



**PRO FOOTBALL HALL OF FAME YOUTH AND EDUCATION**

# MATHEMATICS

**ACTIVITY GUIDE 2019-2020**





# PRO FOOTBALL HALL OF FAME

ACTIVITY GUIDE 2019-2020

## MATHEMATICS TABLE OF CONTENTS



LESSON	COMMON CORE STANDARDS	PAGES
Attendance is Booming	MD	MA 1
Be an NFL Statistician	MD	MA 4
Buying and Selling at the Concession Stand	NOBT	MA 5
Driving the Field With Data	MD	MA 6
Finding Your Team's Bearings	GEO	MA 7
Hall of Fame Shapes	GEO	MA 8
Jersey Number Math	NOBT	MA 9-10
Math Football	NOBT	MA 11
How Far is 300 Yards?	MD	MA 12-13
Number Patterns	NOBT, MD	MA 14-15
Punt, Pass and Snap	NOBT, MD	MA 16
Running to the Hall of Fame	NOBT, MD	MA 17
Same Data Different Graph	MD	MA 18-19
Stadium Design	GEO	MA 20
Surveying The Field	MD	MA 21
Using Variables with NFL Scorers	OAT	MA 22-24
What's In a Number?	OAT	MA 25-26
Tackling Football Math	OAT, NOBT, MC	MA 27-36
Stats with Randy Moss	RID	MA 37-38
NFL Wide Receiver Math	RID	MA 39-40
NFL Scoring System	OAT	MA 41-42
Tom Benson HOF Stadium Geometry	GEO	MA 43-44
Miscellaneous Math Activities		MA 45
Answer Keys		MA 46-48

# Attendance Is Booming

**Goals/Objectives:**

Students will:

- Review front end estimation and rounding.
- Review how to make a line graph.

**Common Core Standards:** Measurement and Data**Methods/Procedures:**

- The teacher can begin a discussion asking the students if they have ever been to an NFL game or if they know anyone who has gone to one. Discuss the positives of attending an NFL Game (i.e the excitement of the crowd).
- As a class, the teacher will use the board or overhead projector to show samples of how to round. Depending on the students' abilities, the students can round to the nearest thousand, hundred, tenth, hundredth, etc.
- Once the teacher feels secure that the students can round numbers, the teacher will introduce front-end estimation. Remind the students that when doing front-end estimation they should take the first number and turn everything else into a 0. Examples:  $17,000 = 10,000$ ;  $22,000 = 20,000$ ;  $45.16 = 40$
- Depending upon ability, students will do the worksheet independently, with a partner, or as a whole class. It can also be revised for older students to estimate the number of tickets sold, for example, in 1990 and 1989. It can also be adjusted to do subtraction problems, such as to compute how many more tickets were sold in one year than in another. Once they have their answers they need to decide whether or not it makes sense.
- Students can also find the landmarks of the data: median, mode, maximum and range.
- Once the chart is completed, the students will take this information and use it to create a line graph. If students are unfamiliar with line graphs, it can be done as a class on the overhead. If you choose, you can assign different groups a type of graph to complete and the students can judge which one best shows the data. Some examples could be a bar graph or scatter plot.

**Materials:**

- Estimation worksheet
- Line graph worksheet
- Smartboard, Overhead, Chalk, or Dry Erase Board
- Pencils

**Assessment:**

- Teacher Observation
- Worksheets





# How Many People Attended NFL Games?

**Directions:** Use the following numbers that tell the average number of people who purchased tickets to NFL games during the regular season. Round the number and then use front-end estimation. *(Compiled from 2019 NFL Record and Fact Book)*

Year	Average Attendance	Rounding	Front End Estimation
2018	64,173		
2017	64,156		
2016	66,725		
2015	65,524		
2014	65,386		
2013	65,772		
2012	65,074		
2011	64,698		
2010	64,978		
2009	65,043		
2008	66,625		
2007	66,836		
2006	66,666		
2005	66,455		
2004	66,409		
2003	66,328		
2002	66,755		
2001	65,187		

# How Many People Attended NFL Games?



Directions: Use the rounded numbers to make a line graph.

Graph Title: \_\_\_\_\_





# Be an NFL Statistician

## Goals/Objectives:

Students will:

- Create a graph of information obtained from a data set.
- Analyze data recorded on a graph.
- Calculate the mean, median, and mode of Super Bowl MVP's by starting position.

## Common Core Standards: Measurement and Data

## Methods/Procedures:

- Using Superbowl.com, have students record the starting position of each MVP from all Super Bowl games. Students should record this information in a graph (bar, pie, line). Have students analyze the data as follows:
  - \* Find the position that is the mode of the data set.
  - \* Find the median of the data set.
  - \* Find the mean of the data set.
  - \* Find the mean of each position relative to the number of Superbowls.

## Materials:

- Super Bowl MVP's information
- Paper
- Pen or pencil
- Calculator (optional)
- Colored pencil (optional)

## Assessment:

- Students will be assessed on accuracy of responses.

# MATHEMATICS

# Buying and Selling at the Concession Stand



## Goals/Objectives:

Students will:

- Review counting money
- Practice addition, subtraction, and multiplication facts
- Make change for purchases at a football concession stand
- Write monetary units using the dollar sign and the decimal point

**Common Core Standards:** Number Operations in Base Ten

## Methods/Procedures:

- As a whole class or small group activity, have students create a menu board for a concession stand. The menu should include foods typically served at a football game such as hot dogs, popcorn, soda, Cracker Jacks, etc., and should include competitive pricing.
- Students should work in pairs so each student has a turn as the buyer and the seller. Make sure each pair of students has a copy of the menu board for the concession stand with the items for sale and prices on it. Give each student an envelope with various amounts of play money.
- Have each student complete a tally ticket, which asks questions about the possibilities afforded them with their available money. Questions posed on the tally ticket could include the following:
  1. How much money do you have to spend at the game?
  2. If your family of four wants to buy hot dogs and drinks, how much will it cost for all of you? How much change will you receive?
  3. Do you have enough money to buy one of each item on the menu board? How much will it cost? How much change will you receive? \*Partners should check one another's tally ticket responses for accuracy.
- Have students role play the purchasing of food at the concession stand. The buyer should order items from the menu board. The seller should create a receipt for the buyer. Then, the buyer should pay the bill and the seller makes change if necessary. Each partner should check the monetary transactions performed for accuracy.

## Materials:

- Envelopes
- Play money (assortment of bills and coins)
- Materials for constructing a menu board
- Tally Ticket

## Assessment:

- Student participation
- Accuracy of answers on Tally Ticket
- Accuracy of monetary transactions
- Teacher observations of money skills, addition, subtraction and multiplication



# Driving the Field With Data

## Goals/Objectives:

Students will:

- Practice with units of measurements: yards, feet, inches.
- Keep statistics for an individual player of their choice.
- Review the concept of *to scale*.

## Common Core Standards: Measurement and Data

## Methods/Procedures:

- Students will use a replica of a football field (drawn to scale, unless a trip to the high school stadium can be arranged) and practice measuring.
- Students will practice measuring 'downs.'
- Students will use the statistics of a player to see how the yardage is compiled.

## Materials:

- Rulers
- Measuring tape
- Pencils
- Small footballs (can use the example from the drawing section)
- Actual Football Field if available

## Assessment:

- Students will be able to explain what a football field looks like and draw a replica of a field (yard markers, etc.)
- Teacher observations of students' measurements
- Teacher and students can review data collected



# Finding Your Team's Bearings



## Goals/Objectives:

Students will:

- Demonstrate an understanding of the concept of bearings.
- Demonstrate an understanding of the two types of information given on a compass:
  1. Direction – North, East, South, West
  2. Bearings – degree measurements (North = 0 or 360 degrees, East = 90 degrees, South = 180 degrees, and West = 270 degrees)

## Common Core Standards: Geometry

## Methods/Procedures:

- Students need a protractor and a United States map showing major cities (All NFL Cities should be shown)
- The teacher will review the concept of bearings:
  - The directions on a compass – North, South, East and West also can be described by degree measurements
- North = 0 degrees and 360 degrees; East = 90 degrees; South = 180 degrees; West = 270 degrees
- The teacher models using a protractor to find bearings.
- Each student is assigned an NFL Team in which the students need to find the bearings their team will take to each game.

For example: Cleveland Browns

- A. Play at home against the Pittsburgh Steelers their second game – skip
- B. In their third game the Browns must travel to Baltimore – what is the bearing they must travel?
- C. In their fourth game the Browns must travel to Cincinnati – so for purposes of this exercise what is the bearing the team must travel from Baltimore to Cincinnati?
- D. In their fifth game, the Browns must travel back home to play the New York Giants – so for purposes of this exercise what is the bearing the team must travel from Cincinnati to Cleveland?
- E. Etc.

## Materials:

- Access to the Internet
- Access to NFL team websites at [www.nfl.com](http://www.nfl.com) (links to team sites are at the top of the page)
  - Schedules can be printed for the students before the lesson
- Map of the U.S.
- Protractor, paper and writing tool

## Assessment:

- Teacher Observations
- Check for accuracy of bearings

## Adaptation for primary grades:

- Have students locate two cities on a large map. For example, Baltimore to Cleveland and then instead of using bearings have the students estimate the approximate direction between the cardinal compass points.



# Hall of Fame Shapes

## Goals/Objectives:

Students will:

- Locate and name planes and solid shapes: circle, square, triangle, diamond, oval, sphere, pyramid, cone, cylinder, cube
- Find planes and solid shapes in the environment
- Sort objects by shape
- Graph everyday objects
- Write or dictate a sentence related to each shape that was located

## Common Core Standards: Geometry

## Methods/Procedures:

- Students will review plane and solid shape names and the characteristics of each.
- Students will locate real objects to match these shapes in their classroom, school building or home and match them to class models of these shapes. Pictures of familiar objects will be sorted, classified and graphed by shape name.
- Teacher prepares name tags for groups, each depicting one plane and one solid shape.
- Students will tour the Pro Football Hall of Fame to get an overview. During a shape scavenger hunt through the building, groups of students (those wearing the same shape name tags) will find real objects that are the same as the plane and solid shape depicted on their tag.
- The chaperone accompanying each group of students will allow a group member to take a photo of each shape that was found on the shape scavenger hunt and will record the name of the object.
- Photos will be developed or printed. Chaperone will give teacher a list of what their group photographed. Each group of students will write or dictate a sentence about the shape, such as, "The ring is a circle."
- If a field trip to the Hall of Fame cannot be made, students should use the Hall of Fame's website at [Profootballhof.com](http://Profootballhof.com) to view its exhibits

## Materials:

- Models of shapes
- Name tags depicting one plane and one solid shape
- Disposable or digital camera for each group of 3-4 students
- Paper/pencil for chaperone to record shape names

## Assessment:

- Teacher observation during the trip
- The photo product from the shape scavenger hunt
- The sentences written or dictated by the students

# MATHEMATICS

# Jersey Number Math



## Goals/Objectives:

Students will:

- Research Hall of Famers' jersey numbers.
- Using <http://www.profootballhof.com/players/> find the jersey number worn by each player
  - In the "Find Your Hero" Bar, type in the last name of the player you are looking for
  - After you search for this player, click on "View Profile"
  - When you get to the player, do not scroll down the page, click on "Career Capsule"
    - If "Career Capsule" is not listed, look at some of the pictures of the player and use the jersey number in those pictures
  - This will take you to the players basic information
  - At the bottom of that page you will see "Uniform Number"
- Solve basic addition and subtraction facts

**Common Core Standards:** Number Operations in Base Ten

## Methods/Procedures:

- Students will research Pro Football Hall of Famers' jersey numbers.
- Students will complete the Hall of Famer Jersey Math Worksheet
- Students can find a Hall of Famer's jersey number for the answer.
- This can be adapted to multiplication and division as well.

## Materials:

- Computer
- Access to the Internet
- Access to <http://www.profootballhof.com/players/>
- Hall of Famer Jersey Math Worksheet
- Pen or Pencil

## Assessment:

- Accuracy of answers on Hall of Famer Jersey Math Worksheet.



MATHEMATICS

# Hall of Famer Jersey Math

**Directions: Look up the Hall of Famers number. Use the Hall of Famers number to complete each equation.**

$$\begin{array}{r} \text{Len Dawson} \\ + \text{Troy Aikman} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Dave Casper} \\ + \text{Bart Starr} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Lou Groza} \\ + \text{Andre Tippett} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Dan Hampton} \\ + \text{Fritz Pollard} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Dan Dierdorf} \\ + \text{Mike Haynes} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Larry Csonka} \\ + \text{John Elway} \\ \hline \end{array}$$

$$\begin{array}{r} \text{George Blanda} \\ - \text{Guy Chamberlin} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Terry Bradshaw} \\ - \text{Wilber Henry} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Mike Ditka} \\ - \text{Charlie Sanders} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Ozzie Newsome} \\ - \text{Joe Montana} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Jerry Rice} \\ - \text{Jack Ham} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Curtis Martin} \\ - \text{Joe Namath} \\ \hline \end{array}$$

$$\begin{array}{r} \text{John Randle} \\ - \text{Lou Creekmur} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Bronko Nagurski} \\ + \text{Joe Perry} \\ \hline \end{array}$$

$$\begin{array}{r} \text{Jack Youngblood} \\ + \text{Dan Marino} \\ \hline \end{array}$$



# MATHEMATICS

# Math Football



## Goals/Objectives:

Students will:

- Practice math facts for review.
- Create a fun way to practice math facts.

## Common Core Standards: Number Operations in Base Ten

## Methods/Procedures:

- The class will be divided into two equal groups (teams).
- Students will need pencil and paper.
- Students from each team will be given a number that matches one other student from the opposing team.
- The teacher will choose a captain and quarterback from each team. There will be a coin toss at the beginning to see which team will kickoff or receive.
- The team that kicks will choose a card from the kickoff cards, which represents different lengths of kicks. The ball will be marked on the overhead.
- The teams will compete by working on the problems given by the teacher.
- Once the problem is given, the teacher will wait 5-10 seconds and pull a number chip. The players from each team that represents the number drawn will get to answer the problem. The person who answers first gets a first down or a block for their respective team.
- If the offensive team gets blocked 3 times, they must go to the 4th down cards or try for a field goal (if they are inside the opposing team's 40 yard line). Passing cards are allowed after every third play, as long as the offensive team has at least one first down.
- Play continues until time runs out.
- The team with the most points wins. If tied, the team with the most first downs wins. If first downs are tied, then the winner is determined by most blocks.
- Chalkboard is used to record points, first downs and blocks.

## Materials:

- Paper, pencil, chalk & chalkboard, White Board or SMART Board
- Overhead projector & football field overhead
- Math sheets & number chips
- Cards for kickoff, 4th down pile and passing

## Assessment:

- Teacher observation
- Teacher visually checks problems worked on paper.



# How Far is 300 Yards?

**Goals/Objectives:**

Students will:

- Convert measurements between yards, feet, and inches.
- Measure objects to the nearest inch, foot, and yard.

**Common Core Standards:** Measurement and Data**Methods/Procedures:**

- Students will use a ruler to determine how many inches there are in a foot.
- Students will measure three items to the nearest inch (i.e., their pencil, book, crayon, desk, etc.) Share with the class and explain how they obtained their results.
- Students will then measure some objects to the nearest foot i.e., the White Board/SMART Board, door, height, etc. Then students will compute how many inches that would be. Students will share their conversions and procedures with the class so the teacher can assess understanding.
- Students will then use a yardstick to measure several objects i.e., a counter, a carpet, or a table. Then students will convert the number of yards to the amount of feet and inches. Students will share answers with the class so the teacher can assess understanding. These results can be made into a table on the chalkboard.
- Students will then complete the worksheet provided on the following page with the table to convert the number of yards gained during the football game to inches and feet.
- After the students complete the worksheet, they may go outside to the playground or football field and see the actual measurements.
- Older students can then compare their answers and discuss why there are different results. Was everyone precise with their measuring? Which measurements are accurate? Discuss how most measurements contain some error in them.

**Materials:**

- Ruler with inches
- Yard stick
- Materials in the classroom to measure
- Worksheet (easy or harder version)
- Pencils

**Assessment:**

- Teacher Observation
- Worksheet Accuracy

# MATHEMATICS

# Math Football



**Directions:** Below is a list of some of the players who earned 300 combined net yards in a single game. Complete the chart by converting the amount of net yards in a game to feet and inches.

Player	Team	Yards	Feet	Inches
Jason Tucker	Dallas Cowboys	331		
Jermaine Lewis	Baltimore Ravens	308		
Jacoby Ford	Oakland Raiders	329		
Glyn Milburn	Denver Broncos	404		
Tyrone Hughes	New Orleans Saints	347		
John Taylor	San Francisco 49ers	321		
Willie Anderson	Los Angeles Rams	336		
Joshua Cribbs	Cleveland Browns	316		
Stephone Paige	Kansas City Chiefs	309		
Lionel James	San Diego Chargers	345		
Adrian Peterson	Minnesota Vikings	361		
Walter Payton	Chicago Bears	300		
Darren Sproles	San Diego Chargers	317		
Steve Smith	Carolina Panthers	313		
Gale Sayers	Chicago Bears	339		



# Number Patterns

## Goals/Objectives:

Students will:

- Students will determine number patterns from a given set of numbers

**Common Core Standards:** Number Operations in Base Ten; Measurement and Data

## Methods/Procedures:

- Students will be given a chart with the yardage gained from running backs in each quarter of a game.
- Students will look at the number in each quarter to determine the number pattern.
- Students will then determine either how to continue the pattern or what number in the pattern is missing.
- Students will share the number operations they used to determine the pattern.

## Materials:

- Number Pattern Worksheet
- Pencils

## Assessment:

- Teacher Observation
- Worksheet Accuracy



# MATHEMATICS

## Number Patterns



**Directions: Fill-in the charts below by analyzing the numbers given to determine the numbers needed to complete each pattern.**

Running Back	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
A	3 yards	6 yards	9 yards	
B	15 yards		25 yards	30 yards
C		16 yards	20 yards	24 yards
D	28 yards	40 yards		64 yards

What is running back A's number pattern? \_\_\_\_\_

What is running back B's number pattern? \_\_\_\_\_

What is running back C's number pattern? \_\_\_\_\_

What is running back D's number pattern? \_\_\_\_\_

You may use the space below to show your work.

Running Back	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
A	4.5 yards	8 yards	11.5 yards	
B	12.2 yards		26.8 yards	34.1 yards
C		15.4 yards	17.1 yards	18.8 yards
D	28.6 yards	39 yards		59.8 yards

What is running back A's number pattern? \_\_\_\_\_

What is running back B's number pattern? \_\_\_\_\_

What is running back C's number pattern? \_\_\_\_\_

What is running back D's number pattern? \_\_\_\_\_

You may use the space below to show your work.



# Punt, Pass and Snap

## Goals/Objectives:

Students will:

- Learn the proper techniques of punting, passing and snapping a football.
- Calculate the mean, median and mode of the class's data for these three football skills.
- Compare/contrast the three different sets of data.

**Common Core Standards:** Number Operations in Base Ten; Measurement and Data

## Methods/Procedures:

- Introduce and define the three measures of central tendency: mean=average, median=exact middle, mode=number occurring most often
- Set up a chart for the class listing all students' names, leaving blank sections to record the distance each student throws, kicks and long-snaps the ball.
- Teach students to execute all three skills, allow time for practice.
- Have students take turns throwing the football as far as they can, recording the distance each student throws in yards. Repeat this procedure with the kick and long snap.
- Have students arrange the data on a visual chart, graph or number line in ascending order, displaying individual statistics.
- Instruct students to calculate the mean, median and mode for each of the 3 sets of data.
- Guide students through a comparison of each set of data and discuss why they differ.

## Materials:

- Footballs
- Paper
- Pen/pencil
- Clipboards
- Chart paper
- Whistle
- Field marked off in yards

## Assessment:

- Teacher Observation
- Completion of mean, median and mode calculations

# Running to the Hall of Fame



## Goals/Objectives:

Students will:

- Create a scatter plot with information on attempts and yards gained.
- Create a best fit line which would show the slope of the line as the average yards per carry.

**Common Core Standards:** Number Operations in Base Ten; Measurement and Data

## Methods/Procedures:

- Find information on attempts and yards gained for Hall of Fame running backs like Jim Brown, Jim Taylor and Walter Payton.
- Create a scatter plot using the x-axis for number of attempts and the y-axis for yards gained.
- Plot the (x,y) points of at least seven Hall of Fame running backs.
- Create a best fit line (straight line that represents these x,y data points).
- Find a good slope  $\frac{Y2-Y1}{X2-X1}$  of this best fit line.
- This should be the approximate yards per carry of these great running backs.

## Materials:

- Computers (Hall of Famer information on ProFootballHOF.com)
- Graph paper
- Rulers
- Colored pencils
- Calculators.
- Sports books for reference like 2019 NFL Record and Fact Book.

## Assessment:

- Students will be able to show a best fit line on a scatter plot graph. The average yards per carry should be reasonable (slope of line calculated).



# Same Data Different Graph

## Goals/Objectives:

Students will:

- Take data provided by the teacher and as a class, group or individual, compare differing representations of it to determine which representation best imparts the intended message or meaning.

## Common Core Standards: Measurement and Data

## Methods/Procedures:

- This lesson can be undertaken prior to or after visiting the Pro Football Hall of Fame or the Hall of Fame website at [Profootballhof.com](http://Profootballhof.com). Students will have held at least one discussion on professional football and various aspects of the sport to make certain all students are somewhat familiar with the game.
- The teacher will then provide the students with data from this activity guide or from the website ([ProFootballHOF.com](http://ProFootballHOF.com).) A good source in this activity guide is the page listing the current Super Bowl Champs, the Denver Broncos (page MA 35). This page has a column that lists which college each player attended. Students can use this data in their data representations (bar, pie etc.).
- At this point the instructor should decide whether to do this data representation as a class, group or individual. Doing one graphic representation (i.e. bar graph) of colleges attended by the winning Super Bowl team as a class is a great starting point for discussion and reference point.
- Students can be assigned to do another graph (i.e. pie) by filling in the proper 'slice' with college name as a transition to doing a representation without any assistance.
- If the teacher chooses individual or group work instead of class as a whole work, time should be set aside to present graphs and findings to class.
- The class should come to a consensus or at the least discuss which graphic representation best imparts the information. The strong and weak points of each representation should be addressed.

## Materials:

- Access to the Internet
- Access to HOF website at [ProFootballHOF.com](http://ProFootballHOF.com)
- Statistics to graph....i.e. Current Super Bowl Team Members' Roster in Activity Book

## Assessment:

- Students will present to the class graphical representations and analysis of the data.
- See examples on the following page.



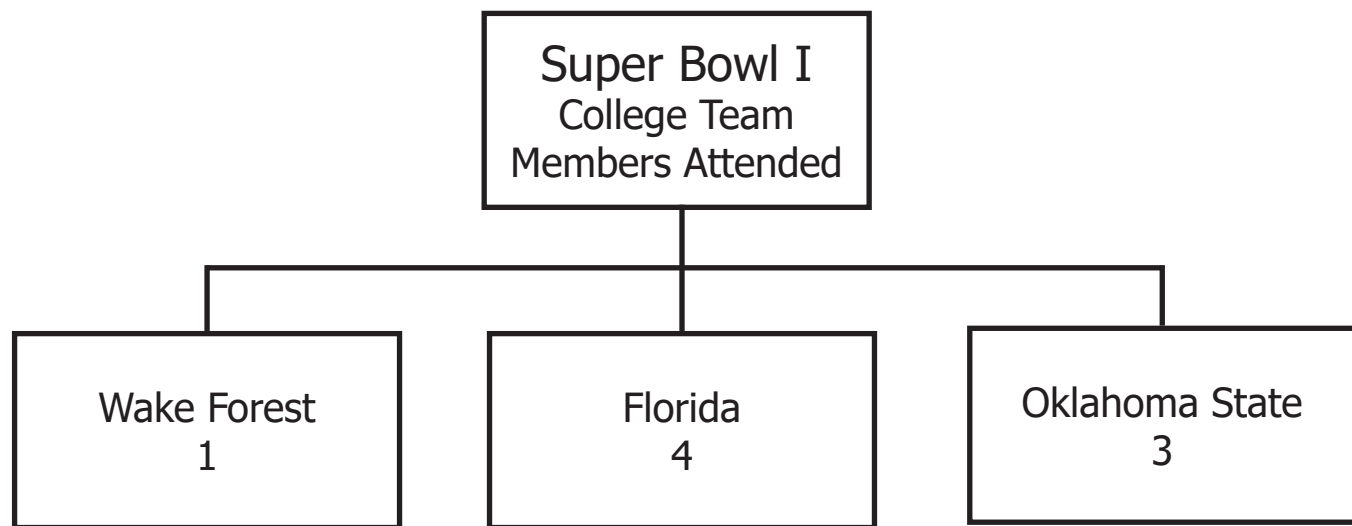
# Same Data Different Graph



## Example 1:

Ohio State	Illinois	Alabama	Pitt
2	1	3	1

## Example 2:





# MATHEMATICS

# Stadium Design

## Goals/Objectives:

Students will:

- Follow Directions and Create a New Football Stadium using knowledge of shapes and numbers.

## Common Core Standards: Geometry

## Methods/Procedures:

- Students will work in pairs or small groups. (Building Teams)
- Each team will review a list of requirements that the stadiums must have to be considered complete.
- Each team will plan and draw their stadium.
- Each team will check to make sure they meet each requirement.

## Materials:

- Drawing paper for each pair or group
- Pencils
- Rulers
- Checklists

## Assessment:

- Observation of team discussions
- Completed stadium drawings

# MATHEMATICS

## Surveying The Field



### Goals/Objectives:

Students will:

- Design a survey, collect data and interpret data collected related to an 'issue' in professional football.

### Common Core Standards: Measurement and Data

### Methods/Procedures:

- Prior to visiting to the Pro Football Hall of Fame or the Hall of Fame website (Profootballhof.com), students will have held one (or more if necessary) discussion on professional football and the role it plays in the lives of individuals today.
- The teacher will guide the discussion to include 'issues' or concerns that students have thought of themselves or have read or seen in the media. An example might be the age that an individual should be before he can be drafted by an NFL team. Another could be the role that women play in the NFL. The possibilities are endless and students will have no problem compiling a significant list of 'issues.'
- At this point the instructor should decide whether this is an individual OR a group project.
- Once the make-up of the study's members is decided, students need to write the survey question or issue in a coherent and statistically measurable format.
- After the instructor approves the format of the issue to be surveyed, students must collect data from an adequate audience population and a representative audience. Because this is part of the standard's requirements and will be part of the instructor's evaluation criteria, the audience and population of the audience is something the student(s) must determine.
- Once the survey has been completed, the student(s) will interpret the data with graphical displays. At this point, the instructor can determine the format and the quantity of diverse graphic representations that are necessary.
- The student(s) must include in their presentation variability as a factor, correlation and standard deviation.
- The presentation can be in the form of a class lecture by each student or group or in the form of a turn-in project. The use of the tri-fold science fair board is a great method of display for data and explanation of 'issue.'

### Materials:

- Access to the Internet
- Access to HOF website at ProFootballHOF.com
- Optional science fair tri-folds

### Assessment:

- Students will present to the class or in report form to the instructor the results and analysis of the data collected.



# Using Variables with NFL Scorers

## Goals/Objectives:

Students will:

- Create number sentences with variables and then solve the variables using story problems

**Common Core Standards:** Operations and Algebraic Thinking

## Methods/Procedures:

- The class will begin discussing how many points are usually scored in a football game.
- The class will use the worksheets provided on the following pages to make number sentences with variables and then solve the variables.

## Materials:

- Pencil
- Worksheet

## Assessment:

- Classroom participation
- Completion of worksheet



# Using Variables with NFL Scorers



**Directions:** For each problem write a number sentence to solve the problem and see how many points the top 10 NFL scorers made. Then find out the variable by using another sheet of paper. Use the table to help you. The first one has been done for you.

TYPE OF PLAY	POINTS
Touchdown	6
Field Goal	3
Extra Point	1

1. Adam Vinatieri has scored 2,605 points. He scored one 2-point conversion and kicked 583 field goals. How many extra points did he score? \_\_\_\_\_

Number sentence: \_\_\_\_\_

2. Morten Andersen scored 2,544 points. He made 565 field goals and no touchdowns. How many extra points did he score? \_\_\_\_\_

Number sentence: \_\_\_\_\_

3. Gary Anderson has 2,434 points. He earned 820 extra points and no touchdowns. How many field goals did he get? \_\_\_\_\_

Number sentence: \_\_\_\_\_

4. Jason Hanson has played football for 21 years. He didn't have any touchdowns but he did score 2,150 points. If he had 665 extra points, how many field goals did he score? \_\_\_\_\_

Number sentence: \_\_\_\_\_

5. John Carney has played football for 23 years. During that time he scored 628 extra points and 478 field goals. How many total points did he score? \_\_\_\_\_

Number sentence: \_\_\_\_\_

6. Matt Stover has played in the NFL for 19 years. During that time he has scored 471 field goals, 0 touchdowns, and a total of 2,004 points. Determine how many extra points he scored. \_\_\_\_\_

Number sentence: \_\_\_\_\_

7. George Blanda scored 2,002 points. He scored 9 touchdowns and 335 field goals. How many extra points did he score? \_\_\_\_\_

Number sentence: \_\_\_\_\_



# Using Variables with NFL Scorers

8. Jason Elam is the 8th top scorer in NFL history. He scored 1,983 points and didn't score any touchdowns. If he made 675 extra points, how many field goals did he score? \_\_\_\_\_

Number sentence: \_\_\_\_\_

9. John Kasay played football for 20 years. He did not score any touchdowns but he did score 461 field goals and a total of 1,970 points. How many extra points did he get? \_\_\_\_\_

Number sentence: \_\_\_\_\_

10. Sebastian Janikowski is the 10th top scorer in NFL history. He scored 1,913 points. If he made 605 extra points, how many field goals did he score? \_\_\_\_\_

Number sentence: \_\_\_\_\_

Compiled from 2019 NFL Record and Fact Book

# What's In a Number?

**Goals/Objectives:**

Students will:

- Find factors and multiples of players' numbers
- Identify numbers as prime and composite

**Common Core Standards:** Operations and Algebraic Thinking**Methods/Procedures:**

- The students should have familiarity with finding factors. The class should begin with a review of how to find factors of a number. For example, the factors of 50 would be: 1, 2, 5, 10, 25, 50. You may prefer for the students to list the factors like this:  $1 \times 50$ ,  $2 \times 25$ ,  $5 \times 10$ .
- Students will learn how to classify numbers whether they are prime or composite. A prime number has only two factors: 1 and itself. An example would be 5 because the only two numbers that multiply together to equal 5 would be 1 and 5. Composite numbers have 3 or more factors. For example 50 would be composite because it has 6 factors.
- Students will do some practice determining if a number is prime or composite. The teacher can hand each student a different number on an index card and the students can find the factors and then place the card on the chalkboard either in the prime or composite category. Students can also count the letters in their first or last name and determine if that number is prime or composite.
- The class should also talk about finding multiples of a number. So given the number 4, the multiples would be 4, 8, 12, 16, 20, etc.
- Once the class has practiced, they can work on the worksheet.

**Materials:**

- Pencil
- Worksheet
- Index cards
- Tape to place the index cards on the board

**Assessment:**

- Teacher Observation
- Worksheet



# What's In a Number?

**Directions:** Use the number of each Hall of Famer to complete the worksheet.

**Troy Aikman**  
**#8**

The factors of 8 are:

Is the number 8 prime or composite?

Five multiples of 8 are:

**Bill George**  
**#61**

The factors of 61 are:

Is the number 61 prime or composite?

Five multiples of 61 are:

**Harry Carson**  
**#53**

The factors of 53 are:

Is the number 53 prime or composite?

Five multiples of 53 are:

**David (Deacon) Jones**  
**#75**

The factors of 75 are:

Is the number 75 prime or composite?

Five multiples of 75 are:

**Dick Lane**  
**#81**

The factors of 81 are:

Is the number 81 prime or composite?

Five multiples of 81 are:

**Doak Walker**  
**#37**

The factors of 37 are:

Is the number 37 prime or composite?

Five multiples of 37 are:

**Lee Roy Selmon**  
**#63**

The factors of 63 are:

Is the number 63 prime or composite?

Five multiples of 63 are:

**Otto Graham**  
**#60**

The factors of 60 are:

Is the number 60 prime or composite?

Five multiples of 60 are:

# Tackling Football Math

**Goals/Objectives:**

Students will:

- Improve math skills by applying basic functions to the game of football.
- Review basic football facts and game terms.
- Utilize statistics of NFL football players and teams for computing math problems.
- Research statistics of selected NFL football players and teams for use as alternative information in certain math problems.

**Common Core Standards:** Operations and Algebraic Thinking; Number Operations in Base Ten; Measurement and Data

**Methods/Procedures:**

- Students will complete the math worksheets provided on the following pages related to the game of football. They may work independently or with others. Feel free to make adaptations in players and teams to suit your students. Answers to the following worksheets are found in the back of this publication.
  - \* A Day at the Game (CCS: Number Operations in Base Ten)
  - \* How Old are They? (CCS: Number Operations in Base Ten)
  - \* Conversions in Football (CCS: Measurement and Data)
  - \* Super Bowl Numbers (CCS: Number Operations in Base Ten)
  - \* Top Active Rushers (CCS: Number Operations in Base Ten; Measurement and Data)
  - \* Super Bowl LII Thunder (CCS: Number Operations in Base Ten; Measurement and Data)
  - \* Miscellaneous Math Activities

**Materials:**

- Pencil
- Scrap paper for working problems
- Calculators if permitted
- Worksheets

**Assessment:**

- Students will be assessed on accuracy of responses.





# A Day at the Game

**Directions: Complete the following problems, be sure to show all of your work on a separate sheet of paper.**

1. Tickets for the game are \$62.00 each. A family of six attended the game on Sunday. What was the total cost of the tickets?
2. There are four quarters in a game, each lasting 15 minutes. What is the total number of minutes in a game? Convert the total minutes to seconds.
3. There are 53 members on one NFL team, but only 11 players are on the field at one time. How many are still on the sideline?
4. The seating capacity for FirstEnergy Stadium in Cleveland is 73,200. There were 66,528 in attendance for the game. How many empty seats were there?
5. Twenty-four game balls are used in every indoor NFL game. If one ball weighs 14 ounces, how many ounces do 24 balls weigh? Convert to pounds. Clue: 16 ounces = 1 lb.
6. Vendors were selling programs for \$5.00 each throughout the stadium. If 20 vendors each sold 32 programs in one hour for five hours, how many total programs did the vendors sell?
7. A family of three decided to buy some souvenirs while at the game. They purchased two pennants at \$4.99 each, two hats at \$24.99 each, one football at \$19.99 and two programs at \$5.00 a piece. How much did they spend?
8. Throughout the game they purchased snacks to eat. They bought 5 hot dogs at \$3.00 each, 2 bags of peanuts and 2 bags of popcorn at \$3.25 a piece, 4 soft drinks at \$2.75 each and 2 ice cream cones at \$3.25 each. What was the total?
9. The game kicked off at 1:05 p.m. and ended at 4:44 p.m. How many hours and minutes did the game last?
10. If 90% of the seats in Ford Field, which holds 65,000 people, are filled for an NFL game, how many fans are there?
11. Your football team scored 18 points more than the previous high score of 56 points. What is their new high score?
12. On a series of downs, the football was spotted on your own 48-yard line. The quarterback passed for 15 yards, lost 9 yards when the quarterback was sacked, and then gained 17 yards on a halfback run. Where was the ball placed for the next down?

# A Day at the Game



13. Your football team had a field goal in the first quarter, a touchdown plus an extra point in the second quarter, a touchdown but missed the extra point in the third quarter, and a safety in the fourth quarter. In the fourth quarter, the opposing team had 2 touchdowns followed by 2-point conversions for each touchdown. What was the final score of the game?
14. Your football team had penalties of 15 yards, 5 yards, 15 yards, and 15 yards. The opposing team had 5 yards fewer than half that in penalties. What were the total yards lost for the game?
15. At the concession stand, the Booster Club makes a nickel profit on each candy bar, a quarter on each box of popcorn, and \$.40 for each beverage. If they sold 70 boxes of popcorn, 45 candy bars, and 107 beverages, what was their total profit?
16. What is the area of a high school football field from goal line to goal line (a football field is  $53 \frac{1}{3}$  yards wide)?
17. Ticket sales were up this season by 17%. If last year's totaled \$12,000, what were this year's sales?
18. The price of a student ticket was raised from \$3.00 to \$3.50 and the price of an adult ticket was raised from \$5.00 to \$5.50. If ticket sales for the first game of the season were 210 student tickets and 748 adult tickets, what was the total additional revenue?
19. Football ticket sales bring in a profit of \$10,000 annually. New stadium lights and bleachers will cost \$24,000, annual maintenance is \$2,000 and \$1,000 is needed for the replacement of equipment each year. Given the figures, how many years will it take to break even and begin making a profit?
20. It is second down and 9-yards to go for the first down. The quarterback is sacked for an 8-yard loss. On third down, how many yards are necessary to achieve a first down?
21. The football game is scheduled to begin at 7:30 p.m. The pre-game show lasts 8 minutes. The band must report 10 minutes prior to the start of the pre-game show. What time must the band be present?
22. In the fourth quarter the clock says 1:59.04. The next 4 plays take 39.2 seconds, 15.85, 20.08, and 9.79 seconds off the clock. How much time is left?
23. The stadium lights are turned on at 6:40 p.m. and turned off 30 minutes after the game is over. If the game is over at 9:28 p.m., how many minutes of electricity will be charged by the utility company?



# A Day at the Game

24. Given the following attendance statistics for your school's 7 home games, find the median for the attendance at the home games

Home Games	Attendance
#1	958
#2	15,002
#3	500
#4	12,980
#5	11,040
#6	935
#7	10,091

25. The kickoff return player fielded 5 punts during the game. The first, he caught at his own 8-yard line and returned it to his own 26-yard line. The second, he caught at the opponent's 48-yard line and returned it to their 34-yard line. The third, he made a "fair catch" at his own 26-yard line. The fourth he fielded at his own 12-yard line and scored a touchdown. The fifth, he caught on his 28-yard line and was immediately tackled for no gain. What was his average punt return for this game?
26. What percentage of the field has your team covered if they move the ball from their 20-yard line to their 40-yard line?
27. The defensive back intercepts the football at his own 5-yard line and runs to the opposing team's 5-yard line before being tackled. How many yards did he gain on the interception?
28. The kicker made successful field goals of 37 yards, 29 yards, 42 yards, 18 yards, 19 yards, 40 yards, 31 yards, and 20 yards. He missed field goals of 50 yards and 46 yards. What was his percent of success?
29. In the first game of the season, the fullback ran for 17 yards, 5 yards, 12 yards, 21 yards, -6 yards, 34 yards, 3 yards, -2 yards, 10 yards, 7 yards, 4 yards, 18 yards, 66 yards, and 2 yards. What was his average yards per carry for the game?
30. What is the difference between the tallest player on the team at  $7' 5\frac{5}{8}"$  and the shortest player on the team at  $5' 6\frac{3}{4}"$ ?

# How Old Are They?



**Directions:** Read the following paragraphs about two NFL stars. Then complete the charts to figure out each one's age.

During his 17-year, 242-game career with the Miami Dolphins, Hall of Fame quarterback Dan Marino, has earned the right to be called the most prolific passer in NFL history. At the time of his retirement Marino held four of the NFL's major career passing records with 61,361 passing yards, 4,967 completions, 8,358 passing attempts, and 420 passing touchdowns. Marino was selected to nine Pro Bowls during his illustrious career with the Dolphins. Thirteen times Marino passed for 3,000 yards or more in a single season, including six seasons in which he threw for 4,000 yards or more, and one season where he became the first player in NFL history to throw for 5,000 yards in one season. Marino passed for 300 yards in a single game 63 times, and threw for 400 yards or more in a single game 13 times – both were NFL records when he retired. Use the steps below to figure out his age.

Step 1 _____ # of career completions x _____ # of Pro Bowls = _____ total for step 1	Step 4 _____ # of career games + _____ total for step 3 = _____ total step 4	Step 7 _____ total step 6 + _____ # of 400-yard games = _____ total step 7
Step 2 _____ # of career passing yards - _____ total Step 1 = _____ total for step 2	Step 5 _____ total step 4 - _____ # of career touchdown passes = _____ total step 5	Step 8 _____ total of step 7 + _____ 8 = _____ Dan's Age
Step 3 16,854 - _____ total step 2 = _____ total step 3	Step 6 _____ total step 5 + _____ # of 3,000-yd seasons = _____ total step 6	

Hall of Fame quarterback John Elway became known as "Mr. Comeback" due to his 47 career fourth quarter comeback victories or ties. Elway was selected to nine Pro Bowls during his 16-year career with the Denver Broncos. Considered as one of the most versatile quarterbacks in NFL history Elway scrambled to a career rushing mark of 3,407 yards. His 51,475 career passing yards, along with 4,123 completions, place him fourth on the NFL's all-time passing list. His 7,250 passing attempts are fourth all time in that category. Elway's versatility is displayed by his 334 total career touchdowns (300 passing, 33 rushing, and 1 receiving). Elway led his team into five Super Bowl appearances that included two NFL championships. Elway took home the Super Bowl MVP Award in the final game of his career. Use the steps below to figure out his age.

Step 1 _____ # career passing yards / _____ # Super Bowl starts = _____ total for step 1	Step 3 _____ total for step 2 - _____ total for step 1 = _____ total for step 3	Step 5 _____ total for step 4 + _____ # of Super Bowl MVP = _____ total of step 5
Step 2 _____ # of career attempts + _____ # of career rushing yards = _____ total for step 2	Step 4 _____ total career touchdowns (passing, rushing, receiving) - _____ fourth quarter comebacks + _____ Pro Bowls = _____ total for step 4	Step 6 _____ total for step 3 - _____ total for step 5 - _____ 12 = _____ John's age



# Conversions in Football

**Directions:** Complete the following problems, be sure to show all of your work on a separate sheet of paper.

1. During his career, Barry Sanders rushed for 15,269 yards. How many feet is that? \_\_\_\_\_
2. Cordarrelle Patterson of the Minnesota Vikings returned a kickoff for an NFL record 109 yards in 2013. How many inches is that? \_\_\_\_\_
3. Dan Marino passed for 61,361 yards in his career. How many miles is that? \_\_\_\_\_  
\*Hint: 1 mile = 1,760 yards Round to the nearest tenth.
4. Julio Jones of the Atlanta Falcons led the NFL in receiving yards with 1,677 receiving yards in 2018. How many feet is that? \_\_\_\_\_
5. The Packers have the ball on their own 25-yard line and they complete a 45-yard pass. They then lose 4 yards on the next play. What yard line are they on now? \_\_\_\_\_
6. Patrick Mahomes throws a 54-yard pass. How many inches did he throw? \_\_\_\_\_ How many centimeters? \_\_\_\_\_ Hint: 1 inch = 2.54 centimeters
7. A football field measures 100 yards from goal line to goal line. A field is  $53 \frac{1}{3}$  yards wide. Convert these measurements to feet. \_\_\_\_\_
8. Trent Brown of the Oakland Raiders weighs 380 pounds. How much does he weigh in ounces? \_\_\_\_\_
9. A game normally lasts 60 minutes. During a 16-game season, how many total minutes does one team play? \_\_\_\_\_
10. There are seven officials on the field for every NFL game. If 16 games are played each week, what is the total number of officials officiating throughout the NFL each week? \_\_\_\_\_

# Super Bowl Numbers



Super Bowl games are written with Roman numerals. The use of Roman numerals actually began with Super Bowl V. Use the chart to calculate past and future games.

Roman Numeral Chart

1	2	3	4	5	6	7	8	9	10	50
I	II	III	IV	V	VI	VII	VIII	IX	X	L

Example: $X = 10$ $+ IX = 9$ Super Bowl <u>19</u>		
$X = \underline{\hspace{1cm}}$ $+ V = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>	$X = \underline{\hspace{1cm}}$ $+ IV = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>	$V = \underline{\hspace{1cm}}$ $+ IV = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>
$X = \underline{\hspace{1cm}}$ $+ X = \underline{\hspace{1cm}}$ $+ III = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>	$X = \underline{\hspace{1cm}}$ $+ X = \underline{\hspace{1cm}}$ $+ VI = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>	$X = \underline{\hspace{1cm}}$ $+ V = \underline{\hspace{1cm}}$ $+ III = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>
$X = \underline{\hspace{1cm}}$ $+ X = \underline{\hspace{1cm}}$ $+ X = \underline{\hspace{1cm}}$ $+ V = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>	$X = \underline{\hspace{1cm}}$ $+ X = \underline{\hspace{1cm}}$ $+ X = \underline{\hspace{1cm}}$ $+ II = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>	$X = \underline{\hspace{1cm}}$ $+ X = \underline{\hspace{1cm}}$ $+ X = \underline{\hspace{1cm}}$ $+ VII = \underline{\hspace{1cm}}$ Super Bowl <u>        </u>

- Write the Roman numeral for Super Bowl 54 which will be played in Miami Gardens, FL. \_\_\_\_\_





# Super Bowl Thunder

**Directions:** Answer the following questions using the New England Patriots' roster on the following page.

1. Who was the oldest player on the team?
2. What number was Nate Ebner?
3. How many wide receivers (WR) were there?
4. How many players had 10 or more years of NFL experience?
5. How many quarterbacks (QB) were listed?
6. Who was the only player to attend Kent State?
7. Who was the heaviest player on the team?
8. Who was the lightest player on the team?
9. What position did number 6 play?
10. Add up the total weight of all the running backs (RB/FB).

# MATHEMATICS

## Super Bowl Thunder



### New England Patriots - Super Bowl LIII Champions

#	NAME	POS	HT.	WT.	AGE	EXP.	COLLEGE
83	Allen, Dwayne	TE	6'4	260	28	7	Clemson
6	Allen, Ryan	P	6'2	220	28	6	Louisiana Tech
80	Anderson, Stephen	TE	6'3	230	26	3	California
60	Andrews, David	C	6'3	300	26	4	Georgia
12	Brady, Tom	QB	6'4	225	41	19	Michigan
90	Brown, Malcom	DT	6'2	320	25	4	Texas
67	Brown, Trent	OT	6'8	380	25	4	Florida
34	Burkhead, Rex	RB	5'10	215	28	6	Nebraska
70	Butler, Adam	DT	6'5	300	24	3	Vanderbilt
61	Cannon, Marcus	OL	6'6	335	30	8	TCU
49	Cardona, Joe	LS	6'3	245	26	4	Navy
23	Chung, Patrick	DB	5'11	215	31	10	Oregon
94	Clayborn, Adrian	DL	6'3	280	30	8	Iowa
59	Crossen, Keion	CB	5'10	185	22	1	Western Carolina
35	Davis, Keionta	DL	6'4	280	24	2	TN - Chattanooga
42	Dawson, Duke Jr.	CB	5'10	198	22	1	Florida
46	Develin, James	RB	6'3	255	30	7	Brown
13	Dorsett, Phillip	WR	5'10	192	26	4	Miami (Florida)
43	Ebner, Nate	DB	6'0	215	30	7	Ohio State
11	Edelman, Julian	WR	5'10	198	32	10	Kent State
66	Ferentz, James	C	6'2	300	29	4	Iowa
98	Flowers, Trey	DE	6'2	265	25	4	Arkansas
24	Gilmore, Stephon	CB	6'1	202	28	7	South Carolina
3	Gostkowski, S.	K	6'1	215	35	13	Memphis
87	Gronkowski, Rob	TE	6'6	265	29	8	Arizona
93	Guy, Lawrence	DT	6'4	315	28	8	Arizona State
21	Harmon, Duron	FS	6'1	205	28	6	Rutgers
54	Hightower, Dont'a	LB	6'3	260	28	7	Alabama
15	Hogan, Chris	WR	6'1	210	30	7	Monmouth
2	Hoyer, Brian	QB	6'2	216	33	10	Michigan State
50	Humber, Ramon	LB	5'11	232	31	10	North Dakota State
27	Jackson, J.C.	DB	6'1	198	23	2	Maryland
31	Jones, Jonathan	DB	5'10	190	25	3	Auburn
94	Kamalu, Ufomba	DE	6'6	295	26	3	Miami (Florida)
75	Karras, Ted	OG	6'4	305	25	3	Illinois
36	King, Brandon	DB	6'2	220	25	4	Auburn
69	Mason, Shaq	C	6'1	310	25	4	Georgia Tech
59	McClellan, Albert	DE	6'2	235	32	9	Marshall
32	McCourty, Devin	DB	5'10	195	31	9	Rutgers
30	McCourty, Jason	DB	5'11	195	31	10	Rutgers
22	Melifonwu, Obi	SS	6'4	224	24	2	Connecticut
29	Michel, Sony	RB	5'11	215	23	1	Georgia
84	Patterson, C.	WR	6'2	220	27	6	Tennessee
95	Rivers, Derek	DE	6'5	250	24	2	Youngstown State
52	Roberts, Elandon	LB	6'0	238	24	3	Houston
55	Simon, John	DE	6'2	260	28	6	Ohio State
18	Slater, Matthew	WR	6'0	205	33	11	UCLA
62	Thuney, Joe	OG	6'5	308	26	4	North Carolina State
53	Van Noy, Kyle	LB	6'3	250	27	5	BYU
68	Waddle, LaAdrian	T	6'6	315	27	5	Texas Tech
28	White, James	RB	5'10	205	27	5	Wisconsin
91	Wise, Deatrich JR.	DE	6'5	275	24	2	Arkansas



# Top Active Rushers

## Top Active Rushers Heading into the 2019 Season (1,000 or more attempts)

	Player	Attempts	Yards	Average Yards/Attempt
1.	Frank Gore	3,412	14,836	
2.	Adrian Peterson	2,835	13,343	
3.	LeSean McCoy	2,367	10,710	
4.	Mark Ingram	1,348	6,161	
5.	Lamar Miller	1,354	5,864	
6.	Le'Veon Bell	1,267	5,464	
7.	Doug Martin	1,322	5,356	
8.	Cam Newton	934	4,806	
9.	Todd Gurley	1,072	4,707	
10.	Ezekiel Elliott	904	4,212	

\*Source: National Football League

1. Who had the best average yards/carry?
2. Who had the lowest average yards/carry?
3. What is the total yards rushed by all ten rushers?
4. What is the total of attempts of all ten rushers?
5. What is the average yards/attempt of all ten rushers combined?

# Stats with Randy Moss



## Goals/Objectives:

Students will:

- Order numbers from smallest to largest
- Review the terms range, median, mode and mean.
- Determine the range, median, mode of a list of numbers.
- Read and interpret a chart

**Common Core Standards:** Represent and Interpret Data

## Methods/Procedures:

- Students will answer a set of questions based on a chart given to them representing Hall of Famer Wide Receiver Randy Moss' career receiving yards
- If able to, create a graph using the data from the chart
- If able to, using NFL.com and/or ProFootballHOF.com, find another Hall of Famer's statistics, create a chart, and find the range, mode, median and mean of the statistics

## Materials:

- Hall of Famer's Statistics Chart
- Calculator
- Worksheet
- Access to NFL.com and/or ProFootballHOF.com by computer

## Assessment:

- Students will be assessed on accuracy of responses



# Randy Moss Worksheet

**Directions: Using the chart below, answer the questions.**

Randy Moss played professional football as a wide receiver from 1998 to 2010. He is a member of the Pro Football Hall of Fame Class of 2018. During his career he caught passes for an amazing 15,292 yards.

Randy Moss Career Receiving Yards	
Year	Yards
1998	1313
1999	1413
2000	1437
2001	1233
2002	1347
2003	1632
2004	767
2005	1005
2006	553
2007	1493
2008	1008
2009	1264
2010	393
Total	15,292

1. The range is the difference between the largest number and the smallest number. What is the range of Moss' receiving yards?

2. The mode is the number that occurs the most. Is there a mode in the chart? Why or why not?

3. The median is the middle number in a series of numbers in ascending order. If there is an even amount of numbers the median is the average of the two middle numbers. What is the median of the chart?

4. The mean is the average of a group of numbers. What is the mean of the chart (Round to the nearest tenth)?

# NFL Wide Receiver Math

**Goals/Objectives:**

Students will:

- Order numbers from smallest to largest
- Review the terms range, median, mode and mean.
- Determine the range, median, mode of a list of numbers.
- Read and interpret a chart

**Common Core Standards:** Represent and Interpret Data

**Methods/Procedures:**

- Students will answer a set of questions based on a chart depicting the leaders in the NFL for receptions in the 2015-2016 NFL Season
- If able, they can create a bar graph showing in graph form the number of receptions of each NFL Wide Receiver
- If able, use NFL.com and / or ProFootballHOF.com to find other NFL Statistical Category leaders and do the same process

**Materials:**

- NFL Reception Leaders Chart
- Calculator
- Worksheet
- Graph Paper (If doing bar graphs)
- Access to NFL.com and / or ProFootballHOF.com by computer

**Assessment:**

- Student will be assessed on accuracy of responses





# NFL Wide Receiver Math

**Directions: Using the chart below, answer the questions.**

Below is a chart that shows the top ten number of passes caught by wide receivers in the 2018 season.

WR Reception Leaders		
<u>PLAYER</u>	<u>2018 TEAM</u>	<u>RECEPTIONS</u>
Michael Thomas	New Orleans Saints	125
Zach Ertz	Philadelphia Eagles	116
DeAndre Hopkins	Houston Texans	115
Julio Jones	Atlanta Falcons	113
Adam Thielen	Minnesota Vikings	113
Davante Adams	Green Bay Packers	111
JuJu Smith-Schuster	Pittsburgh Steelers	111
Christian McCaffrey	Carolina Panthers	107
Antonio Brown	Pittsburgh Steelers	104
Travis Kelce	Kansas City Chiefs	103

1. The range is the difference between the largest number and the smallest number. What is the range of the chart?
2. The mode is the number that occurs the most. Is there a mode in the chart? Why or why not?
3. The median is the middle number in a series of numbers in ascending order. If there is an even amount of numbers the median is the average of the two middle numbers. What is the median of the chart?
4. The mean is the average of a group of numbers. What is the mean of the chart?

# MATHEMATICS

# NFL Scoring System



## Goals/Objectives:

Students will:

- Review addition facts
- Practice problem solving skills
- Read and interpret a chart

**Common Core Standards:** Operations and Algebraic Thinking

## Methods/Procedures:

- Students will answer a set of questions based on a chart given to them about how points were given for touchdowns, field goals, and point-after conversions throughout history
- If visiting the Hall of Fame, there is an interactive chart where students can view this

## Materials:

- Scoring System Chart (If no visit)
- Calculator
- Worksheet

## Assessment:

- Student will be assessed on accuracy of responses



# NFL Scoring System

**Directions: Using the chart below, answer the questions.**

During your visit to the Pro Football Hall of Fame you saw an interactive chart that explained the development of the NFL scoring system. In 1892 scoring in football looked quite different than today. For example, a field goal was worth more than a touchdown.

History of Scoring in the NFL	
Type of Score	Points Awarded
<u>1892</u>	
Field Goal	5 points
Touchdown	4 points
Point After Touchdown	2 points
<u>1897</u>	
Point After Touchdown	1 point
<u>1904</u>	
Field Goal	4 points
<u>1909</u>	
Field Goal	3 Points
<u>1912</u>	
Touchdown	6 points
<u>1994</u>	
2-Point Conversion	2 points

In 2018, the Carolina Panthers played the New Orleans Saints in the NFC Playoffs. The final score of this game was:

Panthers - 26  
Saints - 31

Panthers Field Goals = 4 for 12 points  
Panthers Touchdowns = 2 for 12 points  
Panthers Extra Points = 2 for 2 points  
2-Point Conversions = 0 for 0 points  
Panthers Total: 26

Saints Field Goals = 1 for 3 points  
Saints Touchdowns = 4 for 24 points  
Saints Extra Points = 4 for 4 points  
2-Point Conversions = 0 for 0 points  
Saints Total: 31

1. Are there other ways the teams could have achieved the same scores? If so, please explain. If no, please explain.

2. What would the score be if the game had been played in 1892?

1904?

1909?

1912?

# Tom Benson Hall of Fame Stadium Geometry

**Goals/Objectives:**

Students will:

- Review the basic geometric shapes.
- Locate and name basic geometric shapes from a photo.

**Common Core Standards:** Reason with shapes and their attributes

**Methods/Procedures:**

- Students will review the names of the basic shapes of triangle, square, rectangle.
- Students will be given copies of a Tom Benson Hall of Fame Stadium photo.
- Students will each have a red, blue, green and orange color pencils.
- Students will circle the triangles red, the squares blue, the rectangles green and the circles orange.
- Students will share what they find and see who finds the most shapes.
- The lesson can include parallelograms, trapezoids and / or three-dimensional shapes such as spheres, cubes, pyramids and cones.
- Students can design their own stadiums and include a given list of shapes.

**Materials:**

- Models of shapes
- Photo of the Tom Benson Hall of Fame Stadium (MA44)
- Color pencils

**Assessment:**

- The assessment is an informal observation.
- The completed photo page with the correct colors can be assigned a grade.



MATHEMATICS

# Tom Benson Hall of Fame Stadium Geometry

## Pro Football Hall of Fame Stadium - Geometry

Name \_\_\_\_\_

Look at the picture below of the Pro Football Hall of Fame Stadium. You will notice there are many shapes throughout the photo. Use a red pencil to circle the triangles. Use a blue pencil to circle the squares blue. Use a green pencil to circle the rectangles green. Use an orange pencil to circle the circles.



**How many shapes did you find?**

Triangles \_\_\_\_ Squares \_\_\_\_

Rectangles \_\_\_\_ Circles \_\_\_\_



# Miscellaneous Math Activities



**Teachers:** The following are classroom mathematics activities for you and your students to enjoy. Feel free to adapt and make copies of these ideas to suit your classroom.

**NERF FOOTBALL:** Use a Nerf football to provide math practice. With a permanent marker draw puzzle pieces all over the ball and number each piece. When the student catches the football, they either add or multiply the numbers found under their fingers. You can be “all thumbs” and still enjoy!

**WEEKLY ANALYZING:** Assign each student a team or a player and have them keep track of their weekly statistics. Give weekly math problems to the students in order to practice various mathematics skills. Students can keep a journal of their findings to compare with their classmates’ findings.

**FIELD FACTS:** Take a trip to a football field. Have the students practice using rulers, measuring tapes, and compasses by giving assignments related to the field. How far is the end zone from the goal post? How many inches is the entire field? How many yards across is a field? You could even have the students play a game of catch – how far can they throw? Who can catch the farthest throw?

**FOOTBALL FOLDER GAME:** Using the inside of a file folder, draw the outlines of 10 footballs and then write a different number inside each one. Laminate the folder. Draw matching football shapes on poster board, add corresponding number of dots, laminate and cut out. To play, the student counts the number of dots on the football and places it on top of the matching numbered footballs on the file folder. You could also use this for multiplication and subtraction by adapting the numbers.

**ROMAN NUMERAL FUN:** Super Bowls are numbered by Roman numerals. Make a list of Roman numerals from one to fifty. Multiply each number on your list by ten and write the products in Roman numerals.

**The Hall of Fame welcomes any suggestions for classroom activities.  
Please share your thoughts and ideas by contacting the  
Educational Programs Staff at (330) 456-8207 or e-mail at  
Education@ProFootballHOF.com.**



# Answer Key

**How Far is 300 Yards?**

Jason Tucker - 993 feet, 11,916 inches  
Jermaine Lewis - 924 feet, 11,088 inches  
Jacoby Ford - 987 feet, 11,844 inches  
Glyn Milburn - 1,212 feet, 14,544 inches  
Tyrone Hughes - 1,041 feet, 12,492 inches  
John Taylor - 963 feet, 11,556 inches  
Willie Anderson - 1,008 feet, 12,096 inches  
Joshua Cribbs - 948 feet, 11,376 inches  
Stephone Paige - 927 feet, 11,124 inches  
Lionel James - 1,035 feet, 12,420 inches  
Adrian Peterson - 1,083 feet, 12,996 inches  
Walter Payton - 900 feet, 10,800 inches  
Darren Sproles - 951 feet, 11,412 inches  
Steve Smith - 939 feet, 11,268 inches  
Gale Sayers - 1,017 feet, 12,204 inches

**Using Variables With NFL Scorers**

- |   |             |
|---|-------------|
| 1. $(583 \times 3) + x + 2 = 2,605$                       | $x = 854$   |
| 2. $(565 \times 3) + x = 2,544$                           | $x = 849$   |
| 3. $(820 \times 1) + (0 \times 6) + (3 \times x) = 2,434$ | $x = 538$   |
| 4. $(3 \times x) + 655 = 2,150$                           | $x = 495$   |
| 5. $(478 \times 3) + 628 = x$                             | $x = 2,062$ |
| 6. $(471 \times 3) + x = 2,004$                           | $x = 591$   |
| 7. $(9 \times 6) + (335 \times 3) + x = 2,002$            | $x = 943$   |
| 8. $(3 \times x) + 675 = 1,983$                           | $x = 436$   |
| 9. $(461 \times 3) + x = 1,970$                           | $x = 587$   |
| 10. $(3 \times x) + 605 = 1,913$                          | $x = 436$   |

**How Many People Attended NFL Games**

2018 - 64,000 - 60,000  
2017 - 64,000 - 60,000  
2016 - 67,000 - 70,000  
2015 - 66,000 - 60,000  
2014 - 65,000 - 60,000  
2013 - 66,000 - 60,000  
2012 - 65,000 - 60,000  
2011 - 65,000 - 60,000  
2010 - 65,000 - 60,000  
2009 - 65,000 - 60,000  
2008 - 67,000 - 60,000  
2007 - 67,000 - 60,000  
2006 - 67,000 - 60,000  
2005 - 66,000 - 60,000  
2004 - 66,000 - 60,000

2003 - 66,000 - 60,000

2002 - 66,000 - 60,000

2001 - 65,000 - 60,000

**What's in a Number?**

- #8: Factors: 1, 2, 4, 8  
Composite  
Multiples: 8, 16, 24, 32, 40, etc.
- #61: Factors: 1 & 61  
Prime  
Multiples: 61, 122, 183, 244, 305, etc.
- #53: Factors: 1 & 53  
Prime  
Multiples: 53, 106, 159, 212, 265, etc.
- #75: Factors: 1, 3, 5, 15, 25, 75,  
Composite  
Multiples: 75, 150, 225, 300, 375, etc.
- #81: Factors: 1, 3, 9, 27, 81  
Composite  
Multiples: 81, 162, 243, 324, 405, etc.
- #37: Factors: 1 & 37  
Prime  
Multiples: 37, 74, 111, 148, 185, etc.
- #63: Factors: 1, 3, 7, 9, 21, 63  
Composite  
Multiples: 63, 126, 189, 252, 315, etc.
- #60: Factors: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60  
Composite  
Multiples: 60, 120, 180, 240, 300, etc.

**A Day At The Game**

- \$372.00
- 60 minutes, 3,600 seconds
- 42 players
- 6,672 empty seats
- 336 ounces, 21 pounds
- 3,200 programs
- \$ 89.95
- \$ 45.50
- 3 hours, 39 minutes
- 58,500 fans
- 74 points
- Opposing team's 29-yard line



# MATHEMATICS

## Answer Key



13. 18 to 16
14. 70 yards
15. \$62.55
16. 5,333  $\frac{1}{3}$  square yards or 48,000 square feet
17. \$14,040
18. \$479
19. Four years
20. 17
21. 7:12 PM
22. 0:34.12 or 34.12 seconds
23. 198 minutes
24. 10,091
25. 30 yards (the fair catch does not count against him, thus, total yards is divided by 4 instead of 5)
26. 20%
27. 90 yards
28. 80%
29. 13.64 yards per carry
30. 1'5  $\frac{7}{8}$ "

### **How Old are They?**

Dan Marino:  
Step 1 – 44,703  
Step 2 – 16,658  
Step 3 – 196  
Step 4 – 438  
Step 5 – 18  
Step 6 – 31  
Step 7 – 44  
Step 8 – 52

John Elway:  
Step 1 – 10,295  
Step 2 – 10,657  
Step 3 – 362  
Step 4 – 296  
Step 5 – 297  
Step 6 – 53

### **Conversions in Football**

1. 45,807 feet
2. 3,924 inches
3. 34.9 miles
4. 5,031 feet
5. 34 yard line of opposing team

6. 1,944 inches, 4,937.76 centimeters
7. 300 feet long, 160 feet wide
8. 6,080 ounces
9. 960 minutes
10. 112 officials

### **Super Bowl Numbers**

- 15, 14, 9
- 23, 26, 18
- 35, 32, 37
- LIII

### **Super Bowl Thunder**

1. Tom Brady (41)
2. 43
3. 5
4. 8
5. 2
6. Julian Edelman
7. Trent Brown - 380 lbs.
8. Keion Crossen - 185 lbs.
9. Punter
10. 890 lbs.

### **Top Rushers**

1. Cam Newton - 5.2
2. Doug Martin - 4.0
3. 75,459 yards
4. 16,815 attempts
5. 4.5

### **Randy Moss**

1. 1,239
2. No. There are no repeated numbers
3. 1,264
4. 1,142.9

### **NFL WR Math**

1. 22
2. Yes. 111 & 113
3. 112
4. 111.8

### **Scoring System**

1. Answers will vary
2. See Below:  
1892: Saints 29 - Panthers 32  
1904: Saints 28 - Panthers 28  
1909: Saints 27 - Panthers 24  
1912: Saints 31 - Panthers 26



# MATHEMATICS

## Answer Key

### Number Patterns

Running Back	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
A	3 yards	6 yards	9 yards	12 yards
B	15 yards	20 yards	25 yards	30 yards
C	12 yards	16 yards	20 yards	24 yards
D	28 yards	40 yards	52 yards	64 yards

What is running back A's number pattern? \_\_\_\_\_ +3 \_\_\_\_\_

What is running back B's number pattern? \_\_\_\_\_ +5 \_\_\_\_\_

What is running back C's number pattern? \_\_\_\_\_ +4 \_\_\_\_\_

What is running back D's number pattern? \_\_\_\_\_ +12 \_\_\_\_\_

Running Back	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
A	4.5 yards	8 yards	11.5 yards	15 yards
B	12.2 yards	19.5 yards	26.8 yards	34.1 yards
C	13.7 yards	15.4 yards	17.1 yards	18.8 yards
D	28.6 yards	39 yards	49.4 yards	59.8 yards

What is running back A's number pattern? \_\_\_\_\_ +3.5 \_\_\_\_\_

What is running back B's number pattern? \_\_\_\_\_ +7.3 \_\_\_\_\_

What is running back C's number pattern? \_\_\_\_\_ +1.7 \_\_\_\_\_

What is running back D's number pattern? \_\_\_\_\_ +10.4 \_\_\_\_\_