

# THE BILLY GOATS GRUFF

## JOHN DAVIES

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## Mathematics: 5<sup>th</sup> and 6<sup>th</sup> Grade

### Students will:

- Categorize numbers in a table.
- Find the mean, median, mode and range of the information given.

**Copies for Each Student:** The Story of the Opera, The Characters, Worksheet 1, Worksheet 2

**Copies for the Teacher:** The Story of the Opera, The Characters, Worksheet 1, Worksheet 2, Answer Sheets

### Getting Ready

Read the “Story of the Opera” and “The Characters” as a class. Discuss and familiarize the students with the story and themes. Explain that the Goats from the story will be involved in completing math equations. At that time, review basic math operations you will be using in this lesson.

**Instructional Time:** One 45-minute class period

### Introduction

The first half of this Then have the students read the information and arrange the numbers in the table to find the mean, median, mode and the range of the numbers given.

### Guided/Independent Practice

Give each student a copy of the guided practice worksheet. Read the instructions on the guided practice. With the instructor’s assistance, have the students calculate the answers on Worksheet 1. Then give each student a copy of the independent practice worksheet. Depending on the class size, you may choose to have the students work as a whole class, in small groups or individually. Have the students complete Worksheet 2. Give time to check answers in class.

### Evaluation

- Did the students complete and understand Worksheets 1 and 2?

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## TEKS

Mathematics

### 5<sup>th</sup> – 6<sup>th</sup> Grade:

(13) Probability and statistics

The student solves problems by collecting, organizing, displaying, and interpreting sets of data. (B)

(15) Underlying processes and mathematical tools

The student communicates using informal language. (A)

**Gardner's Intelligences:** Linguistic, Logical -Mathematical

**Bloom's Taxonomy:** Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation

### Sources:

*The Billy Goats Gruff* Libretto

Warrack, John and West, Ewan, The Oxford Dictionary of Opera, Oxford University Press, 1992.

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# The Story of the Opera

*The Billy Goats Gruff* is a one-act opera adapted from a traditional fairy tale, and features music by Mozart, Donizetti, and Rossini.

The story takes place in a forest clearing, along the road between the Billy Goats' home and school. The road crosses a bridge over a stream, and this bridge is the central focus of all the action.

The story begins as three billy goats named Lucy, Ernesto, and Dandini celebrate on their way home from school. From the other side of the bridge, another billy goat named Osmin watches them sing and play. When they begin a game of hide-and-seek, he declares that he will spoil their game. Hearing his voice, the three billy goats begin to feel afraid, but reassure each other and begin their game. Dandini is the first to count, and Lucy and Ernesto run off to hide.

Meanwhile, Osmin brags about being a bully. When the three friends return, he hides behind a tree. Then they hear Osmin's voice, asking sarcastically if he can join their game. The three billy goats are afraid, and decide to go home, but Osmin declares that he will not allow them to cross the bridge without a fight. He begins calling them names, steals Lucy's doll, and chases them all away. Then he puts up a sign next to the bridge reading "KLOSED," and leaves.

The three friends return, and Ernesto tells Lucy and Dandini that he recognizes Osmin, warning them about all the mean things a bully might do. They decide to avoid the bridge, taking the long way home, but Lucy refuses to leave her doll, which is still "hiding" in the tree on the other side of the bridge. The three billy goats muster up their courage to cross the bridge and get the doll, and declare that they will teach the bully a lesson. Osmin overhears them and steps onto the bridge, scaring the three friends away.

The three billy goats return again, whispering a plan to tiptoe across the bridge. Meanwhile, Osmin listens from a distance. Ernesto manages to sneak over the bridge to retrieve Lucy's doll. Osmin pops up to scare him and Ernesto is so startled that he throws the doll up in the air.

Osmin catches the doll, plays with it in a mocking way, and declares that he will keep it. He puts the doll in the tree and hides again.

From his hiding place, Osmin warns the three billy goats to go away, threatening the doll. Ernesto and Dandini leave to tell an adult about trouble they have been having with the bully, but Lucy still refuses to go anywhere without her doll. She confronts Osmin, asking him to give her doll back. She steps onto the bridge and approaches Osmin to take back the doll. Osmin threatens her and says she's "just a girl," but she does not listen. When Osmin grabs Lucy's arm, she hits him in self-defense, causing him to fall off the bridge. He comes out of the water on the verge of tears, and Lucy reproaches him, telling him never to mess with a mother. Then she asks Osmin if he is all right. He says he is, and then asks Lucy if she is all right. She says she is all right, but that her doll doesn't like to be thrown.

When Ernesto and Dandini return, they are surprised to see that Lucy has her doll back. When they ask how she did it, Lucy says that Osmin was nice enough to give it back. She even claims that Osmin has promised to play nicely and consider others' feelings in the future. When Osmin looks surprised, she whispers to him, asking if he would like her to tell them that a *girl* pushed him into the swamp. He agrees to this understanding, and all four billy goats become friends, joining in a game of hide-and-seek.

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# The Characters

**Osmin:** (baritone) A big boy billy goat who has no friends. Osmin is a bully. He is mean and gets enjoyment from making other people feel bad. At the end, he explains that he has been very lonely and really does want to play with the other billy goats. It takes getting knocked off the bridge by little Lucy to get his attention and make him behave.

**Lucy:** (soprano) A young girl billy goat who loves to play with her doll, Lucy D. Lammermoor, and her best friends Ernesto and Dandini. Lucy is small and not very strong, but she is very brave and not afraid to do the right thing. She is also smart, and is the reason everyone becomes friends in the end.

**Ernesto:** (mezzo soprano) A young boy billy goat who loves his friends. Ernesto is brave when he tries to get Lucy's doll back, but is also not afraid to ask for help when he needs it.

**Dandini:** (tenor) A young boy billy goat who also loves his friends, Lucy and Ernesto. Dandini goes with the flow and chooses to accompany Ernesto to ask a grownup for help with the bully.

**Link to Musical Excerpts:**

<http://www.operatales.com/billy-goat.shtml>

Name: \_\_\_\_\_

Date: \_\_\_\_\_

***The Billy Goats Gruff***  
**Worksheet 1 – Guided Practice**

Draw tally marks to calculate the frequency of the billy goats' height.

45, 52, 50, 50, 52, 46, 46, 49, 53,  
52, 52, 53, 48, 47, 49, 45, 51, 55,  
49, 46, 46, 48, 43, 46, 45, 47, 48,  
50, 50, 44, 44, 43, 45, 46, 49, 48

| Height | Tally Marks | Frequency |
|--------|-------------|-----------|
| 41-43  |             |           |
| 44-46  |             |           |
| 47-49  |             |           |
| 50-52  |             |           |
| 53-55  |             |           |
| Total  |             | 36        |

Using the above information, answer the questions below.

What is the:

Mean: \_\_\_\_\_

Median: \_\_\_\_\_

Mode: \_\_\_\_\_

Range: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## *The Billy Goats Gruff* Worksheet 2 – Independent Practice

Below are the numbers of grass blades the billy goats eat in a week's time. Draw tally marks to calculate the frequency of their grass intake.

| Capacity | Tally Marks | Frequency |
|----------|-------------|-----------|
| 751-755  |             |           |
| 756-760  |             |           |
| 761-765  |             |           |
| 766-770  |             |           |
| 771-775  |             |           |
| 776-780  |             |           |
| 781-785  |             |           |
| 786-790  |             |           |
| 791-795  |             |           |
| 796-800  |             |           |
| Total    |             | 54        |

777, 756, 780, 785, 768, 759,  
773, 770, 765, 779, 782, 796,  
780, 795, 776, 752, 758 790,  
797, 796, 785, 788, 778, 784,  
789, 790, 785, 763, 759, 781,  
755, 786, 762, 769, 751, 780,  
754, 752, 769, 773, 760, 758,  
799, 793, 752, 768, 789, 800,  
772, 762, 751, 780, 799, 777

Using the above information, answer the questions below.

What is the:

Mean: \_\_\_\_\_

Median: \_\_\_\_\_

Mode: \_\_\_\_\_

Range: \_\_\_\_\_

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**ANSWER KEY**

*The Billy Goats Gruff*  
**Worksheet 1 – Guided Practice**

Draw tally marks to calculate the frequency of the billy goats' height.

45, 52, 50, 50, 52, 46, 46, 49, 53,  
52, 52, 53, 48, 47, 49, 45, 51, 55,  
49, 46, 46, 48, 43, 46, 45, 47, 48,  
50, 50, 44, 44, 43, 45, 46, 49, 48

| Height | Tally Marks | Frequency |
|--------|-------------|-----------|
| 41-43  | II          | <b>2</b>  |
| 44-46  | IIIIIIIIII  | <b>12</b> |
| 47-49  | IIIIIIII    | <b>10</b> |
| 50-52  | IIIIIIII    | <b>9</b>  |
| 53-55  | III         | <b>3</b>  |
| Total  |             | <b>36</b> |

Using the above information, answer the questions below.

What is the:

Mean: \_\_\_\_\_ **48** \_\_\_\_\_

Median: \_\_\_\_\_ **48** \_\_\_\_\_

Mode: \_\_\_\_\_ **46** \_\_\_\_\_

Range: \_\_\_\_\_ **12** \_\_\_\_\_

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**ANSWER KEY**

*The Billy Goats Gruff*  
**Worksheet 2 – Independent Practice**

Below are the numbers of grass blades the billy goats eat in a week’s time. Draw tally marks to calculate the frequency of their grass intake.

777, 756, 780, 785, 768, 759,  
773, 770, 765, 779, 782, 796,  
780, 795, 776, 752, 758 790,  
797, 796, 785, 788, 778, 784,  
789, 790, 785, 763, 759, 781,  
755, 786, 762, 769, 751, 780,  
754, 752, 769, 773, 760, 758,  
799, 793, 752, 768, 789, 800,  
772, 762, 751, 780, 799, 777

| Capacity | Tally Marks | Frequency |
|----------|-------------|-----------|
| 751-755  | IIII        | 7         |
| 756-760  | IIII        | 6         |
| 761-765  | III         | 4         |
| 766-770  | IIII        | 5         |
| 771-775  | III         | 3         |
| 776-780  | IIIIIIII    | 9         |
| 781-785  | IIII        | 6         |
| 786-790  | IIII        | 6         |
| 791-795  | II          | 2         |
| 796-800  | IIII        | 6         |
| Total    |             | 54        |

Using the above information, answer the questions below.

What is the:

Mean: 775

Median: 777

Mode: 780

Range: 49