TESTING THE SPARKLE BOX TEACHER NOTES

SE 4.4D, 4.4G, 4.5A, 4.1A, 4.1B, 4.1C

2-Digit by 2-Digit Using Partial Products & Standard Algorithm

Purpose In this activity, students examine problems that have been solved incorrectly. They identify and correct the incorrect solutions, then solve the problem themselves. The mistakes in the problems are designed to mimic common mistakes that 4th-grade students make when solving multiplication problems.

- ☐ Teacher-facilitated w/ Small Student Groups
- ☑ Tutoring/Intervention
- ☐ Journal
- ☑ Small Group
- ☐ Centers
- ☐ Anchor chart

Setting Up For Instruction

☐ Make 1 copy of **Testing the Sparkle Box** (PG. 51–52) for each student.

How-To Guide

1. Put students in groups of 3–4. Hand out materials.
2. Have students work in groups to identify and correct the mistakes, then solve each problem.

Thought Extenders

- What is the number written in expanded form?
- How can you make a rectangle that has the same dimensions as the factors in the problem?
- How is this model different from those in the previous lesson's problems?
- Check your arithmetic.
- What are the partial products?
- What is the sum of the partial products?
- Is the solution close to your estimate?
- In your explanation, did you use academic vocabulary? Can you use words from the Word Wall to help you explain?

Helping Students Write Better Explanations—A Couple of Ideas (4.1G)

#1

"Math speak" can be confusing for students. Even competent students sometimes have difficulty expressing their ideas. Build a Word Wall *with* your students in order to help them understand and use the terminology precisely and appropriately. For multiplication, use words like: place value, partial products, factors, dimensions, area, product, tens, ones, multiply, and add. Encourage your students to use several of the words from the wall in their explanations of the mistakes.

#2

ELAR TEKS 4.19 Writing/Persuasive Texts has a great cross-application in math. Have your students write precise explanations of why the wrong solutions are wrong. After that, collect them all and choose a few decent (but not super amazing) examples, preferably ones that focus on different aspects of the problem. Help your students merge these 3 different explanations into 1 GREAT explanation.

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TESTING THE SPARKLE BOX ANSWER KEY (PG. 1 of 2)

Directions: Each problem has been solved already, but the solutions are WRONG! Your job is to identify the mistake, explain it, and then solve the problem correctly.

Problem	Find the Mistake!	Correction
1 Zappo, the world's greatest magician, designed a new magical tool that he called the Sparkle Box. The Sparkle Box has 12 sides, and each side has 20 sparkling stars. How many stars are on the Sparkle Box?	20 + 0 × 10 + 2 2 40 10 + 200 252 **Solution:** 252 stars	**What is the mistake?** Multiplication errors; 0 × 2 = 0, not 2; 10 × 0 = 0, not 10 **Correction:** 20 + 0 × 10 + 2 0 40 0 + 200 240 **Solution:** 240 stars
2 The Sparkle Box was designed to bounce around shooting fireworks in all directions. In 1 minute, it could shoot 13 fireworks in each of 35 directions. How many fireworks could it shoot in 1 minute?	30 + 5 10 | 300 | 50 +3 | 90 | 15 350 90 50 + 15 305 **Solution:** 305 fireworks	**What is the mistake?** Added incorrectly **Correction:** 350 90 50 + 15 455 **Solution:** 455 fireworks
3 Zappo decided to test the Sparkle Box inside his fireworks warehouse. He shot 1 firework out of each of 27 sides. The fireworks traveled 22 meters each. How many meters did the fireworks travel altogether?	27 × 22 54 + 54 108 **Solution:** 108 meters	**What is the mistake?** Multiplied by 2 instead of 20; didn't place the 0 as a placeholder **Correction:** 27 × 22 54 + 540 594 **Solution:** 594 meters

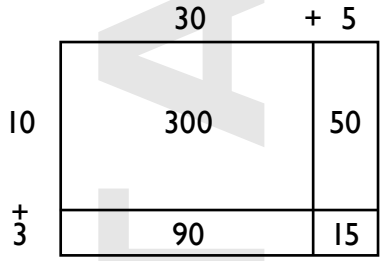
TESTING THE SPARKLE BOX ANSWER KEY (PG. 2 of 2)

Problem	Find the Mistake!	Correction
4 16 of the fireworks crashed into storage boxes and started tiny fires! It took Zappo 41 seconds to put out each fire. How many seconds did Zappo spend putting out fires?	40 + 1 × 10 + 6 7 240 10 + 400 657 **Solution:** 657 seconds	**What is the mistake?** 1 × 6 = 6, not 7 **Correction:** 40 + 1 × 10 + 6 6 240 10 + 400 656 **Solution:** 656 seconds
5 That was a little too dangerous. Zappo took the Sparkle Box outside to try again. This time he launched 60 fireworks. Each firework zigged and zagged in 35 different directions. How many different directions did the fireworks zig and zag?	60 × 35 300 + 180 480 **Solution:** 480 directions	**What is the mistake?** Did not include a place holder for multiplying by 30 or forgot the second 0 for multiplying 3 × 0 **Correction:** 60 × 35 300 + 1800 2,100 **Solution:** 2,100 directions
6 After shooting off those fireworks, the Sparkle Box exploded! The pieces of it flew up in the air and landed all over the place. Zappo called 25 friends over to help clean it up. Zappo and his 25 friends each picked up 39 pieces of the Sparkle Box and took them to the recycling center. How many pieces of the Sparkle Box did they pick up?	39 × 25 195 + 780 975 **Solution:** 975 pieces	**What is the mistake?** Did not include Zappo in the number of people picking up the fireworks **Correction:** 39 × 26 234 + 780 1,014 **Solution:** 1,014 pieces

TESTING THE SPARKLE BOX (PG. 1 of 2)

Name: _____

Directions: Each problem has been solved already, but the solutions are WRONG! Your job is to identify the mistake, explain it, and then solve the problem correctly.

Problem	Find the Mistake!	Correction
1 Zappo, the world's greatest magician, designed a new magical tool that he called the Sparkle Box. The Sparkle Box has 12 sides, and each side has 20 sparkling stars. How many stars are on the Sparkle Box?	$\begin{array}{r} 20 + 0 \\ \times\ 10 + 2 \\ \hline 2 \\ 40 \\ 10 \\ +\ 200 \\ \hline 252 \end{array}$ **Solution:** 252 stars	**What is the mistake?** **Correction:** **Solution:** _____
2 The Sparkle Box was designed to bounce around shooting fireworks in all directions. In 1 minute, it could shoot 13 fireworks in each of 35 directions. How many fireworks could it shoot in 1 minute?	 $\begin{array}{r} 350 \\ 90 \\ 50 \\ +\ 15 \\ \hline 305 \end{array}$ **Solution:** 305 fireworks	**What is the mistake?** **Correction:** **Solution:** _____
3 Zappo decided to test the Sparkle Box inside his fireworks warehouse. He shot 1 firework out of each of 27 sides. The fireworks traveled 22 meters each. How many meters did the fireworks travel altogether?	$\begin{array}{r} 27 \\ \times\ 22 \\ \hline 54 \\ +\ 54 \\ \hline 108 \end{array}$ **Solution:** 108 meters	**What is the mistake?** **Correction:** **Solution:** _____

TESTING THE SPARKLE BOX (PG. 2 of 2)

Name: _____

Problem	Find the Mistake!	Correction
4 16 of the fireworks crashed into storage boxes and started tiny fires! It took Zappo 41 seconds to put out each fire. How many seconds did Zappo spend putting out fires?	$\begin{array}{r} 40 + 1 \\ \times\ 10 + 6 \\ \hline 7 \\ 240 \\ 10 \\ +\ 400 \\ \hline 657 \end{array}$ **Solution:** 657 seconds	**What is the mistake?** **Correction:** **Solution:** _____
5 That was a little too dangerous. Zappo took the Sparkle Box outside to try again. This time he launched 60 fireworks. Each firework zigged and zagged in 35 different directions. How many different directions did the fireworks zig and zag?	$\begin{array}{r} 60 \\ \times\ 35 \\ \hline 300 \\ +\ 180 \\ \hline 480 \end{array}$ **Solution:** 480 directions	**What is the mistake?** **Correction:** **Solution:** _____
6 After shooting off those fireworks, the Sparkle Box exploded! The pieces of it flew up in the air and landed all over the place. Zappo called 25 friends over to help clean it up. Zappo and his 25 friends each picked up 39 pieces of the Sparkle Box and took them to the recycling center. How many pieces of the Sparkle Box did they pick up?	$\begin{array}{r} 39 \\ \times\ 25 \\ \hline 195 \\ +\ 780 \\ \hline 975 \end{array}$ **Solution:** 975 pieces	**What is the mistake?** **Correction:** **Solution:** _____