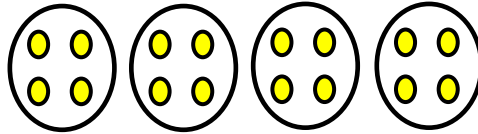


Third Grade Test Operations & Algebraic Thinking

Name _____ Teacher _____ Date _____

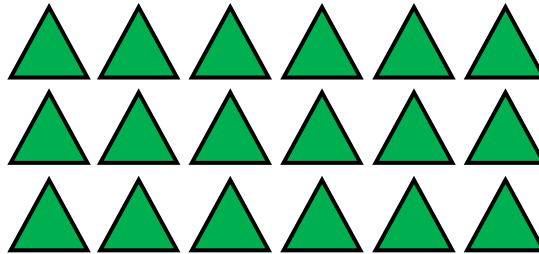
3.OA.A.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.

1. Choose the multiplication equation for the following representation.



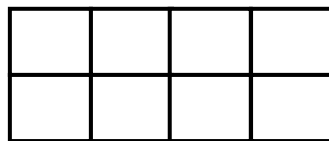
- a. $4 \times 4 \times 4 \times 4 = 16$ b. $4 \times 4 = 16$

2. Choose the multiplication equation for the following array.



- a. $3 \times 6 = 18$ b. $6 \times 6 \times 6 = 18$

3. Choose the multiplication equation for the following area model.

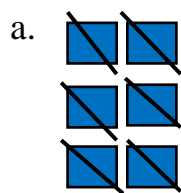


- a. $8 \times 2 = 16$ b. $2 \times 4 = 8$

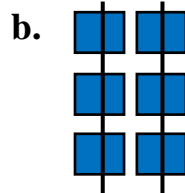
3.OA.A.2 Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

4. Which is the successive subtraction representation for the following division equation?

$$6 \div 2 = 2$$

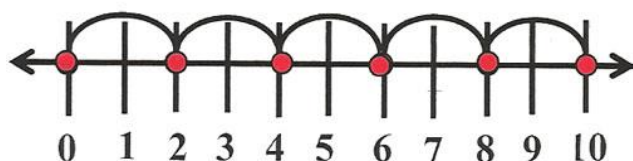


$$\begin{aligned} 6 - 2 &= 4 \\ 4 - 2 &= 2 \\ 2 - 2 &= 0 \end{aligned}$$



$$\begin{aligned} 6 - 3 &= 3 \\ 3 - 3 &= 0 \end{aligned}$$

5. Which is the division equation for the jumps on the number line?



- a. $6 \div 3 = 2$ b. $8 \div 4 = 2$ c. $10 \div 2 = 5$

6. Which is the division equation for the following partitioning?



- a. $9 \div 3 = 3$ b. $3 \div 3 = 1$ c. $9 \div 1 = 9$

7. There are eight cookies and four people. How many cookies would each person get if they wish to share them?



- a. four b. two c. three

3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

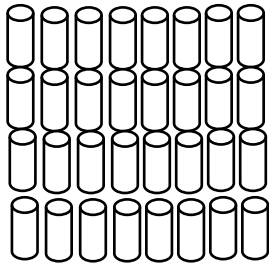
8. Brady brought 24 stickers to school to share with his 6 friends. How many stickers will each friend receive if each friend gets the same amount of stickers? Choose the number sentence that will solve the problem.

a. $24 \times n = 6$

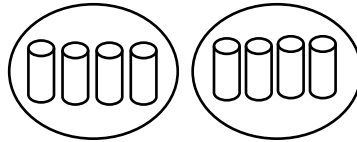
b. $24 \div 6 = n$

c. $24 - n = 6$

9. Harrison drank 8 cups of water a day for 4 days. How many cups of water would he drink altogether? Choose the drawing and the equation that will solve the problem.



a. $4 \times 8 = n$



b. $8 \div 2 = n$



c. $8 - 4 = 2$

10. Carter's grandmother is 78 years old. She is 6 times older than Carter. Choose the equation that you can use to find out Carter's age.

a. $78 \times n = 6$

b. $78 \div n = 6$

c. $78 \div 6 = n$

3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

Find the unknown in the following equations.

11. $8 \times n = 40$

a. 7

b. 6

c. 5

12. $35 \div n = 7$

a. 6

b. 5

c. 8

13. $7 \times 6 = n$

a. 38

b. 42

c. 44

3.OA.B.5 Apply properties of operations as strategies to multiply and divide.

14. Complete the equation for n to show that multiplication is commutative.

$$4 \times 8 = n \times 4$$

- a.** 6 **b.** 8 **c.** 9

15. Complete the equation for n to show that multiplication is associative.

$$6 \times (2 \times 3) = (6 \times 2) \times 3$$

- a.** $6 \times 6 = 12 \times 3$
36 = 36 **b.** $12 \times 3 = 12 \times 3$
36 = 36

16. Select the equation to show that multiplication is distributive.

$$2(5 + 3) = (2 \times 5) + (2 \times 3)$$

- a.** $2 \times 8 = 10 \times 6$
16 = 60 **b.** $2 \times 8 = 10 + 6$
16 = 16

3.OA.B.6 Understand division as an unknown-factor problem.

Choose the related multiplication equation that solves the division equation.

17. $32 \div 8 = n$ **a.** $8 \times 32 = n$ **b.** $8 \times n = 32$

18. $63 \div 3 = n$ **a.** $3 \times n = 63$ **b.** $63 \times 3 = n$

3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Multiplication Facts Test

Complete the facts with fluency and accuracy. Mastery is 16 of 20 in 36 seconds.

$$\begin{array}{r} 8 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$$

Division Facts Test

Complete the facts with fluency and accuracy. Mastery is 16 of 20 in 36 seconds.

$$28 \div 4 = \underline{\hspace{2cm}}$$

$$27 \div 3 = \underline{\hspace{2cm}}$$

$$15 \div 5 = \underline{\hspace{2cm}}$$

$$18 \div 2 = \underline{\hspace{2cm}}$$

$$12 \div 4 = \underline{\hspace{2cm}}$$

$$36 \div 6 = \underline{\hspace{2cm}}$$

$$8 \div 2 = \underline{\hspace{2cm}}$$

$$35 \div 5 = \underline{\hspace{2cm}}$$

$$21 \div 3 = \underline{\hspace{2cm}}$$

$$40 \div 5 = \underline{\hspace{2cm}}$$

$$16 \div 4 = \underline{\hspace{2cm}}$$

$$9 \div 3 = \underline{\hspace{2cm}}$$

$$6 \div 1 = \underline{\hspace{2cm}}$$

$$45 \div 5 = \underline{\hspace{2cm}}$$

$$12 \div 3 = \underline{\hspace{2cm}}$$

$$10 \div 2 = \underline{\hspace{2cm}}$$

$$5 \div 5 = \underline{\hspace{2cm}}$$

$$42 \div 7 = \underline{\hspace{2cm}}$$

$$54 \div 9 = \underline{\hspace{2cm}}$$

$$63 \div 7 = \underline{\hspace{2cm}}$$

3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

- 19.** Aubrey runs for 25 minutes each day. She then swims for 15 minutes each day. How many minutes does Aubrey run and swim in 5 days? Choose the correct equation to solve the problem.

a. $(5 \times 25) + (15 \times 5) = n$ **b.** $25 + (15 \div 5) = n$

- 20.** An airline allows passengers to have bags that weigh up to 50 pounds at no extra charge. For each pound over 50 pounds, the airline charges \$5. How much will a passenger have to pay for a bag that weighs 75 pounds.

Choose the correct equation to solve the problem.

a. $50 \times (75 - 5) = n$ **b.** $(75 - 50) \times 5 = n$

3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

- 21.** The following is part of the multiplication table. Choose the explanation for why 4×4 equals a product that can always be divided by two.

0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40

- a.** When multiplying an even factor by an even factor you always get an even number as the product. Even numbers can be divided by two.
- b.** When multiplying two factors you always get an even number as the product. Even numbers can be divided by two.

Answer Key for Third Grade Test
Number and Operations & Algebraic Thinking

Standard	Answer
3.OA.A.1	1. b 2. a 3. b
3.OA.A.2	4. a 5. c 6. a 7. b
3.OA.A.3	8. b 9. a 10. c
3.OA.A.4	11. c 12. b 13. b
3.OA.B.5	14. b 15. a 16. b
3.OA.B.6	17. b 18. a
3.OA.D.8	19. a 20. b
3.OA.D.9	21. a