MARCH MADNESS BASKETBALL TOURNAMENT

MATH PROJECT

COMMON CORE ALIGNED

Decimals, Fractions, Percents, Probability, Rates, Algebra, Word Problems, and More!

To Use:

-Print out all the worksheets.

-Introduce each activity to your students before the tournament starts. This is important so that students can not only set a purpose before the tournament starts, but so they also know what information they need to look for and keep track of during the tournament.

-Follow the March Madness Basketball Tournament online, on TV, or through the newspaper.

-Track the tournament by having students use a blank printable tournament bracket. A link to the printable bracket is provided on the next page.

-Keep track of wins, losses, and games played in each round of the tournament on the printable tournament bracket. Students can do this individually, or you can do this as a whole class.

-Complete the activities throughout the tournament. Access any necessary websites to complete the questions.

-Use the rubric provided to assess your students on this project.

*The activities in this packet can be completed at different times throughout the tournament (or even throughout the year). Be sure to read the directions for each activity in order to determine the appropriate time to complete it. Remember, if you choose not to follow the March Madness Tournament as it's happening, you can complete some of these activities at any time during the year as long as you have the necessary data.

*In 2013, the NCAA started referring to the 4 play-in games that happen before the tournament as the "first round." Advise students to disregard this. The first round starts when there are 64 teams seeded 1-16.

Materials: Computer with internet or newspaper, pencil, papers (worksheets) provided, blank bracket sheet (print off internet)

Websites to be Used:

•NCAA home page:
   http://www.ncaa.com/sports/basketball-men/d1

•Location of all Universities in USA:
   https://en.wikipedia.org/wiki/Category:Lists_of_universities_and_colleges_by_U.S._state

•List of all College Basketball Teams (organized by division):
   http://espn.go.com/mens-college-basketball/teams

•ESPN Men's Basketball:
    http://espn.go.com/mens-college-basketball/tournament

•NCAA Men's Basketball Printable Bracket:
   http://www.cbssports.com/images/collegebasketball/ncaa-tournament/brackets/printable/cbs-sports-2017.pdf

•NCAA Men's Basketball Online Bracket:
   http://www.cbssports.com/collegebasketball/ncaa-tournament/brackets/viewable_men

•Statistics and Information about Favorite Player:
   http://espn.go.com/mens-college-basketball/statistics

Evaluation: See attached scoring rubric.

Math Common Core State Standards:

<u>5th Grade Common Core Standards Addressed:</u>

-5.OA.1- Use parenthesis, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

-5.OA.2- Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

-5.OA.3- Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

-5.NBT.3- Read, write, and compare decimals to thousandths.

-5.NBT.5- Fluently multiply multi-digit whole numbers using the standard algorithm.

-5.NBT.6- Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

-5.NBT.7- Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or relationships between addition and subtraction.

-5.NF.3- Interpret a fraction as division of the numerator by the denominator. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

-5.NF.1- Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

-5.NF.2- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

-5.MD.2- Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.

6th Grade Common Core Standards Addressed:

-6.RP.1- Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

-6.RP.2- Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.

-6.RP.3- Use ratio and rate reasoning to solve real-world and mathematical problems e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams or equations.

-6.NS.3- Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

-6.NS.4- Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

-6.EE.2- Write, read, and evaluate expressions in which letters stand for numbers.

-6.EE.5- Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

-6.EE.6- Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set

-6.EE.7: Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

-6.SP.1- Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

-6.SP.2- Understand that a set of data collected to answer a statistical question has a distribution which can be spread by its center, spread, and overall shape.

-6.SP.3- Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

-6.SP.4- Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

6th Grade Common Core Standards Addressed (continued...):

-6.SP.5- Summarize numerical data sets in relation to their context, such as by:

-Reporting the number of observations.

-Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

-Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

-Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

THE COMPETITION
Page 1

Name: _____

(Start this activity before the tournament begins, and complete it throughout the tournament. Use this sheet to keep track of the data from each round.)

Website to be used for this page:
http://www.cbssports.com/images/collegebasketball/ncaa-tournament/brackets/printable/cbs-sports-2017.pdf

1.) FILL OUT A BRACKET: Fill out an entire bracket before the tournament begins by picking the teams that you think will win each game.

2.) FOLLOW THE GAMES: After each round of the tournament, look at your bracket and determine the number of correct picks you made. Circle the games you picked correctly, and cross out the games you picked incorrectly.

3.) COMPLETE THE TABLE BELOW: Use the data from your bracket to complete the data in the table below.

ROUND	Write the total number of games played in the round.	Write the total number of games you picked correctly in the round.	Point value for correct picks in each round.	Calculate your points in each round by multiplying the number of correct picks by the point value.
Round of 64			1 point/game	
Round of 32			2 points/game	
Sweet 16			4 points/game	
Elite 8			8 points/game	
Final 4			16 points/game	
NCAA Final			32 points/game	

Use this data table to complete the questions on the pages titled The Competition Page 2.

★ 32 points? Wow! Did you pick the championship team correctly? ★

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THE COMPETITION

Page 2

(Complete this page at the end of the tournament.)

4.) TOTAL YOUR POINTS: How many total points did you score from all rounds of the tournament? *(Calculate by adding all the numbers in the last column of your data table.)*

_____

5.) COMPETE WITH YOUR CLASSMATES: Form a group with at least three other classmates. List each group members' total points (calculated from the previous question) in the space below.

(Teacher note: Instead of forming groups, you can complete this data using your entire class instead of groups.)

Scores:

6.) COMPLETE THE QUESTIONS BELOW: Use the data set above to answer the questions below.

What is the mean average score of the group? _____

What is the median score of the group? _____

Was your score greater than, less than, or equal to the mean average score? _____

Who is the champion with the highest score in the group? _____

Who had the lowest score in the group? _____

What is the range of this data set? _____

Name: _____

THE ELIMINATION

Page 1

(To be completed during or after the tournament. Use this sheet to keep track of the games won and lost throughout each round.)

1.) Find the number of teams eliminated after each round, and record it in the table below.

2.) Calculate the fraction of the teams that are eliminated after each round. Record your data in the table below.

3.) Change each fraction to a decimal and a percent. Record your data in the table below:

ROUND	Write the number of teams eliminated in each round.	Write the number of teams eliminated in each round as a fraction of the total teams that started the tournament.	Reduce the fraction in the column to the left to its simplest form.	What percent of the total teams were eliminated?	Write the percentage of teams eliminated as a decimal amount.
Round of 64					
Round of 32					
Sweet 16					
Elite 8					
Final 4					
NCAA Final					

Use this data table to complete the questions on the pages titled The Elimination Page 2 and Page 3

Space to complete work on next pages...

THE ELIMINATION
work space to complete table:

Reduce Fraction from Round of 64	Reduce Fraction from Round of 32
Reduce Fraction from Sweet 16 Round	Reduce Fraction from Elite 8 Round
Reduce Fraction from Final 4 Round	Reduce Fraction from NCAA Final Round

Name: _____

THE ELIMINATION
work space to complete table:

Fraction to Percent from Round of 64	Fraction to Percent from Round of 32
Fraction to Percent from Sweet 16 Round	Fraction to Percent from Elite 8 Round
Fraction to Percent from Final 4 Round	Fraction to Percent from NCAA Final Round

THE ELIMINATION
work space to complete table:

Percent to Decimal from Round of 64	Percent to Decimal from Round of 32
Percent to Decimal from Sweet 16 Round	Percent to Decimal from Elite 8 Round
Percent to Decimal from Final 4 Round	Percent to Decimal from NCAA Final Round

THE ELIMINATION
Page 2
(To be completed during or after the tournament.)

4.) Do you see the pattern in the amount of teams that were eliminated each round? Describe the pattern you see.

_____

_____

_____

_____

5.) If another round was added, how many teams would start the tournament? How many teams would start the tournament if two rounds were added?

_____

_____

_____

6.) Do you see the pattern in the amount of teams that start the tournament if more rounds are added? Describe the pattern you see.

_____

_____

THE ELIMINATION

Page 3
(To be completed during or after the tournament.)

7.) If two more rounds were added to the 64-team tournament, how many teams would be eliminated in the first two rounds (Note: assume each team has to play a game in the rounds you add)?

_____

_____

_____

8.) Find the sum of the fractions in the table on *The Elimination Page 1*. Does the sum of the fractions add up to 1? Why or why not? If more rounds are added, will the sum of the fractions add up to 1? Why or why not?

Explain your answer: _____

_____

_____

9.) Find the sum of the decimals in the table on *The Elimination Page 1*. Show your work below.

10.) Find the sum of the percentages in the table on *The Eliminate Page 1*. Show your work below.

Name: _____

TAKE YOUR CHANCES

Page 1
(To be completed during or after the tournament.)

1.) If all 64 teams in the NCAA Basketball Tournament were put into a bag, what would be the probability of drawing the winning team out of the bag? Show the answer as a fraction, decimal, and a percentage.

Fraction:_____   Decimal:_____   Percentage:_____

Work Space

2.) Assume that the NCAA decided to add another round to the NCAA Basketball Tournament and invited 128 teams instead of 64. What would be the probability of drawing the winning team out of the bag? Show the answer as a fraction, decimal, and a percentage.

Fraction:_____   Decimal:_____   Percentage:_____

Work Space

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Name: _____

TAKE YOUR CHANCES

Page 2
(To be completed during or after the tournament.)

3.) Do your chances of picking the winning team increase or decrease if more teams are added to the tournament? Explain your answer.

_____

_____

_____

_____

_____

_____

_____

TAKE YOUR CHANCES

Page 3

(To be completed during or after the tournament.)

Use these websites:

List of all College Basketball Teams (Organized by division): http://espn.go.com/mens-college-basketball/teams

Location of all Universities in USA: https://en.wikipedia.org/wiki/Category:Lists_of_universities_and_colleges_by_U.S._state

Name: _____

4.) How many states have teams playing in this year's tournament?

5.) How many teams are from your home state?

6.) From which state would you have the best chances of choosing a team if the team were drawn from a bag? Show your work below:

Explain your answer: _____

_____

_____

Name: _____

TAKE YOUR CHANCES
Page 4
(To be completed during or after the tournament.)

7.) How many states out of the 50 states are represented? Show the answer as a fraction, decimal, and a percentage.

Fraction:_____   Decimal:_____   Percentage:_____

Work Space

Name: _____

Statistics and Data Closing Activity

Page 1
(To be completed after the tournament.)

Choose one of the four regions from the NCAA Tournament, and write it below.

Region: _____

You will create a data set by finding the number of wins for each team in the region that you chose. Record this data in the table titled *Statistics and Data Closing Activity: Table to Record Number of Wins.*

1.) Put the data set (from the table titled: *Statistics and Data Closing Activity: Table to Record Number of Wins*) in order from least to greatest.

2.) For your data set, find:

a.   Mean   _____ (round to the nearest tenth if necessary)

b.   Median   _____

c.   Mode(s)   _____

d.   Maximum   _____

e.   Minimum   _____

f.   Range   _____
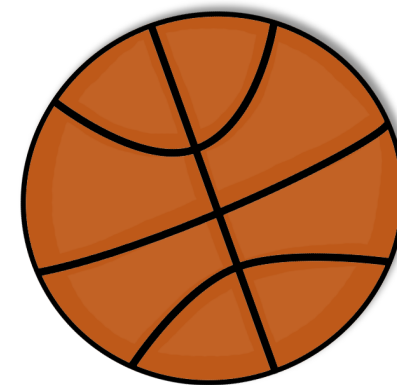
Name: _____

Statistics and Data Closing Activity:
Table to Record Number of Wins
Page 2

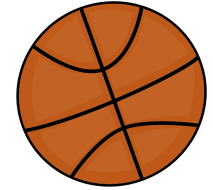| Team	Number Of Wins
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	

Name: _____

Statistics and Data Closing Activity
Page 3
(To be completed after the tournament.)
Work Space

Mean	Median
Mode	Range

Name: _____

Statistics and Data Closing Activity
Page 4
(To be completed after the tournament.)

3.) Use the data from the *Statistics and Data Closing Activity: Table to Record Number of Wins*, to create a line plot in the space below. The line plot will show how many teams won a certain number of games.

Name: _____

Statistics and Data Closing Activity

Page 5

(To be completed after the tournament.)

Use the line plot you created on the previous page to answer the following questions.

4.) How many teams had zero wins? _____

5.) What number of wins was the most common? _____

6.) How many teams had less than three wins? _____

7.) How many teams had at least one win? _____

8.) Which team had the most wins? _____

9.) Is there an outlier in your line plot? If yes, what is the outlier?

_____

Name: _____

Your Favorite Player Statistics Page

Page 1
(To be completed when the tournament ends.)

Website to be used for this page:
http://espn.go.com/mens-college-basketball/statistics

Who is your favorite player in the tournament this year? Choose a player and write his name below.

_____

1.) Go to the website that is provided at the top of the page. Navigate through the statistics to find your favorite player, and write down the following statistics. You will then use a variable to represent these statistics, and write an equation.

  -   Average points per game:

   _____   Let (p) represent this number for the problems on page 2.

  -   Average rebounds per game:

   _____   Let (r) represent this number for the problems on page 3.

  -   Average assists per game:

   _____   Let (a) represent this number for the problems on page 4.

  -   Total number of games played by your player for the tournament:

   _____   Let (g) represent this number for the problems on page 2, 3, and 4.

Your Favorite Player Statistics Page
Page 2
(To be completed when the tournament ends.)

Writing Equations

2.) Now that you know the average amount of <u>points</u> your favorite player scored per game, you can find the total amount of <u>points</u> your player scored for the entire tournament.

You can do this by multiplying the average points per game (p) by the total number of games played in the tournament (g).

Average points per game:

_____ Let (p) represent this number to write the equation below.

Total number of games played by the player for the entire tournament:

_____ Let (g) represent this number to write the equation below.

> **Write the equation here and solve:**

3.) What does this equation and the answer represent? Explain: _____

_____

_____

Name: _____

Your Favorite Player Statistics Page
Page 3
(To be completed when the tournament ends.)

Writing Equations

4.) Now that you know the average amount of <u>rebounds</u> your favorite player got per game, you can find the total amount of <u>rebounds</u> your player got for the entire tournament.

You can do this by multiplying the average rebounds per game (r) by the total number of games played in the tournament (g).

Average rebounds per game:

_____ Let (r) represent this number to write the equation below.

Total number of games played by the player for the entire tournament:

_____ Let (g) represent this number to write the equation below.

Write the equation here and solve:

5.) What does this equation and the answer represent? Explain: _____

_____

_____

Name: _____

Your Favorite Player Statistics Page

Page 4
(To be completed when the tournament ends.)

Writing Equations

6.) Now that you know the average amount of <u>assists</u> your favorite player earned per game, you can find the total amount of <u>assists</u> your player earned for the entire tournament.

You can do this by multiplying the average assists per game (a) by the total number of games played in the tournament (g).

Average assists per game:

_____ Let (a) represent this number to write the equation below.

Total number of games played by the player for the entire tournament:

_____ Let (g) represent this number to write the equation below.

Write the equation here and solve:

7.) What does this equation and the answer represent? Explain: _____

_____

_____

Your Favorite Player Statistics Page
Page 5
(To be completed when the tournament ends.)

8.) Now that you know the equation to determine the total <u>points</u> your favorite player scored (p), solve for the total points your player *would* have scored if they had half as many points per game. Write the equation and solve.

9.) Now that you know the equation to determine the total <u>points</u> your favorite player scored (p), solve for the total points your player *would* have scored if they played three more games. Write the equation and solve.

Your Favorite Player Statistics Page

Page 6

(To be completed when the tournament ends.)

10.) Now that you know the equation to determine the total <u>rebounds</u> your favorite player got per game (r), how many rebounds *would* your favorite player need to get in order to have 150 rebounds for the entire tournament? Write the equation and solve.

11.) If your favorite player wanted to get 50 <u>assists</u> for the entire tournament, how many assists *would* your favorite player need to get per game? You can find this by dividing the 50 assists by the amount of games played (p). Write the equation and solve.

Name: _____

Writing Mathematical Expressions
Page 1
(To be completed any time before, during, or after the tournament.)

Write the expression:

1.) Your favorite player scored 5 more points than another player(p).

2.) Your favorite player had 15 points less than the leading scorer (s).

3.) Your favorite player got (r) rebounds in the first half, and then 8 more in the second half.

4.) Your favorite player scored half as many points as another player (p).

5.) Your favorite player scored 3 times the numbers of points as another player (p).

6.) Your favorite player had 13 more assists than another player (p).

7.) Your favorite player scored five less than twice the number of points by another player (p).

8.) Your favorite player had 3 more than twice the amount of blocks than another player (p).

Name: _____

March Madness Basketball Tournament
Math Project Rubric

	Beginning Level 1	Developing Level 2	Complete Level 3	Outstanding Level 4
Worksheets	Worksheets were incomplete with no explanations.	Worksheets had some incomplete answers with little explanation for most.	All worksheets were complete with few errors. Explanations to questions were complete.	All worksheets were completed accurately and completely. Explanations to questions were precise and went above expectations.
Organization	Materials were lost and/or unorganized throughout the project. Time given to work on the project at school was never used wisely. Did not complete assignments on time	Materials were somewhat organized throughout the project. Time given to work on the project at school was not always used wisely. Some assignments were completed on time.	Materials were organized throughout the project. Time given to work on the project at school was always used wisely. Assignments were completed on time.	Materials were organized and kept in order throughout the project. Time given to work on the project at school was always used wisely. Completed some of the project outside of school. Assignments were completed on time.

Comments:

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_____
Total Points

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