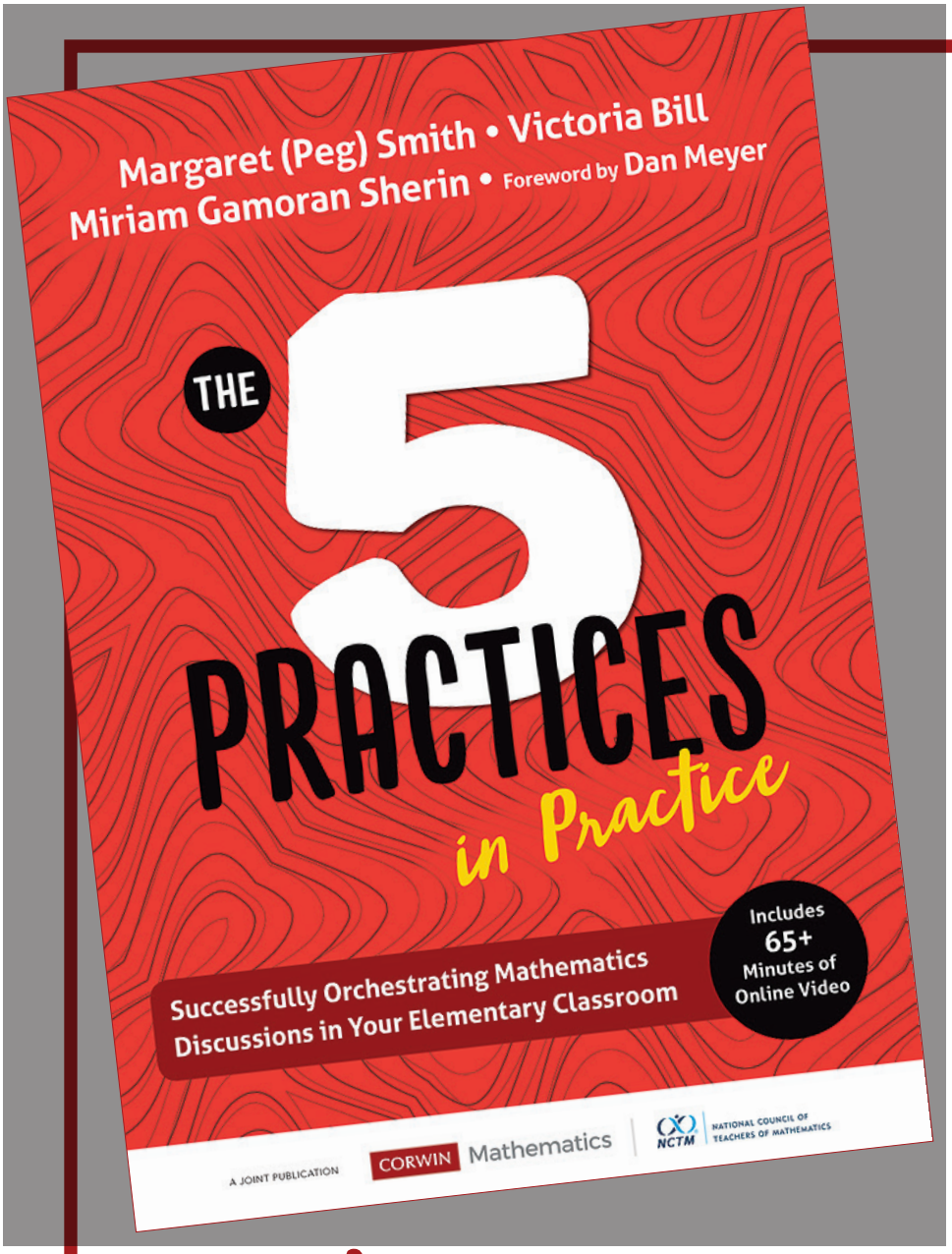

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CORWIN Mathematics

Part One: Unpacking the Practice: Anticipating Student Responses

What is involved in anticipating students' responses? This practice involves getting inside the problem (thinking about different ways students might solve the task), planning to respond to students using assessing and advancing questions, and preparing to notice key aspects of students' thinking in the midst of instruction. Figure 1 highlights the components of this practice along with key questions to guide the anticipating process.

Figure 1 • Key questions that support the process of anticipating students' responses

WHAT IT TAKES	KEY QUESTIONS
Getting inside the problem	How do you solve the task?
	How might students approach the task?
	What challenges might students face as they solve the task?
Planning to respond to student thinking	What assessing questions will you ask to draw out student thinking?
	What advancing questions will help you move student thinking forward?
Planning to notice student thinking	What strategies do you want to be on the lookout for as students work on the task?

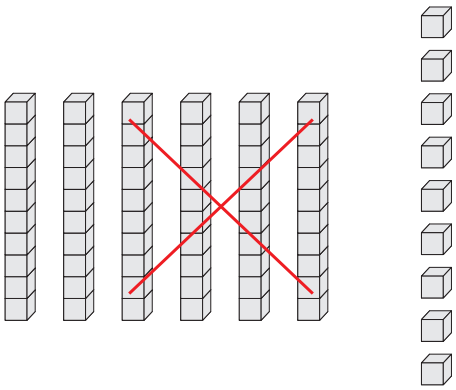
Getting Inside the Problem

The first step is to get inside the problem! Many teachers find it useful to start by thinking about their own approach. How do you solve the task? You will want to think generally about the approach you use and at a detailed level about steps in your process (which may be different from someone else's). Next, consider how students might approach the task. You might investigate the problem using a different representation or think about how manipulatives might shape the way students explore the task. Do some approaches move students more easily toward the learning goals you established? You could also think about whether the task has different entry points. Often when students begin a task by working on different parts of the problem, their solutions look different (Lambert & Stylianou, 2013). Finally, as you explore these various approaches, keep in mind any challenges you think students will face as they solve the task. Are certain parts of the task likely to be difficult for students? Do you expect that students who use certain approaches will face particular kinds of challenges? Where do you think students might get stuck?

In Analyzing the Work of Teaching, we return to the Ms. Tyus's Markers task (Figure 2) that Ms. Tyus selected for her first-grade students. In this activity, you will engage in solving and thinking deeply about the task. We will then look at the strategies that Ms. Tyus anticipated her students would use in solving the task.

Figure 3 • Anticipated solutions to the Ms. Tyus's Markers task generated by Ms. Tyus and her colleagues

A. Decompose and Recompose With Base Ten Blocks



Student decomposes 69 using base ten blocks and then removes 4 tens. Student recomposes the 2 tens and 9 ones.

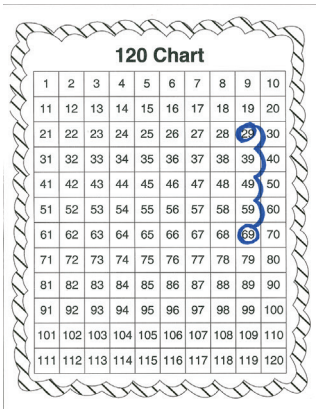
Student writes

$69 - 40 =$

$60 - 40 = 20$

$20 + 9 = 29$

B. Count Back by Tens on a Hundreds Chart



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120

Student starts at 69 on a hundreds chart, then jumps to 59, 49, 39, 29.

Student writes

$69 - 40 =$

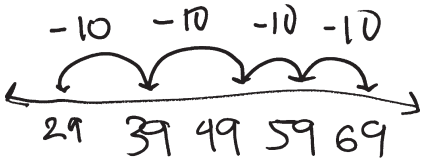
$69 - 10 = 59$

$59 - 10 = 49$

$49 - 10 = 39$

$39 - 10 = 29$

C. Count Back by Tens on an Open Number Line



Student draws a number line and labels the point 69. The student then makes 4 jumps back and marks 10 above each, stopping at 29.

Student writes

$69 - 40 = 29$

D. Round and Compensate

Student adds 1 to 69 to get 70. Student models 70 with base ten blocks or a base ten drawing and then removes 4 tens and has 3 tens left. Student then subtracts 1 from 30 to compensate for the 1 added initially.

Student writes

$69 - 40 =$

$69 + 1 = 70$

$70 - 40 = 30$

$30 - 1 = 29$

E. Subtract Tens, Then Subtract Ones Instead of Add Ones

Student decomposes 69 and then subtracts 40. Student incorrectly subtracts 9 from the remaining 20 rather than recomposing 20 + 9.

Student writes

$69 - 40 =$

$60 - 40 = 20$

$20 - 9 = 11$

F. Round Up, Subtract, and Then Add One Instead of Subtract One

Student adds 1 to 69 to get 70. Student models 70 with base ten blocks or a base ten drawing then removes 4 tens and has 3 tens left. Student then incorrectly adds 1 to 30.

Student writes

$69 - 40 =$

$69 + 1 = 70$

$70 - 40 = 30$

$30 + 1 = 31$

Reference

Lambert, R., & Stylianou, D. A. (2013). Posing cognitively demanding tasks to all students. *Mathematics Teaching in the Middle School*, *18*(8), 500–506.