

Strengths-Based Teaching and Learning in Mathematics

At a Glance

Turnaround Tips tied in with chapter topics include do-today activities that can begin impacting your classroom.

In the rush to complete mathematics prompts, some students equate speed with problem solving and often approach every kind of mathematics prompt with the same mindset about how much perseverance they will need and how much time they will need to solve it. As teachers, we casually use the word *problem* to indicate all kinds of mathematics work that we ask students to do. We say, "Please complete the next problem" when the problem looks like this:

- $8 + 5 = \underline{\quad}$
- $5 \times 6 = \underline{\quad}$
- $23.4 + 1.9 = \underline{\quad}$
- Elena picked 14 flowers. She promised to pick 21 for her mother. How many more does she need to pick?
- Ellie and Tia are running a 10K race. Ellie and Tia started out together. Ellie runs every mile faster than Tia. What is happening to the distance between the two runners? Create a graph that represents the story (Williams, Kobett, & Harbin Miles, 2018).

Some of these prompts will cue students to engage at varying levels of problem-solving depth and perseverance. Therefore, it is critical that students recognize different kinds of problems, and tasks will require different ways of engaging with the problem. A true problem involves a question that cannot be immediately answered. What is a problem at one time to one person may be an **exercise** to another person depending on the students' developmental growth. Students truly enjoy opportunities to evaluate whether a mathematics prompt is indeed a problem and then determine what behaviors they will need to solve it. One way to help students differentiate between a problem and a nonproblem is to create a checklist.



Turnaround Tip

Support students' perseverance with problem solving by cutting out large letter Ps. Some teachers like to make the letter Ps using different kinds of paper, colors, and so on.

Place the Ps in a large jar for the students to see. As students are demonstrating perseverance, hand out a P to the student and describe what you are seeing. They may try to assemble a collection!



Source: Image created by Bob Ronau.

A true problem involves a question that cannot be immediately answered.

• Exercise: A problem with a known solution path.

Pull quotes highlight key topics of the chapter.

Marginal definitions provide clarity to novice and experienced teachers alike.

Try It! features aligned with each Teaching Turnaround introduce easy but impactful activities to use in the classroom.



Try It!

Strategy Collection

As students work toward becoming proficient with computational strategies, ask them to record the strategy they use and an example in a journal or on a tablet (Figures 3.4 and 3.5). Make sure to set aside a designated time for students to share their strategies with partners, small groups, and the whole class. Also, encourage students to seek out other students to help them find a strategy that works for them.

FIGURE 3.4: Student Work Sample Using Five as an Anchor

Strategy	Example	When I can Use My Strategy
Grouping by five when I add	$7+8=$ $5+2+3+3=$ $5+5+5=$	I will use it all the time because I like to see the fives in numbers and add them that way.

Try It! activities also include student facing surveys and templates to use directly in your classroom.



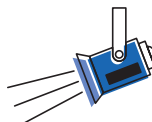
Try It!

Student Attitude Survey

- Math makes me curious.
- I enjoy doing math puzzles.
- I would rather avoid math classes.
- I never think about math unless I am in math class.
- Word problems are confusing.
- I am not very confident in math class.
- Working with numbers is fun.
- Using math materials helps me think about the problems.
- Math class makes me nervous.
- I have never liked math.
- I enjoy being challenged by math problems.
- Math tests are scary.
- When I get a hard math problem, I keep on working until I have a solution.
- My mind sometimes freezes up in math class.

Spotlight on Your Practice invites teachers to write, reflect, and make connections to their own practice.

SPOTLIGHT ON YOUR PRACTICE: What Do You Believe?



We've spent some time unpacking some comments that we have heard; now it is your turn. Take a moment and really think about the students you teach. Shine the spotlight into your mathematics classroom on a student who is currently struggling and a student who is meeting expectations. Write down statements you have made or heard others make about each of the students in each box.

Student #1 _____

Student #2 _____

What kinds of underlying beliefs do you notice in these statements?

Next, select at least one alternative, asset-based belief for the student who is currently struggling and record it in each box.

Student #1 _____

Student #2 _____

- How does the asset-based belief redirect your thinking about the student who is currently struggling?
- How might an exercise like this promote strengths-based teaching?



This template can be downloaded for use at resources.corwin.com/teachingturnarounds.

Templates are available online to help track your progress and reflect as often as you'd like or start fresh with a new class!

FIGURE 2.6: Student Work Samples

MARVIN	LEO
$21 + 18 = \boxed{39} - 7$ what? 	$21 + 18 = \boxed{32} + 7$

- Jasmine:** Wait a second! There are four numbers with the equal sign!
- Katey:** With an equals sign in the middle!
- Jasmine:** I don't think Marvin can cross out stuff. I think he did that because he wasn't sure what to do.
- Katey:** I agree. I did that one time.
- Jasmine:** Well then Leo must be right, but why is he right? Let's check his math!
- Katey:** Well, $21 + 18 = 39$. But, why did he subtract the 7 when the problem says plus 7? Wouldn't we add $39 + 7$?
- Jasmine:** Hmm. Well let's add that. $39 + 7 = 46$. But that doesn't make sense!

Student work samples and vignettes illustrate what strengths-based teaching and learning looks like in the classroom.

End-of-chapter summaries concisely tie up the key ideas and takeaways from the chapter.

Summary

As you venture into exploring how your own strengths can empower you to identify your own capabilities and, in turn, find strengths in your students, your proficiency as a change agent emerges. By creating a habit of identifying your own positives rather than teachers' all too frequent common focus on their weaknesses, the tenor of the instructional experience moves to more solid relationships with the content and the students. Using the tenets of the Appreciative Inquiry model builds productive change on top of a foundation of what's working well. As mathematics teacher educators, the two of us often encounter teacher candidates who come to student teaching seminars or classes feeling that they can't reach a student or don't know how to "handle" an instructional situation. They, like many teachers who care deeply about their students, report that they can't sleep over these concerns and even cry as they talk about particular children. By refocusing their attention to their strengths, we ask them to immediately start journaling about this student and the small (or big) successes they can claim each day. They are surprised when they feel better about these situations as the initial tendency to focus on their frustrations is great. It is these transfers in attention that match the Try It! activities found in this chapter. We know this first step is really a leap. Ready for the next footstep forward? Let's go!