At the Sale Barn
Grades 6-8
Math

Objectives
Through classroom experiences, students will read about cattle auctions and solve math word problems related to buying cattle.

Vocabulary
Auction—a sale at which things are sold to those who offer to pay the most
Bid—to make an offer to buy something
Bidder—the person at the auction who is bidding, or making an offer to buy something
Feeder cattle—steers or heifers mature enough to be placed in a feedlot where they will be fattened prior to slaughter
Stocker cattle—male or female cattle fed and maintained until they have reached a desirable weight to be sold for beef production

Background
Oklahoma is cattle country. Everywhere you go in our state, chances are you will see cattle grazing in fields at the side of the road. Our grasslands, that formerly fed vast herds of bison, are perfect for grazing cattle.

In 1910, just three years after statehood, the Edward Morris Company established a packing plant and livestock sales terminal on 120 acres two miles west of downtown Oklahoma City. The city fathers gave financial assistance, and Oklahoma City became the site of the state’s first major industry – The Oklahoma National Stockyards Company.
Livestock sales were handled only by private agreement between the seller and buyer using the services of commission companies, through 1961. At this time, a second method of trade was introduced, the auction. The auction provided even greater competition for available livestock.

With the auction came a new spurt of growth, and the Oklahoma National Stockyards Company soon became the world’s largest market of stocker and feeder cattle, selling yearly receipts of well over a half a million head. Since the Stockyards opened, more than 102,000,000 head of livestock have been sold. Cattle auctions are still held Monday and Tuesday each week.

In addition to the Oklahoma National Stockyards, there are about 75 livestock auction barns scattered across the state. Cattle are sold by auction to the highest bidder. Swine, goats, sheep, horses and llamas are also sold at sale barns, usually on different days. Most auction barns only have sales on specific days of the week. Certain auction days may be reserved just for beef or dairy cattle or for goats or swine. Cattle may be sold at auction as stockers or feeders. Feeder cattle are sold to feed lots where they are fed until they reach a desired weight to be sold for beef production. Stocker cattle are sold to ranchers to be placed on pasture until they reach a desirable weight to be sold as feeders. Cattle may also be sold as cows, cow/calf pairs and bulls to restock herds.

It is the job of the auctioneer to get the most money possible for an animal or group of animals. Buyers look at the animal’s age, size, quality and health. The auctioneer often starts with a high asking price, then drops it until he or she gets the first bid. Most auctions have one or more people serving as ringmen. Their job is to watch for bids from the crowd and make sure the auctioneer sees them. Auction chant (also known as “bid calling,” “the auction cry,” “the cattle rattle,” or simply “auctioneering”) is a rhythmic repetition of numbers and “filler words” spoken by American auctioneers in the process of conducting an auction. The chant consists of at least the current price and the asking price to outbid. Auctioneers typically develop their own style.

The auction chant is a repetition of two numbers at a time which indicate the monetary amount involved with the sale of an item. The first number is the amount of money which is currently being offered by a bidder for a given item. The second number is what the next bid needs to be in order to become the “high bidder” or simply “the current man on.” In between the numbers are “filler words” which are what
the auctioneer says to tie the chant together making it smooth and rhythmic. Filler words serve as a thinking point for both the auctioneer and the bidders. Filler words can serve to make a statement, ask questions, or can simply serve as a means of adding rhythm to the chant (which all filler words should do regardless). Typical filler words, which are taught at schools of auctioneering, are “dollar bid,” “now,” and “will ya’ give me?”. The typically taught chant for beginning auctioneers using the following pattern: “One dollar bid, now two, now two, will ya’ give me two? Two dollar bid, now three, now three, will ya’ give me three?”, and continues in this fashion until the crowd stops bidding and the item is sold to the highest bidder.

There are many tongue twisters that auctioneers practice to become an auctioneer. Most tongue twisters involve alliteration. One of the hardest, which auctioneers learn in auctioneer school, is called, “Betty Botter.” This tongue twister was written by Carolyn Wells. There are many versions of this tongue twister, but here is one for you to try, if you are interested in becoming an auctioneer.

**Betty Botter**

By: Carolyn Wells

Betty Botter had some butter,
“But,” she said, “this butter’s bitter.
If I bake this bitter butter,
it would make my batter bitter.
But a bit of better butter—
that would make my batter better.”

So she bought a bit of butter,
better than her bitter butter,
and she baked it in her batter,
and the batter was not bitter.
So ’twas better Betty Botter
bought a bit of better butter.

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Grades 6-8
Teacher Resources

Activity 1: A Day at the Auction, (Math)  1  50-minute class period
- Create a free account on https://www.cattleusa.com to show students a livestock auction in real time. You can watch and listen to a variety of livestock auctions across the nation.
- Discuss the auction chants and watch the price differences in the animals. Note animals sold as per head, per hundredweight, individually, or in groups.
- Record and average that day’s selling price on Activity 1 Worksheet 1 “A Day at the Auction”

Activity 2: Cattle Market Math, (Math)  1  50-minute class period
- Provide copies of Activity 2 Worksheet 1 “Cattle Market Math.” Students will solve the word problems.

Activity 3: Cattle Market Reports, (Math)  1  50-minute class period
- Provide copies of Activity 3 Worksheet 1 “Cattle Market Report.” Students will calculate the mean, median, mode, and range for the price per hundredweight of the cattle labeled “fleshy.”
Oklahoma Academic Standards

Activity 1 – A Day at the Auction (Math)

6.N.4.4 Solve and interpret real-world and mathematical problems including those involving money, measurement, geometry, and data requiring arithmetic with decimals, fractions and mixed numbers.

7.N.2.3 Solve real-world and mathematical problems involving addition, subtraction, multiplication and division of rational numbers; use efficient and generalizable procedures including but not limited to standard algorithms.

Activity 2 – Cattle Market Math (Math)

6.N.4.4 Solve and interpret real-world and mathematical problems including those involving money, measurement, geometry, and data requiring arithmetic with decimals, fractions and mixed numbers.

7.N.2.5 Solve real-world and mathematical problems involving calculations with rational numbers and positive integer exponents.

7.A.2.3 Use proportional reasoning to solve real-world and mathematical problems involving ratio.

Activity 3 – Cattle Market Reports (Math)

6.D.1.1 Calculate the mean, median, and mode for a set of real-world data.

6.D.1.2 Explain and justify which measure of central tendency (mean, median, and mode) would provide the most descriptive information for a given set of data.

7.D.1.1 Design simple experiments, collect data and calculate measures of central tendency (mean, median, and mode) and spread (range). Use these quantities to draw conclusions about the data collected and make predictions.

For more resources, please visit [www.agclassroom.org(ok](http://www.agclassroom.org)
At the Sale Barn

Activity 1 Worksheet 1: At the Sale Barn

Name: ____________________________ Date: __________________

Class/Hour/Teacher: ______________________________________________

Fill out the chart below either at a sale barn, or by listening to a live auction online. The lot number is the animal that is being sold.

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<th>Lot Number</th>
<th>Number of Head</th>
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<th>Price per hundredweight</th>
<th>Average Price per hundredweight</th>
<th>Lot Price</th>
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</tbody>
</table>

Average of the day’s price per hundredweight: __________________________

Average of the day’s lot price: __________________________

For more resources, please visit www.agclassroom.org/ok
At the Sale Barn

Activity 2 Worksheet 1: Cattle Market Math

Name: ____________________________ Date: ____________________

Class/Hour/Teacher: ____________________________

Directions: Solve the following word problems related to buying cattle at auction. Show your work.

Sample: Cattle are sold at auction by the hundredweight (cwt), which is 100 pounds.

So, a 600-pound animal that sells for $150 per cwt would cost $900:

\[
\frac{150}{100} = \$1.50 \text{ per pound}
\]

\[
600 \text{ pound calf} = 600 \times \$1.50 = \$900
\]

A 620-pound animal that sells for $170 per hundredweight would cost $1,054:

\[
\frac{170}{100} = \$1.70
\]

\[
620 \text{ pounds} = 620 \times \$1.70 = \$1,054
\]

1. At auction, a 600 pound steer sold for $123 per hundredweight. How much did the buyer pay?

2. A 395-pound feeder steer sold for $202 per hundredweight. How much did the buyer pay?

3. A 420-pound feeder heifer sold for $128 per hundredweight. How much did the buyer pay?

4. A 420-pound feeder steer sold for $188 per hundredweight. How much did the buyer pay?
5. Five head of cattle were sold for $7,500. Their total weight was 6,000. What was the cost of the cattle per hundredweight?

6. Fifty head of cattle, weighing an average 375 pounds sold for $225 per hundredweight. If each steer weighed exactly 375 pounds what would be the total cost?

7. At auction, Lucy Brown bought three heifers. One weighed 752 pounds and sold for $119 per hundredweight, one weighed 637 pounds and sold for $135 per hundredweight, and one weighed 700 pounds and sold for $98 per hundredweight. How much did she pay for the three heifers?

8. Robert Jones bought four heifers. One weighed 389 pounds and sold for $216 per hundredweight, one weighed 395 pounds and sold for $202 per hundredweight, one weighed 375 pounds and sold for $225 per hundredweight, and one weighed 420 pounds and sold for $188 per hundredweight. What was the total cost?

9. Travis White bought 15 head of cattle with an average weight of 389 pounds. He paid a total $3,244.95. What was the average price per head?
# At the Sale Barn

## Activity 3 Worksheet 1: Cattle Market Report

Name: ____________________________  Date: ____________________________

Class/Hour/Teacher: ____________________________

### FEEDER STEERS MEDIUM AND LARGE (PARTIAL LIST)

Report Date 4/26/2019-5/2/2019, Oklahoma National Stockyards, Oklahoma City, OK

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<th>HEAD</th>
<th>WEIGHT RANGE</th>
<th>AVERAGE WEIGHT</th>
<th>PRICE RANGE (per hundredweight)</th>
<th>AVERAGE PRICE (per hundredweight)</th>
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<td>83</td>
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<td>154.51</td>
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<tr>
<td>15</td>
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<td>685</td>
<td>143.00-150.00</td>
<td>148.62</td>
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<td>12</td>
<td>623</td>
<td>623</td>
<td>156.00</td>
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<td>Unweaned</td>
</tr>
</tbody>
</table>
Use the Cattle Market Report chart to answer the following questions.

1. Find the central tendency numbers for the “fleshy” cattle

Mean: _______  Median: _______  Mode: _______  Range: _______

2. Find the central tendency numbers for the “unweaned” cattle

Mean: _______  Median: _______  Mode: _______  Range: _______

3. Find the central tendency numbers for the “full” cattle

Mean: _______  Median: _______  Mode: _______  Range: _______

4. Using the data, what was the total purchase price for the “Thin Fleshed” lot?

Total purchase price: ____________________________________________

Which measure of central tendency (mean, median, or mode) would provide the most descriptive information for this data? ______________________________________________________________

Based on the data, what conclusions can you draw about the cattle market? ______________________

___________________________________________________________________________

___________________________________________________________________________

Based on the data, what predictions can you make about the cattle market? ______________________

___________________________________________________________________________

___________________________________________________________________________
At the Sale Barn

Activity 2 Worksheet 1: Cattle Market Math (ANSWERS)

Name: ____________________________ Date: ________________________

Class/Hour/Teacher: ____________________________________________

Directions: Solve the following word problems related to buying cattle at auction. Show your work.

Sample: Cattle are sold at auction by the hundredweight (cwt), which is 100 pounds.

So, a 600-pound animal that sells for $150 per cwt would cost $900:
$150 ÷ 100 = $1.50 per pound
600 pound calf= 600 x $1.50 = $900

A 620-pound animal that sells for $170 per hundredweight would cost $1,054:
$170 ÷ 100 = $1.70
620 pounds = 620 x $1.70 = $1,054

1. At auction, a 600 pound steer sold for $123 per hundredweight. How much did the buyer pay?
   $123 ÷ 100 = $1.23
   600 x $1.23 = $738.00

2. A 395-pound feeder steer sold for $202 per hundredweight. How much did the buyer pay?
   $202 ÷ 100 = $2.02
   395 x $2.02 = $797.90

3. A 420-pound feeder heifer sold for $128 per hundredweight. How much did the buyer pay?
   $128 ÷ 100 = $1.28
   420 x $1.28 = $537.60

4. A 420-pound feeder steer sold for $188 per hundredweight. How much did the buyer pay?
   $188 ÷ 100 = $1.88
   420 x $1.88 = $789.60

For more resources, please visit www.agclassroom.org/ok
5. Five head of cattle were sold for $7,500. Their total weight was 6,000 pounds. What was the cost of the cattle per hundredweight?

\[
\begin{align*}
\text{Cost per hundredweight} & = \frac{7500}{6000} = 1.25 \\
1.25 \times 100 & = \$125
\end{align*}
\]

6. Fifty head of cattle, weighing an average 375 pounds sold for $225 per hundredweight. If each steer weighed exactly 375 pounds what would be the total cost?

\[
\begin{align*}
\text{Cost per hundredweight} & = \frac{225}{100} = 2.25 \\
375 \times 2.25 & = $843.75 \text{ each} \\
843.75 \times 50 \text{ head} & = \$42,187.50 \text{ total cost}
\end{align*}
\]

7. At auction, Lucy Brown bought three heifers. One weighed 752 pounds and sold for $119 per hundredweight, one weighed 637 pounds and sold for $135 per hundredweight, and one weighed 700 pounds and sold for $98 per hundredweight. How much did she pay for the three heifers?

\[
\begin{align*}
\text{Cost per hundredweight for first heifer} & = \frac{119}{100} = 1.19 \\
752 \times 1.19 & = $894.88 \\
\text{Cost per hundredweight for second heifer} & = \frac{135}{100} = 1.35 \\
637 \times 1.35 & = $859.95 \\
\text{Cost per hundredweight for third heifer} & = \frac{98}{100} = 0.98 \\
700 \times 0.98 & = $686 \\
894.88 + 859.95 + 686 & = \$2,440.83
\end{align*}
\]

8. Robert Jones bought four heifers. One weighed 389 pounds and sold for $216 per hundredweight, one weighed 395 pounds and sold for $202 per hundredweight, one weighed 375 pounds and sold for $225 per hundredweight, and one weighed 420 pounds and sold for $188 per hundredweight. What was the total cost?

\[
\begin{align*}
\text{Cost per hundredweight for first heifer} & = \frac{216}{100} = 2.16 \\
389 \times 2.16 & = $840.24 \\
\text{Cost per hundredweight for second heifer} & = \frac{202}{100} = 2.02 \\
395 \times 2.02 & = $797.90 \\
\text{Cost per hundredweight for third heifer} & = \frac{225}{100} = 2.25 \\
375 \times 2.25 & = $843.75 \\
\text{Cost per hundredweight for fourth heifer} & = \frac{188}{100} = 1.88 \\
420 \times 1.88 & = $789.60 \\
840.24 + 797.90 + 843.75 + 789.60 & = \$3271.49
\end{align*}
\]

9. Travis White bought 15 head of cattle with an average weight of 389 pounds. He paid a total $3,244.95. What was the average price per head?

\[
\begin{align*}
\text{Average price per head} & = \frac{3244.95}{15} = \$216.33
\end{align*}
\]
At the Sale Barn

Activity 3 Worksheet 1: Cattle Market Report (ANSWERS)

Name: __________________________ Date: __________________________

Class/Hour/Teacher: __________________________

FEEDER STEERS MEDIUM AND LARGE (PARTIAL LIST)
Report Date 4/26/2019-5/2/2019, Oklahoma National Stockyards, Oklahoma City, OK

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</tbody>
</table>
Use the Cattle Market Report chart to answer the following questions.

1. Find the central tendency numbers for the “fleshy” cattle

   Mean: $488.31   Median: $166.50   Mode: None   Range: 67

2. Find the central tendency numbers for the “unweaned” cattle

   Mean: $436.75   Median: $495   Mode: None   Range: 300

3. Find the central tendency numbers for the “full” cattle

   Mean: $123.22   Median: $126   Mode: None   Range: 18

4. Using the data, what was the total purchase price for the “Thin Fleshed” lot?

   Total purchase price: $94,854.89

Which measure of central tendency (mean, median, or mode) would provide the most descriptive information for this data? ANSWERS CAN VARY

Based on the data, what conclusions can you draw about the cattle market? ANSWERS CAN VARY

Based on the data, what predictions can you make about the cattle market? ANSWERS CAN VARY