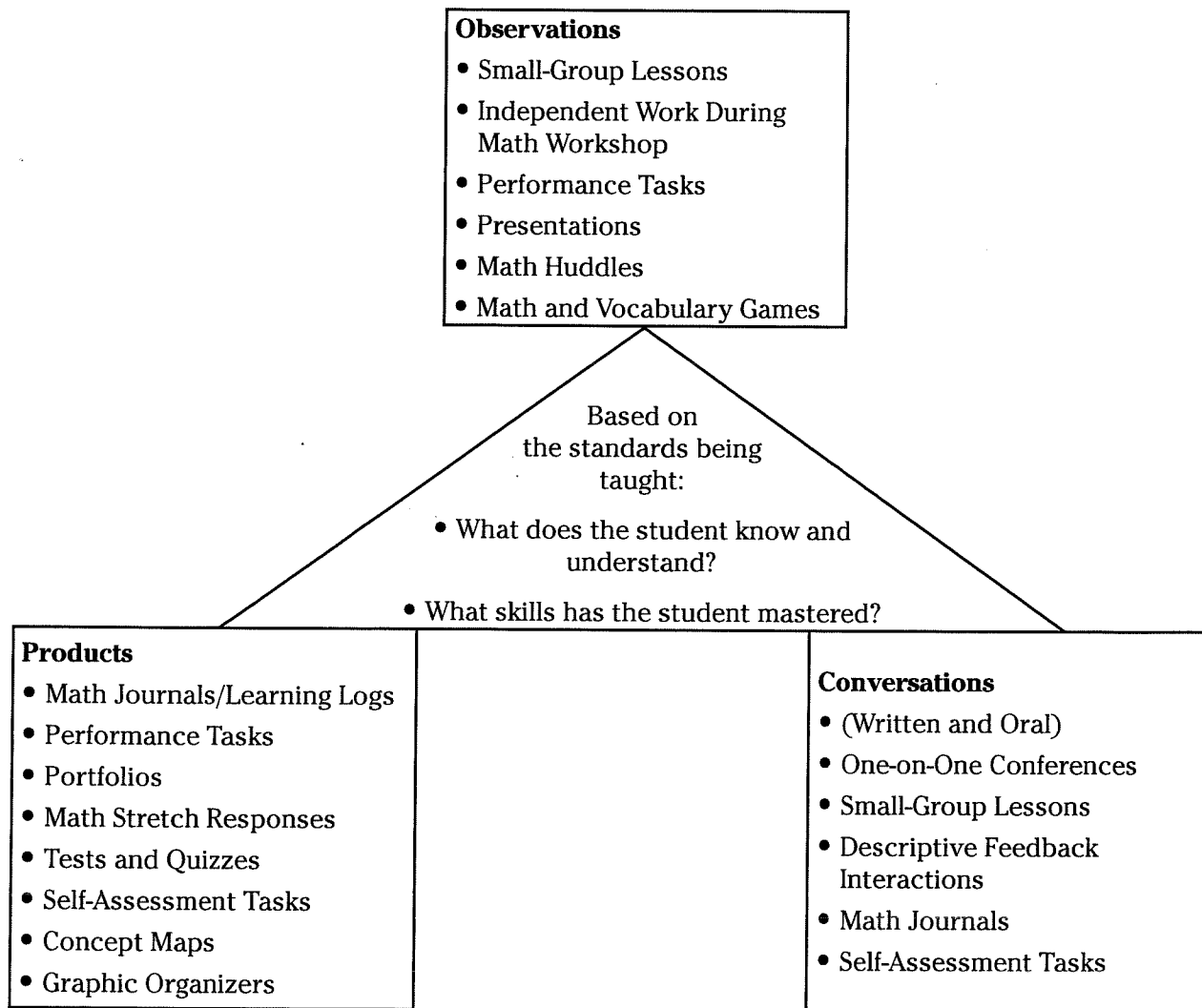


# Strategies for Gathering Evidence of Learning

Just as a photograph of a person at the beach would not give the viewer a complete picture of the many facets of that person's life, a single type of assessment gives only a narrow view of a student's mathematical achievement. Aim to collect an entire assessment photo album for students rather than just a snapshot of success. Gather evidence of students' progress from a variety of sources to increase the reliability and validity of the assessments (Davies 2000). The reliability of the assessment data depends on students producing the consistent results at different times, whereas its validity depends on whether it aligns with the standards being taught.

This process of *triangulation*, or gathering data from multiple sources, increases both the reliability and validity of the student-assessment evidence (Mathison 1988). Although assessment data is sometimes contradictory or inconsistent, by analyzing the results from multiple sources, teachers can verify and make sense of it.



# Strategies for Involving Students in the Assessment Process

As students become more involved in assessing their own learning, not only does the teacher have a more complete vision of students' achievements but also the achievements are enhanced. Students shift from being passive learners to becoming more active participants. According to Davies (2000), students who are involved in shaping and assessing their own learning are more likely to:

- Understand what is expected of them
- Access prior knowledge
- Have some ownership over making it happen
- Be able to give themselves descriptive feedback as they are learning
- Give the information a teacher needs to adjust his or her teaching

According to McTighe and O'Connor (2005), the most successful learners establish learning goals, use proven strategies, and continually self-assess their work. Students' increased self-awareness of their individual learning paths leads them to make connections that strengthen their mathematical understanding. As they become more conscious of the *how* of learning, they assume greater responsibility for their own learning. By having students use rubrics and checklists to assess their achievement and then having them communicate evidence of their learning based on the criteria, the teacher is given an inside glimpse of students' mathematical understanding that allows him or her to more effectively meet the individual learning needs of students. Self-assessment by students, far from being a luxury, is an essential component of formative assessment (Black and William 1998).

Consider using the following strategies to maximize the effectiveness of student self-assessment:

- **Model the process of self-assessment so that students have a firm understanding of what it entails.**
- **Teach students how to set learning goals based on their self-assessments.** Using the criteria from checklists or rubrics, students can determine what their “next steps” in learning should be by identifying criteria they have not yet mastered. This is a powerful way to focus student learning (Davies 2000).
- **Expect students to apply these habits of mind regularly and share these expectations with students.** Include references to self-assessment and goal-setting as part of the daily math conversations.

## Strategies for Involving Students in the Assessment Process *(cont.)*

- **Prompt students to reflect on their progress and the quality of their work by asking such questions as:**
  - What part of your work shows that you have met the criteria for quality work?
  - What part of your work can be improved?
  - What will you do to improve it?
  - How do you rate your understanding? Why?
  - What, if anything, do you not understand?
  - What steps will you take to expand your understanding?
  - Have you met your learning goal? What will you need to do to meet it?
  - What is your next learning goal?
- **Debrief with students after learning experiences.** With students, reflect on what has been learned, what about the lesson was successful, and what did not work. Ask students to reflect and record their thoughts in their Math Journals prior to the discussion. Not only do debriefings prompt students to self-assess but they also give the teacher important insights about the effectiveness of his or her lessons and the needs of students from their own perspectives. In addition, teachers show their students that they respect and value their opinions.
- **Make use of all three types of self-assessment activities** (Gregory, Cameron, and Davies 2000). Depending upon the amount of time available and the depth of reflection sought from students, choose between these self-assessment activities:
  - **Pause and Think:** Students take a few minutes to reflect about what they have been learning.
  - **Look for Proof:** Students select a work sample that is proof of their learning and comment on it.
  - **Connect to Criteria:** Students use criteria that have been set to self-assess their work.
- **Share student self-assessments and accompanying work samples with parents.** Parents learn much more about their child's learning experiences when they have an opportunity to share these self-assessments than when they receive a letter or numerical grade.
- **Create checklists and rubrics with clearly stated criteria to guide students in their self-assessment and goal-setting efforts.**

# Strategies for Involving Students in the Assessment Process *(cont.)*

## Math Journals

Math Journal writing is an excellent way to encourage students to organize their thinking, share their observations, make connections, and reflect on the understanding of mathematical concepts they are learning and the quality of the mathematical work they have completed. Students must self-assess as they work to make sense of mathematics (Thompson et al. 2008). According to Countryman, student journal writing reveals students' "journey through the course and a way for them to keep track of where they are going, and where they have been, as they struggle with the stuff of mathematics" (1992, 27). Journals also provide students a way of communicating with you as they engage in self-assessment either by posing questions or sharing areas of difficulty in a private context. Applying these strategies will help teachers get the most from using Math Journals for student self-assessment:

- Before asking students to reflect on their learning in Math Journals, let them know why you are asking them to do it. Share with them both the importance of reflecting and clarifying their thinking in writing as well as the value of the writing as a method of communicating with you so you can best meet their learning needs.
- Reassure students that this is a risk-free task during which they can express their mathematical thinking without criticism. Do not feel as if you have to correct every punctuation or spelling error—instead focus on the content.
- Let students know that they are encouraged to ask questions or to express any confusion or lack of understanding they discover as they reflect on their mathematical learning.
- Give students sufficient time to both reflect and write, but not so much that students become distracted. The first few times you assign reflective journal writing, closely observe students to determine what length of time is most productive. With experience, the writing stamina of your students should increase.
- Provide writing prompts to focus student reflection. Vary the kinds of prompts you provide, making some open-ended and others very specific.
- Read the entries carefully and respond to them in writing. This shows students that journaling is a valuable activity.

# Strategies for Involving Students in the Assessment Process *(cont.)*

<b>Math Journal Prompts</b>	
<b>Open-Ended</b>	<ul style="list-style-type: none"> <li>• I learn most in math class when...</li> <li>• I feel uncomfortable in math class when...</li> <li>• What math connections can you make?</li> <li>• My math goals are...</li> <li>• What are you thinking about mathematically?</li> <li>• What questions, if any, do you have about the mathematics we are learning?</li> <li>• How have you used the math we are studying outside the classroom?</li> <li>• Explain your reasoning about...</li> <li>• To improve my math work, I should...</li> <li>• Summarize what we learned in class today. What questions do you have about it?</li> </ul>
<b>Specific</b>	<ul style="list-style-type: none"> <li>• Choose three words from the Math Word Wall and define them in your own words.</li> <li>• Explain the math we are working on so that a younger student can understand it.</li> <li>• Does _____ make sense? Why or why not?</li> <li>• Explain why _____.</li> <li>• Find two ways to solve the problem. Which do you think would be most efficient? Explain why.</li> <li>• Tell everything you know about _____.</li> <li>• How are _____ and _____ alike? How are they different? Are they more alike or more different?</li> <li>• Why do we _____ when we _____?</li> <li>• List the properties of a _____.</li> <li>• Write _____ in at least two different ways.</li> </ul>

# Strategies for Involving Students in the Assessment Process *(cont.)*

## Tickets Out the Door

Use Tickets Out the Door to prompt students to reflect on the mathematics they learned during class and as a formative assessment. At the end of a class, students are asked to explain their understanding of a concept, answer a question, complete a calculation, or solve a problem and hand the work in to the teacher as a “ticket out the door.” Teachers then use this work to assess student understanding of the day’s lesson and to inform instruction for the following day.

**3-2-1 Ticket Out the Door**

Ticket Out the Door

Name: \_\_\_\_\_ Date: \_\_\_\_\_

<b>3</b>	List three things you learned.
<b>2</b>	List two things you can do.
<b>1</b>	List one question you have.

---

Ticket Out the Door

Name: \_\_\_\_\_ Date: \_\_\_\_\_

<b>3</b>	List three things you learned.
<b>2</b>	List two things you can do.
<b>1</b>	List one question you have.

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### 3-2-1 Ticket Out the Door

This Ticket Out the Door requires students to list three things they learned, two things they can do, and one question they have about the math they have been studying. Students may complete this on a sheet of paper or use the *3-2-1 Ticket Out the Door* on the Digital Resources CD (321ticket.pdf).

**Comprehension Check Ticket Out the Door**

Ticket Out the Door

Name: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_ I've got it! 😊

\_\_\_\_ I'm still thinking about it. 🤔

\_\_\_\_ Help! 🙋

---

Ticket Out the Door

Name: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_ I've got it! 😊

\_\_\_\_ I'm still thinking about it. 🤔

\_\_\_\_ Help! 🙋

---

Ticket Out the Door

Name: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_ I've got it! 😊

\_\_\_\_ I'm still thinking about it. 🤔

\_\_\_\_ Help! 🙋

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### Comprehension Check Ticket Out the Door

To have students self-check their overall level of understanding, use a *Comprehension Check Ticket Out the Door* (compticket.pdf). Ask students to rate their level of understanding on the day's lesson.