Tennessee Comprehensive Assessment Program / Mathematics

TCAP/CRA PILOT 2012

Task 4 : Birthday Candy

Scoring Guide

Task 4. Birthday Candy Task

For his mom's birthday, Tony plans to order a special bag of gumdrops containing only purple and pink gumdrops. 10 out of every 15 gumdrops will be purple. The bag will contain 150 gumdrops.

Tony wants to know how many gumdrops will be purple. He uses the method described in the box below.

> Tony's method to find the number of purple gumdrops in the bag:
>
> First, add 10 + 15 = 25.
>
> Then you can see that 25 × 6 = 150.
>
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

REVIEW YOUR WORK IF YOU HAVE TIME.

4. Birthday Candy Task Scoring Guide

The CCSS for Mathematical Content (2 points)

6.RP.1 Uses ratios and/or ratio language in responding to the question, e.g., $\frac{\text{10 purple gumdrops}}{\text{15 total gumdrops}}$, or 10 purple gumdrops:5 pink gumdrops or, "For every 10 purple gumdrops, there are 5 pink gumdrops." _____

6.RP.3 Indicates that the problem can be solved in any of the following ways: _____

- Drawing diagrams iterating the 10 purple gumdrops and 5 pink gumdrops for a total of 15 gumdrops, until a total of 150 gumdrops is reached.
- Scaling up with ratios.
- Scaling up using tables.
- Multiplying, e.g., since 15 x 10 = 150 total gumdrops, 10 x 10 = 100 purple gumdrops.
- Using a proportion or proportional reasoning.
- Noting that $\frac{2}{3}$ or $\frac{10}{15}$ of the gumdrops are purple and finding $\frac{10}{15}$ of 150.

Total Content Points _____

The CCSS for Mathematical Practices (3 points)

MP2 Writes a part:whole ratio or a purple gumdrops:total gumdrops ratio describing the situation and correctly indicates what the ratio means in the context of the problem. _____

(MP2: Reason abstractly and quantitatively.)

MP3 Cites evidence coherently indicating disagreement with Tony or notes that Tony has added 10, a part, to 15, the whole, before using a multiplicative technique for solving the problem where 150 represents the whole. _____

(MP3: Construct viable arguments and critique the reasoning of others.)

MP7 Work indicates that the student understands the part:whole multiplicative relationship that is implied by the context. _____

(MP7: Look for and make use of structure.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed In This Task

Understand ratio concepts and use ratio reasoning to solve problems.

6.RP.1 Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2: 1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

The CCSS for Mathematical Practices*

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 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 4. Birthday Candy Task

For his mom's birthday, Tony plans to order a special bag of gumdrops containing only purple and pink gumdrops. 10 out of every 15 gumdrops will be purple. The bag will contain 150 gumdrops.

Tony wants to know how many gumdrops will be purple. He uses the method described in the box below.

> Tony's method to find the number of purple gumdrops in the bag:
>
> First, add 10 + 15 = 25.
>
> Then you can see that 25 × 6 = 150.
>
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

The mistake Tony has made is: Scince there's 10 purples for every 15 gumdrops you wouldn't add the two. You could put it into a fraction: $\frac{10}{15}$. 15 is multiplyed by 10, so you'd multiply 10 by 10 making it $\frac{100}{150}$. There would be 100 gumdrops in the bag.

REVIEW YOUR WORK IF YOU HAVE TIME.

Guide 1 Litho 60026

Total Content Points: 2 (6.RP.1, 6.RP.3)

Total Practice Points: 3 (MP2, MP3, MP7)

The student uses ratio language, "10 purples for every 15 gumdrops," in response to the question (6.RP.1). The student uses proportional reasoning to solve the problem by stating that there would be 100 gumdrops (6.RP.3). The student writes a part:whole ratio, $\frac{100}{150}$, and correctly indicates that, in the context of the problem, the ratio means there would be 100 gumdrops in the bag (MP2). The student constructs a viable argument and critique of Tony's reasoning (MP3). The work indicates that the student understands the part: whole multiplicative relationship implied by the context (MP7).

Total Awarded Points: 5 of 5

Task 4. Birthday Candy Task

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> First, add 10 + 15 = 25.
>
> Then you can see that 25 × 6 = 150.
>
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

First simplify = $\frac{10}{15} = \frac{2}{3}$

Second work it out = $150 \div 3 = 50$

Third just do it = $50 \times 3 = 150$

$50 \times 2 = 100$

Lastly wrap it up = $\frac{100}{150}$

100 out of 150 gumdrops will be purple, Tony should have done the method in the box above.

always * look at the * steps

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60025

Guide 2 Litho 60025

Total Content Points: 2 (6.RP.1, 6.RP.3)

Total Practice Points: 3 (MP2, MP3, MP7)

The student provides a ratio, $\frac{10}{15}$, (6.RP.1), and clearly explains a strategy for solving the problem (6.RP.3). The student writes a part:whole ratio and correctly indicates that, in the context of the problem, the ratio means that 100 out of 150 gumdrops will be purple (MP2). The student provides a viable argument and clear critique of Tony's reasoning by stating, "Tony should have done the method in the box above" (MP3). The work indicates that the student understands the part:whole multiplicative relationship implied by the context (MP7).

Total Awarded Points: 5 of 5

Task 4. Birthday Candy Task

For his mom's birthday, Tony plans to order a special bag of gumdrops containing only purple and pink gumdrops. 10 out of every 15 gumdrops will be purple. The bag will contain 150 gumdrops.

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>
> First, add 10 + 15 = 25.
>
> Then you can see that 25 × 6 = 150.
>
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

10:15 is the ratio. 10 is purple gumdrops. 15 is total gumdrop. You have to divide 150 by 15 and multiply the answer by 10.

$$\frac{150}{15} \cdot 10$$

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60103

Guide 3 Litho 60103

Total Content Points: 2 (6.RP.1, 6.RP.3)

Total Practice Points: 2 (MP2, MP7)

The student provides a ratio, 10:15 (6.RP.1), and clearly explains a strategy for solving the problem (6.RP.3). The work indicates that the student understands part:whole ratio (MP2) and the multiplicative relationship implied by the context (MP7). No argument or critique is provided to refute Tony's reasoning (no credit for MP3).

Total Awarded Points: 4 of 5

Task 4. Birthday Candy Task

For his mom's birthday, Tony plans to order a special bag of gumdrops containing only purple and pink gumdrops. 10 out of every 15 gumdrops will be purple. The bag will contain 150 gumdrops.

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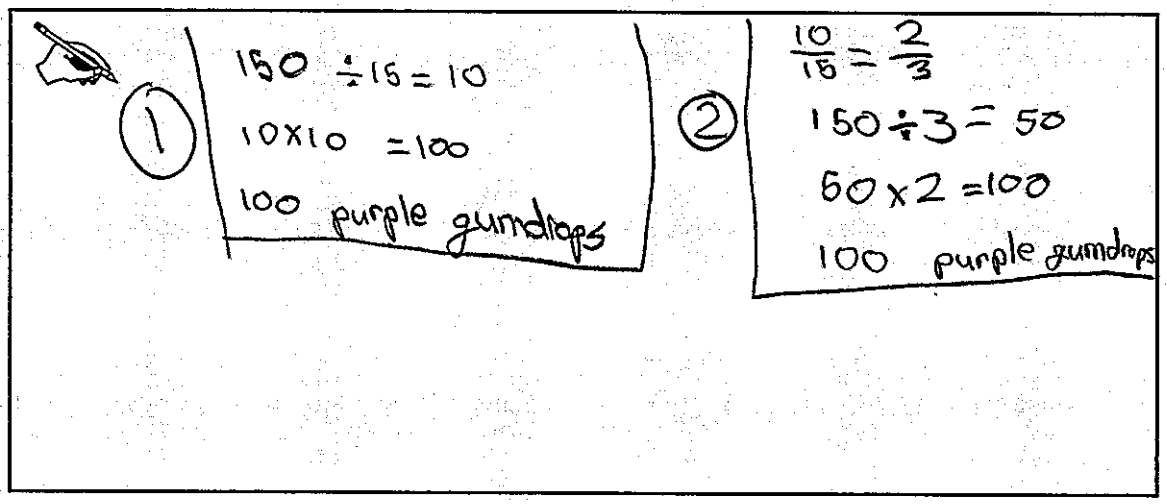
Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.



REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60173

Guide 4 Litho 60173

Total Content Points: 2 (6.RP.1, 6.RP.3)

Total Practice Points: 2 (MP2, MP7)

The student provides a ratio, $\frac{10}{15}$ (6.RP.1), and a correct strategy, "10 × 10 = 100," for solving the problem (6.RP.3). The student provides a correct part:whole ratio (MP2) and correctly indicates that, in the context of the problem, the ratio means there are 100 purple gumdrops. The work indicates that the student understands the part:whole multiplicative relationship that is implied by the text (MP7). No argument or critique is provided to refute Tony's reasoning (no credit for MP3).

Total Awarded Points: 4 of 5

Task 4. Birthday Candy Task

For his mom's birthday, Tony plans to order a special bag of gumdrops containing only purple and pink gumdrops. 10 out of every 15 gumdrops will be purple. The bag will contain 150 gumdrops.

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> First, add 10 + 15 = 25.
>
> Then you can see that 25 × 6 = 150.
>
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

You would change 10+15 to 10x15=150 Then you know 10x15=150÷10=15 & 150÷15=10. So now you would do this. 10x6=100 purple gumdrops. 15x10=150 So

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60052

Guide 5 Litho 60052

Total Content Points: 1 (6.RP.3)

Total Practice Points: 2 (MP3, MP7)

The student solves the problem by multiplying $15 \times 10 = 150$ and $10 \times 10 = 100$ to find the correct number of purple gumdrops (6.RP.3). The student constructs a viable argument and critiques Tony's reasoning by stating, "you would change $10 + 15$ to $10 \times 15 = 150$" (MP3). The work indicates that the student understands the multiplicative relationship implied by the context (MP7). No ratio (no credit for MP2) or ratio language is evident in this response (no credit for 6.RP.1).

Total Awarded Points: 3 of 5

Task 4. Birthday Candy Task

For his mom's birthday, Tony plans to order a special bag of gumdrops containing only purple and pink gumdrops. 10 out of every 15 gumdrops will be purple. The bag will contain 150 gumdrops.

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>
> Then you can see that 25 × 6 = 150.
>
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

He should have divided 150 by 15, which is 10, then multiplied (15 • 10) = 150 + (10 • 10) = 100, so there will be 100 purple gumdrops in the bag and 50 pink gumdrops

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60285

Guide 6 Litho 60285

Total Content Points: 1 (6.RP.3)

Total Practice Points: 2 (MP3, MP7)

The student solves the problem by multiplying $15 \times 10 = 150$ and $10 \times 10 = 100$ "so there will be 100 purple gumdrops" (6.RP.3). The student constructs a viable argument and critiques Tony's reasoning by stating, "He should have divided" (MP3). An understanding of the multiplicative relationship that is implied in the prompt is evident (MP7). No ratio (no credit for MP2) or ratio language is evident in the response (no credit for 6RP.1).

Total Awarded Points: 3 of 5

Task 4. Birthday Candy Task

Guide 7

For his mom's birthday, Tony plans to order a special bag of gumdrops containing only purple and pink gumdrops. 10 out of every 15 gumdrops will be purple. The bag will contain 150 gumdrops.

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> First, add 10 + 15 = 25.
>
> Then you can see that 25 × 6 = 150.
>
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

First, divide 150 ÷ 15 = 10

So that means 15 can go into 150 10 times

15 15 15 15 15 15 15 15 15 15

Then how many times can 10 go into each of the 15. which is 100. So that means there will be 100 Purple gumdrops

STOP

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60032

Guide 7 Litho 60032

Total Content Points: 1 (6.RP.3)

Total Practice Points: 1 (MP7)

The student uses proportional reasoning to illustrate that “there will be 100 purple gumdrops” (6.RP.3). The student’s work demonstrates an understanding of the part:whole multiplicative relationship that is implied by the text (MP7). No ratio (no credit for MP2) or ratio language is evident in the response (no credit for 6RP.1). Although the student has constructed an argument, the explanation is unclear, and no effective critique of Tony’s reasoning is provided (no credit for MP3).

Total Awarded Points: 2 of 5

Task 4. Birthday Candy Task

For his mom's birthday, Tony plans to order a special bag of gumdrops containing only purple and pink gumdrops. 10 out of every 15 gumdrops will be purple. The bag will contain 150 gumdrops.

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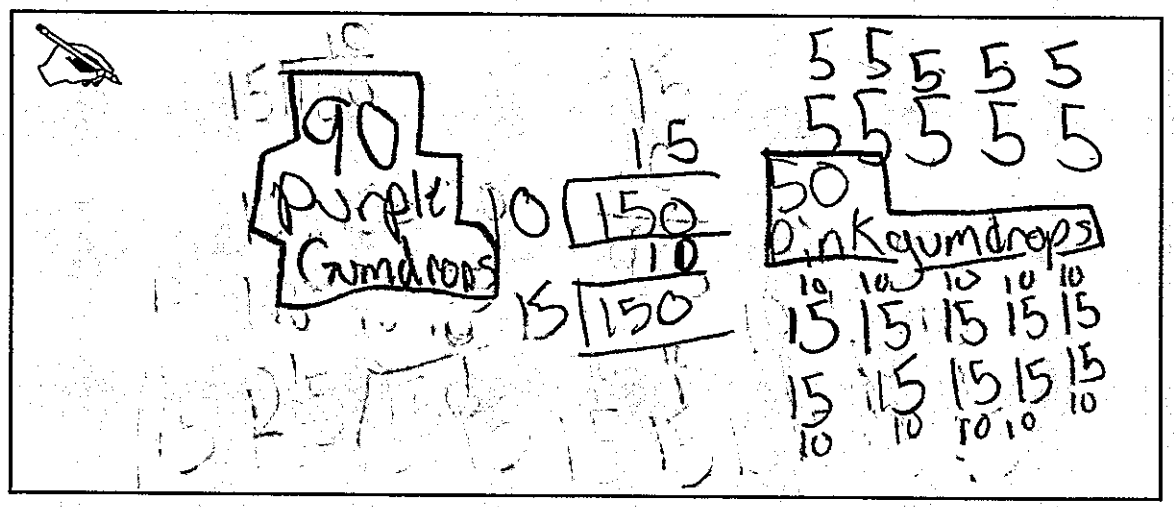

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60185

Guide 8 Litho 60185

Total Content Points: 1 (6.RP.3)

Total Practice Points: 1 (MP7)

The student draws a diagram iterating the 10 purple gumdrops and 5 pink gumdrops for a total of 15 gumdrops, until a total of 150 gumdrops is reached (6.RP.3). The work indicates that the student understands the multiplicative relationship that is implied by the context (MP7). The student's error (90 purple gumdrops) is clearly refuted by the diagram. No ratio (no credit for MP2) or ratio language is evident in the response (no credit for 6RP.1). No argument or critique of Tony's reasoning is provided (no credit for MP3).

Total Awarded Points: 2 of 5

Task 4. Birthday Candy Task

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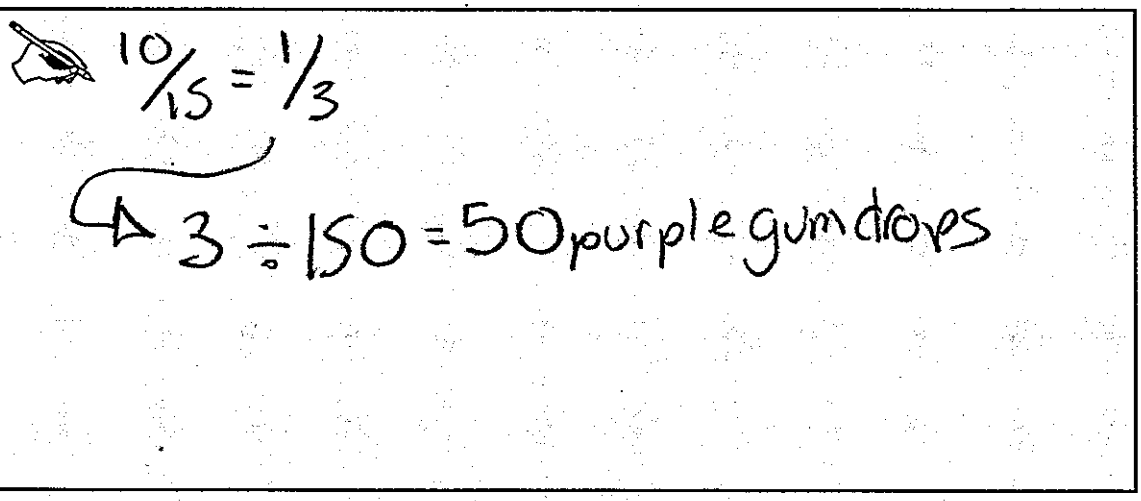

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60306

Guide 9 Litho 60306

Total Content Points: 1 (6.RP.1)

Total Practice Points: 0

The student correctly uses a ratio, $\frac{10}{15}$, in response to the question (6.RP.1), but fails to indicate that, in the context of the problem, the ratio means there are 100 gumdrops (no credit for MP2). A combination of a mathematical error in the reduction of the fraction and the reversal of the terms in the division indicates an incorrect strategy for solving the problem (no credit for 6.RP.3), and no argument or critique of Tony's reasoning is provided (no credit for MP3). No understanding of the multiplicative relationship implied by the text is demonstrated (MP7).

Total Awarded Points: 1 of 5

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Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

You have to turn 10 out of 15 to a fraction of $\frac{10}{15}$. Then, there's 150 in the bag, so 150 will be your denominator of something out of 150. Next How many times does 10 go into 150? 15 right. so the answer would be $\frac{15}{150}$ simp $\frac{1}{10}$.

STOP

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60101

Guide 10 Litho 60101

Total Content Points: 1 (6.RP.1)

Total Practice Points: 0

The student correctly uses a ratio, $\frac{10}{15}$, in response to the question (6.RP.1), but fails to indicate a correct strategy for solving the problem (no credit for 6.RP.3). The remainder of the response demonstrates a lack of understanding of ratios (no credit for MP2) and the multiplicative relationship that is implied by the context (no credit for MP7). No argument or critique of Tony's reasoning is provided (no credit for MP3).

Total Awarded Points: 1 of 5

Task 4. Birthday Candy Task

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>
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

He should have divided 150÷15=10 then done 10x10=100-15=85. There will be 85 purple gumdrops in the bag.

STOP

REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60129

Guide 11 Litho 60129

Total Content Points: 0

Total Practice Points: 1 (MP3)

The student clearly indicates Tony's mistake by stating, "He should have divided," and understands that Tony should not have added before multiplying (MP3). However, the remainder of the response demonstrates no understanding of ratios (no credit for MP2) or the multiplicative relationship that is implied by the context (no credit for MP7). No ratio or ratio language is evidenced in this response (no credit for 6.RP.1), and the response lacks a correct strategy for solving the problem (no credit for 6.RP.3).

Total Awarded Points: 1 of 5

Task 4. Birthday Candy Task

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> Then you can see that 25 × 6 = 150.
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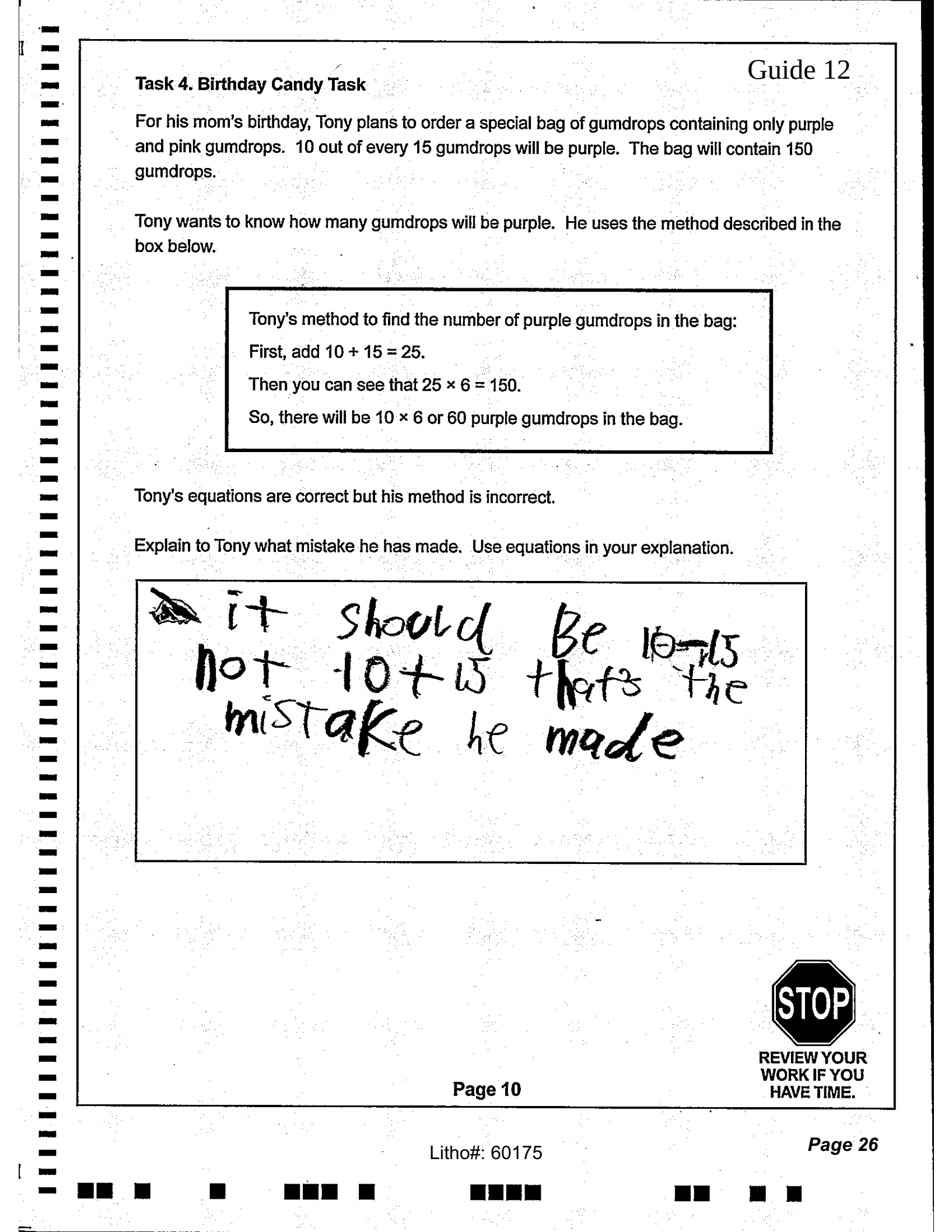
> So, there will be 10 × 6 or 60 purple gumdrops in the bag.

Tony's equations are correct but his method is incorrect.

Explain to Tony what mistake he has made. Use equations in your explanation.

it should be 10+15 not 10+15 that's the mistake he made



REVIEW YOUR WORK IF YOU HAVE TIME.

Litho#: 60175

Guide 12 Litho 60175

Total Content Points: 0

Total Practice Points: 0

This response contains no ratios (no credit for MP2) and no ratio language (no credit for 6.RP.1), and lacks a correct strategy for solving the problem (no credit for 6.RP.3). Although the student attempts to refute Tony's reasoning, the argument provided is not viable (no credit for MP3). The response demonstrates no understanding of the multiplicative relationship implied by the context (no credit for MP7).

Total Awarded Points: 0 of 5