MCMS
6th Grade
NTI Packet
Day 18

Day 18 6th Grade Math

Name _____

Reteaching
19-5

Frequency Tables and Histograms

Maya recorded the number of bags of popcorn she sold each day at the carnival, and then represented the data in a frequency table and histogram.

Bags of popcorn: 62, 65, 58, 31, 64, 58, 66, 68, 56, 67, 68, 51

Make a Frequency Table

Choose a Range: The range should cover all of the data. Divide the range into equal intervals or groups.

Range in popcorn data: 31 to 68, or 38
You can make intervals of 10 by using a range of 30 to 69.

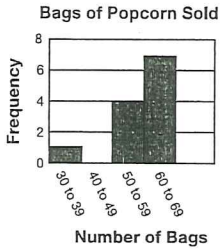
Tally Marks: Record a tally mark for each value in the range.

Frequency: Count the tally marks and record.

Bags	Tally	Frequency
30–39	I	1
40–49		0
50–59	IIII	4
60–69	𝍸 II	7

Make a Histogram

Choose a Title: Bags of Popcorn Sold
Choose a Scale for the Vertical Axis: Use frequency of the data for the scale.
List Intervals on Horizontal Axis



Use a Histogram

Look for clusters, gaps, and outliers.

Clusters: 50–69 for popcorn data
Gaps: 40–49; no bags sold in this interval
Outliers: 1 bag sold in 30–39 range

Use the information below for **1** through **3**.

Tickets Sold to Charity Ice-Skating Event							
72	81	88	51	90	89	85	74
87	100	80	99	87	96	99	84
84	86	94	88	91	85	78	90

1. Represent the data in the table in a histogram.
2. Where do most of the data in your histogram cluster?

_____

3. **Reasoning** Describe any outliers or gaps in the data.

_____

_____

_____

Name _____

Practice
19-5

Frequency Tables and Histograms

Conrad recorded the number of hours he spent on the Internet for two weeks. He made a frequency table of the data. Use the table for **1** through **2**.

Hours on the Internet	
Hours	Frequency
0–4	2
5–9	3
10–14	7
15–19	0
20–24	0
25–29	2

1. What is the mode of the data? Explain.

_____

_____

_____

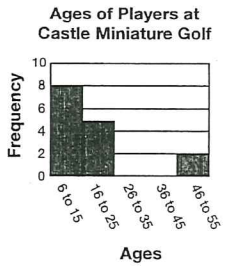
2. How many days did Conrad spend 9 hours or less on the Internet? Explain.

_____

_____

Use the information below for **3** through **5**.

Ages of Players at Castle Miniature Golf				
14	7	6	24	15
9	19	25	10	17
51	8	21	48	12



3. How many of the players are over 25? Explain.

_____

_____

4. Where do most of the data in the histogram cluster?

A 6–15 **C** 26–55
B 16–25 **D** Over 15

5. **Writing to Explain** Explain how you can tell whether a histogram has an outlier.

_____

_____

_____

_____

Basic Skills with Decimals Name_____ ID: Day 8

DO NOT USE A CALCULATOR

Date_____ Period____

Find each sum.

1) 226.3 + 262.53

A) 315.89 B) 649.33
C) 492.43 D) 488.83

2) 91.4 + 160.2

A) 443.16 B) 179.4
C) 608.7 D) 251.6

3) 243.1 + 89.9

A) 583.2 B) 333
C) 555.3 D) 711.4

4) 17.601 + 340.8

A) 558.401 B) 112.901
C) 165.201 D) 358.401

Find each difference.

5) 19.629 – 5.6

A) 462.229 B) 430.929
C) 14.029 D) 55.529

6) 353.6 – 99.1

A) 523.9 B) 314.1
C) 166 D) 254.5

7) 341.5 – 212.1

A) 85.4 B) 376
C) 179.56 D) 129.4

8) 468 – 246.13

A) 247.829 B) 369.67
C) 221.87 D) 321.17

Find each quotient.

9) 3.3 ÷ 3.3

A) 5.91 B) 1
C) 4 D) 6.6

10) 2.1 ÷ 1.4

A) 1.5 B) 3.5
C) 6.4 D) 7.4

11) 5.4 ÷ 2

A) 5.17 B) 7.4
C) 2.7 D) 3.4

12) 0.5 ÷ 5

A) 7.6 B) 2.5
C) 10 D) 0.1

Find each product.

13) 0.6 × 2

A) 1.08 B) 1.2
C) 10.8 D) 2.6

14) 9.8 × 3.4

A) 4.51 B) 30.52
C) 13.2 D) 33.32

15) 1.3 × 9.9

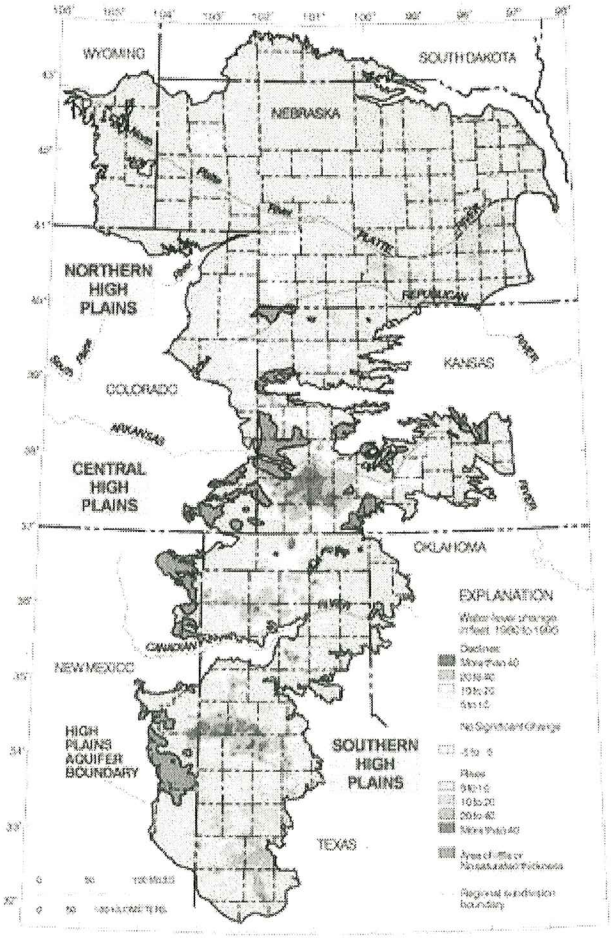
A) 11.2 B) 8.81
C) 12.87 D) 71.036

16) 2.7 × 0.35

A) 0.945 B) 3.05
C) 2.045 D) 0.045

High and Dry

by Kirsten Weir



changes in the Ogallala aquifer from 1980 to 1995

High Plains residents are draining their hidden water supply.

The state of Nebraska gets its name from the Native American word for the "flat water" that flows across its plains. Today we call that water the Platte River. Turns out the state name is more fitting than those early Nebraskans imagined. The state sits atop a vast pool of underground H2O known as the High Plains *aquifer*.

An aquifer is an underground layer of rocks or soil that holds significant amounts of water. The High Plains aquifer, also called the Ogallala aquifer, is one of the largest groundwater reservoirs in the world. It lies under nearly the entire state of Nebraska, as well as parts of Colorado, Kansas, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming.

For decades, residents of those states have been extracting water from the aquifer. But all that pumping has taken a big toll. Could the huge store of groundwater be tapped dry one day?

Major Pileup

The High Plains aquifer was born from the action of wind, water, and a really big crash. About 65 million years ago, two *tectonic plates* began to collide along the western edge of North America, slowly pushing the Rocky Mountains high into the sky. Tectonic plates are enormous sections of Earth's rigid shell. Even as the mountains were being pushed skyward, wind and water began *weathering* (gradually breaking down) the peaks and carrying away the *sediment* (bits of sand and rock), says James Goeke. Goeke is a *hydrologist* at the University of Nebraska in Lincoln. A hydrologist is a scientist who studies water on or below Earth's surface.

Rivers and streams carried sediment from the mountains eastward, where it slowly built up to form the High Plains in the western-central United States. In the process, water was trapped underground. That all happened between 5 million and 20 million years ago, says Goeke, and the aquifer has existed ever since.

The thickness of the High Plains aquifer varies from place to place. In some spots, it's a few feet thick. In others, it's 1,000 feet. In some areas, the aquifer is largely gravel, with a lot of room for water between the rocks. In others, the aquifer is essentially tightly packed sand that holds less water.

Since the 1940s, when pumping began, 88 trillion gallons of water have been extracted from the aquifer, estimates Virginia McGuire, a U.S. Geological Survey scientist. Enough water to equal the volume contained by 18 Colorado Rivers is sucked from the aquifer every year.

America's Breadbasket

Where does all that water go? "Over 95 percent of the water that's pumped is for irrigation," McGuire says. Nineteen percent of the country's wheat, 19 percent of its cotton, and 15 percent of its corn are grown in fields overlying the aquifer. The High Plains states make up the heart of "America's breadbasket," the Midwestern region whose grains feed millions of people. Without irrigation, the High Plains crops would wither and die.

Already, farmers are feeling the pinch of the dwindling groundwater. In parts of Texas and Kansas, water levels have dropped more than 45 meters (150 feet). Farmers in those areas have to dig more and deeper wells to extract enough water for their fields, Goeke says. "As the water levels drop, you have to pull the water from ever-greater depths," he says. "It's more expensive to irrigate." In some places, farmers have abandoned their wells altogether.

Water does make its way back into the aquifer. Rain trickles into the soil and becomes groundwater. Surface water also helps restore the aquifer. In some places, water from rivers and streams seeps through layers of rock until it, too, joins up with the groundwater. But people are taking out water much faster than nature is able to replace it. If the pumping stopped today, it would take 6,000 years of rainfall to replace the water that has been removed. Meanwhile, the pumping continues.

High Plains farmers and researchers are looking for ways to save water. Some farmers have switched from corn, a very thirsty plant, to other crops, such as wheat and sunflowers, that don't need as much water. Plant researchers are trying to create new varieties of corn that thrive in drier

conditions.

New irrigation systems also can reduce water consumption. Traditional irrigation systems spray water over an entire field, but much of it evaporates before the plants can soak it up. Newer drip irrigation systems supply water directly to the plants' roots so that less water is lost to evaporation.

The situation in the High Plains isn't unique. Aquifers are a source of water for billions of people around the globe. We need to conserve them, says Goeke. "In many cases, I don't think we use water as wisely or efficiently as we might be able to," he adds. "Water is so critical to our existence. We can't afford to waste it."

Name: _____ **Date:** _____

1. According to the passage, how thick is the High Plains aquifer?

A. between 5 million and 20 million feet thick

B. between a few feet to 1,000 feet thick

C. no one knows how thick it is

D. it is all the same thickness

2. Farmers are facing a problem of decreasing water levels in the High Plains aquifer. According to the passage, which of the following is one of the possible solutions to this problem of dwindling water supply?

A. find another aquifer in the area to use

B. pump more water from the aquifer

C. switch from corn to other crops that require less water

D. continue to use traditional irrigation systems

3. Based on the passage, what will most likely happen if people continue to pump water from the High Plains aquifer?

A. Farmers do not need to worry because nature can replace the water very quickly.

B. There will be more water that can be found in another aquifer nearby.

C. The aquifer would need more than 6,000 years of rainfall to replace the water.

D. The water in the aquifer can be replaced by rainfall very.

4. Read the following sentence:

"Without irrigation, the High Plains crops would wither and die."

As used in the sentence, **irrigation** means

A. a source of water

B. a source of sunlight

C. removing rocks from the ground

D. a source of soil

5. What is this passage mostly about?

A. farmers who are planting different varieties of corn

B. the High Plains aquifer that is running out of water

C. the High Plains aquifer that will never run out of water

D. how tectonic plates create mountains and aquifers

6. Read the following sentence from the passage:

"The High Plains aquifer was born from the action of wind, water, and a really big crash." Using the passage, describe the process that created the High Plains aquifer.

7. Based on the passage, why have some farmers most likely abandoned their wells?

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

_____ the High Plains aquifer's water supply is dwindling, farmers and researchers are looking for ways to save the water.

A. so

B. because

C. after

D. though

6th English
NTI Day #18

Directions
Read this article. Then answer questions 36 through 42.

Weed Wars

by Roberta Kwok

Weeds are plants that people don't want. When weeds grow on a farm, they hog light, water and nutrients. Then crops don't grow as well.

Farmers used to get rid of weeds by pulling them or digging them out with a hoe. (In poorer countries, many farmers still do this.) Sometimes farmers would cover the soil to block weeds from getting sunlight or throw salt on the weeds to kill them.

Then scientists found chemicals called herbicides that kill weeds. The best herbicide was glyphosate. But farmers had to be careful because glyphosate could also kill crops. Farmers could spray fields with glyphosate only before planting crops. Otherwise, they had to use special equipment that would ensure glyphosate was applied to weeds only.

In the 1990s, something big happened: Scientists made crops that couldn't be killed by glyphosate. They changed the plants' DNA, the genetic instructions that tell cells which molecules to make. If farmers planted these glyphosate-resistant crops, they could spray the herbicide all over the field anytime and kill weeds without harming crops.

"It became very simple," says Steve Duke, a plant scientist at the U.S. Department of Agriculture in Oxford, Miss. "Just spray once or twice, kill everything [but your crops]."

Farmers loved those glyphosate-resistant crops. They started planting more and more of them and using more and more glyphosate.

Winning the lottery

Some people thought glyphosate would work forever. But the weeds were evolving. That means their DNA was changing.

Once in a while, changes to a weed's DNA would allow that weed to survive the glyphosate. The chances of changes like this were very, very small. But when farmers used glyphosate year after year on millions of hectares[1] of crops, "what seems almost impossibly improbable becomes more probable," Duke says.

Mike Owen, a weed scientist at Iowa State University in Ames, compares the process to a lottery. If one person buys a lottery ticket, his or her chances of winning are tiny. But when millions of people play, chances are good that at least one person will pick the

[1] 1 hectare equals 2.47105 acres

winning combination of numbers. As weeds were sprayed with glyphosate every year, it was like billions of plants were buying lottery tickets over and over, trying to "win" resistance to glyphosate. Eventually, some weeds were going to hit the jackpot. It didn't take long for that to happen. In 1996, Australian scientists found a weed called rigid ryegrass that couldn't be killed with normal levels of glyphosate. In 2001, a researcher in the United States reported another resistant weed, called horseweed. Now at least 21 weed species have evolved glyphosate resistance.

Copy that

One of these weeds is called palmer pigweed. It's a leafy plant that can grow two or three inches per day and reach 10 feet tall. "You can sit there and put it on your desk and you can watch it grow," Culpepper[2] says.

These weeds are especially good at becoming resistant to glyphosate. They pass pieces of DNA to each other through their pollen, tiny particles that fertilize plants. So if one palmer pigweed plant figures out how to fight glyphosate, it can give the information to another palmer pigweed. Each fertilized weed can make about half a million seeds. A lot of those seeds can grow into new resistant weeds.

But how are these weeds changing their DNA to resist glyphosate? Todd Gaines, a weed scientist at the University of Western Australia in Crawley, wanted to find out.

Glyphosate normally kills weeds by attaching to a molecule in plant cells called an enzyme. The enzyme helps the cells make other molecules called amino acids, which the plants need to survive. (Amino acids are the building blocks of proteins, which play a role in everything from building tissues to relaying signals about health and a plant's environment.) But when glyphosate sticks to the enzyme, the enzyme no longer works.

Gaines' team found that resistant palmer pigweed plants contain extra copies of a segment of DNA. Called a gene, this DNA piece contains instructions for making the enzyme targeted by glyphosate. Cells of the resistant plant made a lot more of that enzyme —so many that glyphosate couldn't block all of them. These plants were able to keep growing normally.

Outsmarting the weeds

Getting rid of resistant weeds won't be easy. But farmers have their own tricks.

They can use a mixture of herbicides. If a weed is resistant to one herbicide, maybe a different herbicide will kill it. Some weeds, however, are already resistant to several herbicides. For example, Tranel's[3] team found weeds in Illinois that resist four different types of weed-killing chemicals.

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[2] **Stanley Culpepper:** weed scientist at the University of Georgia in Tifton

[3] **Patrick Tranel:** weed scientist at the University of Illinois at Urbana

So farmers will have to use more than one strategy to fight weeds.

Some might plant crops such as rye and then flatten them. The flattened rye will block sunlight from reaching the soil and keep weed seeds from sprouting. Some weed seeds need to be close to the soil's surface to sprout, so farmers could use a plow to bury the seeds deeper underground.

Scientists at the University of Western Australia are also working on a contraption called a seed destructor. When farmers use machines to harvest their crops, the machines pick up weed seeds and spit them back onto the field. The seed destructor will capture the seeds and grind them up.

But no solution will protect all crops, scientists realize. This means many solutions must be developed to manage the many types of weeds that bully the many types of crops in farms across the world.

36 How do lines 18 through 21 build on the idea introduced in lines 10 through 13?

A by showing a relationship between DNA and plant growth

B by showing how changes in DNA can help weeds as well as crops

C by showing that weeds continue to resist farmers' attempts to kill them

D by showing how glyphosate is a long-term solution to the problem of weeds

37 What is the meaning of the phrase "impossibly improbable" as it is used in lines 21 through 23?

A usually certain

B highly unlikely

C extremely slow

D rarely noteworthy

38 Which conclusion is **best** supported by lines 27 through 32?

A The DNA of weeds evolves rapidly.

B Changes to the DNA of plants can occur by chance.

C Greater quantities of glyphosate are required to kill weeds.

D Plants evolve more quickly in some parts of the world than in others.

39 Which statement **best** describes the main idea of the section titled "Winning the lottery"?

A Farmers used glyphosate for many years on millions of hectares of crops.

B The odds of any one person winning the lottery are tiny.

C Many people expected glyphosate to work forever.

D Several kinds of weeds developed a resistance to glyphosate.

40 The section titled "Copy that" relates to the section titled "Winning the lottery" by

A providing evidence to support an opinion

B introducing new ways to solve a problem

C providing an example to explain a main idea

D describing events in the order that they take place

41 Lines 49 through 53 support which of the following claims?

A The use of glyphosate should be stopped because the herbicide has proven to be a failure.

B The only way to prevent weeds from resisting herbicides is to change the DNA of weeds.

C Blocking sunlight from reaching the soil is the best way to prevent weed seeds from sprouting.

D Fighting weeds is especially difficult because of their ability to evolve to resist threats.

42 What is the **most likely** reason the author describes the seed destructor in lines 64 through 67?

A to support the idea that farmers need to use a variety of methods to fight weeds

B to show how technology is the solution to uncontrollable weed growth

C to explain why mechanical methods to fight weeds are better than herbicides

D to describe how scientists have found the best way to protect desirable crops

How The Maya Lived

This text is adapted from an original work of the Core Knowledge Foundation.

The Maya were an American Indian people who lived in Mesoamerica. Their civilization thrived between the years 200 and 900 CE.



Maya farmers raised food for the people of their large cities. In the lowland areas, farmers created waterways to redirect and save water.

How did the Maya Live?

Most Maya people made their living as farmers. Their main crop was corn. One of their main foods was something you may have eaten-a flat bread called a tortilla (/tor*tee*uh/). Farmers also grew beans, squash, sweet potatoes, tomatoes, and pumpkins.

Maya farmers lived in one-room huts made out of mud and grass. Families lived in walled areas that had several huts. Men and boys did the farming. Women and girls took care of the house, cooked, and made clothing and pottery.

Every culture has practices that seem odd to other people. The Maya did two things that may seem a little strange to you. They considered crossed eyes to be beautiful. So mothers would hang something in front of a baby's nose to help the baby develop crossed eyes. The Maya also viewed a flat head as a symbol of beauty. They would strap a long board to the backs of newborn babies. As the babies' heads rested against the board, the board gradually flattened the back of the babies' soft skulls.

Coming of Age

Before age five, Maya children were cared for by parents and other relatives. At age five, they took on new responsibilities, such as helping with farming and household chores. A boy had a white bead braided to his hair. A girl had a string tied to her waist with a red shell attached.

These symbols remained in place until the children reached the age of fourteen. At this point, an initiation ceremony was performed to mark their passage to adulthood. A priest would pick a day when the stars were favorable. Then the priest would cut the bead from the boy's hair. A girl's mother would cut the string from her daughter's waist. Then the parents would have a celebration with family members and neighbors.

After these ceremonies, boys moved into a house for unmarried men. There they would remain until they got married. Marriages were arranged. In the hard life of Maya farmers, marriages were not romantic affairs. They were more like business deals between families.

As with the initiation ceremonies, priests picked marriage dates. They checked with the stars and the gods to find a day that would bring good fortune. However, no Maya couple expected married life to bring only good fortune. The Maya believed that every aspect of life was controlled by the gods. Because some gods were good and some were bad, they expected life to include both joy and sorrow.



The Maya believed that the gods controlled all aspects of life, and they consulted the stars for guidance.

Name: _____ **Date:** _____

1. What did most Maya people do to make a living?

A. they traded

B. they farmed

C. they hunted

D. they stole

2. What does this text describe?

A. This text describes how the Maya lived and some of their important traditions and ceremonies.

B. This text describes what the Maya people thought was the most beautiful way to look and dress.

C. This text describes the way Maya marriages were arranged and how they were more like business deals between families.

D. This text describes the way the Maya people built their one-room huts using mud and grass.

3. At age five Maya children took on new responsibilities.

What evidence from the text supports this statement?

A. Maya children were cared for by parents and other relatives.

B. A girl had a string tied to her waist with a red shell attached.

C. Children started helping with farming and household chores.

D. The Maya believed that every aspect of life was controlled by the gods.

4. Read these sentences from the text:

Priests picked marriage dates. They checked with the stars and the gods to find a day that would bring good fortune. However, no Maya couple expected married life to bring only good fortune. They Maya believed that every aspect of life was controlled by the gods. Because some gods were good and some were bad, they expected life to include both joy and sorrow.

Based on this information, what can you conclude about what Maya people thought when they felt sorrow?

A. They believed the sorrow was their own fault.

B. They believed the sorrow was random.

C. They did not believe in sorrow.

D. They believed the sorrow was controlled by the gods.

5. What is the main idea of this text?

A. When Maya people got married, a priest would pick the marriage date to make sure that it would bring good fortune. They knew, however, that like would include both joy and sorrow, because some gods were good and some were bad.

B. The Maya people did very weird things to their infants. Mothers would hang something in front of a baby's nose to help the baby develop crossed eyes. They also would strap a long board to the backs of newborn babies.

C. Most Maya people were farmers who lived in one room huts. From birth to marriage, the Maya people had many unique traditions and ceremonies that symbolized things such as beauty, growth, and good fortune.

D. A priest would cut a bead from the boy's head at age 14to mark their passage to adulthood. After this ceremony, boys moved into a house for unmarried men. There they would remain until they got married.