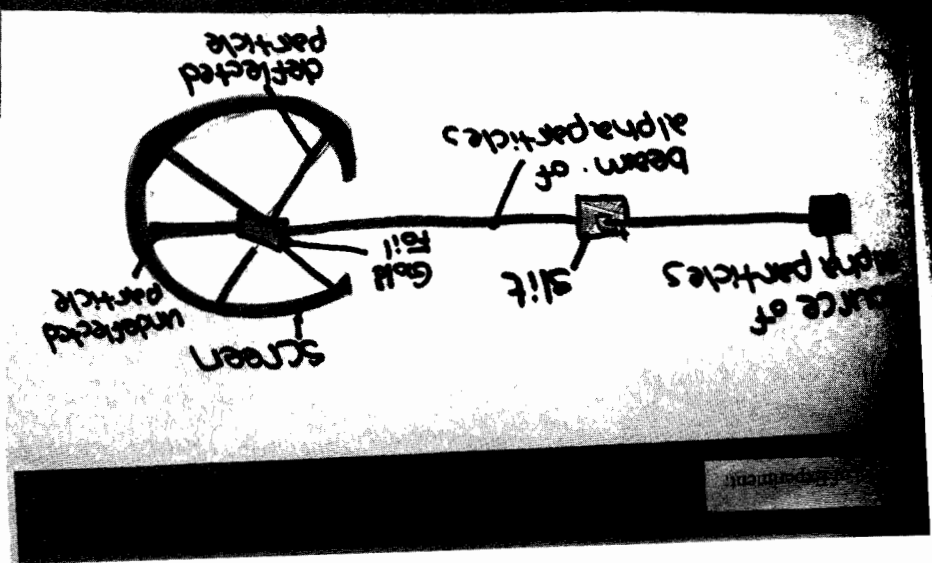


Real Results:



Expected Results:

His predictions proved false. Some of the alpha particles deflected more than 90 degrees while other were not affected at all.

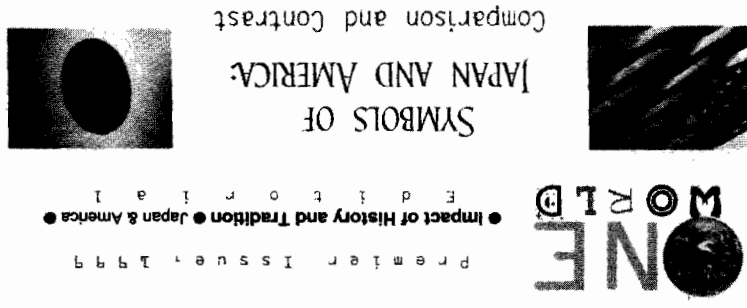


continues

them or not," he explained to these freshmen who were still in the process of getting the hang of high school.

Textbook Connections

Jeff uses drawings to help kids with many topics in his physical science textbook. These are often assigned in place of or in addition to the questions at end of a chapter. But he frequently adds them in, as well, because he finds that this visual thinking is especially effective for improving kids' understanding of science.



CHERRY BLOSSOM

Japanese have always had great respect for nature, culture, although they struggle to maintain their effectiveness to protect nature, their devotion still remains.

CHOP-STICKS

The immediate image conjured by Westerners when the Orient is mentioned most likely because Japan is one of the few places in the world that hasn't adapted the Eurocentric silverware.

KIMONO

This distinctive traditional robe plays a major role in Japan's history. Although they are used less in Japanese everyday life, they are still considered sacred.

We all know the typical symbols that are used to portray both America and Japan, but what exactly do they represent?

American beliefs are ever changing. They do hold fast onto many traditional attitudes and assumptions, but they are often over-powered by their conflicting views. America's quest for knowledge affects their symbols as representative of their country's beliefs, values, attitudes, and assumptions now, may be considered passe or even offensive in the near future. Japan on the other hand, keeps their heritage and traditional ever-present. They represent their country through age old symbols that America is familiar with, which helps us to understand their culture. Commerce, politics, and other interactions may be made more complicated, because the understanding of America's culture (for Japan) is very difficult and indefinite.

WORLD

APPLE PIE

What most Americans consider the ultimate representation of their culture, its simplicity says so much for this complicated and structured culture, that and the fact that Americans love food!

COCA-COLA

How unfortunate it is that commercial symbols have come to represent America, but they do accurately portray the powerful and prosperous commercial American businesses.

GRANDMOTHER

Americans have come to appreciate the friendly warm grandmother figure who provides affection and compassion that pleasantly contrasts the harsh adult world.

Figure 3-6 Marny's fusion article

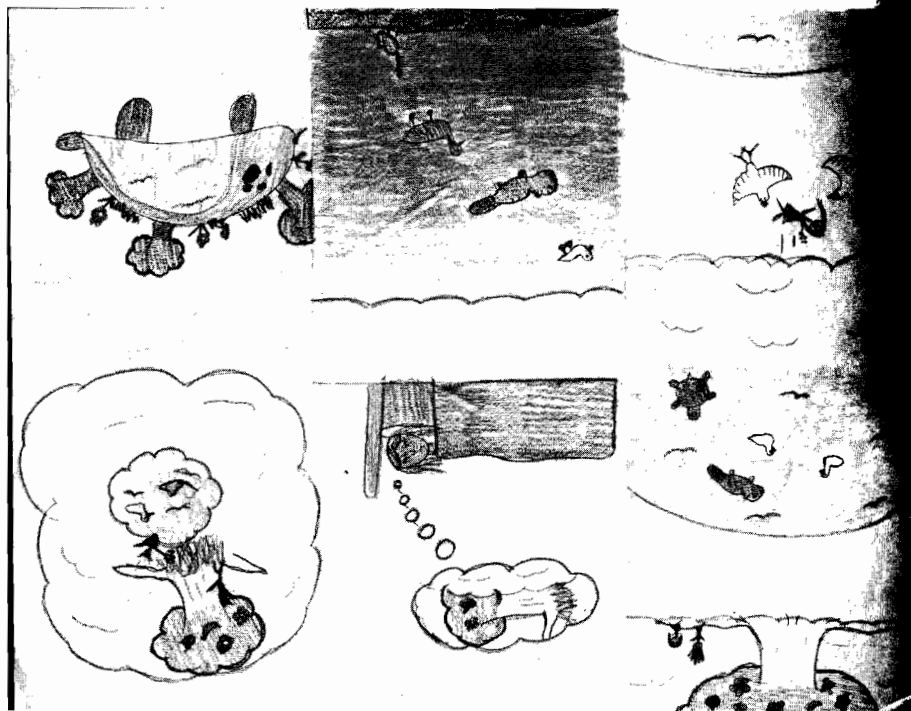
What Can Go Wrong?

When drawings are included within a project like Jeff Janes' booklets on atomic theories, it's no surprise that the Internet makes it easy for students to simply download illustrations. Jeff requires that the kids draw their own, but even when the diagrams are obviously very close to a published version, the students still testify that they learn from them. Of course for in-class activities, this is not a problem.

It often takes repeated reminders to help the nonartists in the room relax and understand that this strategy is not about displaying talent, but simply about thinking and learning. Even then, a few kids who are not visual learners will find the act of drawing unhelpful. Jeff openly discusses this and in fact maintains a set of posters around the room explaining the various modes of learning—visual, kinesthetic, and so forth.

Variations

There are many ways for students to reexpress an idea in two dimensions instead of the single in-line form of reading or writing. Kids enjoy making cartoons to represent a historical situation or event, a conflict, or a controversy. Cartoons can enable math students to write out explanations of the steps in solving problems (called for in many



3-7 Lauren's graphic depiction of the Native American legend "Earth on Turtle's Back"

standardized math tests these days). And they permit students to inject a sense of play or personal ownership into an idea that is otherwise pretty dry in the textbook. Time lines help students visualize the flow of events in history. While they can be very simple, with dates and labels for events, students can further elaborate with added drawings of key turning points so they dig more deeply and place events in perspective.

More abstract sketches can especially help students explore concepts by inviting verbal explanation, whether written or oral. Once in a workshop for teachers on writing, we asked participants to draw their own writing process. One teacher explained the large red dots she had sprinkled across a piece of construction paper, saying, "That's my blood. That's how I feel when I'm asked to write something!" Everyone murmured agreement to this vivid confession—and we were then able to begin talking honestly about it.

Even traditional school assignments can take on a new life and evoke kids' craftsmanship with the addition of an illustration component. One social studies teacher simply asked students to "compare and contrast" stereotypical images that people have of Japan and the United States. Motivated by the chance to do some desktop publishing, Mary took an initial quick-write assignment and ramped it up (see Figure 3-6).

Clustering

What it is

Clustering was first made popular with educators by Gabriele Rico, whose book *Writing the Natural Way*, first published in 1983, still gets glowing reviews on Amazon.com. On her own website, Rico describes the strategy thus: "a non-linear brainstorming process, clustering makes the Design mind's interior, invisible associations visible on a page. Clustering becomes a self-organizing process as words and phrases are spilled onto the page around a center" (from www.gabrieletrico.com/Main/ClusteringSampleVignettes.htm). To put it simply, the writer jots a key word in the center of a page, draws spokes outward, and in associative fashion writes words connected with the key word in circles or balloons at the end of the spokes. Clustering is a way to surface ideas students may need for thinking or writing about a topic they are exploring, or to connect and review ideas they have learned as they study a particular chunk of content. It allows students to uncover possibilities they may not have considered if they were simply writing out linearly what they thought they knew. It is not usually a product, but simply a tool to help students get thinking started. While many people use pure clustering, with simply a word in the center and the bubbles around it, you may well prefer a version that includes phrases or statements written along the

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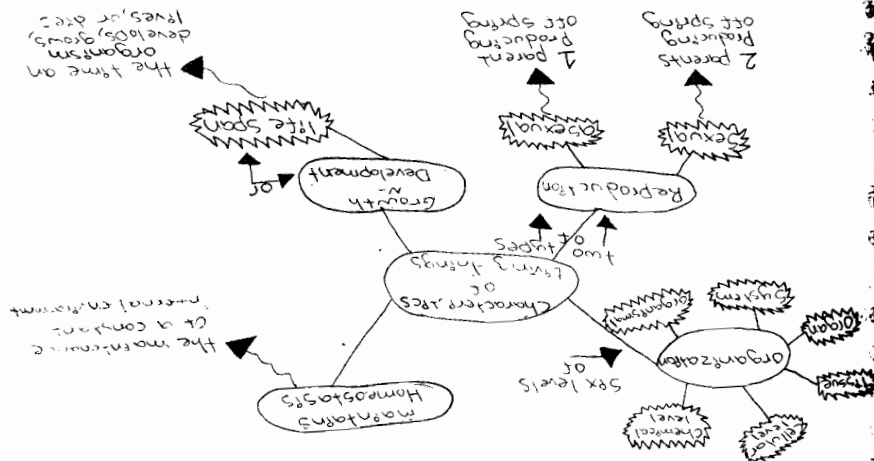


Figure 3-8 Clustering example

Once kids are accustomed to it, using clustering as a frequent tool for jump-starting their thinking is simple. Picture yourself in your classroom about to launch a

Working the Room

The first few times you ask students to try clustering at the beginning of the year, be sure to model it for them on your projection equipment. Use a nontechnical topic, something related to the school or the neighborhood, so the students can see how the process works without worrying about new course content. Next time around, choose a concept close to, but not exactly the same as, the one you will be asking them about, and as you construct your clustering, share your thinking aloud, so the kids can see not only the product but how it gets created. A third try can involve students working in groups.

Getting Started

Play by Play

Kids are often hesitant to make a guess about a question the teacher has posed for fear of being wrong. By using a two-dimensional, associative strategy like clustering before answering, students can try out their ideas on paper and think more creatively and visually. It's easy to use as a quick classroom activity like this to get students' thinking recorded before you begin discussion on a topic. Three minutes of clustering first helps make sure that many of your quieter kids have answers ready and the courage to propose them, so you aren't always depending on the usual eager hand wavers.

While most descriptions of clustering found on the Web or in Rico's book focus on its use in creative writing, it's just as powerful for helping students deepen their thinking about nonfiction subject material. We often tend, as we teach our subjects, to focus on very specific topics—oxidation numbers in chemistry, state powers and limits on them in Article Four of the U.S. Constitution, the definition of a formal Euclidean proof in geometry. But clustering helps students at various stages of their learning to realize what they already know about a subject at the start, or to organize their understanding of its various parts, to make connections with other topics within the subject or outside of it in their present-day world, or to help themselves get started writing about it. It's a tool students can use to get beyond the most obvious ideas that first occur to them—or to conquer the feeling that they really have no ideas at all—and to draw on more of what they know.

When to Use It and Why

spokes to indicate how the ideas are connected, to lead students to think more deeply as they work (see Figure 3-8).

Clustering is a great way to help students get a better handle on the material being presented in their textbooks. All too often, these heavy tomes lay out endless bits and bytes of material without helping students make connections, organize the material in their heads, or maintain a larger view of the big ideas along the way. Studying becomes simply memorizing one disconnected fact or definition or equation after another. So ask kids to pause in their reading to cluster on paper about it, or to create clusters when they arrive in class after having read the assignment the day or the night before, and then have them share the clusters in pairs or use them to contribute to a whole-class cluster. This can help ensure that students do more conceptual thinking and get the most from the textbook by actively reconstructing the ideas in their own way.

Textbook Connections

How do the students share their clustering? How do the results get used, in other words, in teaching and learning? Tina says that sometimes a quick clustering activity meant as a "bell ringer" can turn out to fuel instruction and discussion for the entire period. As the students share their clusters and the teacher comments on the ideas and helps kids elaborate on them or clarify confusions, the content that Tina needs to teach gradually unfolds. In the process, of course, Tina can observe the extent to which kids understand the ideas they've just studied. This informs her about what is getting through and what needs reteaching. It gives her just as much information just as quickly as a quiz, but without any punitive quality to the experience (though the students can of course tell, themselves, when they've got it and when they are confused). Tina is happiest when she discovers that the students are using clustering as a study and review tool on their own. Many of the kids do this not only for her class but for others in their day as well.

Putting the Writing to Work

explains. Tina Steele at Chicago's Academy of Communications and Technology has her ninth-grade biology students start, for example, with a key word like *organization* to help them think about the various levels at which an organism is structured. Tina especially values having students write statements on the spokes to explain the connections they see between their central word and its satellites. She finds that when the students create their own explanations for how ideas are related, they remember them much more firmly. And she wants the kids to develop a larger conceptual view of the material, as well. "Then it's much easier for them to fill in the specifics," she

If the topic is unfamiliar to the students and they are just getting started on it, you may find it makes sense to provide the words and the cluster yourself, projected for the class. This is, however, a different kind of activity. It is often called *word splash* on the Web, and it involves having students write sentences using the words provided. Tina

Variation

If students are not accustomed to associative thinking, they may hesitate, feeling like they need to have all the right words before they begin to write. They'll need reassurance that the object is not to get the right answer, but to get thoughts flowing. Point out that it's better to just get words down quickly, like brainstorming, and not eliminate anything until later. Another challenge involves the teacher. Tina explains that if you have students write statements on the spokes in their clustering, it's all too easy to start judging the quality of their thinking by the length and complexity of the sentences. She says she has to remind herself that the statements are about helping the students develop and remember their own thinking, and if they do that job, then the quality or length of the sentences isn't really the important factor.

What Can Go Wrong?

Even on a task as easy and open-ended as clustering, some kids will say they can't think of anything to write down. What if they haven't completed the assigned reading or are simply (well, it's never *simply*) unengaged? First you need to check on whether the student has special needs of some kind and should receive extra support—more time or a chance to talk with a fellow student first, for example. Then it's important to remember that a strategy like clustering is just one tool, a small part of a wider world of school and the lives of adolescents. Clustering may indeed be a motivator itself, helping some students feel like their ideas are welcomed. But for others, the issue may be larger, due to any one of a number of causes—lack of commitment to school, past experience with failure, a lack of skills, a lack of belief that hard work now might actually lead to a hopeful future, issues at home, or the much-debated peer pressure that seems to hold some students back. We cannot tackle these large issues in this book, though we've seen classrooms where the strategies we offer do help students achieve the kind of everyday success that can turn negative self-perceptions around. But we need to acknowledge that as teachers we face such challenges every day, and if a strategy fails to work when we try it, we must examine both our immediate technique and the larger context in our schools and neighborhoods—do not just conclude, "See, I knew that could never work with my kids."

What About Kids Who Seem to Just Have Nothing to Write?

Steele does on occasion use this variation, with the students writing out sentences to explain relationships between the various terms. While it's a useful activity for getting students started thinking about the topic and focusing them on concepts to watch for as they read and study, or for reviewing material before a test, it's quite a different process than the associative, generative thinking that true clustering invites.

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Mapping

What It Is

Mapping asks students to arrange groups of ideas visually and to show relationships among them. The simpler maps are the various graphic organizers commonly found in our schools. We all know about Venn diagrams, flowcharts, concept wheels, and the like. We provide suggestions for making these effective teaching tools, rather than just cursory exercises. But there are also more colorful and decorative mind maps to try, activities that give students the opportunity to make ideas memorable and route them through another part of the brain by using vivid images.

Mind mapping is a specific version of this activity explored in a number of books, many of them by Tony Buzan. *The Mind Map Book: How to Use Radiant Thinking to Maximize Your Brain's Potential* (1996), is the most widely known, but another valuable resource is Michael Gelb's *How to Think Like Leonardo da Vinci* (2000). Gelb and Lana Israel have both produced videos on the strategy as well. These materials are geared toward businesspeople rather than educators, and—surprise!—a whole industry of high-priced corporate training, materials, and mapping software has grown up around the strategy.

As Buzan explains, "If you want to remember a page of notes, for example, words will help to some extent, of course, but more important for fixing them in your memory will be images, pictures, symbols, codes, colors, associations and connections" (*Management Consulting News*, 2006). The mind, Buzan argues, works by associating words with images. He views maps as colorful radiating figures, with branches and branches on the branches, though many other shapes are possible.

When to Use It and Why

Maps allow students to represent thinking that involves multiple, simultaneous associations, rather than just linear steps. Maps help us organize, consolidate, and digest knowledge. They can enable kids to recall multiple steps in a process for solving complex math or science problems. And of course as students create the maps, they review the material covered and in many cases go back to fill in blanks in their knowledge—so mapping deepens learning in several ways. More vivid mind mapping may be most useful toward the end of a unit or project, because it relates various ideas together and forms a conceptual whole. As one Amazon.com reviewer of Buzan's book explains,

I've used mind maps for about twenty years to organize engineering projects at work, remember books I've read, identify daily goals, learn chess opening ideas, outline papers I'm writing, and identify the important from the trivial. . . . You won't become a genius, you will still have to work at thinking, you'll just have an additional tool to help you. Mind maps are fun, easy-to-use, useful ways to organize and retain information and generate ideas. Linear notes just don't jog the memory. It's still amazing to me how a hastily drawn mind map on an article, book, movie, lecture—a map I'll scribble with stupid little drawings and doodles and throw away days later—can help me remember so much years later!! It works. I use it. It helps.

We don't necessarily agree with Tony Buzan that mind maps will revolutionize human intelligence, but they clearly support student learning and deepen kids' understanding of topics that we teach. And this more creative version of mapping is also a great strategy for differentiated instruction. Students can work at various levels of achievement and all produce results that both help themselves learn and illustrate ideas for their classmates.

Play by Play

Getting Started

Let's begin by looking at the process of using a simple graphic organizer and then we'll go on to the more complex mind mapping strategy.

Jeff Jones, at Andrew High School, especially likes to use Venn diagrams to help students think about topics quickly and immediately. At the beginning of the year, Jeff models the creation of several Venn diagrams for the kids, one comparing boys and girls (with accompanying wisecracks and giggles), and then one on a simple science topic. The students then practice together, on a topic like comparing mammals and reptiles.

Working the Room

Often, as the kids walk into class, Jeff has them pick up sheets with blank linked circles and take a couple of minutes to contrast two related concepts studied the day before (see his completed diagram comparing ionic and covalent bonds in chemistry in Figure 3-9). As students call out items and explain where they go on the diagram, Jeff uses the occasion to clarify things. The length of time he takes for such discussion varies from a couple of minutes to fifteen or more, depending on the importance of the concept.

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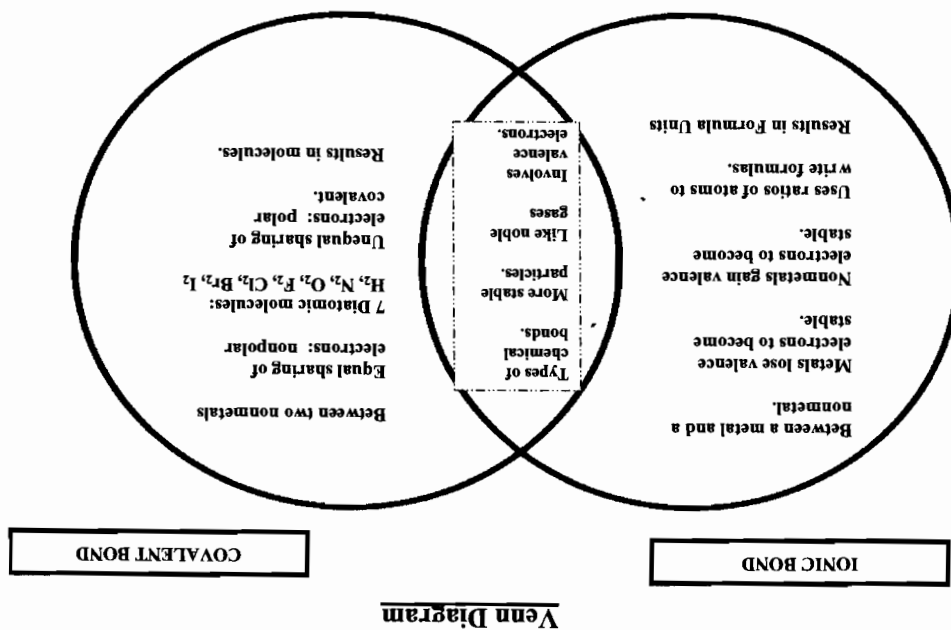
When kids are first learning to create mind maps, it's a good idea to show them student-created examples. If you haven't used this strategy before, you can troll for samples that fellow teachers have lovingly saved or check the Internet. (The Wikipedia encyclopedia entry on "mind mapping" provides a quick overview with several examples and links to other sites on the topic.) And of course numerous companies on the Web are more than happy to sell you their mapping software. At Saline Middle School, in Saline, Michigan, math teacher Nancy Rodgers displays examples of her own maps. And she also shows kids a short video on the strategy, made as a class project by students of fellow Saline teacher Suzanne Brion.

When you show kids sample mind maps, don't flaunt any highly developed works of art—you'll just discourage the all-thumbs kids in the classroom. Before they get started, it's also good to have the students review the big ideas, concepts, and vocabulary terms they'll be mapping, to help make their maps more accurate and complete.

Getting Started with More Complex Mind Maps

Jeff always keeps his overhead projector ready to go in case he wants to stop and construct a diagram as a class, together, as the kids are hearing about or reviewing material. For example, as he explored the periodic table, he stopped to have students complete a Venn diagram to compare the properties of metals and nonmetals.

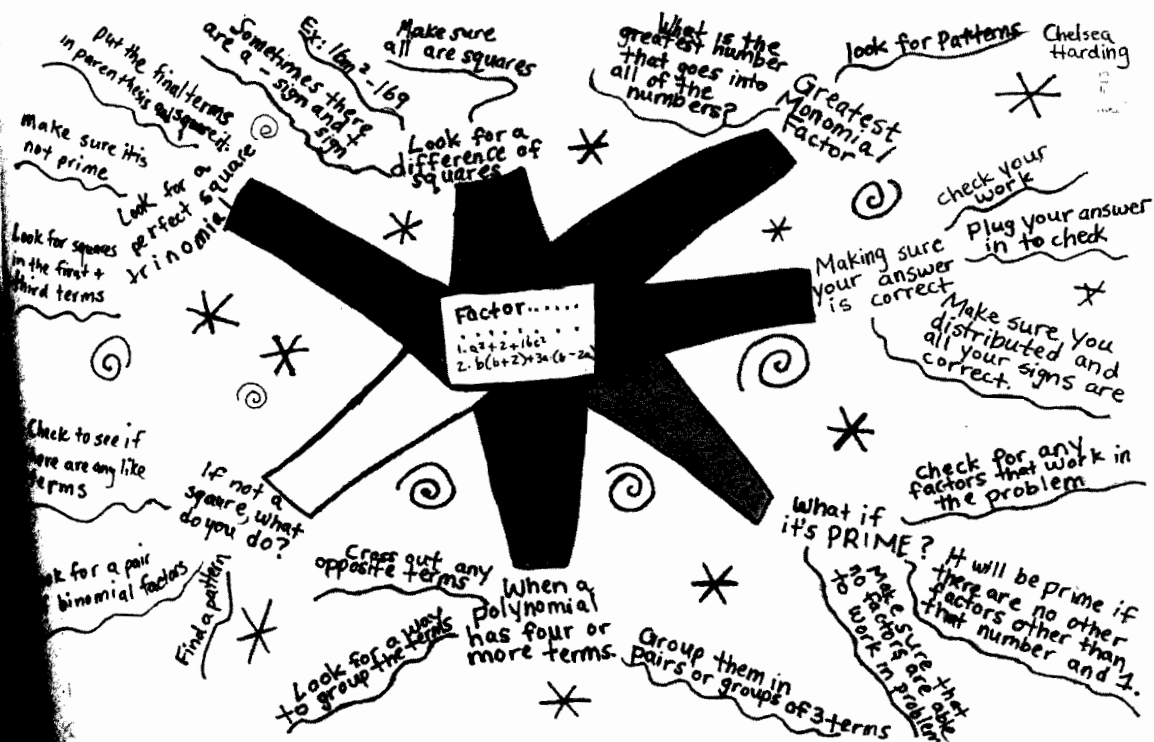
Figure 3-9 Jeff Jones' Venn diagram



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3-10 Chelsea Harding's mind map

Working the Room

Nancy Rodgers uses mind maps to help her eighth-grade students with math topics they find they have the most trouble understanding. They get one class period to start on their maps, after which they finish them up at home. This is active learning time, not just entertainment. And it gives Nancy a valuable opportunity to observe how students are thinking and to teach brief individual or whole-class lessons if she sees students missing important ideas or depicting misconceptions. (See Figure 3-10.)

Putting the Writing to Work

Mind maps are great for reviewing material at the end of a unit, helping students to recall the various steps, concepts, historical events, and so on, as well as the larger perspective that relates all those parts together. Nancy Rodgers even allows maps for answers to questions on tests.

You can use the maps for deeper reflection by having kids look over each other's maps in small groups or posted on the walls. To ensure that students really process the

MATH

information, rather than just stand and gossip about the weekend, you can easily convert this into a thinking-and-responding activity. Tape sheets of paper below the displayed maps. Have students rotate from map to map in small groups, reading the map and then writing a comment on the sheet below to add a further detail, idea, or connection (while you circulate to make sure the comments are on topic, civil, and not crude or rude). If wall space is tight, put up just five or six representative maps for the class to review.

Textbook Connections

The bold headings, lists of major points, and italicized pointers in textbooks are usually intended to make the main ideas stand out. But these don't always help students grasp the larger picture. And they don't usually address issues or controversies or connections with other subjects or real-world applications. Maps provide students with the opportunity not only to review material in their textbooks but to reprocess it through a fresh set of neurons, and to add additional perspectives that go beyond the textbook. The more colorful mind maps can turn review of a chapter from a dull, plodding process with kids nodding off (and how many of us struggled with that as students, ourselves?) into an engaging act of self-expression. You should hang on to some of the kid-created maps as study or review guides for future classes—and to let your present students know that this is one of the more useful purposes for their hard work.

What Can Go Wrong?

One big challenge is likely to be the students who consider themselves completely hopeless artistically. Either in a talk with the whole class or in individual conferences, you'll need to help these students realize that great art is not what this is about, and there is no need for the map to realistically represent or even depict physical objects at all. Nancy Rodgers finds that her students who aren't budding artists tend to imitate her examples rather than branch out on their own—and that's fine. Another difficulty may occur for students who have learning disabilities—or even just natural learning patterns—that make very complex, two-dimensional masses of material difficult to decipher. In fact, we find some of the maps in Tony Buzan's book *dizzying and confusing* rather than helpful. Brief individual conferences, as you circulate the room, can help such students to use accessible shapes or to divide the task and create several submaps instead of one big one that jams everything together in one overwhelming, crazy-quilt diagram.

Want to Jump Around?

Go to "Carousel Brainstorming" in Chapter 4 (page 81) to see another way students can move around the room to write at multiple stations.

Learning Logs, Notebooks, Sketchbooks, and Buttpads

How's it going? We hope that as you've sampled the first seven writing-to-learn activities, you've started trying them out with your students, and that they're adding value to your teaching.

If so, you're probably already wondering: "What am I going to do with all this paper?" You need a place for kids to *collect* all these pieces of their thinking. In fact, you may already be doing quick daily activities, like start-up writes, and you don't want to be handing out blank paper, making up handouts, or even waiting for kids to drag a piece of paper out of their backpacks every time.

That's where learning logs come in: they are a tangible, long-term commitment to the idea of writing to learn, and a way to keep it all organized. These handy little tools are called by various names in different subject fields and different grade levels: notebooks, lab notes, sketchbooks, or buttpads (the smaller back-pocket type). The main idea is for learners to have a place to *do thinking* and *save thinking* for later use—and perhaps, for assessment by their teacher. In fact, we find that a well-kept learning log is a far better and more usable record of student learning than any series of classroom tests we could ever devise.

We've tinkered with learning logs for years, and they need to be carefully tailored to your class and the subject. Here are some of the things we think about when trying to create the just-right format for a given class. To begin, you need a round, continuous section of paper (like a spiral notebook). You might automatically think of lined paper, but don't be too quick. Many teachers think the free-form signaled by blank sheets communicates to students that writing to learn is different from other school writing and that graphic responses are just as valuable as words and sentences. Your pick.

Then you need a container, pocket folder, or envelope to keep loose pieces of paper in one place, like a designated spiral notebook, but that doesn't suit the way we often use WTLs in class. We often have kids write, for example, exit slips or slips on variously sized index cards, ready to immediately pass around or use in a group meeting. Doing this with spirals gets cumbersome. Sometimes kids do writing breaks on sticky notes so kids can stick them on a poster, around which we gather to talk. Additionally, using small pieces of paper dials down the blank-page fever, their fear of getting started with writing because the task is so big. Another drawback with spirals: if you get too religious about writing daily in one place, then every kid has to *remember* to bring her learning log, which will never happen in this millennium. We don't ever want a WTL activity to be delayed because seven kids must first go search their lockers. Responding to management issues, some teachers keep learning logs right in the classroom, circulation allowed. But learning logs make a perfect companion for at-home writing assignments—a tough choice!

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Works Cited

"Where is the line between drawing and mapping?" you might ask. And are Venn diagrams really a kind of clustering or mapping? Should mapping be used only at the end of a unit, or can it help students develop ideas in the middle, or as they begin a project? Are radial diagrams the only ones that are truly mind maps? Must they be formal and fancy or can they be just quick sketches? Truth is, we don't really worry about the labels. If you find, as you teach, that combining words with two-dimensional figures helps students better understand and remember what they are studying, at whatever point works for them, and in whatever level of refinement helps and fits in your schedule, then you are doing the kids a service. With so many different kinds of thinking and relating of ideas in our fields (think of how different algebra and geometry are, for example), we need to try out this larger strategy at various points and see what works and when.

Variations

ends can work, though loose stuff, especially note cards or small slips of paper, can fall out. Though it is heavier, a small (one-inch) three-ring binder covers all the bases; you put a hunk of blank or notebook paper in the front and then select from all kinds of fun prepunched pockets, folders, and containers for the rest. Whatever storage system you design, make sure that kids stick, tape, or glue all small writings (originally done on sticky notes or index cards) onto full-size paper, three-hole punch them, and stick them into the binder. This is much safer than keeping papers in pockets, and it invites students to organize their entries by chronology or topic.

While we usually think that teacher-made tools are better than commercial ones, for math teachers we highly recommend the learning logs available from Universal Learning. These preprinted journals have three kinds of space: one for symbolic computation; another lightly graphed area for drawing and representations; and a lined section for explaining mathematical thinking in prose. A person could also copy this format quite easily, but that would be wrong.

Are we sounding a little too concrete here? Can't help it, we love school supplies!

Now enjoy the next set of WTLs, coming right up.

continued

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