

This task was developed by high school and postsecondary mathematics and design/pre-construction educators, and validated by content experts in the Common Core State Standards in mathematics and the National Career Clusters Knowledge & Skills Statements. It was developed with the purpose of demonstrating how the Common Core and CTE Knowledge & Skills Statements can be integrated into classroom learning – and to provide classroom teachers with a truly authentic task for either mathematics or CTE courses.

## TASK: GROUND BEEF

### TARGET COMMON CORE STATE STANDARD(S) IN MATHEMATICS:

**A.REI.6** Solve systems of linear equations exactly and approximately focusing on pairs of linear equations in two variables.

**A.CED.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.\*

**N.Q.1** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.\*

**N.Q.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.\*

**7.RP.3** Use proportional relationships to solve multi-step ratio and percent problems.

**7.SP.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.

### TARGET STANDARDS FOR MATHEMATICAL PRACTICES

**MP.1** Make sense of problems and persevere in solving them.

**MP.2** Reason abstractly and quantitatively.

**MP.4** Model with mathematics.

**MP.6** Attend to precision.

### TARGET CAREER AND TECHNICAL EDUCATION (CTE) KNOWLEDGE & SKILLS STATEMENTS:

**AGAP01.02.01** Execute key processes related to food product development and enhancement.

**AGAP01.03.01** Prepare products for distribution using an analysis of available product preparation operations.

**AGPG01.04.01** Monitor inventory levels to accomplish practical inventory control.

**AGPA01.04.02** Develop slaughter/inspection techniques to process food products and analyze food product options.

### RECOMMENDED COURSE(S):

**Algebra I or Geometry; Integrated Math I or II; Food Science; Food Processing and Products**

### ADDITIONAL INSTRUCTIONS:

This task requires repeated basic calculations and may or may not use Pearson's Square method to find part of the solution. It can be completed in one class period and may be used as a formative or summative task.

\* Modeling standards appear throughout the CCSS high school standards and are indicated by a star symbol (\*).

***About the Common Core State Standards in Mathematics***

The Common Core State Standards (CCSS) for Mathematics are organized by grade level in grades K–8. At the high school level, the standards are organized by conceptual category (number and quantity, algebra, functions, geometry, and probability and statistics), showing the body of knowledge students should learn in each category to be college and career ready, and to be prepared to study more advanced mathematics. The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. [www.corestandards.org](http://www.corestandards.org)

***About the Common Core State Standards in English Language Arts/Literacy***

The Common Core State Standards (CCSS) for ELA/Literacy are organized by grade level in grades K–8. At the high school level, the standards are organized by 9-10 and 11-12 grade bands. Across K-12 there are four major strands: Reading, Writing, Speaking and Listening, and Language. The CCSS also include Standards for Literacy in History/Social Studies, Science, and Technical Subjects, with content-specific (Reading and Writing) literacy standards provided for grades 6-8, 9-10, and 11-12, to demonstrate that literacy needs to be taught and nurtured across all subjects. [www.corestandards.org](http://www.corestandards.org)

***About the Career Cluster Knowledge and Skill Statements***

As an organizing tool for curriculum design and instruction, Career Clusters™ provide the essential knowledge and skills for the 16 Career Clusters™ and their Career Pathways. It also functions as a useful guide in developing programs of study bridging secondary and postsecondary curriculum and for creating individual student plans of study for a complete range of career options. As such, it helps students discover their interests and their passions, and empowers them to choose the educational pathway that can lead to success in high school, college and career. <http://www.careertech.org/career-clusters/resources/clusters/agriculture.html>. Although not included in this template, all Clusters and Pathways have Foundational Academic Expectations and Essential Knowledge & Skills Statements, which, in some cases, overlap with the Common Core State Standards.

**KEY TERMS**

- Percent lean v. Percent fat
- Pearson's Square method (typically used for finding the desired level of protein in cattle feed)
- Revenue
- Profit
- Cost, Total cost

# GROUND BEEF – *The Task*

On average a grocer sells the following amounts of ground beef each week:

- 485 lbs of Regular Ground Beef (25% fat)
- 1010 lbs of Lean Ground Beef (18% fat)
- 537 lbs of Extra Lean Ground Beef (12% fat)

He orders boneless round and lean trim beef products from which he produces his own ground beef. He orders:

Beef Type	% Lean	Price per Pound
Boneless Round	95%	\$2.13
Lean Trim	70%	\$1.82

Fill in the following table as you answer questions 1 and 2 below:

Type	Regular Ground Beef (lbs)	Lean Ground Beef (lbs)	Extra Lean Ground (lbs)	TOTALS
Boneless Round				
Lean Trim				
TOTALS				

Show all your work:

1. How many pounds of *boneless round* and *lean trim* are needed to make each of the ground beef mixtures to meet demand?
2. How many total pounds of each type will he need to buy each week?
3. To make a 15% profit, how much does he have to charge per pound for each ground beef mixture?
4. On which product is he making the higher profit and how much is that profit?
5. What is his total profit?
6. The grocer has the option to purchase Bull Meat, which is 92% lean and costs \$2.07 per pound. If the grocer replaces the Boneless Round with the Bull Meat, how much will his total profit change, assuming that the charge per pound (calculated in question 3) remains the same?
7. A random sample of 376 customers reveals that 127 bought Extra Lean Ground Beef; how many in the next 500 customers could be expected to purchase Extra Lean Ground Beef.

# GROUND BEEF – Possible Solution(s)

1. First convert all ground beef **fat percentages** to **lean percentages** (or vice versa) so that all percentages are referring to the same units/quantities.

## Method 1: Systems of Equations

Create a system of equations for each type of ground beef (ground beef, lean ground beef, and extra lean ground beef) based on the number of pounds sold each week, and the lean percentage contents of each mixture in order to determine how much boneless round and lean trim create each type of ground meat mixture.

Let  $x$  = Boneless Round

Let  $y$  = Lean Trim

Regular Ground Beef	Lean Ground Beef	Extra Lean Ground Beef
To solve the system by substitution: $x + y = 485$ $0.95x + 0.70y = 0.75(485) = 363.75$	To solve the system by substitution: $x + y = 1010$ $0.95x + 0.70y = 0.82(1010)$	To solve the system by substitution: $x + y = 537$ $0.95x + .070y = .88(537)$
Solve the first equation for $x$ ^ $x = 485 - y$ .	Solve the first equation for $x$ ^ $x = 1010 - y$ .	Solve the first equation to ^ $x = 537 - y$ .
Substitute this into the second equation to solve: $0.95(485 - y) + 0.70y = 0.75(485)$ $460.75 - 0.95y + 0.70y = 363.75$ $- 0.25y = - 97$ <b><math>y = \underline{388 \text{ lbs of Lean Trim}}</math></b>	Substitute this into the second equation to solve: $0.95(1010 - y) + 0.70y = .82(1010)$ $959.50 - 0.95y + 0.70y = 828.2$ $0.25y = 131.3$ <b><math>y = \underline{525.2 \text{ lbs of Lean Trim}}</math></b>	Substitute this into the second equation to solve: $0.95(537 - y) + 0.70y = .88(537)$ $510.15 - 0.95y + 0.70y = 472.56$ $0.25y = 37.59$ <b><math>y = \underline{150.4 \text{ lbs of Lean Trim}}</math></b>
Then substitute this into the original equation to solve for $x$ : $x + 388 = 485$ <b><math>x = \underline{97 \text{ lbs of Boneless Round}}</math></b>	Then substitute this into the original equation to solve for $x$ : $x + 525.2 = 1010$ <b><math>x = \underline{484.8 \text{ lbs of Boneless Round}}</math></b>	Then substitute this into the original equation to solve for $x$ : $x + 150.36 = 537$ <b><math>x = \underline{386.6 \text{ lbs of Boneless Round}}</math></b>

**OR** solve the system by addition/elimination. Here is an example using regular ground beef:

Multiply both sides of the first equation by -0.7 to get

$$- 0.7x - 0.7y = - 0.7(485) = - 339.5$$

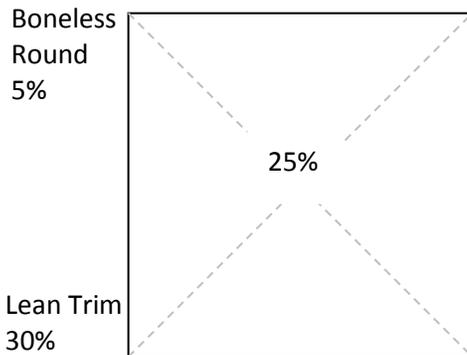
Now add the new equation to the second equation to eliminate the y-variable:

$$\begin{array}{r}
 0.95x + 0.70y = 363.75 \\
 + \quad - 0.7x - 0.7y = - 339.5 \\
 \hline
 0.25x \quad \quad = 24.25 \\
 x \quad \quad \quad = 24.25 / 0.25 \\
 x \quad \quad \quad = \mathbf{97 \text{ lbs}}, \text{ Then find } y \text{ using substitution: } \mathbf{y = 388 \text{ lbs}}
 \end{array}$$

## Method 2: Pearson Square

For all three Pearson Square calculations, Boneless Round is 5% fat and Lean Trim is 30% fat.

### Regular Ground Beef: 25% fat



$$(30 - 25) / 25 = 0.2 = 20\%$$

$$(30 - 25) + (25 - 5) = 5 + 20 = 25 \text{ (Pearson Square divisor)}$$

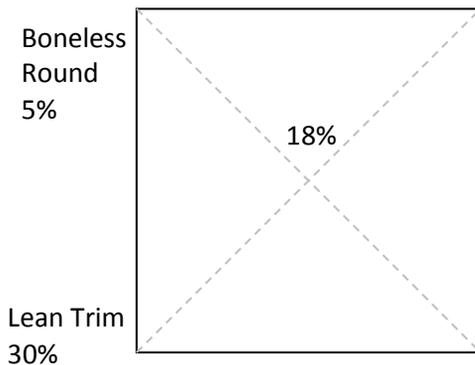
$$(25 - 5) / 25 = 0.8 = 80\%$$

The Pearson Square shows us that the Regular Ground Beef Mixture is 20% Boneless Round and 80% Lean Trim. The student would then find 20% and 80% of the total mixture (485lbs).

Boneless Round:  $0.2 \times 485 = 97 \text{ lbs}$

Lean Trim:  $0.8 \times 485 = 388 \text{ lbs}$

### Lean Ground Beef: 18% fat



$$(30 - 18) / 25 = 0.48 = 48\%$$

$$(30 - 18) + (18 - 5) = 12 + 13 = 25 \text{ (Pearson Square divisor)}$$

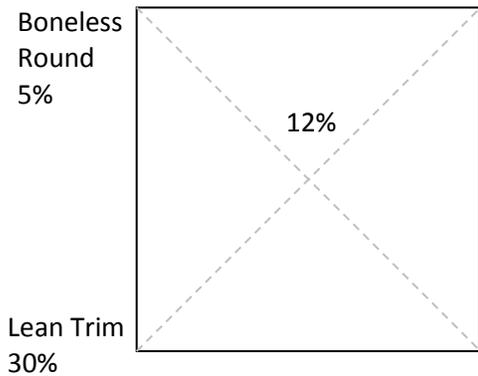
$$(18 - 5) / 25 = 0.52 = 52\%$$

Using the Pearson Square we see that the Lean Ground Beef Mixture is 48% Boneless Round and 52% Lean Trim. Now find 48% and 52% of the total mixture (1010 lbs).

Boneless Round:  $0.48 \times 1010 = 484.8 \text{ lbs}$

Lean Trim:  $0.52 \times 1010 = 525.2 \text{ lbs}$

**Extra Lean Ground Beef: 12% fat**



$$(30 - 12) / 25 = 0.72 = 72\%$$

$$(30 - 12) + (12 - 5) = 18 + 7 = 25 \text{ (Pearson Square divisor)}$$

$$(12 - 5) / 25 = 0.28 = 28\%$$

From the Pearson Square we see that the Lean Ground Beef Mixture is 72% Boneless Round and 28% Lean Trim. The student would then find 72% and 28% of the total mixture (537 lbs).

Boneless Round:  $0.72 \times 537 = 386.6 \text{ lbs}$

Lean Trim:  $0.28 \times 537 = 150.4 \text{ lbs}$

2. The table for Parts 1 and 2:

Type	Regular Ground Beef (lbs)	Lean Ground Beef (lbs)	Extra Lean Ground (lbs)	TOTALS
Boneless Round	97 lbs	484.8 lbs	386.6 lbs	968.4 lbs
Lean Trim	388 lbs	525.2 lbs	150.4 lbs	1063.6 lbs
TOTALS	485 lbs	1010 lbs	537 lbs	2032 lbs

The grocer needs **968.4 lbs of Boneless Round and 1036.6 lbs of Lean Trim Beef.**

3. To find the revenue we must first determine the total cost for each ground beef mixture and then use the Percentage Profit Formula:

$$\frac{\text{Revenue}(R) - \text{Cost}}{\text{Cost}} = \% \text{ Profit}$$

This equation shows the ratio of profit to cost, which for this task must be 15%. For each percentage lean ground beef the following equation can be used to determine the total cost:

$$\text{Cost} = (\text{Pounds Boneless Round})(\$2.13 \text{ per pound}) + (\text{Pounds Lean Trim})(\$1.82 \text{ per pound}) = 2.13x + 1.82y$$

Regular Ground Beef	Lean Ground Beef	Extra Lean Ground Beef
Cost = $97(2.13) + 388(1.82)$ = <b>\$912.77</b>	Cost = $484.8(2.13) + 525.2(1.82)$ = <b>\$1988.48</b>	Cost = $386.6(2.13) + 150.4(1.82)$ = <b>\$1097.19</b>
Now put this into the Percentage Profit Formula and solve for R: $\frac{R - 912.77}{912.77} = 15\%$	Now put this into the Percentage Profit Formula and solve for R: $\frac{R - 1988.48}{1988.48} = 15\%$	Now put this into the Percentage Profit Formula and solve for R: $\frac{R - 1097.19}{1097.19} = 15\%$
$R - 912.77 = 0.15(912.77)$ $R = 136.9155 + 912.77 = 1049.69$ <b>Revenue = \$1049.69</b>	$R - 1988.48 = 0.15(1988.48)$ $R = 298.272 + 1988.48 = 2286.75$ <b>Revenue = \$2286.75</b>	$R - 1097.19 = 0.15(1097.19)$ $R = 164.5785 + 1097.19 = 1261.77$ <b>Revenue = \$1261.77</b>
Divide this total revenue by the total number of pounds of ground beef (485) to find the cost per pound: $1049.69/485 = \underline{\underline{\$2.16 \text{ per pound for Regular Ground Beef.}}}$	Divide this total revenue by the total number of pounds (1010) to find the cost per pound: $2286.75/1010 = \underline{\underline{\$2.26 \text{ per pound for Lean Ground Beef.}}}$	Divide this total revenue by the total number of pounds (537) to find the cost per pound: $1261.77/537 = \underline{\underline{\$2.35 \text{ per pound for Extra Lean Ground Beef.}}}$

4. To find the total profit use the following formula:

$$\text{Profit} = \text{Revenue} - \text{Total Cost} = (\text{Cost per pound})(\text{total pounds}) - \text{Total Cost}$$

$$\text{Ground Beef: } \$2.16(485) - \$912.77 = \underline{\underline{\$134.83}}$$

$$\text{Lean Ground Beef: } \$2.26(1010) - \$1988.48 = \underline{\underline{\$294.12}}$$

$$\text{Extra Lean Ground Beef: } \$2.35(537) - \$1097.19 = \underline{\underline{\$164.76}}$$

He makes the most profit with the Lean Ground Beef. He makes \$294.12 per week.

Note: If the Revenue and Cost figures from the table above are used, profit figures may vary slightly due to rounding, but the largest profit is still earned from the Lean Ground Beef.

$$\text{Ground Beef: } \$1049.69 - \$912.77 = \$136.92$$

$$\text{Lean Ground Beef: } \$2286.75 - \$1988.48 = \$298.27$$

$$\text{Extra Lean Ground Beef: } \$1261.77 - \$1097.19 = \$164.58$$

5. Total Profit:  $\$134.83 + \$294.12 + \$164.76 = \underline{\underline{\$593.71}}$

Total Profit using profit figures derived from the table result in a slightly different total profit due to rounding:

$$\text{Total Profit: } \underline{\underline{\$136.92 + \$298.27 + \$164.58 = \$599.77}}$$

6. We need to repeat the calculations of Part 1 using the percentages and price-per-pound for Bull Meat:

<b>Regular Ground Beef – Using Bull Meat</b>	<b>Lean Ground Beef – Using Bull Meat</b>	<b>Extra Lean Ground Beef – Using Bull Meat</b>
$x + y = 485$ $0.92x + 0.70y = 0.75(485)$ Solve the first equation for x: $x = 485 - y$  Substitute this into the second equation to solve: $0.92(485 - y) + 0.70y = 0.75(485)$ $446.2 - 0.92y + .70y = 363.75$ $0.22y = 82.45$ $y = \underline{\mathbf{374.8\ lbs}}$  Substitute this into the original equation to solve for x: $x = 485 - y$ $x = \underline{\mathbf{110.2\ lbs}}$	$x + y = 1010$ $0.92x + 0.70y = 0.82(1010)$ Solve the first equation for x: $x = 1010 - y$  Substitute this into the second equation and solve: $0.92(1010 - y) + 0.70y = 0.82(1010)$ $929.2 - 0.92y + 0.70y = 828.2$ $0.22y = 101$ $y = \underline{\mathbf{459.1\ lbs}}$  Substitute this into the original equation to solve for x: $x = 1010 - y$ $x = \underline{\mathbf{550.9}}$	$x + y = 537$ $0.92x + 0.70y = 0.88(537)$ Solve the first equation for x: $x = 537 - y$  Substitute this into the second equation and solve: $0.92(537 - y) + 0.70y = 0.88(537)$ $494.04 - .92y + 0.70y = 472.56$ $0.22y = 21.48$ $y = \underline{\mathbf{97.6}}$  Substitute this into the original equation to solve for x: $x = 537 - y$ $x = \underline{\mathbf{439.4}}$

*[This part can also be solved using the addition method for solving systems of equations or the Pearson Square method, as shown above.]*

Now to determine the difference in total profit we need to know the cost for each mixture:

$$\text{Total Cost} = (\text{Total Pounds Bull Meat})(\$2.07 \text{ per pound}) + (\text{Total Pounds Lean Trim})(\$1.82 \text{ per pound})$$

<b>Regular Ground Beef – Using Bull Meat</b>	<b>Lean Ground Beef – Using Bull Meat</b>	<b>Extra Lean Ground Beef – Using Bull Meat</b>
Cost = $110.2(2.07) + 374.8(1.82)$	Cost = $550.9(2.07) + 459.1(1.82)$	Cost = $439.4(2.07) + 97.6(1.82)$
<b>Total Cost = \$910.25</b>	<b>Total Cost = \$1975.92</b>	<b>Total Cost = \$1087.19</b>

To find the profit at the same price:

$$\text{Profit} = (\text{price per pound})(\text{total pounds}) - \text{total cost}$$

$$\text{Ground Beef: } \$2.16(485) - \$910.25 = \mathbf{\$137.35}$$

$$\text{Lean Ground Beef: } \$2.26(1010) - \$1975.92 = \mathbf{\$306.68}$$

$$\text{Extra Lean Ground Beef: } \$2.35(537) - \$1087.19 = \mathbf{\$174.76}$$

$$\text{Total Profit: } \mathbf{\$618.79}$$

Using Boneless Round the total profit was: \$593.71, therefore he makes **\$25.08 more profit**, by replacing Boneless Round with Bull Meat.

7. To find how many customers out of the next 500 can be expected to purchase extra lean ground beef the student should set up a proportion:

$$\frac{127}{376} = \frac{z}{500}$$

$$376z = 127 \times 500 = 63,500$$

$$z = 63,500/376 = 168.88 = \underline{\mathbf{169 \text{ customers}}}$$

## GROUND BEEF – *Possible Extensions*

The extensions below represent potential ways in which mathematics and/or CTE teachers can build on the task above. All of the extensions are optional and can be used in the classroom, as homework assignments, and/or as long-term interdisciplinary projects.

1. You have 50lbs of frozen lean ground beef (original sell price from above) left in the inventory. You want to put it on sale 10% off the previous day's sell price each day. You sell it all within 5 days; what was the final sell price?
2. Research USDA regulations regarding ground beef categories (i.e. ground beef vs. hamburger, storage and shelf life, etc.). Identify any potential problems with the grocer's practices.
3. The grocer can make 200 quarter lb. lean ground beef (with Boneless Round & Lean Trim mix) hamburger patties per hour, and the pre-made patties are sold at a 22% mark up. How much could he pay a part-time employee and still maintain his profit (assuming all of the patties are sold over the course of an eight-hour day) as calculated above?
  - a. Describe how the grocer could use the patties' sale as a marketing technique.
4. The grocer has seen an increase in demand of about 15% over the last four years in the month of July; how much more ground meat will the grocer need to order (of all mixtures described above)? How much more might he charge per pound, given the rise in demand?
5. If 60% of all ground beef bought is used for quarter lb. patties, how many patties is the grocer producing? And if we assume that buns are purchased for 89% of the patties made, calculate (in packages of 8), how many packages of buns does the grocer need to buy each week?
6. Using ground beef from the three different percentages of lean, make three (3) equal weight patties weighing with an electronic scale. Completely cook the three patties at equal temperature and equal amount of time, until well done at 155°F internal temperature. At conclusion of cooking time, weigh each patty on the electronic scale to determine final weight. Calculate percentage weight remaining for each type of ground beef. Assuming the percent fat was accurate, determine the percent water loss.

# GROUND BEEF – *Appendix: Alignment Ratings*

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The rating system used in the following charts is as follows:

### **3 EXCELLENT ALIGNMENT:**

The content/performance of the task is clearly consistent with the content/performance of the Common Core State Standard.

### **2 GOOD ALIGNMENT:**

The task is consistent with important elements of the content/performance of the CCSS statement, but part of the CCSS is not addressed.

### **1 WEAK ALIGNMENT:**

There is a partial alignment between the task and the CCSS, however important elements of the CCSS are not addressed in the task.

### **N/A:**

For Mathematical Practices a content rating does not apply.

In the charts **C = Content Rating** and **P = Performance Rating**

#### **COLOR KEY**

- **Black** = Part of CCSS/K&S Statement aligned to task
- **Gray** = Part of CCSS/K&S Statement *not* aligned to task

### Task-to-Mathematical Practice Alignment Recording Sheet

Task Name	Aligned CCSS Mathematical Practice Standards	C	P	Alignment Comments (Standards selection, partial alignments, reasons for rating, etc)	Task Comments (Strengths, weaknesses, possible improvements, effectiveness, etc)
<b>GROUND BEEF</b>	<b>MP.1</b> Make sense of problems and persevere in solving them.	N/A	3	For this task students analyze givens, constraints, relationships, and goals. They must make conjectures about the form and meaning of the solution and plan a solution pathway. They must check the reasonableness of their solution, continually asking themselves, “Does this make sense?”	This is a multi-stage problem with real life applications and considerations. Students must identify quantities and other measures to determine costs, using abstract reasoning, practical situations, and accurate quantitative calculations. They must show their work/explain their reasoning at each step of the process.
	<b>MP.2</b> Reason abstractly and quantitatively.	N/A	3	This task involves both abstract and quantitative reasoning, particularly if equations are set up, as opposed to using the Pearson Square. It requires that students make sense of quantities and their relationships in the problem situation. They must attend to the meaning of the quantities and pay attention to units as they represent the quantities and measures in a table.	
	<b>MP.4</b> Model with mathematics.	N/A	3	Students translate constraints into a system of equations and use them to calculate the amounts of various types of meat needed. They interpret results in the context of the problem.	
	<b>MP.6</b> Attend to precision.	N/A	2	Students must be precise in establishing their equations and in performing calculations. This task did not call for students to round, as might be expected in the ordering of cuts of meat, so clearer expectations with respect to rounding would be appropriate. Students are expected, however, to round solutions to appropriately represent money or decimal measures of weight.	

### Task-to-Common Core State Standards Alignment Recording Sheet

Task Name	Aligned CCSS Content Standards	C	P	Alignment Comments (Standards selection, partial alignments, reasons for rating, etc.)	Task Comments (Strengths, weaknesses, possible improvements, effectiveness, etc.)
<b>GROUND BEEF</b>	<b>A.REI.6</b> Solve systems of linear equations exactly and approximately focusing on pairs of linear equations in two variables.	<b>3</b>	<b>3</b>	Questions 1 and 6 require solutions of systems of two linear equations. Students must round solutions to appropriately represent money or decimal measures of weight.	This complex real-world task combines systems of equations and calculation with work shown to support results.
	<b>A.CED.2</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*	<b>3</b>	<b>2</b>	The task requires creation of equations and the application of formulas. Graphing technology could be used to arrive at approximate, as opposed to more precise, solutions, but it is not required.	
	<b>N.Q.1</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.*	<b>2</b>	<b>3</b>	There is no requirement in the task to use graphs or data displays. Students are required to use the formula for percentage profit, which requires attention to units.	
	<b>N.Q.3</b> Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*	<b>3</b>	<b>3</b>	Decisions regarding levels of precision are required throughout the task. To make the task more realistic, quantities for amount of meat to be purchased could have been rounded, rather than expressed to the tenth of a pound.	
	<b>7.RP.3</b> Use proportional relationships to solve multi-step ratio and percent problems.	<b>3</b>	<b>3</b>	Percentages are required throughout the task. Proportions are not required but are useful in answering question 7.	
	<b>7.SP.6</b> Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.	<b>2</b>	<b>2</b>	Question 7 requires approximation of a probability. There is no long-run frequency observation required or addressed.	

\* Modeling standards appear throughout the CCSS high school standards and are indicated by a star symbol (\*).

### Task-to-National Career Cluster Knowledge & Skills Statements Alignment Recording Sheet

Task Name	Aligned National Career Cluster Knowledge & Skills Statements	C	P	Alignment Comments	Task Comments
<b>GROUND BEEF</b>	<b>AGAP01.02.01</b> Execute key processes related to food product development and enhancement.	<b>3</b>	<b>2</b>	The task requires students to make informed decisions about the development and needed supply of food, as well as understand the key process of mixing meat in creating ground beef products. To increase performance rating, students could be asked to research sales records, USDA standards, and nutritional analyses.	Overall, the task provides an opportunity for students to evaluate current products and determine options for the future in the context of meat processing and food science.
	<b>AGAP01.03.01</b> Prepare products for distribution using an analysis of available product preparation operations.	<b>2</b>	<b>2</b>	This task requires students to conduct an analysis of product preparation options, taking into account supply, demand, and costs. To increase content and performance ratings, student could be asked to perform quality assurance tests, describe storage procedures, etc. that would enhance the experience.	
	<b>AGPG01.04.01</b> Monitor inventory levels to accomplish practical inventory control.	<b>2</b>	<b>1</b>	The task provides a basic scenario of evaluating inventory and determining possible changes in the management of the inventory through changing products. The task does not apply the additional aspects of inventory control including costs of carrying inventory, logistics, or maintaining optimum inventory levels.	
	<b>AGPA01.04.02</b> Develop slaughter/inspection techniques to process food products and analyze food product options	<b>1</b>	<b>1</b>	The concepts of food product option analysis are embedded within the task, but the role of developing slaughter/inspection techniques is not addressed.	