Greta has a vegetable garden. She sells her extra produce at the local Farmer’s Market. One Saturday she sold $200 worth of vegetables — peppers, squash, tomatoes and corn.

• Greta received the same amount of money for the peppers as she did for the squash.
• The tomatoes brought in twice as much as the peppers and squash together.
• The money she made from corn was $8 more than she made from the other three kinds of vegetables combined.

How much did Greta receive for each kind of vegetable?

Can you think of a reason why Great might want to sell multiple kinds of vegetables even though some of them make more money than others?

Extra: What percent of the total sales did each kind of vegetable represent?

MATH STANDARDS ALIGNMENT: OPERATIONS AND ALGEBRAIC THINKING
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.

Practices:
Make sense of problems and persevere in solving them. (P1)
Reason abstractly and quantitatively. (P2)
Attend to precision. (P6)
Look for and express regularity in repeated reasoning. (P8)

Personal Finance Big Ideas:
Opportunity Costs

METHOD 1: GUESS-AND-TEST
I used Guess and Check. I made a table with a column for each kind of vegetable. I started with $10 for the peppers and squash. I knew the tomatoes sold for twice the total of the peppers and squash, so I doubled $10 and doubled it again to get $40. Since the corn brought $8 more than the total of the other three vegetables, I added $8 to their sum. $10 + $10 + $40 + $8 = $68. Then I added all the vegetables together and got $128.

I knew I had to make the peppers and squash worth more, so I tried $11 for them and then repeated the other steps and totaled them to $140. Next I tried $12 each for the peppers and squash. The total was $152.
I noticed that each time I increased the value of the peppers and squash by $1, the total increased by $12. The difference between $152 and $200 is $48, or 4 * $12, so I increased the sales of peppers and squash by $4 to $16. When I found the value of the tomatoes and corn and the total of all the vegetables, it came to $200.

<table>
<thead>
<tr>
<th>Peppers</th>
<th>Squash</th>
<th>Tomatoes</th>
<th>Corn</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
<td>40</td>
<td>68</td>
<td>$128</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>44</td>
<td>74</td>
<td>$140</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>48</td>
<td>80</td>
<td>$152</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>64</td>
<td>104</td>
<td>$200</td>
</tr>
</tbody>
</table>

The fourth row of my table shows that the peppers and squash brought in $16, the tomatoes four times that, or $64, and the corn $104.

$16 + $16 + $64 + $104 = $200

I was thinking that even though Greta made more money selling corn than anything else, that might be because it was the height of corn season, so she had a lot of it. In other weeks, she might have the most tomatoes and less corn, so it might change week to week what makes the most money. And since she is growing all the vegetables, there’s no reason not to sell them at the market, even when she has less of some items.

**METHOD 2: MAKING A DRAWING**

I drew a bag of money to represent how much money the peppers brought in and wrote a P on it for peppers. I drew another for the squash because it brought in the same amount, and wrote S on it. I knew tomatoes sold for twice what the peppers and squash brought in, so I drew four more bags and wrote T on them. That made six equal bags so far. I know the corn made $8 more than the rest put together, so I drew 6 more bags and wrote C on them.

Now I had 12 equal amounts and $8 that had to add up to $200. I subtracted $8 from $200.

200 - 8 = 192

I divided 192 to make 12 equal groups.

192 / 12 = 16, so the peppers and squash must have sold for $16.
4 * 16 = 64, so the tomatoes sold for $64.
16 + 16 + 64 = 96. The corn sold for $8 more than that, or $104.

I know I am correct because 16 + 16 + 64 + 104 = $200

[A similar solution could be accomplished using squares in a diagram, or on graph paper, to represent the equal shares.]

I think that Greta sells all the vegetables because she grows all the vegetables, if she only sold the ones that made the most money she would be missing an opportunity to make money on the others. And since she is there anyway, she might as well bring the ones that make less money, because it is still money that can be made.
METHOD 3: FRACTIONS WITH EXTRA
Since the corn sold for $8 more than the rest of the vegetables combined, I knew that I could subtract $8 from $200 and the corn would represent 1/2 of the remainder.
200 - 8 = 192
1/2 of 192 = 96

The other $96 consisted of 6 equal parts — 1 of peppers, 1 of squash and 4 of tomatoes.
1/6 of 96 = 16 (each, peppers and squash)
4/6 of 96 = 64 (tomatoes)

Peppers and squash each brought in $16. Tomatoes brought in $64. Corn brought in $104 (96 + 8).
To check my answer I added. 16 + 16 + 64 + 104 = 200.

I think Great sells all the kinds of vegetables because they all grow the most at different times of the summer and she might make different amounts of money from each vegetable each week. Earlier in the summer she might have made the most from tomatoes, and since she still has some tomatoes growing on this Saturday, she might as well sell them because she will make some money, if she doesn’t even bring them to sell, she won’t make any money.

**Extra:** I know that percent means out of 100. 16 out of 200 would be the same 8 out of 100, or 8%. 64 out of 200 would be the same as 32 out of 100, or 32%. 104 out of 200 would be the same as 52 out of 100, or 52%. I know this is correct because 8% + 8% + 32% + 52% = 100%

METHOD 4: ALGEBRAIC, WITH EXTRA
I let p stand for the money brought in by the peppers. The sales of the squash would also be p. Tomatoes sold for twice the sum of the peppers and squash, or 4 p. Corn sold for $8 more than the other vegetables combined, or 6p = 8.

The total of all the vegetables was $200.
p + p + 4p + 6p + 8 = 200
12p = 200 - 8 = 192 (combining like terms)
p = 16 (dividing both sides by 12)

Evaluating each expression:
Peppers = $16
Squash = $16
Tomatoes = 4p = $64
Corn = 6p + 8 = $104

To find the percent of each I divided each value by 200.
Peppers = 16/200 = 8%
Squash = 16/200 = 8%
Tomatoes = 64/200 = 32%
Corn = 104/200 = 52%

The sum of all those percents is 100%, so I know it’s correct.