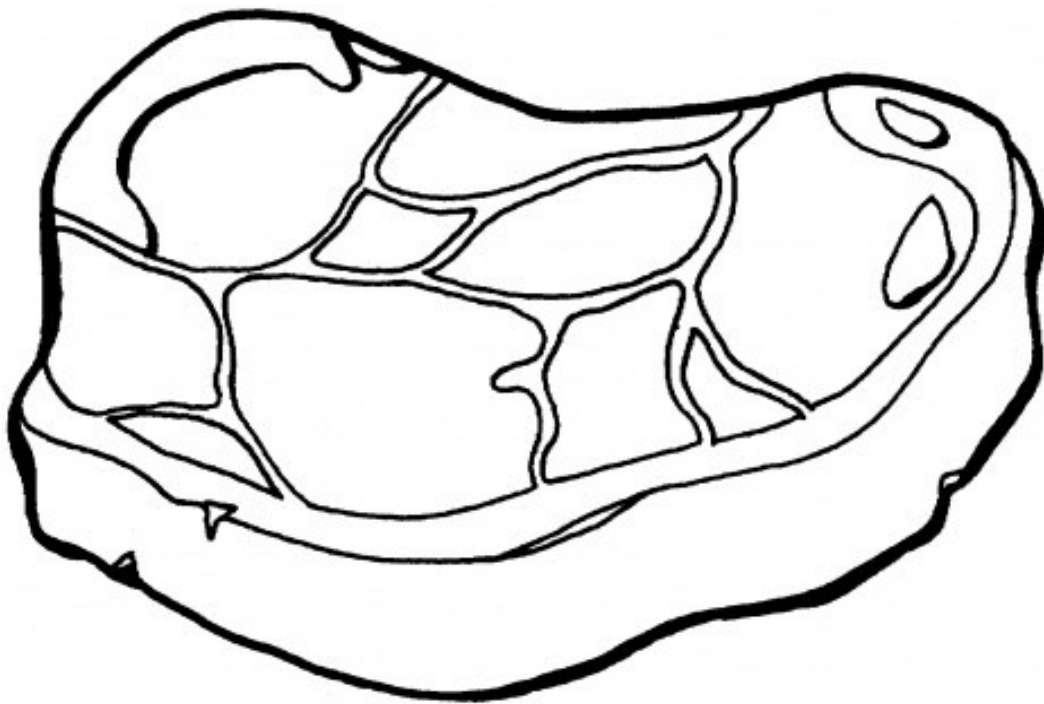


Meat Magic

Using Science & Math to Learn
Beef Quality Grades



Oregon State UNIVERSITY **OSU** Extension Service



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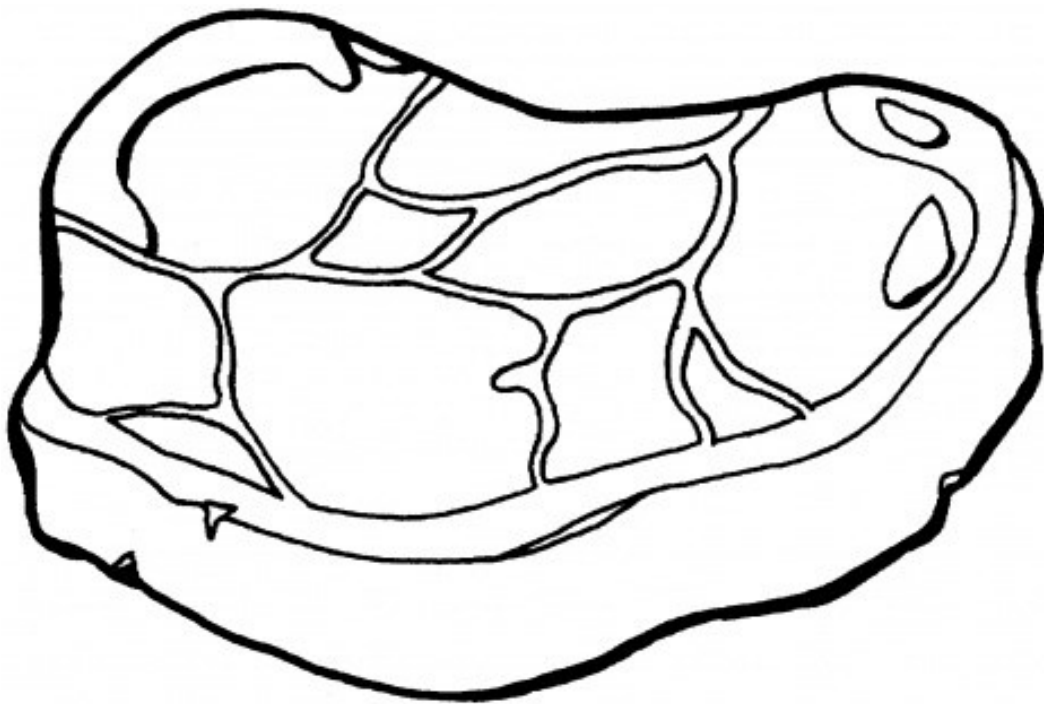
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Meat Magic

Using Math & Science to Learn
Beef Quality Grades



Kindergarten



Grade: Kindergarten

Objective:

Students will identify the characteristics of a steak that determine quality grade: color and marbling.

Science Standard:

K3.S2 Make observations about the natural world.

Time: 30 Minutes

Materials:

Cooked Steak Picture
Steer Picture
Raw Steak Picture
Meat & Marbling Coloring Page
Crayons or Colored Pencils
Dark Cutter Picture

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

- Beef Cattle – An A to Z Book
- Beef Cattle in the Story of Agriculture
- Cattle Kids: A Year on the Western Range
- Cow
- Cows – A True Book Series

Meat Magic

Lesson 1 – Look & See

Building Background

1. Cooked Steak Picture
2. If you are eating a very good steak, what word comes to mind?
3. Characteristics of a Delicious Steak: Tender, Juicy, Flavorful

Essential Question

If I am at the grocery store, trying to decide what to have for dinner, can I look at a steak and know whether it will taste tender, juicy, and flavorful?

Observe

1. Raw Steak Picture
2. Partners or small groups of students observe a picture of a raw beef steak and describe what they see.
3. Each group shares results with the class.
4. Red part of the steak is meat.
5. A good steak will be cherry red. Cherry red steaks come from a beef cow that was 9 to 30 months old. Cherry red steaks will be tender, one of the characteristics of a delicious steak.
6. White flecks in the steak are fat called marbling.
7. Marbling makes steaks juicy and flavorful, the other two characteristics of a delicious steak. The more marbling, the better the steak will taste.
8. Quality Grade is guess about how tender, juicy, and flavorful a steak will be based on looking at it.
9. We look for two things when determining quality grades: color and marbling.

Activity

1. Students color a picture of a steak.
2. The teacher should be able to tell the steak will be tender, juicy, and delicious by looking at the way the student colored the steak.

Review

1. Raw Steak Picture & Dark Cutter Picture
2. Which steak would you rather take home for dinner?





Grade: Kindergarten

Objective:

Students will sort steaks based on the amount of marbling and will identify the quality grade of each.

Math Standards:

K.CC.3B Count to tell the number of objects.

K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of/less of” the attribute, and describe the difference.

Time: 30 Minutes

Materials:

- Raw Steak Picture
- Sorting Pages (3)
- Prime Picture
- Choice Picture
- Select Picture
- Matching Pictures (6)

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Meat Magic

Lesson 2 – Compare & Sort

Building Background

1. Raw Steak Picture
2. Can I tell just by looking if a steak will taste tender, juicy, and flavorful?
3. What do I look for? Color & Marbling

Essential Question

1. Do all steaks have the same amount of marbling?

Activity – Part One

1. Sorting Pages
2. Count the pieces of marbling for each steak.
3. Arrange steaks in order from most marbling to least.
4. Quality Grade – estimate of how tender, juicy, and flavorful a steak will taste.
5. Complete chart on the board.

	<u>Prime</u>	<u>Choice</u>	<u>Select</u>
Color	Cherry Red	Cherry Red	Cherry Red
Marbling	Abundant	Moderate	Slight
Price	\$\$\$	\$\$	\$

5. Identify the quality grade of each steak.
6. Match prime, choice, and select pictures to descriptions.

Activity – Part Two

1. Teacher holds up one of the matching pictures.
2. Students hold up the coloring sorting page they think matches the picture’s beef quality grade.

Review

1. Prime Picture, Choice Picture, Select Picture
2. Do all steaks have the same amount of marbling?
3. What is the name of the estimate of how tender, juicy, and flavorful a steak will be?
4. Quality Grade
5. What factors determine quality grade?
6. Color and amount of marbling.





Grade: Kindergarten

Objective:

Students will measure length and width of a rib eye and will determine whether the steak meets industry standards for normal.

Math Standards:

K. MP. 6 Attend to precision.

K.MD.1 Describe measurable attributes of objects, such as length or weight.

Time: 30 Minutes

Materials:

Rib Eye Measurement Pictures (15)
Rib Eye Measurement Worksheets
Rulers

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Meat Magic

Lesson 3 – Measure Rib Eye Area

Building Background

1. What is a quality grade? Estimate of how tender, juicy, and flavorful a steak is.
2. What are the quality grades? Prime, Choice, Select

Essential Question

Does the size of the steak determine how it will taste?

Modeling

1. Rib Eye #1 Picture
2. Rib Eye is one of the deep muscles of the back. It is oval shaped.
3. Identify rib eye on picture.
4. The size of the rib eye tells us how big the steak is.
5. Demonstrate how to measure length.
6. A normal steak is 4-5 inches long.
7. Is our steak normal?
8. Demonstrate how to measure width.
9. A normal steak is 2-3 inches wide.
10. Is our steak normal?

Activity

1. Divide students into pairs.
2. Give each pair a worksheet and a rib eye picture.
3. Students write the steak picture number.
4. Students measure length and width.
5. Is this a normal steak?
6. What quality grade is this steak?

Review

1. What does the rib eye measurement tell us?
2. How big the steak is.
3. Does the size of the steak determine how it will taste?
4. No. But it helps us know how much we will eat.
5. Which is important to consider when you're buying dinner.



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Meat Magic

is a collaborative school enrichment project of the Jefferson Lake, & Lane County 4-H Programs.

Goals:

Students learn math and science through agriculture.

Students learn about their food and where it comes



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Name _____

Steak # _____

Measure rib eye.

Length	Width

Normal Length? _____ Yes _____ No

Normal Width? _____ Yes _____ No

Beef Quality Grade. _____ Prime _____ Choice _____ Select

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Grade: Kindergarten

Objective:

Students will draw a quality grade and create a cookie that has the appropriate amount of marbling.

Time: 30 Minutes

Materials:

Quality Grade Badges
Sugar Cookies
Frosting
Knives
Sprinkles
Paper Towels
Cow Tracer Page
Cow Dot to Dot
Crayons
Pencils

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

- Beef Cattle – An A to Z Book
- Beef Cattle in the Story of Agriculture
- Cattle Kids: A Year on the Western Range
- Cow
- Cows – A True Book Series

Meat Magic

Lesson 4 – Create A Cookie

Activity One

1. Call four or five students to wash their hands and come to the table.
2. Draw a quality grade.
3. Does that quality grade have an abundant, moderate, or slight amount of marbling?
4. Distribute cookies.
5. Students frost cookies.
6. Students use sprinkles to put marbling on their cookie so it matches the quality grade they selected.

Activity Source: Stuftt, Kristen. (2014). Mystery Meat. 2014 National Agriculture in the Classroom Workshop. Harrisburg, Pennsylvania.

Activity Two

1. Students not at the cookie station complete the following activities.
2. Cow Tracer Page
http://www.dltk-teach.com/t_template.asp?t=http://www.dltk-teach.com/rhymes/heydiddle/bposter-cow.gif
3. Cow Dot to Dot
http://www.printactivities.com/ConnectTheDots/Cow-Dot2Dot.shtml#.VEE592O_7uw



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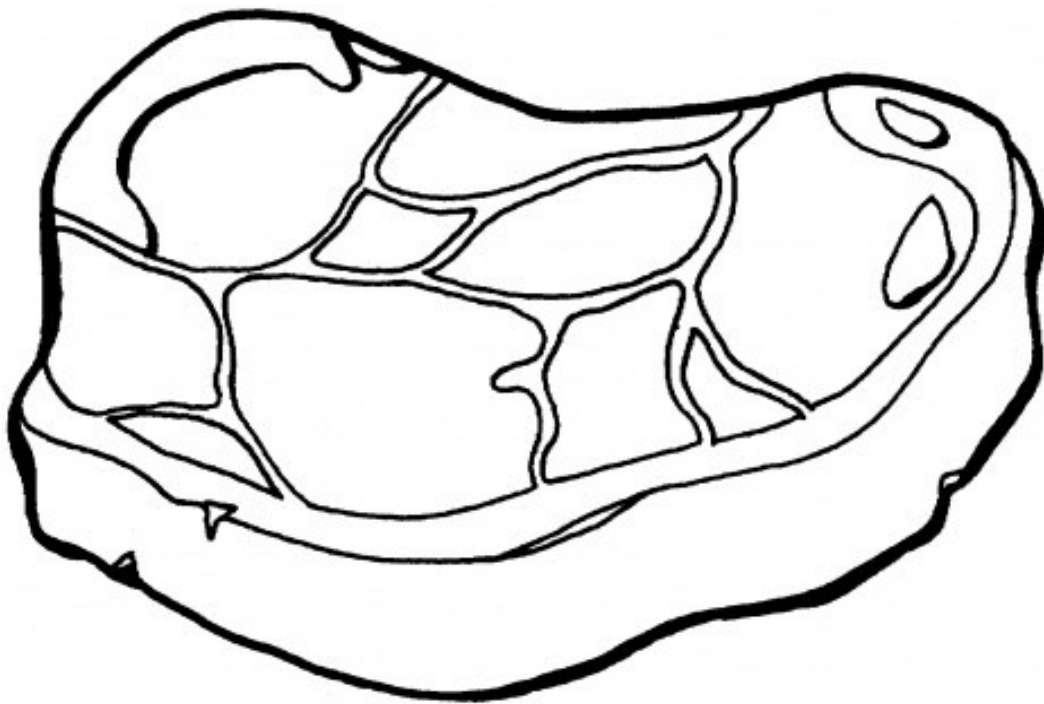
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Meat Magic

Using Math & Science to Learn
Beef Quality Grades



First Grade



Meat Magic

Lesson 1 – Physical Properties

Grade: First

Objective:

Students will identify the appearance, texture, and color of the two components of a steak used to determine quality grades.

Science Standard:

1.1P.1 Compare and contrast physical properties and composition of objects.

Time: 30 Minutes

Materials:

- Cooked Steak Picture
- Raw Steaks
- Meat & Marbling Coloring Page
- Crayons or Colored Pencils

Oregon Agriculture in the Classroom Library

Resources:

- Available for free check out from aitc.oregonstate.edu.
- Beef Cattle – An A to Z Book
 - Beef Cattle in the Story of Agriculture
 - Cattle Kids: A Year on the Western Range
 - Cow
 - Cows – A True Book Series

Building Background

1. Cooked Steak Picture
2. If you are eating a very good steak, what word comes to mind?
3. Characteristics of a Delicious Steak: Tender, Juicy, Flavorful

Essential Question

If I am at the grocery store, trying to decide what to have for dinner, can I look at a steak and know whether it will taste tender, juicy, and flavorful?

Physical Properties

1. Raw Steaks
2. Partners or small groups of students observe a raw beef steak and describe what they see.
3. Each group shares results with the class.
4. Steak is composed of meat and fat.
5. Complete the chart on the board.

	<u>Meat</u>	<u>Fat</u>
Color	Red	White
Appearance (Looks Like)	Sinewy	Bubbly
Texture (Feels Like)	Firm	Squishy
AKA	Muscle	Marbling

Quality Grades

1. Parts of a beef steak: meat and fat. Those parts are different colors, appearances, and textures. Does that tell us anything about how the steak will taste?
2. Actually, yes.
3. Meat Color. A good steak will be cherry red. Cherry red steaks come from a beef cow that was 9 to 30 months old. Cherry red steaks will be tender, one of the characteristics of a delicious steak.
4. White flecks in the steak are fat called marbling.
5. Marbling makes steaks juicy and flavorful, the other two characteristics of a delicious steak. The more marbling, the better the steak will taste.



Lesson 1 – Physical Properties Continued

6. Quality Grade is a guess about how tender, juicy, and flavorful a steak will be based on looking at it.
7. A meat inspector looks for two things when determining quality grades: meat color and amount of marbling.

Activity

1. Students color a picture of a steak.
2. The teacher should be able to tell the steak will be tender, juicy, and delicious by looking at the way the student colored the steak.

Review

1. Quality grade tells us how tender, juicy, and flavorful a steak will taste just by looking at it.
2. What is one thing we look for when determining quality grade? Meat color
3. What color should it be? Cherry Red.
4. What is another thing we look for when determining quality grade? Amount of marbling.
5. How much marbling do we want? A lot.
6. So can look at a steak and decide if it will be tender, juicy, and flavorful? Yes.



Meat Magic

Lesson 2 – Compare with Symbols

Grade: First

Objective:

Students will sort steaks based on the amount of marbling and will identify the quality grade of each.

Science Standard:

1.1P.1 Compare and contrast physical properties and composition of objects.

Math Standard:

1.NBT.3 Compare two digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

Time: 30 Minutes

Materials:

- Raw Steak Picture
- Sorting Pages (3)
- Prime Picture
- Choice Picture
- Select Picture
- Matching Pictures (6)

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Building Background

1. Raw Steak Picture
2. Can I tell just by looking if a steak will taste tender, juicy, and flavorful?
3. What do I look for? Meat Color & Marbling

Essential Question

1. Do all steaks have the same amount of marbling?

Activity – Part One

1. Sorting Pages
2. Count the pieces of marbling for each steak.
3. Arrange steaks in order from most marbling to least.
4. Add $>$, $<$ symbols.
5. Quality Grade – estimate of how tender, juicy, and flavorful a steak will taste.
6. Complete chart on the board.

	<u>Prime</u>	$>$	<u>Choice</u>	$>$	<u>Select</u>
Color	Cherry Red		Cherry Red		Cherry Red
Marbling	Abundant		Moderate		Slight
Price	\$\$\$		\$\$		\$

5. Identify the quality grade of each steak.
6. Match prime, choice, and select pictures to descriptions.
7. Add $>$, $<$ symbols.

Activity – Part Two

1. Teacher holds up one of the matching pictures.
2. Students hold up the coloring sorting page they think matches the picture's beef quality grade.
3. Identify quality grade of steak.
4. Which quality grade has more marbling than this one?
5. Which quality grade has less marbling than this one?



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Lesson 2 – Compare With Symbols

Review

1. Prime Picture, Choice Picture, Select Picture
2. Do all steaks have the same amount of marbling?
3. What is the name of the estimate of how tender, juicy, and flavorful a steak will be?
4. Quality Grade
5. What factors determine quality grade?
6. Color and amount of marbling.



Grade: First

Objective:

Students will measure length and width of a rib eye and determine whether the steak meets industry standards for normal.

Students will arrange three steaks by length.

Math Standards:

1.MP.6 Attend to precision.

1.MD.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.

Time: 30 Minutes

Materials:

Rib Eye Measurement Pictures (5)
Rib Eye Measurement Worksheets
Rulers

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Meat Magic

Lesson 3 – Measure Rib Eye Area

Building Background

1. What is a quality grade? Estimate of how tender, juicy, and flavorful a steak is.
2. What are the quality grades? Prime, Choice, Select

Essential Question

Does the size of the steak determine how it will taste?

Modeling

1. Rib Eye #1 Picture
2. Rib Eye is one of the deep muscles of the back. It is oval shaped.
3. Identify rib eye on picture.
4. The size of the rib eye tells us how big the steak is.
5. Demonstrate how to measure length.
6. A normal steak is 4-5 inches long.
7. Is our steak normal?
8. Demonstrate how to measure width.
9. A normal steak is 2-3 inches wide.
10. Is our steak normal?

Activity #1

1. Divide students into pairs.
2. Give each pair a worksheet and Rib Eye #2 picture.
3. Students measure length and width.
4. Is this a normal steak?
5. What quality grade is this steak?

Activity #2

1. Give each pair a worksheet and Rib Eye #3, #4, and #5 pictures.
2. Students measure length.
3. Student arrange steaks from longest to shortest.
4. Student identify the quality grade of each steak.



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Lesson 3 – Measure Rib Eye Area

Review

1. What does the rib eye measurement tell us?
2. How big the steak is.
3. Does the size of the steak determine how it will taste?
4. No. But it helps us know how much we will eat.
5. Which is important to consider when you're buying dinner.



Meat Magic

is a collaborative school enrichment project of the Jefferson Lake, & Lane County 4-H Programs.

Goals:

Students learn math and science through agriculture.

Students learn about their food and where it comes



Name _____

Measure rib eye #2.

Length	Width

Normal Length?

_____ Yes

_____ No

Normal Width?

_____ Yes

_____ No

Beef Quality Grade.

_____ Prime

_____ Choice

_____ Select

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Goals:

Students learn math and science through agriculture.

Students learn about their food and where it comes from.



Name _____

Measure length.

Steak #3	Steak #4	Steak #5

Which steak is the longest?

What is it's quality grade?

Which steak is in the middle?

What is it's quality grade?

Which steak is the shortest?

What is it's quality grade?

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Grade: First

Objective:

Students will draw a quality grade and create a cookie that has the appropriate amount of marbling.

Time: 30 Minutes

Materials:

Quality Grade Badges
Sugar Cookies
Frosting
Knives
Sprinkles
Paper Towels
Cow Tracer Page
Cow Dot to Dot
Crayons
Pencils

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

- Beef Cattle – An A to Z Book
- Beef Cattle in the Story of Agriculture
- Cattle Kids: A Year on the Western Range
- Cow
- Cows – A True Book Series

Meat Magic

Lesson 4 – Create A Cookie

Activity One

1. Call four or five students to wash their hands and come to the table.
2. Draw a quality grade.
3. Does that quality grade have an abundant, moderate, or slight amount of marbling?
4. Distribute cookies.
5. Students frost cookies.
6. Students use sprinkles to put marbling on their cookie so it matches the quality grade they selected.

Activity Source: Stuftt, Kristen. (2014). Mystery Meat. 2014 National Agriculture in the Classroom Workshop. Harrisburg, Pennsylvania.

Activity Two

1. Students not at the cookie station complete the following activities.
2. Cow Tracer Page
http://www.dltk-teach.com/t_template.asp?t=http://www.dltk-teach.com/rhymes/heydiddle/bposter-cow.gif
3. Cow Dot to Dot
http://www.printactivities.com/ConnectTheDots/Cow-Dot2Dot.shtml#.VEE592O_7uw
4. Cow Maze
http://www.printactivities.com/Mazes/Shape_Mazes/Cow-Maze.shtml



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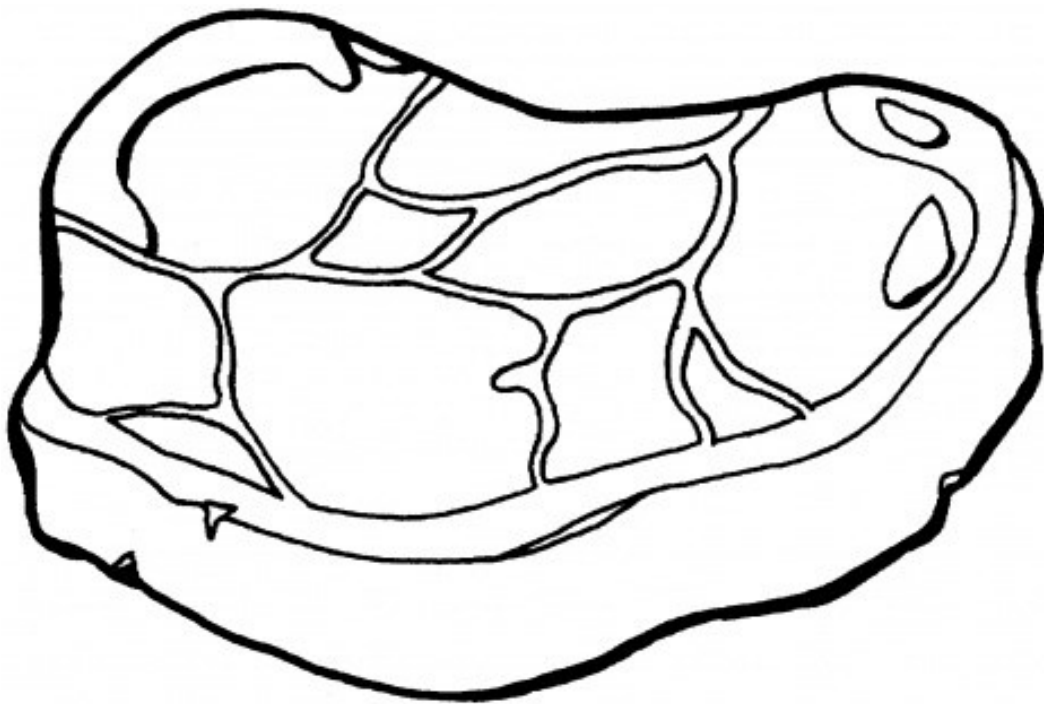
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Meat Magic

Using Math & Science to Learn
Beef Quality Grades



Second Grade



Grade: Second

Objective:

Students will observe a beef steak, describe what they see, and record their observations.

Science Standard:

2.3S.3 Make, describe, and compare observations, and organize recorded data.

Time: 30 Minutes

Materials:

- Cooked Steak Picture
- Raw Steaks
- Worksheet
- Meat & Marbling Coloring Page
- Crayons or Colored Pencils

Oregon Agriculture in the Classroom Library

Resources:

- Available for free check out from aitc.oregonstate.edu.
- Beef Cattle – An A to Z Book
 - Beef Cattle in the Story of Agriculture
 - Cattle Kids: A Year on the Western Range
 - Cow
 - Cows – A True Book Series

Meat Magic

Lesson 1 – Observe, Describe, Record

Building Background

1. Cooked Steak Picture
2. If you are eating a very good steak, what word comes to mind?
3. Characteristics of a Delicious Steak: Tender, Juicy, Flavorful

Essential Question

If I am at the grocery store, trying to decide what to have for dinner, can I look at a steak and know whether it will taste tender, juicy, and flavorful?

Activity #1

1. Raw Steaks
2. Activity #1 Worksheet
3. Partners or small groups of students observe a raw beef steak, describe, and record what they see.
4. Each group shares results with the class.
5. Steak is composed of meat and fat.
6. Complete the chart on the board.

	<u>Meat</u>	<u>Fat</u>
Color	Red	White
Appearance (Looks Like)	Sinewy	Bubbly
Texture (Feels Like)	Firm	Squishy
AKA	Muscle	Marbling

Quality Grade

1. Two parts of a steak: meat and fat. Those parts are different colors, appearances, and textures. Does that tell us anything about how the steak will taste?
2. Actually, yes.
3. Meat Color. A good steak will be cherry red. Cherry red steaks come from a beef cow that was 9 to 30 months old. Cherry red steaks will be tender, one of the characteristics of a delicious steak.
4. White flecks in the steak are fat called marbling.
5. Marbling makes steaks juicy and flavorful, the other two characteristics of a delicious steak. The more marbling, the better the steak will taste.



Lesson 1 – Observe, Describe, Record

6. Quality Grade is an estimate of how tender, juicy, and flavorful a steak will be based on looking at it.
7. A meat inspector looks for two things when determining quality grades: meat color and amount of marbling.

Activity #2

1. Students color a picture of a steak.
2. The teacher should be able to tell the steak will be tender, juicy, and flavorful by looking at the way the student colored the steak.

Review

1. Quality grade tells us how tender, juicy, and flavorful a steak will taste just by looking at it.
2. What is one thing we look for when determining quality grade? Meat color.
3. What color should it be? Cherry red.
4. What is another thing we look for when determining quality grade? Amount of marbling.
5. How much marbling do we want? A lot.
6. So can I look at a steak and decide if it will be tender, juicy, and flavorful? Yes.



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Goals:

Students learn math and science through agriculture.

Students learn about their food and where it comes



Name _____

Observe the beef steak. Discuss what you see. Record your observations.

Colors		
Appearance (Looks Like)		
Texture (Feels Like)		

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Meat Magic

Lesson 2 – Observe, Record Stations

Grade: Second

Objective:

Students will sort steaks based on the amount of marbling and will identify the quality grade of each.

Science Standard:

2.3S.3 Make, describe, and compare observations, and organize recorded data.

Time: 30 Minutes

Materials:

- Raw Steak Picture
- Sorting Pages (3)
- Prime Picture
- Choice Picture
- Select Picture
- Worksheets
- Steak Pictures (6)

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Building Background

1. Raw Steak Picture
2. Can I tell just by looking if a steak will taste tender, juicy, and flavorful?
3. What do I look for? Meat Color & Marbling

Essential Question

1. Do all steaks have the same amount of marbling?

Activity – Part One

1. Sorting Pages
2. Count the pieces of marbling for each steak.
3. Arrange steaks in order from most marbling to least.
4. Quality Grade – estimate of how tender, juicy, and flavorful a steak will taste.
5. Complete chart on the board.

	<u>Prime</u>	<u>Choice</u>	<u>Select</u>
Color	Cherry Red	Cherry Red	Cherry Red
Marbling	Abundant	Moderate	Slight
Price	\$\$\$	\$	\$

5. Identify the quality grade of each steak.
6. Match prime, choice, and select pictures to descriptions.

Activity – Part Two

1. Distribute worksheet.
2. Steak #1 – Model determining marbling amount: abundant, moderate, or slight.
3. Steak #1 – Model determining quality grade: prime, choice, or select depending on answer to #2 above.
4. Steak #2 – Students determine marbling quantity and quality grade.
5. Continue for steak #3-6.



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Lesson 2 – Compare With Symbols

Review

1. Prime Picture, Choice Picture, Select Picture
2. Do all steaks have the same amount of marbling?
3. What is the name of the estimate of how tender, juicy, and flavorful a steak will be?
4. Quality Grade
5. What factors determine quality grade?
6. Color and amount of marbling.



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Goals:

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Students learn about their food and where it comes from.



Name _____

Identify the marbling quantity and quality grade for each steak.

Marbling Quantity: Abundant (A), Moderate (M), or Slight (S)

Quality Grade: Prime (P), Choice (C), or Select (S)

	Marbling Quantity	Quality Grade
Steak #1		
Steak #2		
Steak #3		
Steak #4		
Steak #5		
Steak #6		

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Grade: Second

Objective:

Students will measure the length of two steaks and will calculate the difference in length.

Math Standards:

2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

Time: 30 Minutes

Materials:

Rib Eye Measurement Pictures (5)
Rib Eye Measurement Worksheets
Rulers

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Meat Magic

Lesson 3 – Measure Rib Eye Area

Building Background

1. What is a quality grade? Estimate of how tender, juicy, and flavorful a steak is.
2. What are the quality grades? Prime, Choice, Select

Essential Question

Does the size of the steak determine how it will taste?

Modeling

1. Rib Eye #1 Picture
2. Rib Eye is one of the deep muscles of the back. It is oval shaped.
3. Identify rib eye on picture.
4. The size of the rib eye tells us how big the steak is.
5. Demonstrate how to measure length.
6. A normal steak is 4-5 inches long.
7. Is our steak normal?
8. Demonstrate how to measure width.
9. A normal steak is 2-3 inches wide.
10. Is our steak normal?
11. Rib Eye #2 Picture
12. Measure length.
13. Calculate differences in length.

Activity #1

1. Divide students into pairs.
2. Give each pair a worksheet and Rib Eye #3 picture.
3. Students measure length and width.
4. Is this a normal steak?
5. What quality grade is this steak?

Activity #2

1. Rib Eye #4 pictures and worksheet.
2. Students measure length.
3. Students calculate the differences in length.



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Lesson 3 – Measure Rib Eye Area

Review

1. What does the rib eye measurement tell us?
2. How big the steak is.
3. Does the size of the steak determine how it will taste?
4. No. But it helps us know how much we will eat.
5. Which is important to consider when you're buying dinner.



Meat Magic

is a collaborative school enrichment project of the Jefferson Lake, & Lane County 4-H Programs.

Goals:

Students learn math and science through agriculture.

Students learn about their food and where it comes



Name _____

Measure rib eye #3.

Length	Width

Normal Length?

_____ Yes

_____ No

Normal Width?

_____ Yes

_____ No

Beef Quality Grade.

_____ Prime

_____ Choice

_____ Select

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Name _____

Measure rib eye length.

Steak #3	Steak #4

Write an equation to calculate the difference in lengths.
Solve the equation.

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Grade: Second

Objective:

Students will draw a quality grade and create a cookie that has the appropriate amount of marbling.

Time: 30 Minutes

Materials:

Quality Grade Badges
Sugar Cookies
Frosting
Knives
Sprinkles
Paper Towels
Cow Tracer Page
Cow Dot to Dot
Crayons
Pencils

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

- Beef Cattle – An A to Z Book
- Beef Cattle in the Story of Agriculture
- Cattle Kids: A Year on the Western Range
- Cow
- Cows – A True Book Series

Meat Magic

Lesson 4 – Create A Cookie

Activity One

1. Call four or five students to wash their hands and come to the table.
2. Draw a quality grade.
3. Does that quality grade have an abundant, moderate, or slight amount of marbling?
4. Distribute cookies.
5. Students frost cookies.
6. Students use sprinkles to put marbling on their cookie so it matches the quality grade they selected.

Activity Source: Stuftt, Kristen. (2014). Mystery Meat. 2014 National Agriculture in the Classroom Workshop. Harrisburg, Pennsylvania.

Activity Two

1. Students not at the cookie station complete the following activities.

2. Cow Dot to Dot

http://www.printactivities.com/ConnectTheDots/Cow-Dot2Dot.shtml#.VEE592O_7uw

3. Cow Maze

http://www.printactivities.com/Mazes/Shape_Mazes/Cow-Maze.shtml



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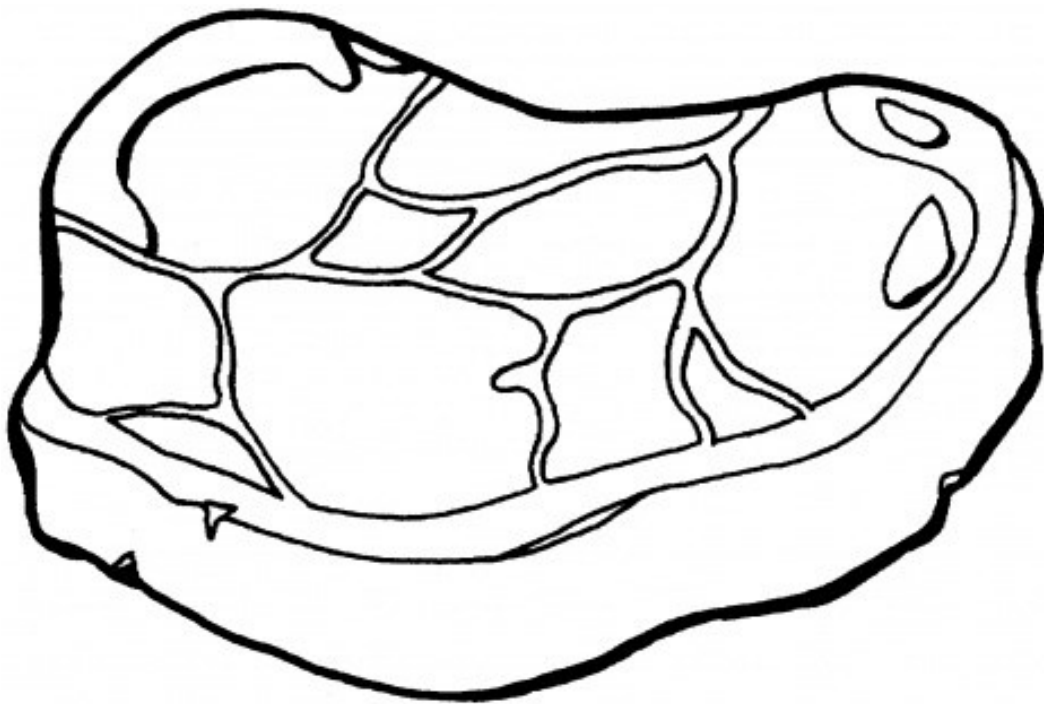
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Meat Magic

Using Math & Science to Learn
Beef Quality Grades



Third Grade



Grade: Third

Objective:

Students will observe a beef steak, describe what they see, and record their observations.

Science Standard:

3.1 Structure and Function. Living and non-living things vary in their characteristics and properties.

Time: 30 Minutes

Materials:

- Cooked Steak Picture
- Raw Steaks
- Worksheet
- Meat & Marbling Coloring Page
- Crayons or Colored Pencils

Oregon Agriculture in the Classroom Library

Resources:

- Available for free check out from aitc.oregonstate.edu.
- Beef Cattle in the Story of Agriculture
 - Cattle Kids: A Year on the Western Range
 - Cow
 - Cows – A True Book Series

Meat Magic

Lesson 1 – Observe Characteristics

Building Background

1. Cooked Steak Picture
2. If you are eating a very good steak, what word comes to mind?
3. Characteristics of a Delicious Steak: Tender, Juicy, Flavorful

Essential Question

If I am at the grocery store, trying to decide what to have for dinner, can I look at a steak and know whether it will taste tender, juicy, and flavorful?

Activity #1

1. Raw Steaks
2. Activity #1 Worksheet
3. Partners or small groups of students observe a raw beef steak, describe, and record what they see.
4. Each group shares results with the class.
5. Steak is composed of meat and fat.
6. Complete the chart on the board.

	<u>Meat</u>	<u>Fat</u>
Color	Red	White
Appearance (Looks Like)	Sinewy	Bubbly
Texture (Feels Like)	Firm	Squishy
AKA	Muscle	Marbling

Quality Grade

1. Two parts of a steak: meat and fat. Those parts are different colors, appearances, and textures. Does that tell us anything about how the steak will taste?
2. Actually, yes.
3. Meat Color. A good steak will be cherry red. Cherry red steaks come from a beef cow that was 9 to 30 months old. Cherry red steaks will be tender, one of the characteristics of a delicious steak.
4. White flecks in the steak are fat called marbling.
5. Marbling makes steaks juicy and flavorful, the other two characteristics of a delicious steak. The more marbling, the better the steak will taste.



Lesson 1 – Observe Characteristics

6. Quality Grade is an estimate of how tender, juicy, and flavorful a steak will be based on looking at it.
7. A meat inspector looks for two things when determining quality grades: meat color and amount of marbling.

Activity #2

1. Students color a picture of a steak.
2. The teacher should be able to tell the steak will be tender, juicy, and flavorful by looking at the way the student colored the steak.

Review

1. Quality grade tells us how tender, juicy, and flavorful a steak will taste just by looking at it.
2. What is one thing we look for when determining quality grade? Meat color.
3. What color should it be? Cherry red.
4. What is another thing we look for when determining quality grade? Amount of marbling.
5. How much marbling do we want? A lot.
6. So can I look at a steak and decide if it will be tender, juicy, and flavorful? Yes.



Meat Magic

is a collaborative school enrichment project of the Jefferson Lake, & Lane County 4-H Programs.

Goals:

Students learn math and science through agriculture.

Students learn about their food and where it comes



Name _____

Observe the beef steak. Discuss what you see. Record your observations.

Colors		
Appearance (Looks Like)		
Texture (Feels Like)		

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Grade: Third

Objective:

Students will sort steaks based on the amount of marbling and will identify the quality grade of each.

Science Standard:

3.1 Structure and Function: Living and non-living things vary in their characteristics and properties.

Time: 30 Minutes

Materials:

- Raw Steak Picture
- Sorting Pages (3)
- Prime Picture
- Choice Picture
- Select Picture
- Worksheets
- Steak Pictures (6)

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Meat Magic

Lesson 2 – Different Quantities

Building Background

1. Raw Steak Picture
2. Can I tell just by looking if a steak will taste tender, juicy, and flavorful?
3. What do I look for? Meat Color & Marbling

Essential Question

1. Do all steaks have the same amount of marbling?

Activity – Part One

1. Sorting Pages
2. Count the pieces of marbling for each steak.
3. Arrange steaks in order from most marbling to least.
4. Quality Grade – estimate of how tender, juicy, and flavorful a steak will taste.
5. Complete chart on the board.

	<u>Prime</u>	<u>Choice</u>	<u>Select</u>
Color	Cherry Red	Cherry Red	Cherry Red
Marbling	Abundant	Moderate	Slight
Price	\$\$\$	\$	\$

5. Identify the quality grade of each steak.
6. Match prime, choice, and select pictures to descriptions.

Activity – Part Two

1. Distribute worksheet.
2. Steak #1 – Model determining marbling amount: abundant, moderate, or slight.
3. Steak #1 – Model determining quality grade: prime, choice, or select depending on answer to #2 above.
4. Steak #2 – Students determine marbling quantity and quality grade.
5. Continue for steak #3-6.



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Lesson 2 – Different Quantities

Review

1. Prime Picture, Choice Picture, Select Picture
2. Do all steaks have the same amount of marbling?
3. What is the name of the estimate of how tender, juicy, and flavorful a steak will be?
4. Quality Grade
5. What factors determine quality grade?
6. Color and amount of marbling.



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Goals:

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Name _____

Identify the marbling quantity and quality grade for each steak.

Marbling Quantity: Abundant (A), Moderate (M), or Slight (S)

Quality Grade: Prime (P), Choice (C), or Select (S)

	Marbling Quantity	Quality Grade
Steak #1		
Steak #2		
Steak #3		
Steak #4		
Steak #5		

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Steak #6



Grade: Third

Objective:

Students will multiply length times width to determine rib eye area and will determine whether the steak meets industry standards for normal.

Math Standards:

3.OA.1 Interpret products of whole numbers.

Time: 30 Minutes

Materials:

Rib Eye Measurement Pictures (5)
Rib Eye Measurement Worksheets
Rulers

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Meat Magic

Lesson 3 – Measure Rib Eye Area

Building Background

1. What is a quality grade? Estimate of how tender, juicy, and flavorful a steak is.
2. What are the quality grades? Prime, Choice, Select

Essential Question

Does the size of the steak determine how it will taste?

Modeling

1. Rib Eye #1 Picture
2. Rib Eye is one of the deep muscles of the back. It is oval shaped.
3. Identify rib eye on picture.
4. The size of the rib eye tells us how big the steak is.
5. Demonstrate how to measure length.
6. A normal steak is 4-5 inches long.
7. Is our steak normal?
8. Demonstrate how to measure width.
9. A normal steak is 2-3 inches wide.
10. Is our steak normal?
11. Demonstrate how to measure rib eye area. (Length X Width)
12. What is the quality grade of our steak?

Activity

1. Divide students into pairs.
2. Give each pair a worksheet and Rib Eye picture.
3. Students share results with the class.

Review

1. What does the rib eye measurement tell us?
2. How big the steak is.
3. Does the size of the steak determine how it will taste?
4. No. But it helps us know how much we will eat.
5. Which is important to consider when you're buying dinner.



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Meat Magic

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Goals:

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Name _____

Steak # _____

Measure length and width.

Length	Width

Calculate rib eye area. Length X Width = Rib Eye Area

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Meat Magic

Lesson 4 – Create A Cookie

Grade: Third

Objective:

Students will draw a quality grade and create a cookie that has the appropriate amount of marbling.

Time: 30 Minutes

Materials:

Quality Grade Badges
Sugar Cookies
Frosting
Knives
Sprinkles
Paper Towels
Cow Tracer Page
Cow Dot to Dot
Crayons
Pencils

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

- Beef Cattle – An A to Z Book
- Beef Cattle in the Story of Agriculture
- Cattle Kids: A Year on the Western Range
- Cow
- Cows – A True Book Series

Activity One

1. Call four or five students to wash their hands and come to the table.
2. Draw a quality grade.
3. Does that quality grade have an abundant, moderate, or slight amount of marbling?
4. Distribute cookies.
5. Students frost cookies.
6. Students use sprinkles to put marbling on their cookie so it matches the quality grade they selected.

Activity Source: Stuftt, Kristen. (2014). Mystery Meat. 2014 National Agriculture in the Classroom Workshop. Harrisburg, Pennsylvania.

Activity Two

1. Students not at the cookie station complete the following activities.
2. Cow Dot to Dot
http://www.printactivities.com/ConnectTheDots/Cow-Dot2Dot.shtml#.VEE592O_7uw
3. Cow Maze
http://www.printactivities.com/Mazes/Shape_Mazes/Cow-Maze.shtml
4. Count by 4s
<http://www.printactivities.com/Mazes/Math-Mazes/FarmAnimals-CountingBy4s.shtml>



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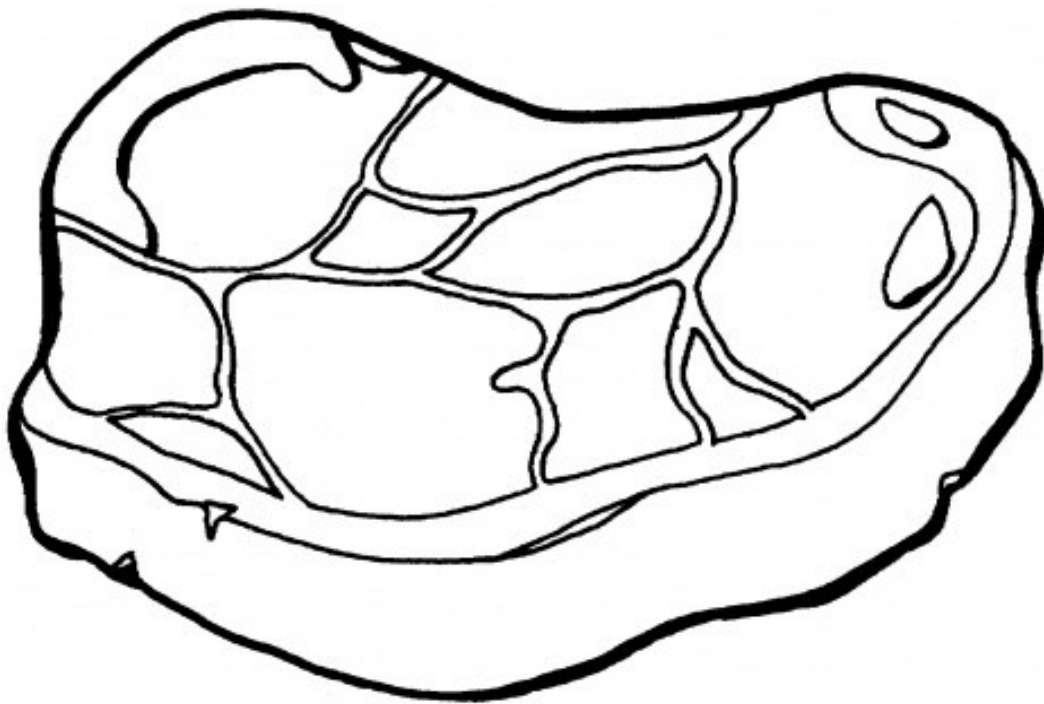
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Meat Magic

Using Math & Science to Learn
Beef Quality Grades



Fourth Grade



Meat Magic

Lesson 1 – Characteristics

Grade: Fourth

Objective:

Students will characteristics of a beef steak used to determine quality grade: meat color and marbling.

Science Standard:

4.1 Structure and Function: Living and non-living things can be classified by their characteristics and properties.

Time: 30 Minutes

Materials:

- Cooked Steak Picture
- Raw Steaks
- Worksheet
- Meat & Marbling Coloring Page
- Crayons or Colored Pencils

Oregon Agriculture in the Classroom Library

Resources:

- Available for free check out from aitc.oregonstate.edu.
- Beef Cattle in the Story of Agriculture
- Cattle Kids: A Year on the Western Range
- Cow
- Cows – A True Book Series

Building Background

1. Cooked Steak Picture
2. If you are eating a very good steak, what word comes to mind?
3. Characteristics of a Delicious Steak: Tender, Juicy, Flavorful

Essential Question

If I am at the grocery store, trying to decide what to have for dinner, can I look at a steak and know whether it will taste tender, juicy, and flavorful?

Activity #1

1. Raw Steaks
2. Activity #1 Worksheet
3. Partners or small groups of students observe a raw beef steak, describe, and record what they see.
4. Each group shares results with the class.
5. Steak is composed of meat and fat.
6. Complete the chart on the board.

	<u>Meat</u>	<u>Fat</u>
Color	Red	White
Appearance (Looks Like)	Sinewy	Bubbly
Texture (Feels Like)	Firm	Squishy
AKA	Muscle	Marbling

Quality Grade

1. Two parts of a steak: meat and fat. Those parts are different colors, appearances, and textures. Does that tell us anything about how the steak will taste?
2. Actually, yes.
3. Meat Color. A good steak will be cherry red. Cherry red steaks come from a beef cow that was 9 to 30 months old. Cherry red steaks will be tender, one of the characteristics of a delicious steak.
4. White flecks in the steak are fat called marbling.
5. Marbling makes steaks juicy and flavorful, the other two characteristics of a delicious steak. The more marbling, the better the steak will taste.



Lesson 1 – Characteristics

6. Quality Grade is an estimate of how tender, juicy, and flavorful a steak will be based on looking at it.
7. A meat inspector looks for two things when determining quality grades: meat color and amount of marbling.

Activity #2

1. Students color a picture of a steak.
2. The teacher should be able to tell the steak will be tender, juicy, and flavorful by looking at the way the student colored the steak.

Review

1. Quality grade tells us how tender, juicy, and flavorful a steak will taste just by looking at it.
2. What is one thing we look for when determining quality grade? Meat color.
3. What color should it be? Cherry red.
4. What is another thing we look for when determining quality grade? Amount of marbling.
5. How much marbling do we want? A lot.
6. So can I look at a steak and decide if it will be tender, juicy, and flavorful? Yes.



Meat Magic

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Goals:

Students learn math and science through agriculture.

Students learn about their food and where it comes



Name _____

Observe the beef steak. Discuss what you see. Record your observations.

Colors		
Appearance (Looks Like)		
Texture (Feels Like)		

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Meat Magic

Lesson 2 – Sort & Classify

Grade: Fourth

Objective:

Students will sort steaks based on the amount of marbling and will identify the quality grade of each.

Science Standard:

4.1 Structure and Function: Living and non-living things can be classified by their characteristics and properties.

Time: 30 Minutes

Materials:

- Raw Steak Picture
- Sorting Pages (3)
- Prime Picture
- Choice Picture
- Select Picture
- Worksheets
- Steak Pictures (6)

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Building Background

1. Raw Steak Picture
2. Can I tell just by looking if a steak will taste tender, juicy, and flavorful?
3. What do I look for? Meat Color & Marbling

Essential Question

1. Do all steaks have the same amount of marbling?

Activity – Part One

1. Sorting Pages
2. Count the pieces of marbling for each steak.
3. Arrange steaks in order from most marbling to least.
4. Quality Grade – estimate of how tender, juicy, and flavorful a steak will taste.
5. Complete chart on the board.

	<u>Prime</u>	<u>Choice</u>	<u>Select</u>
Color	Cherry Red	Cherry Red	Cherry Red
Marbling	Abundant	Moderate	Slight
Price	\$\$\$	\$\$	\$

5. Identify the quality grade of each steak.
6. Match prime, choice, and select pictures to descriptions.

Activity – Part Two

1. Distribute worksheet.
2. Steak #1 – Model determining marbling amount: abundant, moderate, or slight.
3. Steak #1 – Model determining quality grade: prime, choice, or select depending on answer to #2 above.
4. Steak #2 – Students determine marbling quantity and quality grade.
5. Continue for steak #3-6.



Lesson 2 – Sort & Classify

Review

1. Prime Picture, Choice Picture, Select Picture
2. Do all steaks have the same amount of marbling?
3. What is the name of the estimate of how tender, juicy, and flavorful a steak will be?
4. Quality Grade
5. What factors determine quality grade?
6. Color and amount of marbling.



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Goals:

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Students learn about their food and where it comes



Name _____

Identify the marbling quantity and quality grade for each steak.

Marbling Quantity: Abundant (A), Moderate (M), or Slight (S)

Quality Grade: Prime (P), Choice (C), or Select (S)

	Marbling Quantity	Quality Grade
Steak #1		
Steak #2		
Steak #3		
Steak #4		
Steak #5		

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Steak #6



Grade: Fourth

Objective:

Students calculate rib eye area of a beef steak.

Math Standards:

4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

Time: 30 Minutes

Materials:

Rib Eye Measurement Pictures (5)
Rib Eye Measurement Worksheets
Rulers
Plastic Grids (Transparency from Iowa State University)

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

Meat Magic

Lesson 3 – Measure Rib Eye Area

Building Background

1. What is a quality grade? Estimate of how tender, juicy, and flavorful a steak is.
2. What are the quality grades? Prime, Choice, Select

Essential Question

Does the size of the steak determine how it will taste?

Modeling

1. Rib Eye #1 Picture
2. Rib Eye is one of the deep muscles of the back. It is oval shaped.
3. Identify rib eye on picture.
4. The size of the rib eye tells us how big the steak is.
5. Demonstrate how to measure length.
6. A normal steak is 4-5 inches long.
7. Is our steak normal?
8. Demonstrate how to measure width.
9. A normal steak is 2-3 inches wide.
10. Is our steak normal?
11. Demonstrate how to measure rib eye area. (Length X Width)
12. What is the quality grade of our steak?

Activity #1

1. Divide students into pairs.
2. Give each pair a worksheet and Rib Eye #2 picture.



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Lesson 3 – Measuring Rib Eye Area

Modeling

1. Rib Eye #3 Picture.
2. Demonstrate how to use the plastic grid.
3. Place the largest box on the grid that fits entirely within the rib eye.
4. Determine the base number.

Plastic Grid Box	Number of Dots	Conversion to Square Inches	Area in Square Inches
2	40	40/20	2.00
3	60	60/20	3.00
4	80	80/20	4.00

5. Count the number of dots within the rib eye but outside the grid box.
6. Divide the number by 20 (20 dots per inch on the grid) = Additional Square Inches
7. Box Square Inches + Additional Square Inches = Rib Eye Area
8. Repeat demonstration as needed.

Activity #2 (Optional)

1. Divide students into pairs.
2. Give each pair a worksheet, plastic grid, and Rib Eye picture.
3. Students use the plastic grid to calculate rib eye area.

Review

1. What does the rib eye measurement tell us?
2. How big the steak is.
3. Does the size of the steak determine how it will taste?
4. No. But it helps us know how much we will eat.
5. Which is important to consider when you're buying dinner.

Source: Ohio State University. Swine Learning Laboratory Kit.



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Goals:

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Students learn about their food and where it comes



Name _____

Steak # _____

Measure length and width.

Length	Width

Calculate rib eye area. Length X Width = Rib Eye Area

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Meat Magic

is a collaborative school enrichment project of the Jefferson Lake, & Lane County 4-H Programs.

Goals:

Students learn math and science through agriculture.

Students learn about their food and where it comes



Name _____

Steak # _____

Base Area = _____

Calculate additional area.

Additional Dots = _____

Additional Area = _____

Additional Dots / 20 _____

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Meat Magic

Lesson 4 – Create A Cookie

Grade: Fourth

Objective:

Students will draw a quality grade and create a cookie that has the appropriate amount of marbling.

Time: 30 Minutes

Materials:

Quality Grade Badges
Sugar Cookies
Frosting
Knives
Sprinkles
Paper Towels
Cow Tracer Page
Cow Dot to Dot
Crayons
Pencils

Oregon Agriculture in the Classroom Library

Resources:

Available for free check out from aitc.oregonstate.edu.

- Beef Cattle – An A to Z Book
- Beef Cattle in the Story of Agriculture
- Cattle Kids: A Year on the Western Range
- Cow
- Cows – A True Book Series

Activity One

1. Call four or five students to wash their hands and come to the table.
2. Draw a quality grade.
3. Does that quality grade have an abundant, moderate, or slight amount of marbling?
4. Distribute cookies.
5. Students frost cookies.
6. Students use sprinkles to put marbling on their cookie so it matches the quality grade they selected.

Activity Source: Stufft, Kristen. (2014). Mystery Meat. 2014 National Agriculture in the Classroom Workshop. Harrisburg, Pennsylvania.

Activity Two

1. Students not at the cookie station complete the following activities.
2. Cow Dot to Dot
http://www.printactivities.com/ConnectTheDots/Cow-Dot2Dot.shtml#.VEE592O_7uw
3. Cow Maze
http://www.printactivities.com/Mazes/Shape_Mazes/Cow-Maze.shtml
4. Count by 4s
<http://www.printactivities.com/Mazes/Math-Mazes/FarmAnimals-CountingBy4s.shtml>



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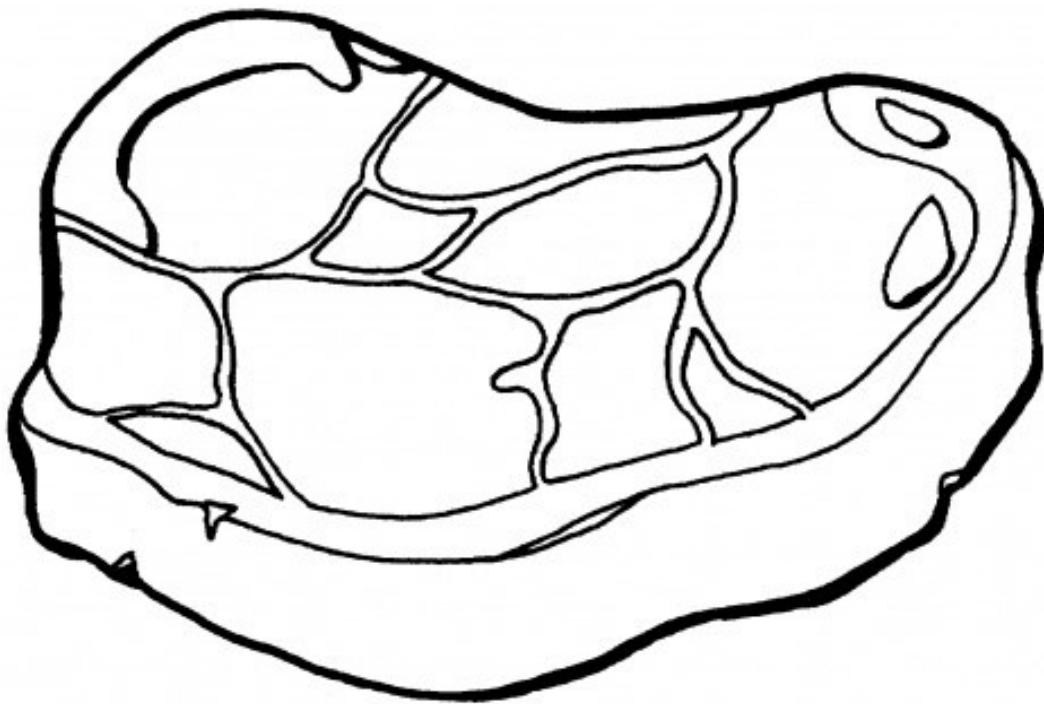
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Meat Magic

Using Math & Science to Learn
Beef Quality Grades



Lesson One Materials









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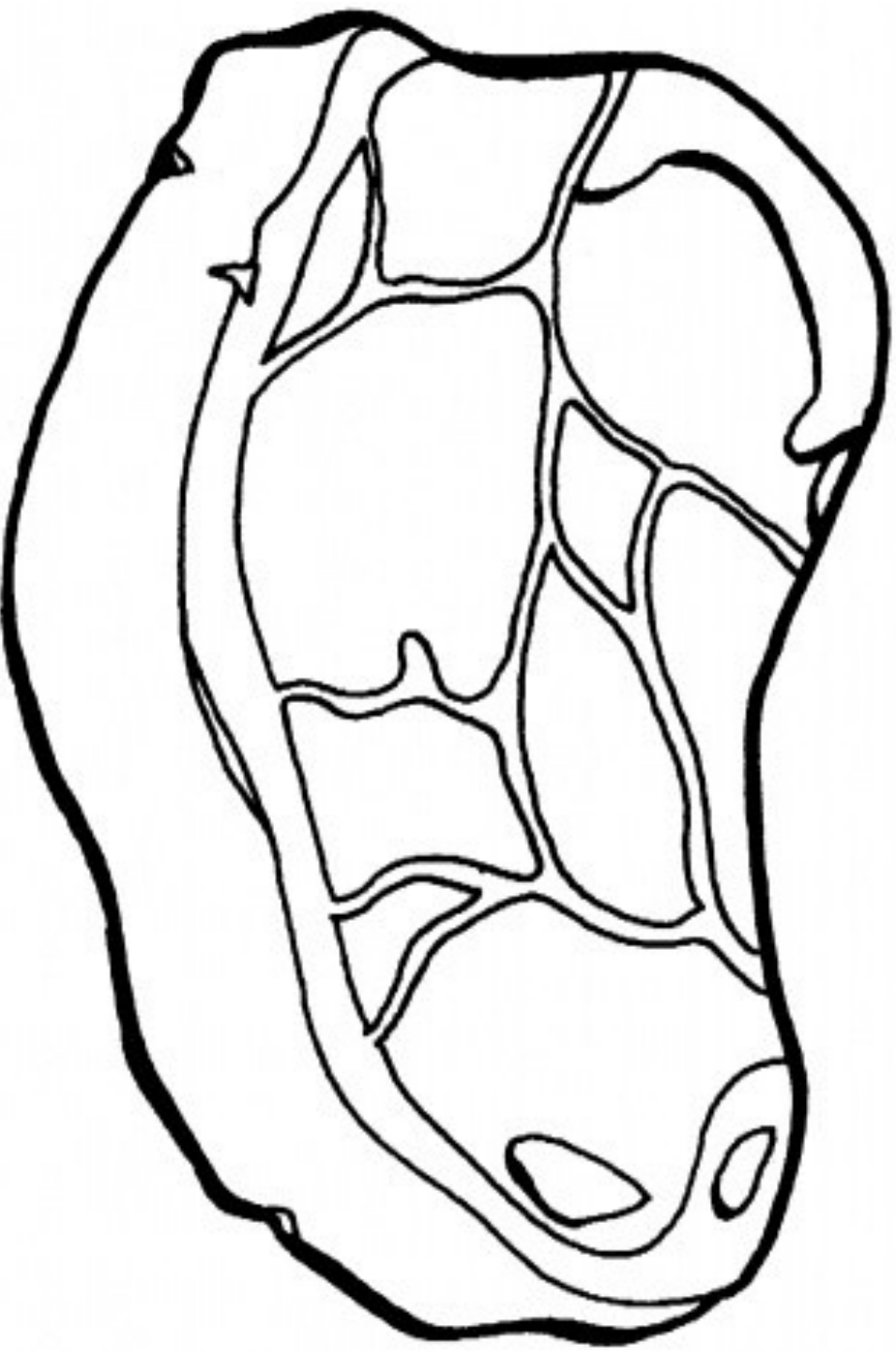
Goals:

Students learn math and science through agriculture.



Name _____

Color the meat and the marbling of the beef steak.



Laurie Rice
Karissa Dishon
Jon Gandy

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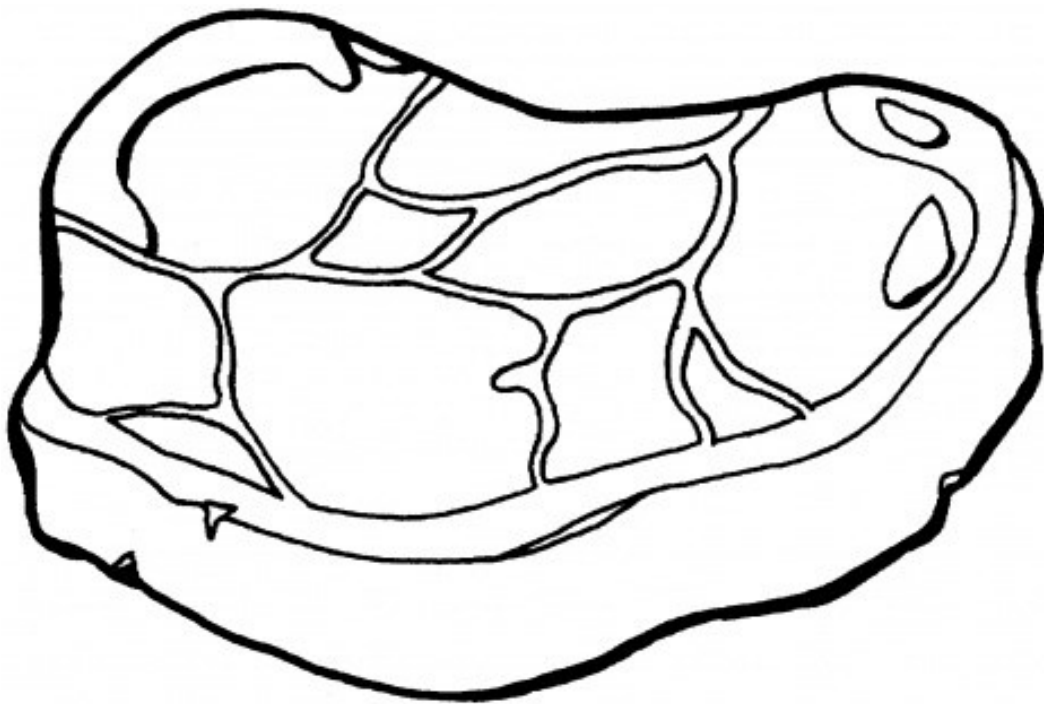
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Lesson Two Materials





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Goals:

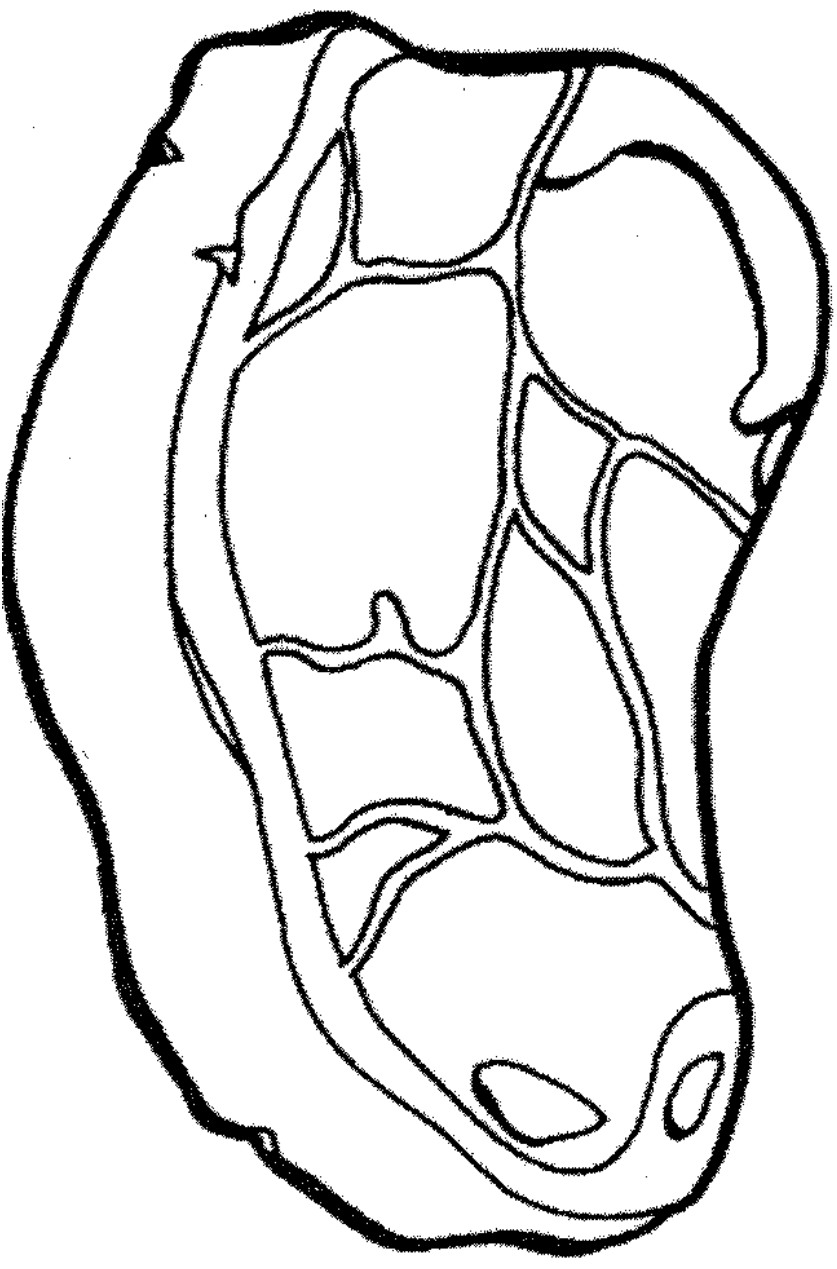
Students learn math and science through agriculture.

Students learn about their food and where it comes



Name _____

Count the marbling.



Pieces of Marbling = _____

Beef Quality Grade _____

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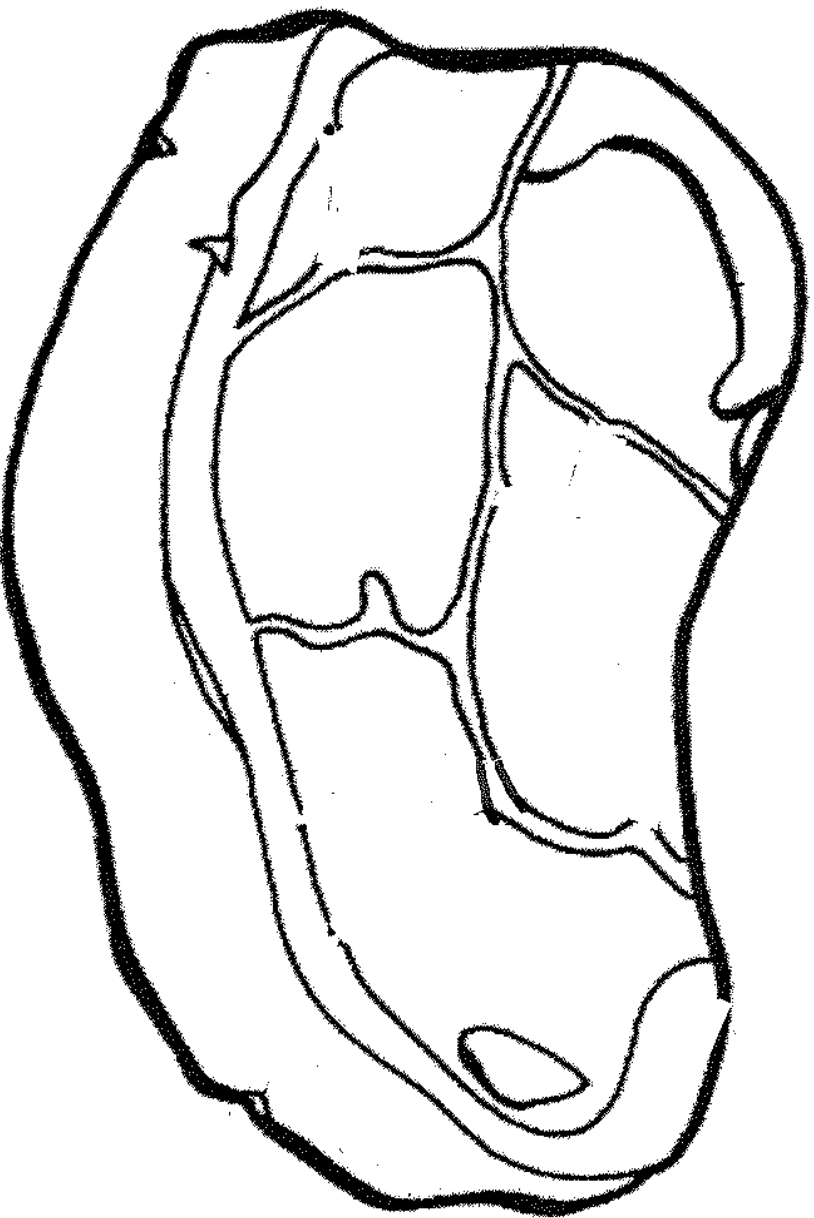
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Students learn about their food and where it comes



Name _____

Count the marbling.



Pieces of Marbling = _____

Beef Quality Grade _____

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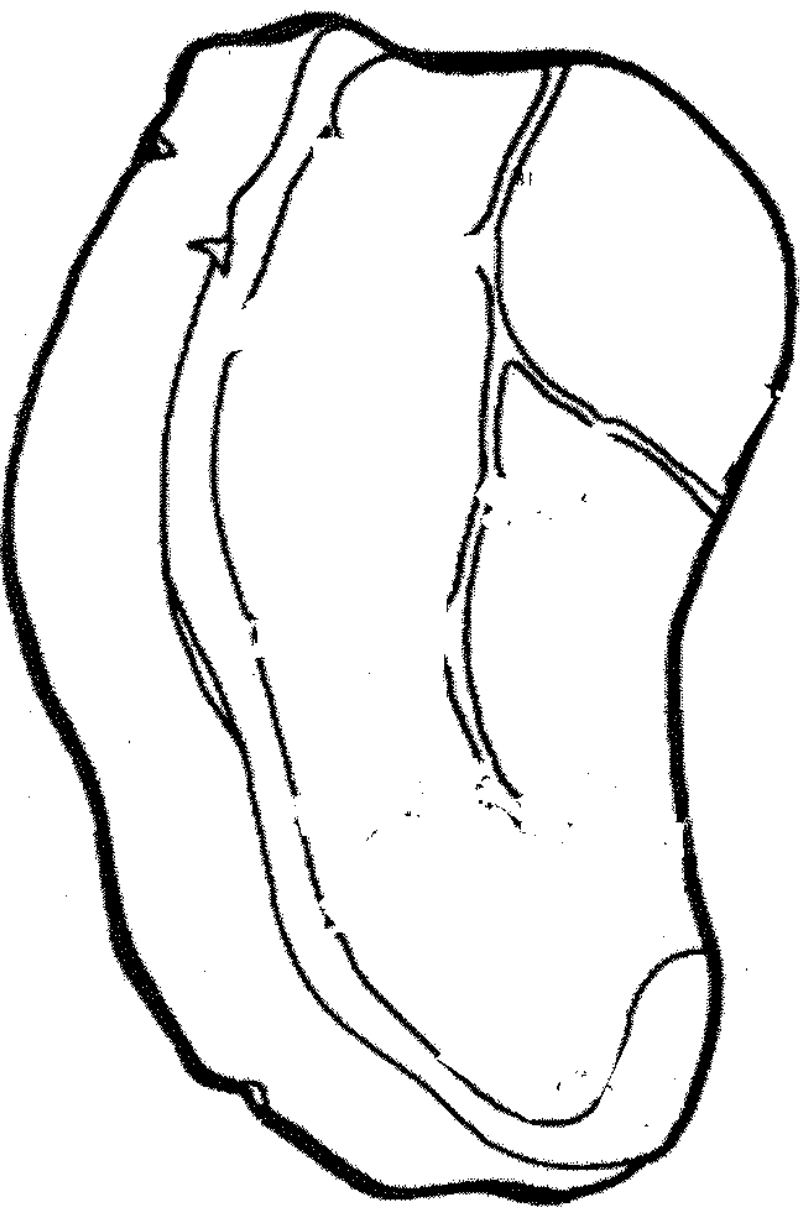
Students learn math and science through agriculture.

Students learn about their food and where it comes



Name _____

Count the marbling.



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Beef Quality Grade _____

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Graphic from: <http://insights.looloo.com/steaks-101-learn-different-grades-of-beef/>



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1



2



3



4



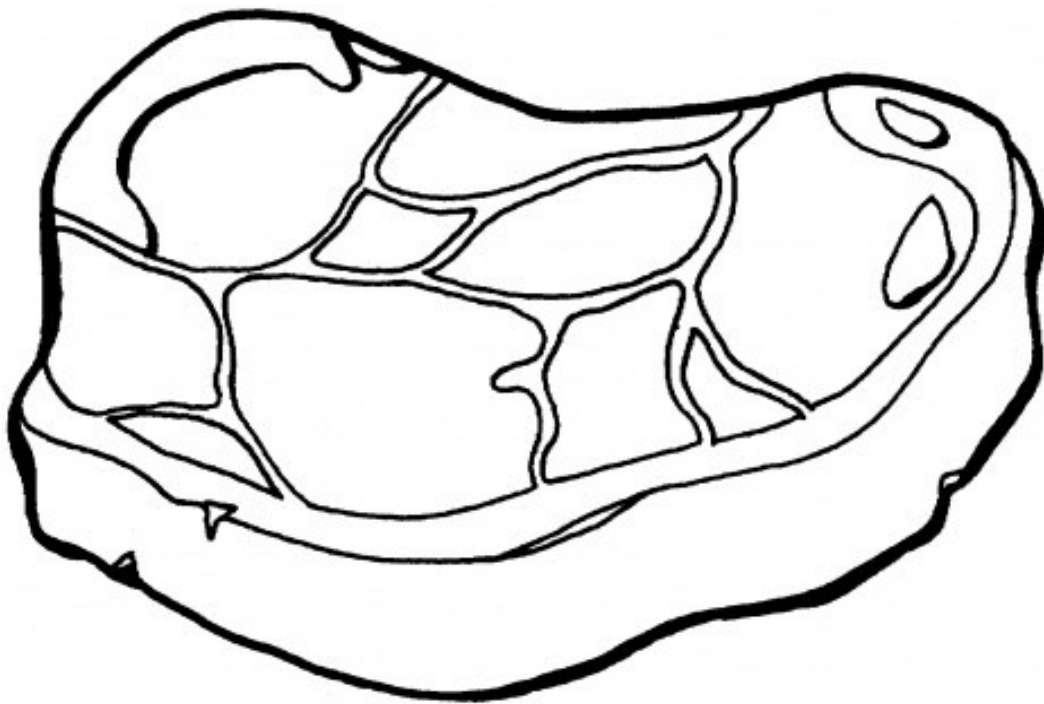
5





Meat Magic

Using Math & Science to Learn
Beef Quality Grades



Lesson Three Materials

Plus Lesson Two Steaks One-Six

7





9



10



11



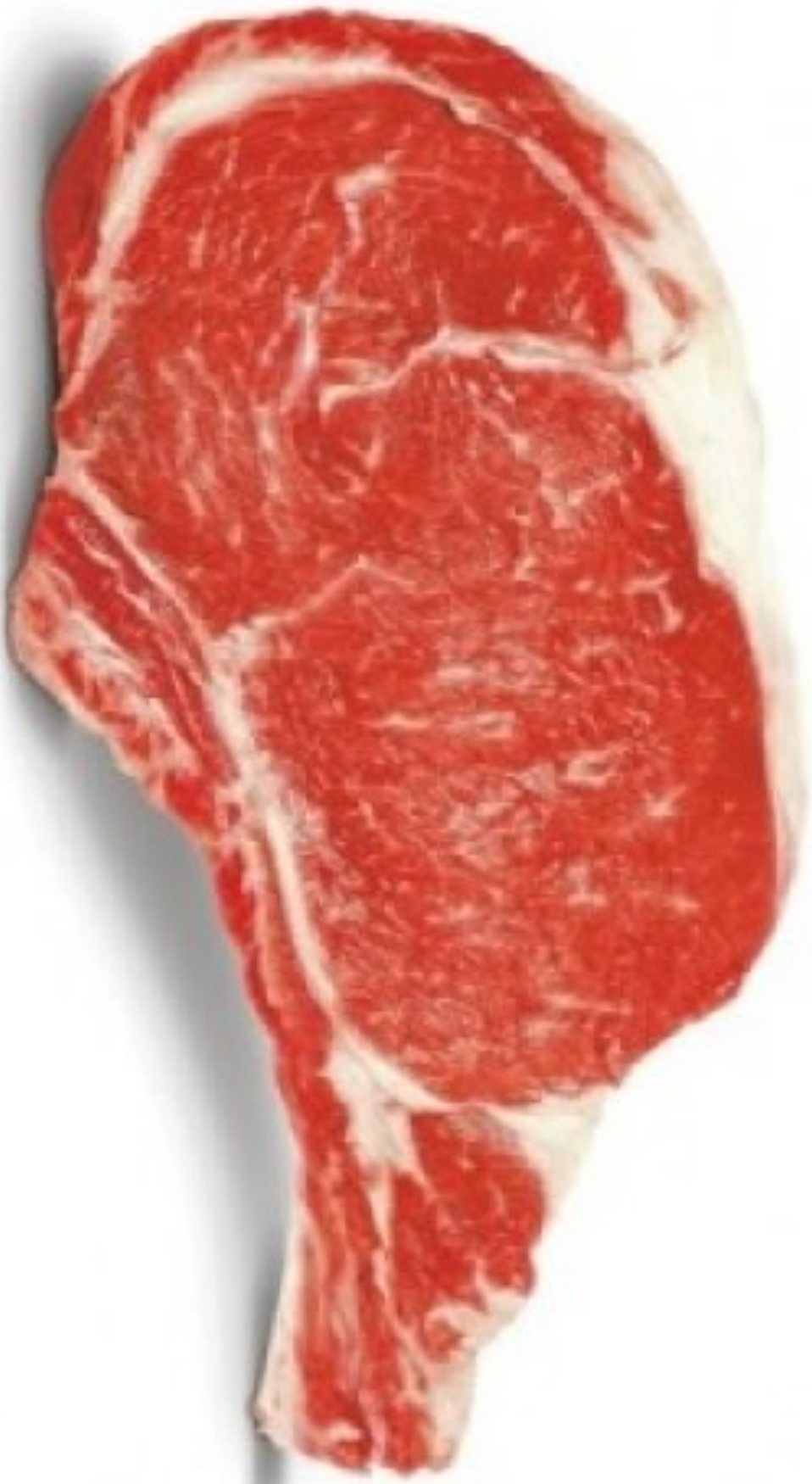
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13



14

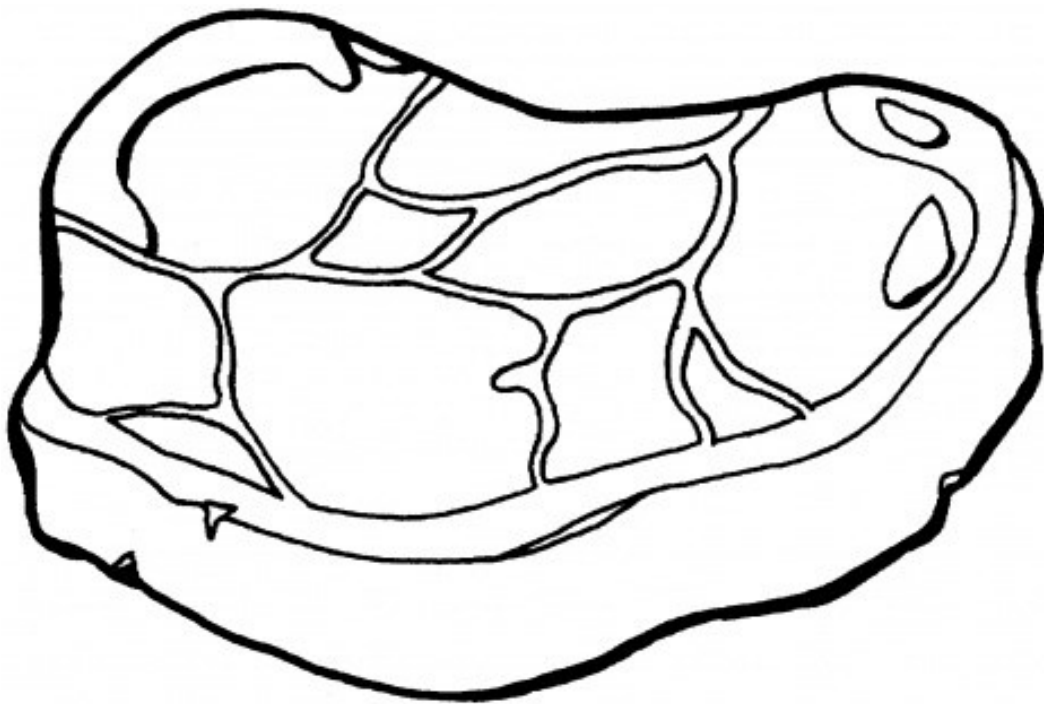


15



Meat Magic

Using Math & Science to Learn
Beef Quality Grades



Lesson Four Materials





A decorative label with a scalloped border containing the text "USDA" and "SELECT" stacked vertically.

USDA
SELECT

A decorative label with a scalloped border containing the text "USDA" and "SELECT" stacked vertically.

USDA
SELECT

A decorative label with a scalloped border containing the text "USDA" and "SELECT" stacked vertically.

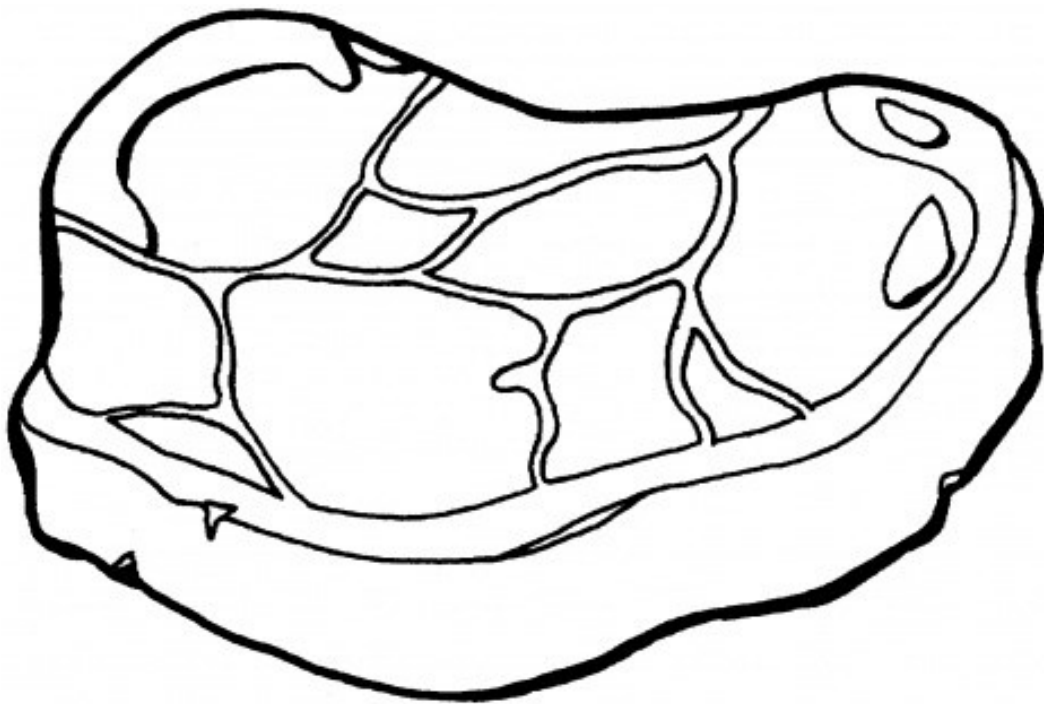
USDA
SELECT

A decorative label with a scalloped border containing the text "USDA" and "SELECT" stacked vertically.

USDA
SELECT

Meat Magic

Using Math & Science to Learn
Beef Quality Grades



Pre-Post Assessment



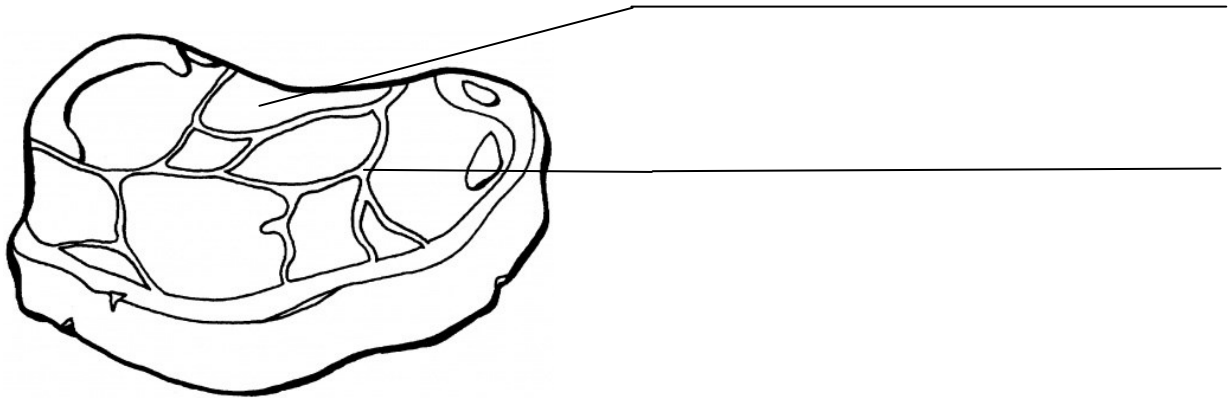
Meat Magic



Name _____

Grade _____

1. Identify the two parts of a beef steak.

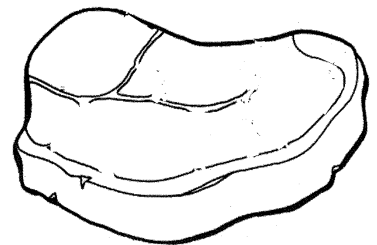
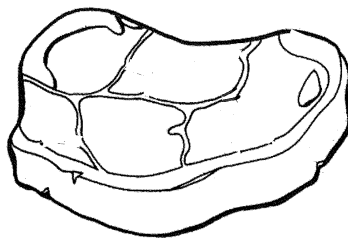
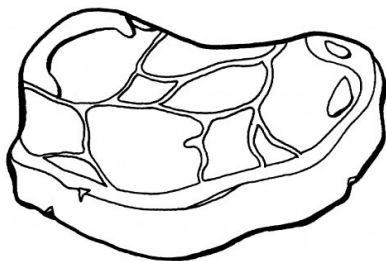


2. Which beef steak has the most marbling? _____

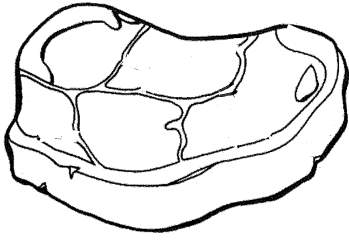
A

B

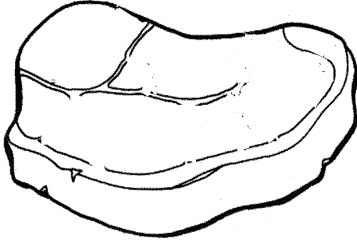
C



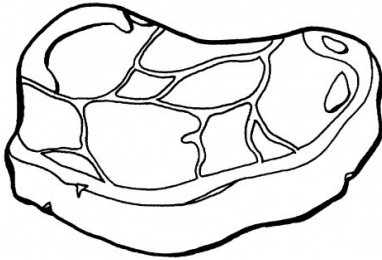
3. Draw a line to match the beef steak with its amount of marbling.



Abundant

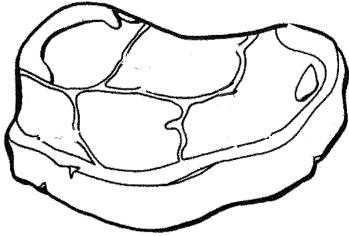


Moderate

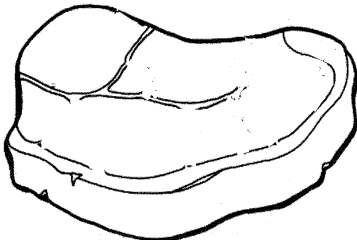


Slight

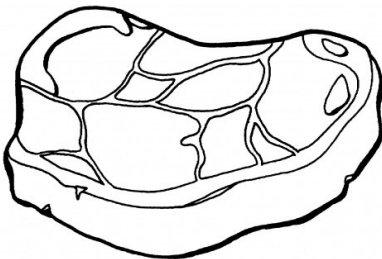
4. Draw a line to match the beef steak with its quality grade.



Prime



Choice



5. Circle the face that best describes how you feel about each statement.

I learned about agriculture.



I used science in a new way.



I used math in a new way.



I had fun.



Rice, Laurie, Dishon, Karissa, and Gandy, Jon. (2015). Meat Magic: Using Science and Math to Learn Beef Quality Grades. Oregon State University.