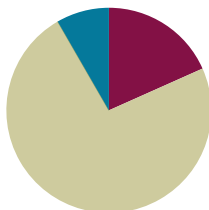


Lesson 25

Objective: Make sense of complex, multi-step problems and persevere in solving them. Share and critique peer solutions.

Suggested Lesson Structure

■ Fluency Practice	(11 minutes)
■ Concept Development	(44 minutes)
■ Student Debrief	(5 minutes)
Total Time	(60 minutes)



Fluency Practice (11 minutes)

- Multiply **5.NBT.5** (4 minutes)
- Order of Operations **5.OA.1** (3 minutes)
- Subtract Unlike Denominators **5.NF.1** (4 minutes)

Multiply (4 minutes)

Materials: (S) Personal white boards

Note: This drill reviews year-long fluency standards.

T: (Write $4 \text{ tens } 9 \text{ ones} \times 4 \text{ ten } 3 \text{ ones} = \underline{\quad} \times \underline{\quad}$.) Write the multiplication sentence in standard form.

S: (Write 49×43 .)

T: Solve 49×43 using the standard algorithm.

S: (Write $49 \times 43 = 2,107$ using the standard algorithm.)

Continue the process for 249×43 , 67×32 , 867×32 , and 938×27 .

Order of Operations (3 minutes)

Materials: (S) Personal white boards

Note: This fluency prepares students for today's lesson.

T: (Write $24 \div 3 + 1$.) On your boards, write the complete number sentence.

S: (Write $24 \div 3 + 1 = 9$.)

T: (Write $24 \div (3 + 1)$.) On your boards, copy the expression.



NOTES ON LESSONS 21–25:

Lesson Sequence for M6–Topic E:

- Lessons 21–22 use a protocol to solve problems within teams of four. The number of problems solved will vary between teams.
- Lesson 23 uses a protocol to share and critique student solutions from Lessons 21–22.
- Lesson 24 resumes the problem solving begun in Lessons 21–22.
- Lesson 25 uses the protocol from Lesson 23 to again share and critique student solutions.

S: (Write $24 \div (3 + 1)$.)

T: Write the complete number sentence, performing the operation inside the parentheses.

S: (Beneath $24 \div (3 + 1) = \underline{\quad}$, write $24 \div 4 = 6$.)

Continue this process with the following possible sequence: $5 \times 4 - 2$, $5 \times (4 - 2)$, $36 \div 6 - 2$, and $36 \div (6 - 2)$.

Subtract Unlike Denominators (4 minutes)

Materials: (S) Personal white boards

Note: This drill reviews G5–Module 3 content.

T: (Write $\frac{3}{5} - \frac{1}{2}$.) Add the fractions. Simplify the difference, if possible.

S: (Subtract.)

Repeat the process for $\frac{3}{4} - \frac{3}{8}$, $1\frac{5}{8} - \frac{2}{5}$, and $2\frac{1}{4} - \frac{2}{3}$.

Concept Development (44 minutes)

Materials: (S) Student work from G5–M6–Lessons 21, 22, and 24

1. Establish the intention and structure of today's lesson: to construct arguments, share, and critique peer solutions.

Advise students that today, they will revisit their solutions completed in G5–M6–Lessons 21, 22, and 24 and discuss their answers with students who also solved that problem.

2. Re-organize new teams of three (or keep those from G5–M6–Lesson 23) based upon an analysis of the solutions, students' strengths, weaknesses, and inter-relationships.

3. Re-introduce the protocol to the students, which may have been edited during the Debrief of G5–M6–Lesson 23. (See box to the right.)

Step 1 Student A presents his/her solution step by step to the others in the group. (Allow two minutes.)

Step 2 Students B and C discuss and make sense of the solution while Student A listens without intervening. (Allow two minutes.)

Step 3 Students B and C each ask one question or share one thought directly related to the written solution and explanation. (Allow six minutes or three minutes per question.) Student A responds and whole-group dialogue follows.



A NOTE ON MULTIPLE MEANS OF REPRESENTATION:

To clarify the *share and critique* protocol for the students, you might post the process listed step by step.

1. Student A presents her solution to the group.
2. Students B and C analyze and discuss the solution as Student A listens.
3. Students B and C each ask a question or share a thought about the solution. Student A responds first.
4. Student A explains to the group what has been learned and specific changes to improve the solution.
5. Repeat the process with Students B and C.

Suggested stems:

- Can you explain why you chose to ____?
- What did you mean when you wrote (or said) ____?
- I think you omitted ____.
- It might have been easier to understand your solution if you ____.
- I would argue that ____.



NOTES ON MULTIPLE MEANS OF EXPRESSION:

One way to have shy students share solution strategies or critique is through the use of puppets. Have the students put hand puppets as they explain their solution.

Step 4 Student A explains to the group what has been learned from the process and what changes would be made to the solution, if any. (Allow one minute.)

Step 5 Repeat Steps 1–4 for each student on the team.

4. Give students time to either revise their solution based on their peers' input or support a peer's revision. (7 minutes)

5. File all student solutions in their work portfolio.

Student Debrief (5 minutes)

Lesson Objective: Make sense of complex, multi-step problems and persevere in solving them. Share and critique peer solutions.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

- Did your sharing and critiquing experience improve since the last time? How?
- What emotions did you experience during the share and critique process? (Follow up with additional questions based on the responses.) When did you experience nervousness? Annoyance? Surprise? Confusion?
- Did those emotions change as you went through the process? How? Why?
- What is the value of seeing other solutions and arguing about ways of solving problems?
- What did you learn today that will make you a better problem solver in the future?

Note: There is no Exit Ticket for this lesson.

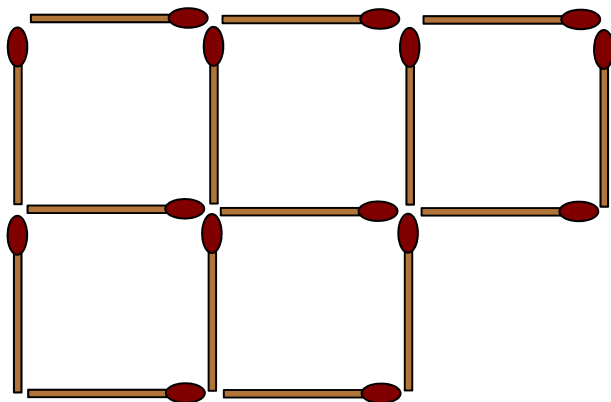
Name _____

Date _____

Fred and Ethyl had 132 flowers altogether at first. After Fred sold $\frac{1}{4}$ of his flowers and Ethyl sold 48 of her flowers, they had the same number of flowers left. How many flowers did each of them have at first?

The following problems are puzzles for your enjoyment. They are intended to encourage working together and family problem solving fun. They are not a required element of this homework assignment.

Without removing any, move 2 matchsticks to make 4 identical squares. Which matchsticks did you move? Draw the new shape.



Move 3 matchsticks to form exactly (and only) 3 identical squares. Which matchsticks did you move? Draw the new shape.

