Tennessee Comprehensive Assessment Program

TCAP/CRA 2013

4

Task 3 Scoring Guide

Library Books Task

3. Library Books Task Scoring Guide

The CCSS for Mathematical Content (1 point)

4.NF.B.4c Identifies the correct number of each type of book that is new by shading in the number of books or by providing numerical answers. _____

(1 Point)

Total Content Points _____

The CCSS for Mathematical Practice (2 points)

MP4 Models the multiplication using expressions and/or equations or the diagrams provided. _____

(1 Point)

(MP4: Model with mathematics.)

MP6 Both parts of the response are complete and correct. _____

(1 Point)

(MP6: Attend to precision)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Build fractions from unit fractions by applying and extending previous understanding of operations on whole numbers.

4.NF.B.4c Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

The CCSS for Mathematical Practice*

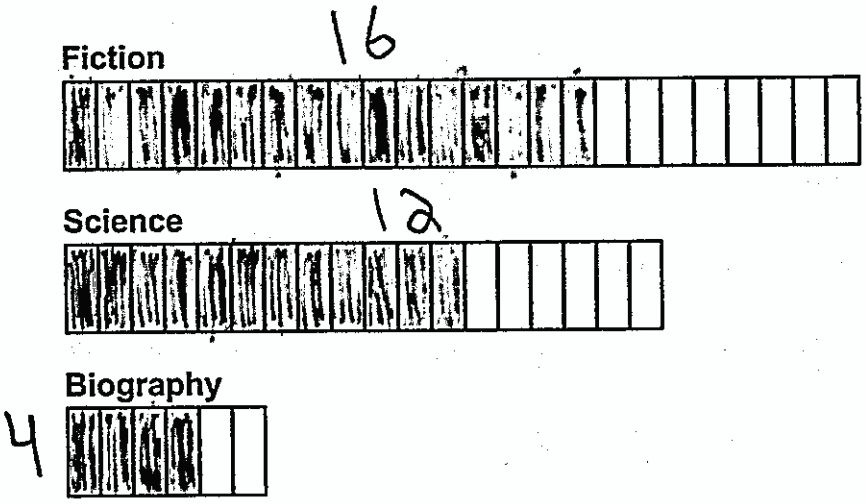
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*Gray text indicates Mathematical Practices that are not addressed in this task.

Students' responses to a mathematical task provide evidence of what they understand and are able to do in relation to the standards and practices. Across tasks, this cumulative evidence shows students' understanding and abilities within a domain. When students do not respond completely to all parts of a task, they provide insufficient evidence of their mathematical understanding and abilities and therefore do not fully demonstrate the expectations of the standards and practices aligned with that task.

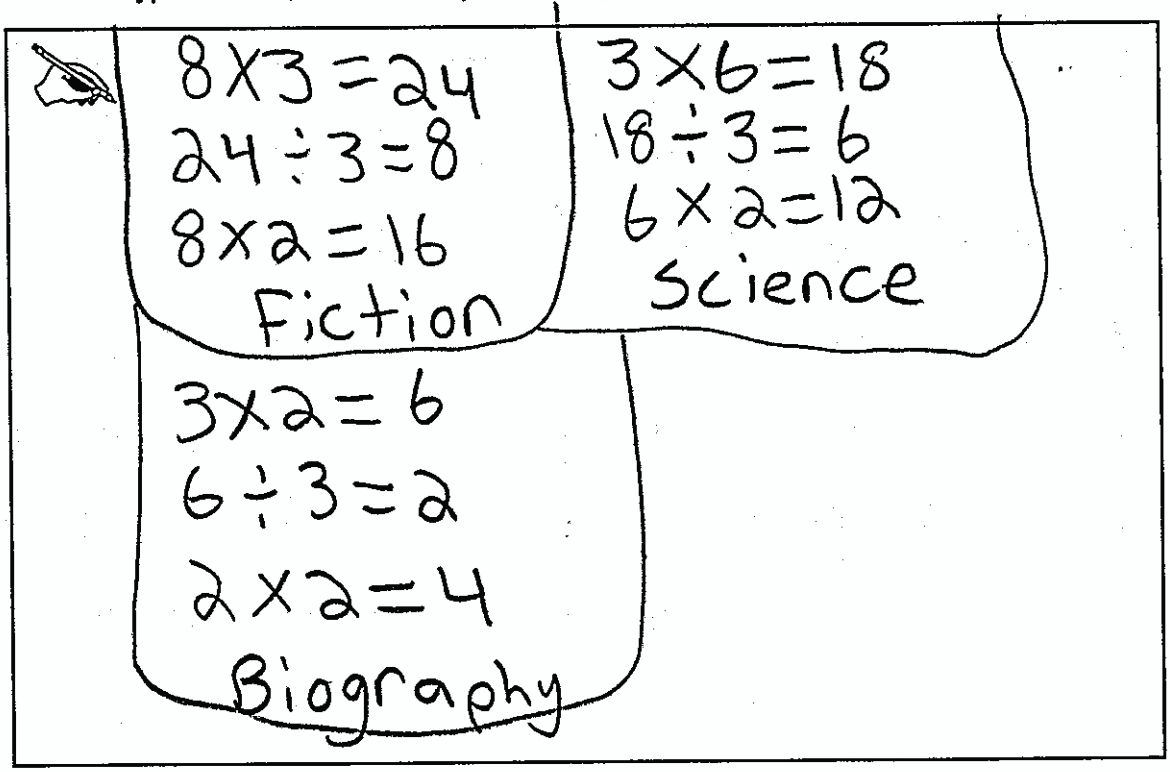
Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.



a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.



Litho#: 451275

Guide 1 Litho 451275

Total Content Points: 1 (4.NF.4c)

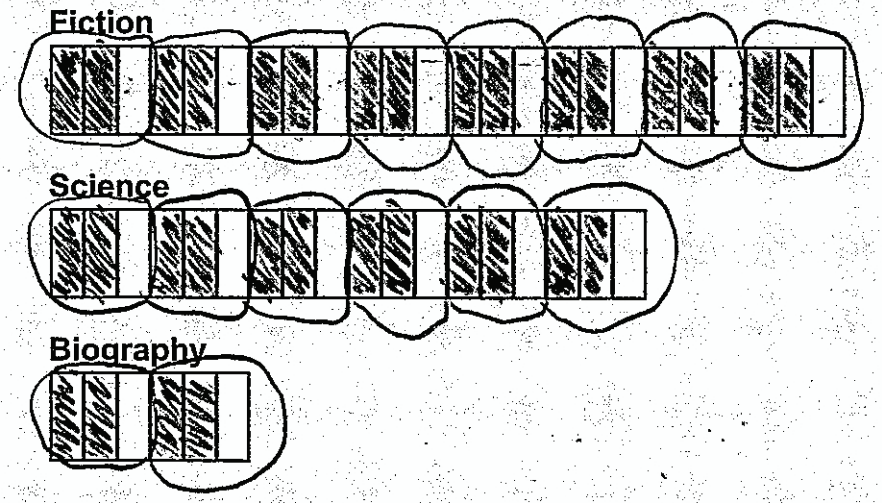
Total Practice Points: 2 (MP4, MP6)

The student shows an understanding of the multiplication of fractions by a whole number by correctly identifying the number of each type of book that are new. The student correctly shades two-thirds of each type of book and also provides a correct numerical value for each type of book (Fiction 16, Science 12, and Biography 4) (4.NF.4c). The student uses a series of equations (e.g., $24 \div 3$, $8 \times 2 = 16$) to appropriately model the multiplication required by the situation (MP4). The student has provided complete and correct responses for both parts (MP6).

Total Awarded Points: 3 out of 3

Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.



a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.

Fiction	Science	Biography
$8 \times 2 = 16$ 1 new books	$6 \times 2 = 12$ 1 new books	$2 \times 2 = 4$ 1 new books

Litho#: 465547

Guide 2 Litho 465547

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 2 (MP4, MP6)

The student shows an understanding of the multiplication of fractions by a whole number by correctly shading two-thirds of the new books in the pictures provided and calculating correct numerical values for each type of book (16, 12, 4) (4.NF.4c). The student models the situation by using multiplication equations ($8 \times 2 = 16$, $6 \times 2 = 12$, $2 \times 2 = 4$) (MP4). The student has provided complete and correct responses in both parts (MP6).

Total Awarded Points: 3 out of 3

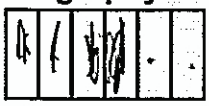
Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.

Fiction

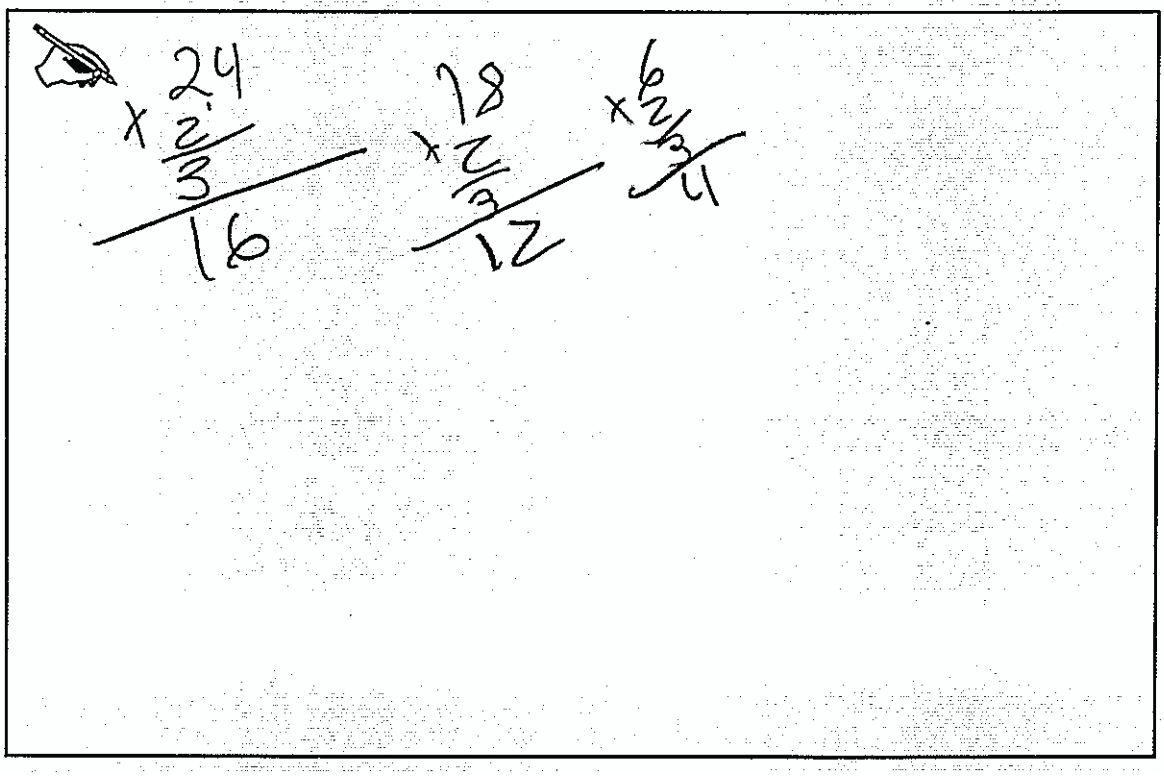
Science

Biography



a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.



Litho#: 471132

Guide 3 Litho 471132

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 2 (MP4, MP6)

The student shows an understanding of the multiplication of fractions by a whole number by shading the correct number of books and also by providing the correct numerical values for each type of book (16, 12, 4) (4.NF.4c). The student uses vertical expressions to model the correct multiplication (MP4). The student has provided work that is both complete and correct (MP6).

Total Awarded Points: 3 out of 3

Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.

Fiction

Science

Biography

a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.

B: $\frac{2}{3} \times 6 = 4$

S: $\frac{2}{3} \times 18 = 12$

F: $\frac{2}{3} \times 24 = 16$

Litho#: 459305

Guide 4 Litho 459305

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 2 (MP4, MP6)

The student shows an understanding of the multiplication of fractions by a whole number by correctly identifying the number of each type of book that are new. The student correctly shades two-thirds of each type of book and provides the correct numerical answers (4.NF.4c). The student models the situation with multiplication equations that contain a fraction multiplied by a whole number $\left(\text{e.g., } \frac{2}{3} \times 6 = 4\right)$ and have the correct solutions (16, 12, 4) (MP4). The student has provided complete and correct work in both parts of the response (MP6).

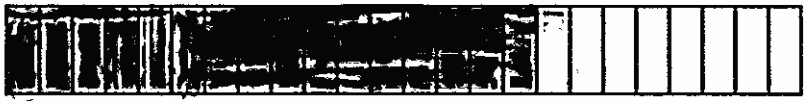
Total Awarded Points: 3 out of 3

A-5a

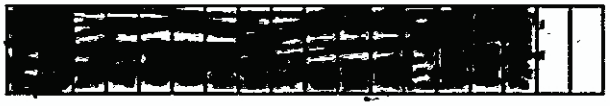
Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.

Fiction



Science



Biography

a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.

$\frac{2}{3} \times 24 = 16$	Fricion
$\frac{2}{3} \times 18 = 12$	Scince
$\frac{2}{3} \times 6 = 4$	Biography

Litho#: 449888

Guide 5 Litho 449888

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 1 (MP4)

Although the shading for science books in Part A is incorrect, the student has identified the number of each type of book that are new by providing correct numerical values for each type of book (16, 12, 4) (4.NF.4c). The student models the situation by using multiplication equations that use $\frac{2}{3}$ and the correct total number of books as factors (MP4). Since the shading of new books for science is incorrect (16 shaded instead of 12), the response shows some lack of precision (no credit for MP6).

Total Awarded Points: 2 out of 3

Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.

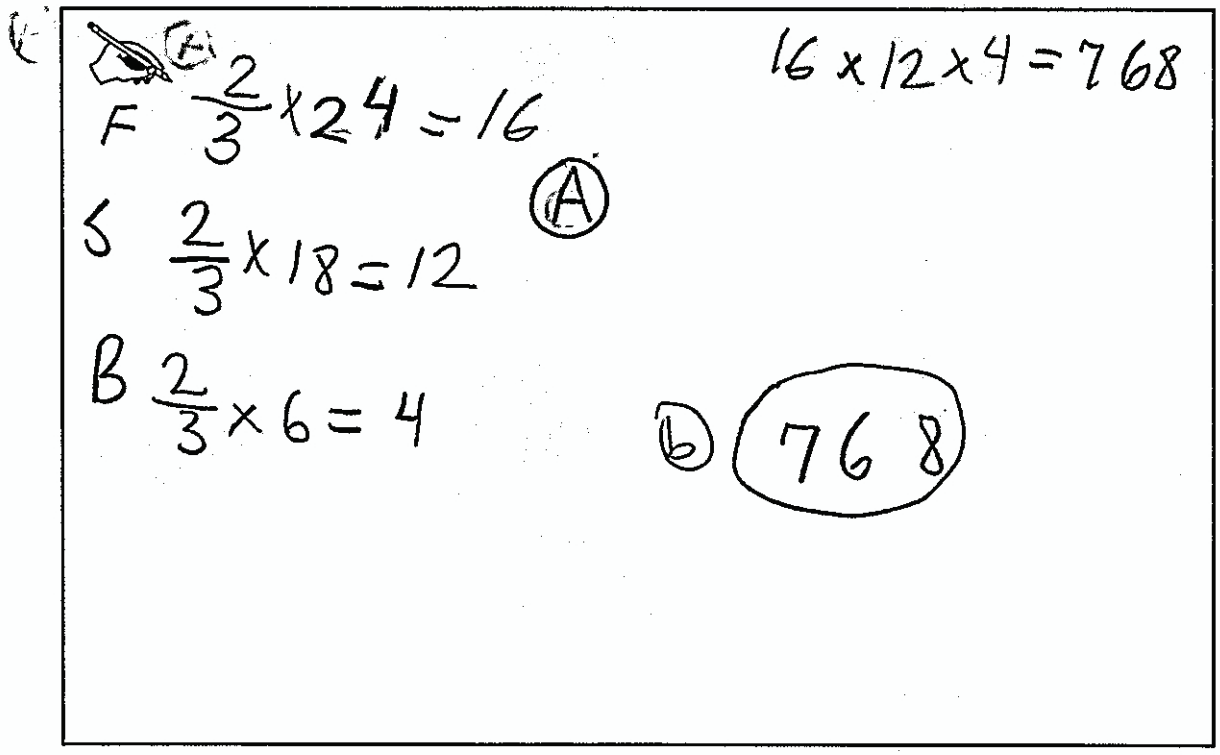
Fiction

Science

Biography

a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.



Litho#: 452354

Guide 6 Litho 452354

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 1 (MP4)

The student has identified the number of each type of book that are new by providing correct numerical answers labeled with the initial letter of the respective type of book (4.NF.4c). The student models the situation by using multiplication equations that use $\frac{2}{3}$ and the correct numbers of total books as factors $\left(\text{e.g., } \frac{2}{3} \times 24 = 16\right)$ (MP4). The student does not shade the correct number of new books for any of the three types. As a result, the student has not provided complete and correct responses for both parts (no credit for MP6).

Total Awarded Points: 2 out of 3

A-7a

Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.

Fiction

= 24 $\frac{2}{3}$ of 24

Science

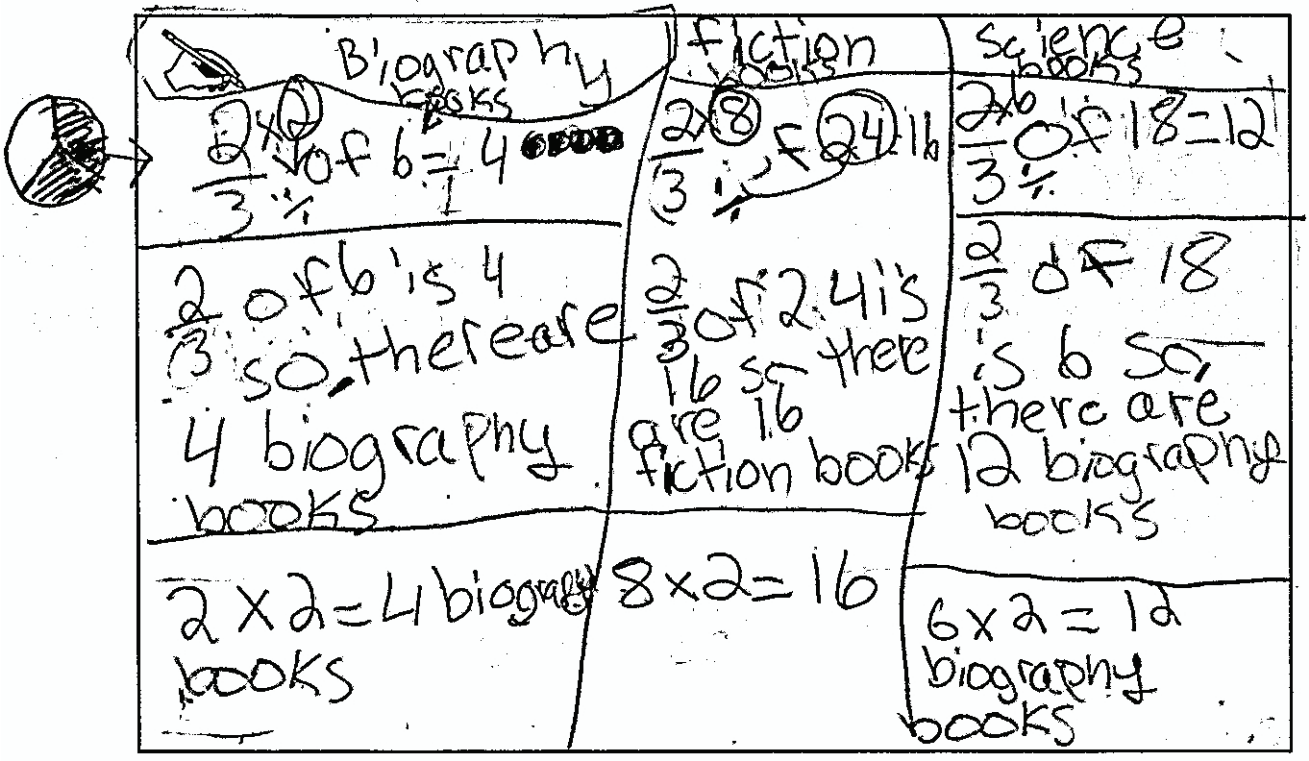
= 18 $\frac{2}{3}$ of 18

Biography

= 6 $\frac{2}{3}$ of 6

a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.



Litho#: 449452

Guide 7 Litho 449452

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 1 (MP4)

The student provides correct numerical values showing how many of all three types of book are new (4, 16, 12) (4.NF.4c). The student models the situation by using multiplication equations ($2 \times 2 = 4$, $6 \times 2 = 12$, $8 \times 2 = 16$) (MP4). The student does not attempt to shade the correct number of new books for any of the three types. As a result, the student has not provided complete and correct responses for both parts (no credit for MP6).

Total Awarded Points: 2 out of 3

Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.

Fiction

Science

Biography

a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.

$\frac{2}{3} \times 6 =$

$\frac{2}{3} \times 18 =$

$\frac{2}{3} \times 24 =$

Litho#: 449950

Guide 8 Litho 449950

Total Content Points: 0

Total Practice Points: 1 (MP4)

The student does not demonstrate an understanding of the multiplication of fractions by a whole number, neither providing correct numerical answers nor shading the correct numbers of books (no credit for 4.NF.4c). The student does correctly model the multiplication using the expressions $\frac{2}{3} \times 6$, $\frac{2}{3} \times 18$, and $\frac{2}{3} \times 24$ (MP4). The student does not provide a complete and correct response for either part (no credit for MP6).

Total Awarded Points: 1 out of 3

Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.

$\frac{16}{24} = \frac{2}{3}$

Fiction

Science

$\frac{12}{6} = \frac{2}{3}$

Biography

$\frac{4}{6} = \frac{2}{12}$

a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.

Fiction

18 X 2 = 16

Science

2 X 6 = 12

Biography

2 X 3 = 6

Litho#: 467760

Guide 9 Litho 467760

Total Content Points: 1 (4.NF.4c)

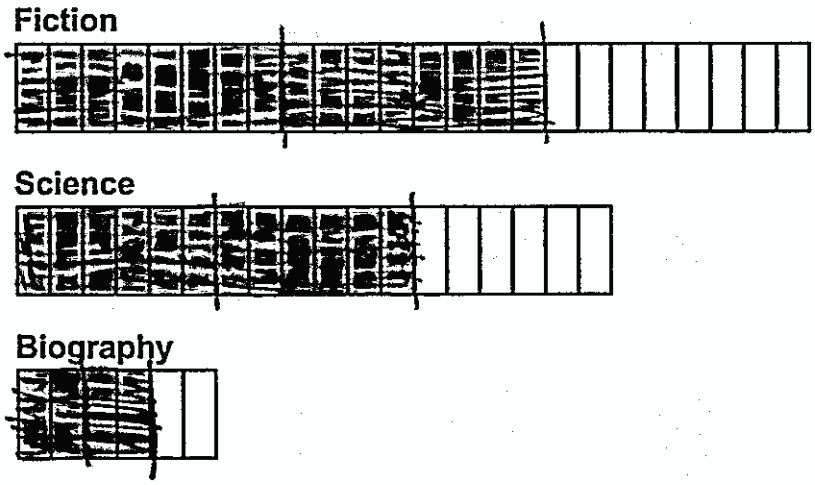
Total Practice Points: 0

The student identifies the correct numbers of books that are new by shading the correct number of rectangles for each type (4.NF.4c). However, the student incorrectly models the Biography books with the expression 2×3 rather than 2×2 (no credit for MP4). The student does not provide complete and correct responses for both parts (no credit for MP6).

Total Awarded Points: 1 out of 3

Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.



a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.

Fiction = 24 books $3 \times 8 = 24$ books
Science = 18 books $3 \times 6 = 18$ books
Biography = 6 books $3 \times 2 = 6$ books

Litho#: 479784

Guide 10 Litho 479784

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 0

The student identifies the correct numbers of books that are new by shading in the correct number of rectangles for each type (16, 12, 4) (4.NF.4c). The equations used to model the multiplication are incorrect (e.g., $3 \times 8 = 24$ models the total number of fiction books, not the number of new books) (no credit for MP4). The student does not provide complete and correct responses for both parts (no credit for MP6).

Total Awarded Points: 1 out of 3

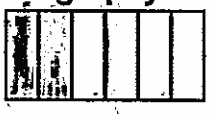
Task 3. Library Books Task

The school library has three types of books: fiction, science, and biography. Each small rectangle represents one book.

Fiction

Science

Biography



a. The librarian says that $\frac{2}{3}$ of each type of book are new. In the pictures above, shade in the correct number of new books for each type.

b. For each type of book, write a multiplication equation that shows how many are new.

$\frac{1}{3} \times 2 = \frac{2}{3}$ or $\frac{8}{24}$

$\frac{1}{3} \times 2 = \frac{2}{3}$ or $\frac{6}{18}$

$\frac{1}{3} \times 2 = \frac{2}{3}$ or $\frac{2}{6}$

Litho#: 449597

Guide 11 Litho 449597

Total Content Points: 0

Total Practice Points: 0

The student does not show an understanding of the multiplication of fractions by a whole number, neither correctly shading the pictures nor providing correct numerical values for the numbers of books that are new (no credit for 4.NF.4c). The equations provided do not model the multiplication required by the situation $\left(\text{e.g., } \frac{1}{3} \times 2 = \frac{2}{3} \text{ or } \frac{8}{24}\right)$ (no credit for MP4). The student does not provide complete and correct responses for both parts (no credit for MP6).

Total Awarded Points: 0 out of 3