Kathy had fun baking lots of cookies. She left them on a plate to cool while she went shopping with her dad. Her brother saw the cookies and took 1/2 of them to his Scout meeting. Her sister took 2/3 of the remaining cookies to share with her friends. Finally, her mom took 1/2 of the remaining cookies to her Book Club meeting. When Kathy and her dad got home, there were only 5 cookies left on the plate.

How many cookies had Kathy baked?
Disappearing Cookies

Suggested Grade Span

3-5

Task

Kathy had fun baking lots of cookies. She left them on a plate to cool while she went shopping with her dad. Her brother saw the cookies and took 1/2 of them to his Scout meeting. Her sister took 2/3 of the remaining cookies to share with her friends. Finally, her mom took 1/2 of the remaining cookies to her Book Club meeting. When Kathy and her dad got home, there were only 5 cookies left on the plate.

How many cookies had Kathy baked?

Alternate Versions of Task

More Accessible Version:

Kathy had fun baking lots of cookies. She made 24 of them, leaving them on a plate to cool while she went shopping with her dad. Her brother saw the cookies and took 1/2 of them to his Scout meeting. Her sister took 1/4 of the remaining cookies to share with her friends. Finally, her mom took 1/3 of the remaining cookies to her Book Club meeting. When Kathy and her dad got home, how many cookies were left on the plate?

More Challenging Version:

Go to the library and sign out a cookbook that has a recipe for chocolate chip cookies. Use the recipe to determine the exact amount of each ingredient Kathy used to make the cookies.

Context

This task was piloted in a fourth-grade classroom.

What This Task Accomplishes

This task allows the teacher to assess students’ understanding of fractions and the problem-solving strategy of working backwards to solve a problem.

Time Required for Task

45 minutes
Interdisciplinary Links
This task could link to a unit on cooking.

Teaching Tips
To make the task more complicated, you can change the fractions presented in the task.

Suggested Materials
Manipulatives (students can use to represent cookies)

Possible Solutions
There were 60 cookies to begin with.

More Accessible Version Solution:
\[ 24 \times \frac{1}{2} = 12 \text{ left} \]
\[ 12 \times \frac{3}{4} = 9 \text{ left} \]
\[ 9 \times \frac{2}{3} = 6 \text{ left on the plate} \]

More Challenging Version Solution:
The solution will depend of the recipe the student finds. To determine accuracy, divide the number of cookies the recipe makes by the number of cookies Kathy makes. Multiply each ingredient in the recipe by this amount.

Task Specific Assessment Notes

Novice
The student is unable to proceed toward a solution. Little or no math language is used. Representations may be attempted.

Apprentice
Little math language is used. A partial solution is achieved, but all parts of the task are not attempted or are attempted unsuccessfully. Representations are used to organize the solution.

Practitioner
The student has an approach that works and achieves a correct solution. Representations are used to organize the solution. Work is shown and labeled. Math language is used to communicate.
Expert
The student has an approach that works and achieves a correct solution. Sophisticated math language is used to communicate. Representations are used to organize the solution. The student demonstrates solid understanding of fractions.
Novice

Disappearing Cookies

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<table>
<thead>
<tr>
<th>Person</th>
<th>Cookies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dad</td>
<td>10</td>
</tr>
<tr>
<td>Mom</td>
<td>10</td>
</tr>
<tr>
<td>Sister</td>
<td>10</td>
</tr>
<tr>
<td>Brother</td>
<td>5</td>
</tr>
</tbody>
</table>

**35 cookies**

- **Little math reasoning is evident.**
- **No approach is evident – merely answers.**
- **Few or no parts are correct.**
Apprentice

Disappearing Cookies

Kathy had fun baking lots of cookies. She left them on a plate to cool while she went shopping with her dad. Her brother saw the cookies and took 1/2 of them to his Scout meeting. Her sister took 2/3 of the remaining cookies to share with her friends. Finally, her mom took 1/2 of the remaining cookies to her Book Club meeting. When Kathy and her dad got home, there were only 5 cookies left on the plate. How many cookies had Kathy baked?

```
  Dad  Kathy  Mom  hersister  Brother
  0    0      0     10          0
  0    0      0     10  10/2
  0    0      0     10  10/2
  0    0      0    20  30
  0    0      0    30
  0    0      0    20
  0    0      0    10
  0    0      0    10
  0    0      0  70  baked
```

Some reasoning and parts are correct.

There is an attempt to organize and label work.

Some math language is used.

An incorrect answer is achieved.
Practitioner

Disappearing Cookies

Kathy had fun baking lots of cookies. She left them on a plate to cool while she went shopping with her dad. Her brother saw the cookies and took 1/2 of them to his Scout meeting. Her sister took 2/3 of the remaining cookies to share with her friends. Finally, her mom took 1/2 of the remaining cookies to her Book Club meeting. When Kathy and her dad got home, there were only 5 cookies left on the plate. How many cookies had Kathy baked?

I will make a chart and work backwards to see how many cookies Kathy cooked.

<table>
<thead>
<tr>
<th>Kathy/Dad</th>
<th>00000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mom</td>
<td>00000</td>
</tr>
<tr>
<td>Sister</td>
<td>0000000000000000000000</td>
</tr>
<tr>
<td>Brother</td>
<td>00000000000000000000000000</td>
</tr>
</tbody>
</table>

The approach is explained.

Work is labeled and organized.

All parts are correct.

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Disappearing Cookies

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Disappearing Cookies

Kathy had fun baking lots of cookies. She left them on a plate to cool while she went shopping with her dad. Her brother saw the cookies and took 1/2 of them to his Scout meeting. Her sister took 2/3 of the remaining cookies to share with her friends. Finally, her mom took 1/2 of the remaining cookies to her Book Club meeting. When Kathy and her dad got home, there were only 5 cookies left on the plate. How many cookies had Kathy baked?

You have to work backwards to solve this task.

<table>
<thead>
<tr>
<th>Cookies</th>
<th>who has them</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>dad + cathy</td>
</tr>
<tr>
<td>5</td>
<td>mom</td>
</tr>
<tr>
<td>20</td>
<td>sister</td>
</tr>
<tr>
<td>30</td>
<td>brother</td>
</tr>
</tbody>
</table>

60 cookies to start

- 1/3 of 60 = 20
- 2/3 of 30 = 20
- Other 1/2

1/2 of 20 = 10

The chart is labeled, accurate and appropriate.
The approach used is identified.

All work is shown.
The student shows good understanding of fractions.
Accurate math language is used throughout to communicate.

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