



The College Football Hall of Fame Teacher's Playbook for Middle School Grades 6 – 8

KICK-OFF!

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OVERTIME!

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The College Football Hall of Fame: www.cfbhall.com

Content created by TurnKey Education, Inc., for Atlanta Hall Management and the College Football Hall of Fame.

TurnKey Education, Inc.: www.turnkeyeducation.net

Welcome to the College Football Hall of Fame!

Game on! Your class has earned a coveted, All-Access Pass to the hallowed halls of college football. On your class tour through the College Football Hall of Fame, you and your students will experience the science, history, rivalries, and pageantry that have made college football one of the most beloved sports in America.

The College Football Hall of Fame is a highly-immersive and engaging experience that blends historic college football artifacts with state-of-the-art, interactive, multimedia college football exhibits. Most recently located in South Bend, Indiana, The National Football Foundation (NFF) voted to relocate the Hall of Fame to downtown Atlanta in 2009, with the attraction opening in 2014. The Hall is located adjacent to the Georgia World Conference Center (GWCC), one of the largest convention facilities in the country. It is also just steps from Centennial Olympic Park, the World of Coca-Cola, the Georgia Aquarium, CNN Center, the Imagine It! Children's Museum, and the Center for Civil and Human Rights.

The National Football Foundation launched the College Football Hall of Fame in 1951 to stand as one of the nation's premier sports shrines, immortalizing the game's greatest players and coaches as positive role models for future generations. The Hall of Fame represents the

highest level of achievement for players and coaches and serves as a tribute to all of amateur football.

The National Football Foundation itself was founded in 1947 with early leadership from General Douglas MacArthur, legendary Army football coach Earl "Red" Blaik, and revered sports journalist Grantland Rice. It is a not-for-profit, educational organization with programs that use the power of amateur football to develop scholarship, citizenship, and athletic achievement in young people.

Through exhibits, programs, and special events, the Hall of Fame will provide your students with a vivid look into the rich tradition and excitement of college football. You will find that you can use the topic of sports, along with the interactive experiences at the Hall of Fame itself, to connect the educational themes of the exhibition to your national and local STEAM curricula and content requirements. This Teacher's Guide features a curriculum designed to offer a memorable learning experience that is interdisciplinary and applicable across several grade levels and areas of study. You are sure to score points with your students throughout the school year. Now let's blow the whistle and start the game!

IMAGE SUGGESTIONS

- A basic photo of the exterior of the Hall, or any images used in PR/marketing.
- Official logo?

During Your Field Trip

This section of the Teacher’s Guide provides a brief overview of what your students will see and do during your field trip. As you kick off your class visit to the College Football Hall of Fame, the first thing you and your students will notice is a towering wall holding over 765 helmets, one from every college that has a football team. With each team averaging 90 players, these helmets represent almost 70,000 scholar-athletes! The excitement and adventure of a college football game day fills the air as your students make their way through the *Quad* and upstairs to *Why We Love College Football*. Here, they will find the annual awards honoring the most accomplished teams, players, and coaches in college football. These trophies include the Heisman Trophy for the most outstanding college player and the National Championship Trophy for the number one team at the end of each season.

Along with the trophies, a giant interactive wall will feature photos and videos of players, fans, cheerleaders, marching bands, college campuses, and stadiums where students will want to explore the themes and experiences yet to come at the College Football Hall of Fame. Follow the interactive wall to the *Game Day Theater* where the film, “The Game of Your Life,” is a one-of-a-kind look at the ultimate college football experience as told through the eyes of those who live it every season—the players, coaches, fans, media, cheerleaders, and bands. Get in the spirit!

Some of college football’s most compelling and colorful activities take place in the stands and outside the stadiums. Fans cheer, chant, chat, and chew their way to making their campus the only place to be on Saturdays in the Fall. The history of these uniquely American traditions is explored next, in *Fans’ Game Day*. Tailgating from its earliest years to today shows how changes in technology and society go hand-in-hand, from horse-drawn wagons in the late

1800s to modern-day mobile satellite TV systems and Game Day recycling challenges. Many of the interesting artifacts featured here reveal a unique connection between college football and Coca-Cola (another Atlanta institution). How refreshing!

Students should look carefully for some of the most beloved football traditions in history, such as the hound’s-tooth fedora worn by legendary Alabama coach Paul “Bear” Bryant. Keep an eye out for authentic marching band, cheerleading, and mascot uniforms that showcase the colors and creativity unique to each school. You won’t want to miss the interactives in *Fans’ Game Day* including a “Face Painting Station” to celebrate your team colors and “Fight Song Karaoke” to show your school spirit through music—educational and entertaining, just like the sport itself.

Your students may even have a chance to sit behind the ESPN GameDay Desk and play the role of an on-camera sports broadcaster predicting the results of a game. Stop at the *Fans’ Game Day* interactive table to test your trivia knowledge, search for your favorite tailgate food, and create your own marching band routine and cheerleading performances. Can you locate your favorite?

The next gallery, *Building a Champion*, highlights those college football coaches who molded the game into what it is today and helped shape the characters of countless student-athletes. Artifacts and objects of great interest to your students include an interactive version of a 1920s playbook from John Heisman (Rice, Georgia Tech) and personal items from coaches Bobby Bowden (Florida), Hayden Fry (Iowa), Tubby Raymond (Delaware), and Woody Hayes (Ohio State). Interviews with individual college football players found at the “Meet the Players” interactive reveal how these young men manage to successfully balance academics

with conditioning and practice, down time, media attention, and a social life. That's quite a schedule considering that there are only 24 hours in each day!

Football is more than just a game for players and coaches. It also relies on experts—men and women—who can provide advice on physical training, adequate nutrition, and mental preparation. And let's not forget the scientists and engineers! The significance of technology is at the forefront of the "Evolution of Equipment" section of *Building a Champion*. You can compare and contrast the kinds of gear, uniforms, and protection that have been used in well over a century of college football. Here, you will also find the "Touchdown Timeline," a copy of which is included in the Appendix to this Teacher's Guide. At the College Football Hall of Fame, this timeline is augmented with rare historic treasures such as the Yale-Eaton game program from 1873 and the first penalty flag, thrown at Youngstown State in 1941. So much to learn and see!

Every week, from coast to coast, great rivalries and matchups are staged in hallowed cathedrals before millions of loud and loyal fans. The next gallery, *Game Time*, brings it all to life—the greatest sights, sounds, stadiums, and singular moments from over a century of college football. "Rivalry Row" conveys the range of emotions, from agony to ecstasy, elicited by annual games between rivals. Did you know that the Yale-Harvard rivalry became so heated by the 1890s that Harvard President Charles Eliot called for a ban on football altogether? Scenes from these annual competitions are presented in the "ESPN Annual Theater," with a highlight reel that will either preview the upcoming season or review the previous season.

Your class will get really close to the action at the interactive stations in *Game Time*. There is an opportunity for some individual students to record their own play-by-play calls of some of college football's memorable moments from

1972 to today or to use cutting edge virtual video technology to place themselves on the field at one of college football's iconic stadiums. The culmination of everything your students have learned thus far at the College Football Hall of Fame can be put to the test with an opportunity to take on the role of a Head Coach building his or her college football program from the ground up in the "Getting to the Championship" interactive station. Another feature found here that put you in the middle of it all is "Anatomy of a Play." This video breaks down all that happens between the end of a play, through the huddle, snap, and execution of the next play, as told by first-hand accounts from players and coaches.

Before leaving this level of the College Football Hall of Fame, you will pass a gallery that hosts a variety of related educational exhibitions on a rotating basis. Keep checking back to see what comes next! In this area, you will also find some of the most treasured items in the Hall of Fame's collection as well as a "Greatest Moments" film. This film is a timeline of notable events from the history of college football.

Only the most outstanding performers on and off the field are even considered for membership in the College Football Hall of Fame, and even fewer are voted in. In the *Hall of Fame* gallery on the third floor, your students can find Hall of Famers on glass panels on the perimeter and interact with stations to access information, images and videos about every inductee, many of whom are highlighted in the lesson plans and activities in this Teacher's Guide.

Your field trip continues in *Building Leaders*, which introduces your students to the achievements made by players after their college football careers. The vast majority of these men go on to pursue careers and occupations off the gridiron. The National Football Foundation's (NFF) highest honors are reserved for these remarkable people who have

made contributions in many facets of their lives, whether they spend most of their time in a locker room or a classroom or a board room. Interactive stations focus on the themes of “Character,” “Teamwork,” “Excellence,” and “Dedication.”

As the time clock winds down, the field trip ends for your students the same way most college football games begin for its players, by walking through the *Touchstone Tunnel* and onto the field. It’s a moment that will stay with your students long after the final whistle blows.

IMAGE SUGGESTIONS

- Floor plan/map of the Hall
- Images of interior spaces/inside the galleries (can also be used for the next section if the text needs to be broken up visually), with location identified in captions

Using This Teacher's Playbook

As a companion to your experience at the College Football Hall of Fame, this comprehensive Teacher's Guide for Middle School has been created to complement your classroom instruction and make the most of your school field trip. This Teacher's Guide contains original, assessable, STEAM-related classroom lesson plans with additional inquiry-based interdisciplinary activities and project ideas for you to use and share.

The Teacher's Guide for Middle School contains dynamic activities and assignments for students in grades six through eight. There are also Teacher's Guides for Elementary School and High School. Each of these Guides is created to be flexible; use them to best meet the needs and capabilities of your class. You know your students better than anyone else!

Following this Introduction, you will find a list of School Names and Nicknames that you and your students may encounter within this Teacher's Guide, followed by an onsite activity that can be completed during your field trip to the College Football Hall of Fame. The list of school names also includes the states within which each school is located along with their team names based on their mascots. Use this information to assign a mapping activity, have your students create their own matching worksheet, or play a round of Game Day Game Show. Your call, Coach!

The next section contains five Classroom Lesson Plans designed to correlate directly with your state curriculum standards. The lesson plans begin with the Teacher Instructions pages, which include the answer keys for those activities. At the top of the Teacher instruction page, you will find the appropriate content areas and skills addressed by the activities in the lesson. Each lesson continues with complete, ready-to-copy, Student Activity worksheets that center on key topics featured

in the exhibition. Depending on your schedule, these lesson plans can also be conveniently broken down and completed over a series of days.

The first lesson plan, **Height vs. Weight**, includes a chart with the average heights and weights of college football linemen and backs from 1890 to 2010. Your students will begin by finding out what, if any, relationship can be found between the size of a player and the position he plays. Then, they will see how the sizes of student athletes have changed over time and investigate whether a player's height correlates to his weight. Along the way they will convert between feet and inches, create a scatter plot, and calculate means and ranges while looking for correlations.

In the second lesson plan, **Center of Gravity**, your students will see Newton's Laws of Motion in action as they experiment to see how their own centers of gravity help them move. Then they will discover how talented college football running backs are able to maximize their center of mass to their benefit. Finally, they will consider situations when a high or even unbalanced center of gravity is actually an advantage.

For the third lesson, **Taking the Field**, your students practice geometry and proportional relationships by planning for a hypothetical, new, youth-sized football field to be built at your school. They need to find out what the measurements of the new field will be, identify a piece of land large enough for the field, and then calculate what it will cost to use artificial turf for the field. Because the field is for smaller football players, it will be built at a 1:1.25 ratio (as compared to the full-sized fields used in high school, college, and professional football).

The fourth lesson plan, **Football Fabrics**, begins with a materials science question answered by

an experiment. Why are modern football jerseys made from synthetic fabric instead of cotton or wool like they were originally? The Student Activity pages lead your class through predicting a hypothesis, testing samples, analyzing results, and drawing conclusions.

The final lesson plan is **The Favorite Field Trip—A Logic Puzzle**. Your class will read a short story and use their critical reasoning skills to solve a logic puzzle that matches three fictitious students with some of their favorite parts of the class field trip to the College Football Hall of Fame. Your students will be making deductions and establishing equalities similar to those used in algebra, but without using numbers!

A field trip to the College Football Hall of Fame has connections to multiple content areas at the middle school level. To round out your playbook, additional Interdisciplinary Activities and Inquiry-based Project Ideas follow the Classroom Lesson Plans and can be incorporated into a wide variety of curricula, including Social Studies and Language Arts. The next section contains three Games and Puzzles related to the themes of college football and the College Football Hall of Fame. These are excellent activities for your bus ride to and from the Hall of Fame or to assign for extra credit PAT (“Points after Trip”) as you see fit.

Under Additional Resources, you will find a handy “Football 101” reference guide. Keep this guide within reach as you introduce your class to the basics of college football. Be prepared to tackle their questions about the field, the player positions, the point system, and the College Football Hall of Fame itself. You may also find it helpful to copy “Football 101” and distribute it to your students for their own

use. The second part of Additional Resources contains a “Recommended Reading” list. Before or after a class trip to the College Football Hall of Fame, you will want to use this list as a starting point to create your own “Literary Hall of Fame” exploring the science, math, history and fun of college football. This section also includes a copy of the “Touchdown Timeline” of American history and college football you will see displayed at the College Football Hall of Fame in *Building a Champion*.

We know how important it is to be able to justify field trips and document how instructional time is spent outside of your classroom. To that end, this Teacher’s Guide is directly correlated to the Common Core State Standards for Mathematics and English Language Arts along with the Next Generation Science Standards and the C3 Framework for Social Studies State Standards. In addition you will find specific state requirements for Alabama, Florida, Georgia, North Carolina, South Carolina, and Tennessee to assist with your planning needs. The correlations are organized by content and grade level. You can readily see how they fit into your required curriculum making it easier than ever to connect a field trip to the College Football Hall of Fame with your classroom instruction.

All of these education resources can be used before your visit to the Hall of Fame to help prepare students for the teachable moments found throughout the exhibition as well as when you return to school to further explore connections between the educational themes of the exhibition and your classroom STEAM instruction. We look forward to seeing you at the College Football Hall of Fame. Time for kick-off!

IMAGE SUGGESTIONS

- Images of interior spaces/inside the galleries (if not used in previous section and if the text here needs to be broken up visually), with location identified in captions

College Names and Nicknames

This list contains the names and nicknames of the colleges and universities you may encounter in the College Football Hall of Fame Lesson Plans and Activities. The chart matches the official name of the school with its nicknames. You will see a few schools that are referred to by multiple names! The state in which the school is located is also included as well as the team names based on their mascots.

Official name	Also known as	Team	State
Arizona State University	Arizona State, ASU	Sun Devils	AZ
Boise State University	Boise State	Broncos	ID
Boston College	Boston, BC	Eagles	MA
Clemson University	Clemson	Tigers	SC
Columbia University	Columbia	Lions	NY
Dartmouth College	Dartmouth	Big Green	NH
Eastern Washington University	EWU	Eagles	WA
Georgia Institute of Technology	Georgia Tech, GT	Yellow Jackets	GA
Heidelberg University	Heidelberg	Fighting Student Princes	OH
Indiana University	Indiana, IU	Hoosiers	IN
Morehouse College	Morehouse	Maroon Tigers	GA
Princeton University	Princeton	Tigers	NJ
Purdue University	Purdue, PU	Boilermakers	IN
Rice University	Rice	Owls	TX
Rutgers, The State University of New Jersey	Rutgers, Rutgers University, RU	Scarlet Knights	NJ
Saint Ambrose University	Saint Ambrose	Fighting Bees	IA
Stanford University	Stanford, Leland Stanford Junior University, The Farm	Cardinal	CA
Syracuse University	Syracuse, SU	Orange	NY
Texas A&M University	Texas A&M, TAMU	Aggies	TX
United States Military Academy	Army, West Point	Black Knights	NY
United States Naval Academy	Navy	Midshipmen	MD
University of Arkansas	Arkansas	Razorbacks	AR
University of Chicago	Chicago	Maroons	IL
University of Florida	Florida, UF	Gators	FL
University of Illinois	Illinois	Fighting Illini	IL
University of Kansas	Kansas, KU	Jayhawks	KS
University of Missouri	Missouri, Mizzou	Tigers	MO
University of Notre Dame	Notre Dame, ND	Fighting Irish	IN
University of Wisconsin	Wisconsin	Badgers	WI
Virginia Polytechnic Institute and State University	Virginia Tech	Hokies	VA

Wesleyan University	Wesleyan	Cardinals	CT
Whittier College	Whittier	Poets	CA

First Down! A Student Field Trip Activity

Teacher Instructions

This activity is for your students to complete during their field trip to the College Football Hall of Fame. The galleries inside the Hall of Fame are highly immersive and interactive. Your class will have a true fan experience with audio features, videos, games, and touchscreen interactives. This Field Trip Activity will help your students make the most of their time at the Hall of Fame, while highlighting some of the content they might not otherwise see or read.

In each gallery, your students will be able to direct their own learning by choosing questions about the topics and people that interest them most. Each list of questions comes with directions indicating how many need to be answered from that group. By the end of the field trip, your students will have answered a total of 18 questions. However, you can assign the number of questions that best fits the skill level and interests of your students. The five galleries with questions on this Field Trip

Activity are: *Why We Love College Football, Fan's Game Day, Building a Champion, Game Time, Hall of Fame, and Building Leaders*. Hall of Fame Fan Ambassadors will greet your group upon arrival and provide directions as to how and where your experience will begin.

During your preparations for the field trip, advise your students to read through the questions carefully ahead of time so they will know what to look for once they are inside the galleries. Upon returning to school after the field trip, have students share and compare the answers to the questions they chose. By working in groups or as a whole class, try to complete all of the questions from the Field Trip Activity. The Answer Key below gives specific answers where appropriate and provides the locations where the answers will be found within the galleries for those questions with answers that can vary.

Answer Keys

Why We Love College Football

1. 25 lbs
2. Frank Eliscu
3. Coach of the year/most outstanding head football coach
4. Choices include national championships for Division I, II, and III, or FCS and NAIA; bowl games such as the Orange, Fiesta, Cotton, or Sugar; or the Heisman

Fan's Game Day

1. Tailgating at harvest celebrations in ancient Greece and Rome
2. Yale's bulldog, Handsome Dan
3. As an attempt to keep female fans from leaving a game that they were losing badly, 1907
4. Students will be able to choose from a list of over 50 colleges and universities.
5. 65,000
6. College of Wooster, Ohio

Building a Champion

1. Coaches on the mural: Eddie Robinson, Knute Rockne, Pop Warner, Bud Wilkinson, Bobby Bowden, Vince Dooley, Bobby Dodd, Bo Schembechler, Amos Alonzo Stagg, Lavell Edwards, John McKay, Woody Hayes, Bear Bryant, Darrell Royal
2. The 16 attributes and goals: Commitment - to common goals and to being successful. Unselfishness - there is no "I" in team. Unity - Come together as never before. Improve - everyday...as a player, person, and student. Be tough - mentally and physically. Self Discipline - do it right, and don't accept less. Great Effort. Enthusiasm. Eliminate Mistakes - don't beat yourself. Never Give Up. Never, Never, Never. Don't Accept Losing - if you do so one time, it will be easy to do so for the rest of your life. No Self-Limitations - expect more of yourself. Expect to Win - and truly believe we will. Consistency - your very, very best every time. Leadership - everyone can set the example. Responsibility - you are responsible for your own performance.
3. Four choices: Derrick Brooks, Florida State; Sam Acho, Texas; Peyton Manning, Tennessee; Doug Flutie, Boston College
4. Film projectors
5. USAF: "Aim High...Fly! Win! Fight!" Army: "Duty, Honor, Country." Navy: "Honor, Courage, Commitment."
6. To maximize the players ability to focus for a long time and to make sure workouts are fun
7. 4000-6000 calories a day
8. He replaced music heard during practice with the honk of a car alarm, the roar of a jet engine, a crying baby or a squealing pig
9. "Decrease multi-tasking, as it hurts efficiency. Compartmentalize, and do one thing at a time—academics, football, and personal matters." "Be clear on your purposes—know why you're doing what you do." "Develop an appreciation for the living in the moment. Bring the now to whatever you do; it's the only time you can ever truly be in control of anything." "Learn how to learn from your inevitable mistakes and successes. Although life guarantees you nothing, we can learn from something from each moment."
10. No; it was only made of cloth with some leather patches on the chest and arms
11. The suspension helmet was replaced with air-celled head gear. Hip and thigh pads were worn in girdles, and specialized position-specific pads became standard.
12. Leather, wood, metal, rubber
13. Because she sewed the first penalty flag for her husband, Youngstown State coach Dwight Beede
14. Gaither was supposed to become a preacher, like his father. But when his father died, Gaither took a high school coaching job to help support the family.

Game Time

1. Agricultural and Mechanical College of Alabama
2. Hope vs. Kalamazoo
3. Wide receiver, right guard, left guard, running back, or tight end
4. 41
5. It was freezing cold and he was sick.

Hall of Fame

1. Inductees are listed by year on the panels along the walls.
2. The "Legends of College Football" interactive touch screens are located in the center of the gallery. Students can select from a large number of Hall of Fame players and coaches.

Building Leaders

1. 60%
2. The nation's top scholar-athlete
3. General Douglas MacArthur. He commanded Allied troops in the Pacific in World War II and was an early leader the National Football Foundation.
4. The four themes are Character, Dedication, Teamwork, and Excellence. (The stations are located along the wall opposite the glass windows overlooking the field.)

First Down!

Student Field Trip Activity

You have a choice of questions to answer for each gallery. You can move around to see the exhibitions in any order. The questions are in the first column. Write the numbers for the questions you chose with your answers in the second column. Please do not lean on the glass cases or touchscreens to write.

Why We Love College Football: Choose two.

<p>1. How much does the Heisman Trophy weigh?</p> <p>2. What is the name of the artist who sculpted the Heisman Trophy?</p>	<p># _____</p>
<p>3. To whom is the Dodd Trophy awarded each year?</p> <p>4. Which of the trophies in the glass case is your favorite? Why?</p>	<p># _____</p>

Fan's Game Day: Choose four.

<p>1. <i>Kick Off</i>: What are the ancient origins of tailgating?</p> <p>2. <i>Mascot</i>: What is the oldest college mascot?</p>	<p># _____</p>
<p>3. <i>Cheerleaders</i>: How and when did the "Yell Leaders" at Texas A&M get started?</p>	<p># _____</p>
<p>4. <i>Down, Set, Sing</i>: If you did the "Fight Song Karaoke," which song did you sing?</p> <p>5. <i>Family, Food, Fun</i>: How many bottles of water do fans go through on game days at the University of Michigan?</p>	<p># _____</p>
<p>6. <i>Bands</i>: Which college band has members who wear kilts? In which state is it located?</p>	<p># _____</p>

Building a Champion: Choose six.

<p>1. <i>Coaches Who Changed the Game</i>: Pick a quote that you like from the cartoon mural. What is the quote? Who said it? What does it mean?</p> <p>2. <i>Chemistry Counts</i>: Which of the Kansas State 16 goals and attributes is a good motto for your own life? Why?</p>	# _____
<p>3. <i>Meet the Players</i>: Which player did you meet at this touchscreen interactive? Where did he go to school? What did you learn about this student-athlete?</p> <p>4. <i>Coaches Desk</i>: How did coaches show practice and game films before videotapes were invented?</p>	# _____
<p>5. <i>Service Academies</i>: What is the motto for two of the football teams from the US military academies?</p> <p>6. <i>The Weight Room</i>: Why did coach Tom Moffitt add yoga and karate to the LSU players' workouts?</p>	# _____
<p>7. <i>The Training Table</i>: How many calories a day do football players need to eat to maintain their weight?</p> <p>8. <i>The Practice Field</i>: How did Tennessee coach Butch Jones prepare his players for noisy, hostile crowds?</p> <p>9. <i>The Mind Game</i>: What is one of the tips offered by sports psychologists to improve your game?</p>	# _____
<p>10. <i>Evolution of Equipment, Shoulder Pads</i>: Find the photo of Fritz Crisler. Do you think his jersey from 1921 offered much protection? Why?</p> <p>11. <i>Evolution of Equipment, Don McPherson</i>: Find the mannequin with McPherson's Syracuse uniform. How did protective equipment change in the 1980s?</p>	# _____
<p>12. <i>Evolution of Equipment, Cleats</i>: Name two materials that have been used for cleats.</p> <p>13. <i>Touchdown Timeline</i>: Why is Irma Beede called the "Betsy Ross" of college football? (Hint: 1941)</p> <p>14. <i>HBCU</i>: What career did Jake Gaither plan to pursue? Why did he become a football coach?</p>	# _____

Name _____

Class _____

Date _____

Game Time: Choose three.

1. <i>Rivalries</i> : When the Auburn vs. Alabama rivalry began in 1893, what was Auburn's name?	# _____
2. <i>Rivalries</i> : Which two teams play each other every year for a pair of wooden shoes?	# _____
3. <i>Anatomy of a Pass</i> (window wall, overlooking the field): Name two football positions that need players who can run fast. 4. <i>The Greatest Moments</i> : What number did Glenn Davis wear at the US Military Academy? (Hint: Find his jersey.) 5. <i>The Greatest Moments</i> : Why did quarterback Joe Montana need chicken soup at halftime of the Cotton Bowl in 1979?	# _____

Hall of Fame: Choose one.

1. Name one player from the most recent year of Hall of Fame inductees and one from the year you were born. 2. At the "Legends of College Football" screens, select "Ask A Hall of Famer." Whom did you choose? What year was he inducted? What did you learn about him?	# _____
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Building Leaders: Choose two.

1. How many games must a coach win in his career in order to be inducted into the Hall of Fame? 2. To whom is the William V. Campbell Trophy awarded each year?	# _____
3. For whom is the MacArthur Bowl named? Who was he? 4. Choose one of the four themes for the Leadership Station touchscreen interactives along the wall. Select one player. Who did you choose? Which leadership theme does he represent? Why?	# _____

Lesson 1: Height vs. Weight

Teacher Instruction

Since college football began in 1869, formal rules and regulations have reduced the number of players on a team and standardized the size of the field. Changes in the sizes of the players, though, are not the result of any rule. In *Building a Champion* at the College Football Hall of Fame, you will learn about the importance of a team's strength coach. Strength coaches are charged with designing and implementing training programs that safely make players bigger, faster, stronger, and healthier.

Over the past 40 years, the average weight of an offensive lineman on a college football team has increased by almost 100 pounds. In the "Path to Success" at the College Football Hall of Fame, you will find a chart with the average heights and weights of the linemen and backs on the consensus "All-American" teams, every twenty years from 1890 - 2010. Although the names of some football positions evolved over that 120-year period, the roles of the linemen and backs have remained relatively consistent. The beginning of the Student Activity contains a brief overview of the positions included in these two categories. During your class field trip to the College Football Hall of Fame, check the walls in *Game Time* for a larger-than-life diagram of all the positions that take to the field before each play.

In this activity your students will look at changes in the average heights and weights of

college football linemen and backs from 1890 - 2010. In Part 1, their task will be to find out what, if any, relationship can be found between the size of a player and the position he plays. In Part 2, they will see how the sizes of student athletes have changed over time and investigate whether a player's height correlates to his weight. Along the way they will convert between feet and inches, create a scatter plot, and calculate means and ranges while looking for correlations. For Part 3, they will synthesize the results of their investigations in an essay supported by their calculations.

The students will discover that, overall, linemen are bigger than backs. Linemen also showed a greater increase in size over the years than the backs did. However, players from more recent teams are larger overall than their counterparts in the earlier years of the game. Both positions showed a positive correlation between height and weight, but it is more obvious for the backs. The linemen's correlation between height and weight is not as straightforward, as weight seems to have increased more rapidly than height. Also, the correlation begins to dissipate in the later years of the data.

Hit the weight room to get ready to solve these problems!

Teacher Tips

- Students will need a calculator and two pens or pencils of different colors
 - Consider allowing the students to work with a partner for Part 2 of the activity.
-

ANSWER KEY

Part 1

Year & Positions	Avg Height, Inches
1890 Linemen	70.9
1890 Backs	68.8
1910 Linemen	72.1
1910 Back	69.3
1930 Linemen	73.0
1930 Backs	71.0
1950 Linemen	74.9

1950 Backs	71.8
1970 Linemen	73.8
1970 Backs	72.6
1990 Linemen	74.8
1990 Backs	73.8
2010 Linemen	76.1
2010 Backs	72.3

1. (a) backs from 1890, (b) linemen from 2010
2. (a) backs from 1890, (b) linemen from 2010
3. [chart below]

	Height in inches		Weight in pounds	
	Mean	Range	Mean	Range
All	72.5 in (6'0.5")	7.3	204.9	128.9
Linemen	73.7 in (6'1.7")	5.2	223.4	112.4
Backs	71.4 in (5'11.4")	5	186.5	54.5

4. Linemen are larger, backs are smaller
5. Linemen

Part 2

2. (a) the dots form a diagonal cluster, heading up and to the right, (b) a positive correlation
3. (a) the dots form a diagonal cluster for both, heading up and to the right; (b) the backs are on the smaller/lower end (bottom left) of the grid and the linemen are larger/higher (upper right), and the linemen's points are more scattered (c) yes, but the correlation is not as strong in the linemen
4. (a) 1890 (twice) & 1910 (b) 1970, 1990, 2010
5. false
6. false

Part 3

Answers will vary, but students should note that:

- overall, linemen were bigger than backs
- linemen also showed a greater increase in size over time than the backs did
- however, players from more recent teams were larger overall than their counterparts in the earlier years
- both positions showed a positive correlation between height and weight, but it was more obvious for the backs
- the linemen's correlations between height and weight were not as straightforward; their weight seemed to have increased more rapidly than height.
- the correlation between height and weight began to dissipate in the later years of the data
- Causes of the results will vary as well but students may explain that backs need to be quicker, and therefore smaller, than the linemen whose jobs include blocking opponents. Other factors

may include changes in the responsibilities of the particular positions over time along with overall improvements in health and nutrition.

Height vs. Weight

Student Activity

Since college football began in 1869, formal rules and regulations have reduced the number of players on a team and standardized the size of the field. Changes in the sizes of the players, though, are not the result of any rule. In *Building a Champion* at the College Football Hall of Fame, you will learn about the importance of a team's strength coach. Strength coaches are charged with designing and implementing training programs that safely make players bigger, faster, stronger, and healthier.

Over the past 40 years, the average weight of an offensive lineman on a college football team has increased by almost 100 pounds. In the "Path to Success" at the College Football Hall of Fame, you will find a chart with the average heights and weights of the linemen and backs on the consensus "All-American" teams, every twenty years from 1890 to 2010. Although the names of some football positions evolved over that 120 year period, the skills of the linemen and backs have remained mostly the same. During your field trip to the College Football Hall of Fame, check the walls in *Game Time* for a larger-than-life diagram of all the positions that take to the field before each play. How many can you name?

The backs excel in speed and agility with ball handling, such as catching, passing, and

carrying. The linemen need strength and size for blocking and tackling. Before 1965, linemen's positions were the centers, guards, tackles, and ends. After 1965, the linemen were centers, offensive and defensive tackles, tight ends, defensive ends, and linebackers. In the early years, the backs were the quarterbacks, fullbacks, and halfbacks. More recently, the backs positions include quarterbacks, fullbacks, running backs, wide receivers, and defensive backs.

In this activity you will look at changes in the heights and weights of college football linemen and backs over a period of 120 years. In Part 1, your task will be to find out what, if any, relationship can be found between the size of a player and the position he plays. In Part 2, you will see how the sizes of student athletes have changed over time and investigate whether a player's height correlates to his weight. Along the way you will convert between feet and inches, create a scatter plot, and calculate means and ranges while looking for correlations. For Part 3, you will present the results of your investigations in an essay supported by your data. Hit the weight room to get ready to solve these problems!

Words to Know: *agility, consensus, correlation, mean, range, scatter plot*

Supplies

- Calculator
- Two pens or pencils of different colors

Part 1

- Convert the average heights in the chart from feet and inches into just inches. Round to the nearest tenth and fill in the empty column on the chart. This conversion will make it easier to answer some of the questions that follow. Remember, 1 foot = 12 inches.

Year & Positions	Average Height, in feet & inches	Average Height, in inches	Average Weight, in pounds
1890 Linemen	5'10.9"		172.3
1890 Backs	5'8.8"		155.8
1910 Linemen	6'0.1"		195.7
1910 Back	5'9.3"		166.8
1930 Linemen	6'1.0"		195.6
1930 Backs	5'11.0"		186.5
1950 Linemen	6'2.9"		217.1
1950 Backs	5'11.8"		189.3
1970 Linemen	6'1.8"		231.8
1970 Backs	6'0.6"		197.4
1990 Linemen	6'2.8"		266.4
1990 Backs	6'1.8"		199.1
2010 Linemen	6'4.1"		284.7
2010 Backs	6'0.3"		210.3

- (a) Which position and year had the shortest players? (b) Which position and year had the tallest players?

- (a) Which position and year weighed the least? (b) Which position and year weighed the most?

4. Calculate the means and the ranges for the college football players' heights and weights: first for all positions and years (row #1), then for just the linemen (row #2), and finally for just the backs row #3).

	Height in inches		Weight in pounds	
	Mean	Range	Mean	Range
All				
Linemen				
Backs				

5. Based on your calculations thus far, which of the two kinds of positions seems to be played by larger team members and which one by smaller team members?

6. Which position saw a greater increase in the size of the players over time? (Hint: Check the ranges!)

Part 2

Use the grid on the next page to make scatter plots for all of the players. The heights are marked on the x-axis (horizontal) in inches and the weights are on the y-axis (vertical) in pounds.

Use one colored pen or pencil for the linemen and a different one for the backs. For each measurement, place a dot where an invisible line drawn straight up from the height on the x-axis would intersect an invisible line drawn straight across from the weight on the y-axis: (x, y). For example, the coordinate pair for the 1890 linemen is (70.9, 172.3).

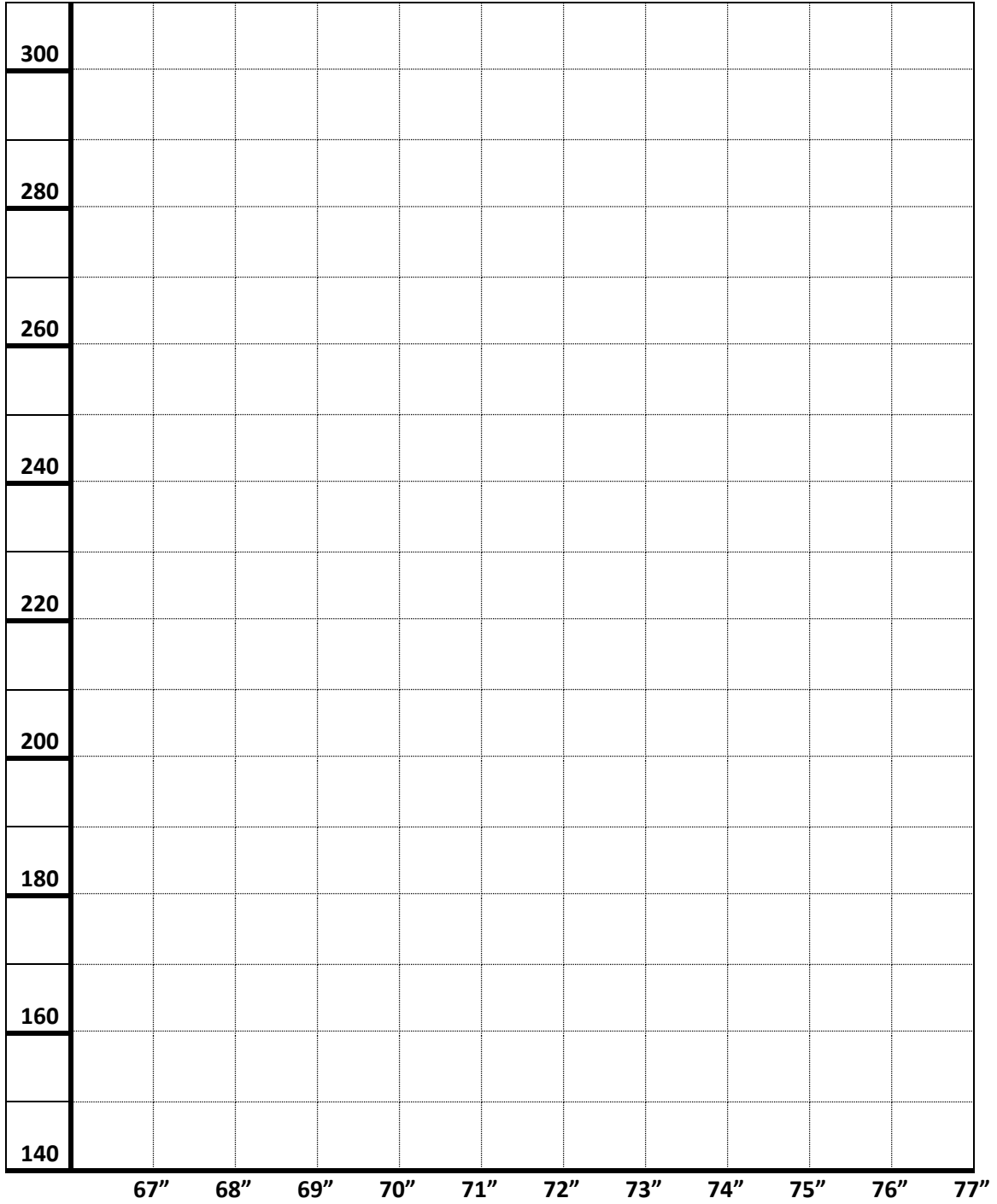
1. (a) What color will you use on your graph for the linemen? (b) What color will you use for the backs?

Name _____

Class _____

Date _____

HEIGHT (x-axis) vs. WEIGHT (y-axis)



Name _____

Class _____

Date _____

2. (a) Describe the shape of the “cloud” formed by all the dots on the scatter plot as a whole. (b) Does the shape indicate a positive or negative correlation between the height and weight of college football players?

3. Look at the scatter plot for just the linemen and compare it to the scatter plot for just the backs. (a) How are the “clouds” for the two positions the same? (b) How are they different? (c) Do they show the same correlation? Why or why not?

4. Consult both your scatter plot and the original chart with the players’ heights and weights. (a) Which years have the three lowest points on the scatter plot? (b) Which years have the three highest points on the scatter plot?

5. True or false? Even the backs from more recent years were smaller than linemen from the earlier years.

6. True or false? There appears to be a stronger correlation between college football players’ heights and weights for the earlier years on the chart than in the more recent years.

Name _____

Class _____

Date _____

Part 3

On separate paper, write a three paragraph essay explaining the results of this investigation. Compare and contrast changes in the heights and weights of the players at the two kinds of positions, linemen and backs. Then, describe the correlations, or lack thereof, revealed by the scatter plots, concerning the heights and weights of college football players over time. In the final paragraph, offer explanations for the results of your research concerning the sizes of particular positions in college football and why they may have changed. Include data from the charts and from the scatter plots to support your statements in the essay.

The Extra Point

What is the rate of change for the correlations that will be found for height and weight? Create a linear equation, using $Y = a + bX$ where a is the intercept, b is the slope (rise over run), Y is the dependent variable, and X is the independent variable.

IT'S A FOOTBALL FACT!

At 5'9", Doug Flutie was considered too small to play big-time college quarterback, yet at Boston College he wound up throwing for more yards than anyone before him before moving on to play professionally. He set NCAA career passing and total offense records, won a Heisman Trophy, and is one of only a small number of players in history to be an NFF National Scholar Athlete and a member of the College Football Hall of Fame.

IMAGE SUGGESTIONS

- NFF photo of Doug Flutie, to go with football fact above
- A scene from the "Bus Graphic"
- Photos of players from the earliest years mentioned in the chart (1890, 1910, 1930), identified in captions
- A photo of an exceptionally large player from today, identified in caption??

Lesson 2: Center of Gravity

Teacher Instructions

Sir Isaac Newton was a mathematician and scientist from England who discovered important facts about how objects on Earth move. He wrote a book about three “laws” of motion in 1687. One of them, his Second Law of Motion, tells us that objects with more mass have more force. When two football players run into each other on the field, it makes sense that the player with more mass and greater force would prevail over the player with less mass. The smaller player should careen off course or fall to the ground.

That brings us to Newton’s Third Law, which states that for every action, there is an equal but opposite reaction. When two objects collide, they both push against each other—even if we cannot see it—and the object with less mass has its speed and direction changed. If you drop a football on the floor and see it bounce back up, that is the floor, which has greater mass than the football, pushing back on the ball, which changes its speed and direction while returning its force.

However, if a football player with less mass and force can make good use of his center of gravity, he can avoid having his own direction and speed changed by the larger force. Sometimes called “center of mass,” your center of gravity is located in your lower abdomen, just under your belly button when you are standing up straight. It is the point at which all your body weight is concentrated and evenly distributed. It shifts constantly as you move, providing both momentum and balance depending on what you are doing. You are the most stable when your center of gravity is positioned directly

above your base of support: your feet. Utilizing their centers of gravity is how running backs—often the smallest players on the field—evade tackles from massive defensive linemen either by breaking free or by knocking the larger player’s own center of gravity off balance.

For example, University of Kansas running back Tony Sands was only 5’6” tall. However, on November 23, 1991, he stood taller than any running back in NCAA history. Sands carried the ball 58 times for a record 396 yards in a 53-29 win over Missouri. Lightly recruited because of his small stature, Sands was carried off the field after his record-setting performance, which came in the last home game of his career. The ball from that game is now in *Building a Champion* at the College Football Hall of Fame, which is where you will also find the 1989 record-setting game ball from legendary Indiana Hall of Fame running back Anthony Thompson. During your field trip, be on the lookout in *Game Time* for the jersey worn in 1924 by another famous Hall of Fame running back, Red Grange from Illinois.

In this activity your students will first experiment to see how their own centers of gravity help them move. Then they will discover how talented running backs are able to maximize their center of mass to their benefit. Finally, they will consider situations when a high or even unbalanced center of gravity is actually an advantage because some activities do not require the ability to withstand the force of impact from a larger object. Football and Physics are a winning combination!

Supplies for Part 1:

- Meter stick
- Masking tape
- Open floor space

Players and sources for excerpts in Part 2:

- Player 1: Delone Carter, Syracuse
 - http://fifthdown.blogs.nytimes.com/2011/04/13/n-f-l-draft-delone-carter-fifth-ranked-rusher/?_r=0
 - Player 2: Montee Ball, Wisconsin
 - <http://www.nfl.com/combine/profiles/montee-ball?id=2539341>
 - Player 3: Christine Michael, Texas A&M
 - <http://www.nfl.com/combine/profiles/christine-michael?id=2539322>
 - Player 4: Stepfan Taylor, Stanford
 - <http://edraft.com/nfl/news/2013-nfl-scouting-report-stepfan-taylor/>
 - Player 5: Dennis Johnson, Arkansas
 - <http://www.cincyjungle.com/2013/1/22/3888020/2013-bengals-draft-backups-with-potential-NFL-Scouting-Reports-Rankings-Running-backs>
-

ANSWER KEY

Part 1

1. While holding their toes for “Distance B,” the distance of the jumps will be non-existent or very small.
2. Most likely, it will be the first jump forward.
3. Impossible to jump forward. The center of gravity was blocked and prevented from moving forward.
4. Small backwards jumps may be possible because the center of gravity is not blocked in that direction. However, the backward jump is still difficult because the center of gravity could not shift forward again to compensate for the lack of balance.

Part 2

1. Low center of gravity
2. Wiggle because it makes it hard to catch him
3. “Sidesteps or stiff-arms oncoming defenders...can sink low and spin out”
5. Answers will vary, but it means running up and down the field, as opposed to side to side, towards the end zone
6. His choppy steps make it hard for defenders to knock him off balance
7. Short, stout & stocky: “he’s short enough to squeeze through a lane” and “good thickness throughout his frame” and “powerful, thick” and “very thick lower half”
8. Answers may vary: wrestling, discus thrower, baseball catcher

Part 3

1. forward
2. up
3. forward

4. up
5. forward and backward
6. side to side
7. backward
8. forward
9. up
10. up

Center of Gravity

Student Activity

Sir Isaac Newton was a mathematician and scientist from England who discovered important facts about how objects on Earth move. He wrote a book about three “laws” of motion in 1687. One of them, his Second Law of Motion, tells us that objects with more mass have more force. When two football players run into each other on the field, it makes sense that the player with more mass and greater force would prevail over the player with less mass. The smaller player should careen off course or fall to the ground.

That brings us to Newton’s Third Law, which states that for every action, there is an equal but opposite reaction. When two objects collide, they both push against each other—even if we cannot see it—and the object with less mass has its speed and direction changed. If you drop a football on the floor and see it bounce back up, that is the floor, which has greater mass than the football, pushing back on the ball which changes its speed and direction while returning its force.

However, if a football player with less mass and force can make good use of his center of gravity, he can avoid having his own direction and speed changed by the larger force. Sometimes called “center of mass,” your center of gravity is located in your lower abdomen, just under your belly button when you are standing up straight. It is the point at which all your body weight is concentrated and evenly distributed. It shifts constantly as you move, providing both momentum and balance depending on what you are doing. You are the most stable when

your center of gravity is positioned directly above your base of support—your feet. Utilizing their centers of gravity is how running backs—often the smallest players on the field—evade tackles from massive defensive linemen, either by breaking free or by knocking the larger player’s own center of gravity off balance.

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In this activity you will first experiment to see how your own center of gravity helps you move. Then you will discover how talented running backs are able to maximize their center of mass to their benefit. Finally, you will consider situations when a high or even unbalanced center of gravity is actually an advantage because some activities do not require the ability to withstand the force of impact from a larger object. Football and Physics are a winning combination!

Words to Know: *abdomen, careen, collide, evade, excel, momentum, prevail, utilizing*

Part 1

In this section you and your partner will attempt several jumps in order to understand the role of the center of gravity in human motion. Take turns performing the exercises and recording measurements.

Supplies:

- Meter stick
- Masking tape
- Open floor space

1. Use the masking tape to make a starting line on the floor.
2. Stand on the starting line and bend your knees slightly. Jump forward off both feet and land on both feet. Measure the distance between the starting line tape and where you landed after your jump. Record this distance in the “Jump forward” row under the “Distance A” column in the chart below.
3. Stand on the starting line and bend your knees slightly. Jump backward off both feet and land on both feet. Measure the distance between the starting line tape and where you landed after your jump. Record this distance in the “Jump backward” row under the “Distance A” column in the chart below.
4. Stand on the starting line. Bend your knees slightly, lean over, and grab hold of your toes with both hands. Jump forward off both feet and land on both feet. Measure the distance between the starting line tape and where you landed after your jump. Record this distance in the “Jump forward” row under the “Distance B” column in the chart below.
5. Stand on the starting line. Bend your knees slightly, lean over, and grab hold of your toes with both hands. Jump backward off both feet and land on both feet. Measure the distance between the starting line tape and where you landed after your jump. Record this distance in the “Jump backward” row under the “Distance B” column in the chart below.

	Distance A	Distance B
Jump forward		
Jump backward		

6. Which jump was your longest?

Name _____ Class _____ Date _____

7. How did holding on to your toes affect your ability to jump to the front? What happened to your center of gravity?

8. How did holding on to your toes affect your ability to jump backward? What happened to your center of gravity?

Part 2

On the “Coach’s Desk” in *Building a Champion* at the College Football Hall of Fame, you saw samples of recruiting questionnaires written by some of today’s star athletes as they prepared to move onto college, including LeBron James, Peyton Manning, and Tony Gonzalez. Now, you will read descriptions from the scouting reports on several recent college football running backs entering the NFL.

The running back’s main responsibilities in a football game are to get the ball from the quarterback, run down the field as far as he possibly can while holding the ball tightly, and avoid getting tackled. In Part 1, you learned that the motion of your center of gravity dictates movement for your whole body.

Answer the questions that follow to discover how players who excel in this position use their center of gravity to stay balanced on their feet. You will also see what other skills they have that make them worthy of scouting by professional football teams.

Player 1, from Syracuse University: “...runs with a low center of gravity and juking ability. That makes it difficult for defenses to get a true angle on him. He’s also a powerful, muscular player who bounces off hits, pushes the pile and finishes plays with a strong stiff-arm. In some ways, he’s the ideal size for a runner: he’s short enough to squeeze through a hole but strong enough to wear down a defense.”

Player 2, from University of Wisconsin: “Sidesteps or stiff-arms oncoming defenders in space after the catch. Good balance and low center of gravity, can get low and spin out of tackles.”

Name _____ Class _____ Date _____

Player 3, from Texas A&M: “A low center of gravity [running] back with good thickness throughout his frame to take and give out punishment. North-south runner who uses his strong legs to burst through the hole to gain six or seven yards in a hurry. More speed in the open field than you’d expect given his size....”

Player 4, from Stanford: “...a powerful, thick running back. ... Defenders will not be able to arm-tackle this running back. He is strong at the point of contact and used a low center of gravity to create an advantage at first contact.”

Player 5, from University of Arkansas: “At 5'9" and 215 lbs, he's built like a modern-day back; very thick lower half and plays with a low center of gravity. Add in his choppy steps and he's very hard for defenders to knock off balance.”

1. What physical trait do all of these players have in common?

2. Besides his center of gravity, how else does Player 1 run that makes it difficult for defenders to catch him? How does this move help him?

3. How does Player 2 avoid defenders and tackles after he catches the ball?

4. What do you think the description “north-south runner” for Player 3 means?

5. Besides his center of gravity and size, what other technique makes Player 5 a good running back? How does this benefit him?

6. What is the best body shape and size for a low center of gravity? Cite examples directly from the quotes above to support your answer.

7. What other sports can you think of where an athlete's stability is helped by a low center of gravity? Think of activities that require balance and the ability to withstand Newton's Third Law of Motion!

Part 3

In football, a high center of gravity is a disadvantage because the farther your center of gravity is from the ground, the easier it is to get knocked off balance. However, a basketball player hoping to make a slam dunk must shift his center of gravity upwards to help carry him to the rim. Raising his arms with the additional weight of the ball helps him get there. Similarly, a swimmer about to start a race positions herself with her center of gravity leaning forward, to help carry her farther into the water on the initial dive.

For many other sports and activities, you have to shift your center of gravity upwards or outwards on purpose. For each activity below, identify which direction you need to shift your center of gravity: down, up, side-to-side, forward, or backward in order to complete the task. Look out for any that use a combination of these motions!

Name _____ Class _____ Date _____

- | | |
|---------------------------------|---------------------------------------|
| 1. Sprinting: _____ | 6. Turning on a unicycle: _____ |
| 2. High jump: _____ | 7. Hiking downhill carefully: _____ |
| 3. Long jump: _____ | 8. Riding a bike uphill: _____ |
| 4. Heading a soccer ball: _____ | 9. Volleyball: _____ |
| 5. Swinging on a swing: _____ | 10. Blocking a basketball shot: _____ |

The Extra Point

Often, exceptional football players are also exceptional track and field stars. For example, C.J. Spiller was an All-American running back from Clemson who also ran in the 60 meter, 100 meter, and 200 meter events for Clemson's track and field team. After Jeffrey Demps' years as a running back for the University of Florida came to an end, he earned a silver medal in track and field during the 2012 Summer Olympics. For David Wilson from Virginia Tech 2011 was a very good year. As a running back, he was named the ACC Offensive Player of the Year for college football and then helped his school's track and field team win the 2011 ACC Indoor Track and Field Championship.

What qualities or skills used by a running back would also make for a successful track star? Now that you have learned a little about the physics of being a successful running back, explore the physics of track and field! Compare how both sports use the center of gravity and how the physics of these sports overlap.

IT'S A FOOTBALL FACT!

Jayson Carter, who walked on the football team as a running back at Rice University in 2012, measures 4-feet-9 inches tall and 135 pounds. His small size, however, did not stop him from rushing for 1,233 yards in high school!

IMAGE SUGGESTIONS

- Image from the "Coach's Desk" set in *Building a Champion* with the recruiting questionnaires for LeBron James, Peyton Manning, and Tony Gonzalez, identified in captions
- Photo of Tony Sands, with caption: University of Kansas running back Tony Sands was only 5'6" tall.
- NFF photo of Herschel Walker, with caption: UGA's Hall of Fame running back Herschel Walker was also an accomplished sprinter.
- Photo of the Red Grange jersey going on display or NFF photo of Red Grange, with caption: During your field trip, look for the jersey worn in 1924 by another famous running back, Red Grange.

- Photo from a game of a running back dodging a tackle, with caption: Utilizing their centers of gravity is how running backs—often the smallest players on the field—evade tackles from massive defensive linemen.

Lesson 3: Taking the Field

Teacher Instructions

The “Touchdown Timeline” found both in the appendix of your Teacher’s Guide and in *Building a Champion* at the College Football Hall of Fame shows that football began soon after the American Civil War ended. In 1869, Princeton and Rutgers played the first college football game in New Brunswick, NJ, with a soccer-style round ball. In the “Evolution of Equipment” at the College Football Hall of Fame, you can compare a reproduction of this 1869 football to a modern ball. Ask your students to note differences other than the shape. At the time of this first game, the field was 120 yards long and 75 yards wide and the game was played with 25 players on each side.

By the early 1880s, the official size of a football field was reduced to near its current dimensions of 120 by $53\frac{1}{2}$ yards (109.7 by 48.8 meters) and teams were limited to only 11 players on the field at a time. As the popularity of the game spread up to professional leagues and down to high school and youth leagues, changes were made to keep the game appropriate for all of its players, from pee wee to the pros.

Just like the players at younger levels are not as big as college or professional players, neither are the lengths of their game, the size of their field, or even the ball they use. In this activity, you will be comparing the size of the football fields used for youth leagues (ages 12 – 14) to the full-sized fields used in high school, college, and professional football.

In Part 1, your class has been given the job of planning for a hypothetical, new, youth-sized football field to be built at your school. They need to find out what the measurements of the new field will be, identify a piece of land large enough for the field, and then calculate what it will cost to use artificial turf for the field. Because the field is for smaller football players, it will be built at a 1:1.25 ratio (as compared to the full-sized fields used in high school, college, and professional football). For Part 2, they will consider the size of the open space they encounter at the end of the field trip to the College Football Hall of Fame’s indoor field that simulates a playing field. How does the size of this activity field compare to the college football fields it honors?

Supplies

- Calculator
- Scratch paper

ANSWER KEY

Part 1

1. 120 yds = 360 ft, 10 yds = 30 ft, 100 yds = 300 ft, $53\frac{1}{2}$ yds = 160 ft
2. 80%
- 3.

	Youth Field	
	Yards	Feet
Entire length of field	96	288
Length of each end zone	8	24
Length between goal lines	80	240
Entire width	42 $\frac{3}{4}$	128

4. 40-yard line
5. 832 ft
6. 912 ft
7. \$17,328
8. (b) Lot B = 110 yd N-S, 60 yd E-W
9. 36,864 ft²
10. (a) 6,144 ft² (b) 1/6
11. \$156,672
12. 4,640 fruit baskets = 7 per student

Part 2

1. 53:120 = 1:2.26
2. 44.12%
3. 3.5 yd
4. 27:53 $\frac{1}{2}$ = 1:1.98
5. 51%
6. (a) 1,431 yd² (b) 6,396 yd²
7. 22.37%

Taking the Field

Student Activity

The “Touchdown Timeline” in *Building a Champion* at the College Football Hall of Fame shows that football began soon after the American Civil War ended. In 1869, Princeton and Rutgers played the first college football game in New Brunswick, NJ, with a soccer-style round ball. In the “Evolution of Equipment” at the College Football Hall of Fame, you can compare a reproduction of this 1869 football to a modern ball. What other differences do you notice besides the shape? At the time of this first game, the field was 120 yards long and 75 yards wide and the game was played with 25 players on each side.

By the early 1880s, the official size of a football field was reduced to its current dimensions of 120 by 53½ yards (109.7 by 48.8 meters) and teams were limited to only 11 players on the field at a time. As the popularity of the game spread up to professional leagues and down to high school and youth leagues, changes were made to keep the game appropriate for all of its players, from pee wee to the pros.

Just like the players at younger levels are not as big as college or professional players, neither

are the lengths of their game, the size of their field, or even the ball they use. In this activity, you will be comparing the size of the football fields used for youth leagues (ages 12 – 14) to the full-sized fields used in high school, college, and professional football.

In Part 1, your class has been given the job of planning for an imaginary new youth-sized football field to be built at your school. You need to find out what the measurements of the new field will be, identify a piece of land large enough for the field, and then calculate what it will cost to use artificial turf for the field. Because the field is for smaller football players, it will be built at a 1:1.25 ratio, as compared to the full-sized fields used in high school, college, and professional football. Armed with the 1:1.25 ratio and the measurements of a full-sized field, you and your classmates have a lot of work ahead of you! For Part 2, you will consider the size of the open space they encounter at the end of the field trip to the College Football Hall of Fame’s indoor field that simulates a playing field. How does the size of this activity field compare to the college football fields it honors?

Supplies

- Calculator
- Scratch paper

Words to Know: *convert, perimeter, ratio, surface area, turf*

Part 1

After converting the yards to feet in the chart on the next page, for the full-size field, begin calculating the size—and the cost—of your school’s new field. (Hint: 1 yard = 3 feet) As you work through the problems, it may be helpful to draw a model of the field on scratch paper.

1. Convert the yards to feet in the chart and fill in the third column.

	Full-size Field	
	Yards	Feet
Entire length of field	120	
Length of each end zone	10	
Length of playing area, between goal lines	100	
Entire width	53 $\frac{1}{3}$	

2. Convert the 1:1.25 ratio to a percentage and complete this statement.

The youth field will be _____% the size of a high school, college, or professional football field.

3. Using the percentage rate you calculated in #2, find the dimensions for the school's new football field (in feet and yards) and complete the chart below.

	Youth Field	
	Yards	Feet
Entire length of field		
Length of each end zone		
Length of playing area, between goal lines		
Entire width		

4. The 50-yard line is the midline of a full-sized field. What will be the midline of your school's new field?

Name _____

Class _____

Date _____

5. What is the perimeter of your field, in feet?

6. The school board has decided there needs to be a safety fence around the new playing field, built 10 yards away from the field on all four sides. How much fencing, in feet, is needed to enclose the space?

7. A chain-link safety fence with two gates will cost \$57 a yard, including materials and installation. How much will the fence for the new field cost?

8. Most football fields are built with the length running north and south (N-S), instead of east and west (E-W), to minimize glare from the sun. Following this practice and keeping the safety fence in mind, which empty lot, listed below, is the best choice as the site of the new field? Circle the best answer.

a) Lot A = 50 yd N-S, 103 yd E-W

b) Lot B = 110 yd N-S, 60 yd E-W

c) Lot C = 96 yd N-S, $42\frac{2}{3}$ yd E-W

d) None of the above

9. What is the surface area of your new playing field, in square feet?

Name _____ Class _____ Date _____

10. (a) What is the combined surface area of just the two end zones, in square feet? (b) Write a reduced fraction that represents how much of the field is dedicated to the end zones.

11. Green turf will be used for the playing field. However, the end zones will also feature your school colors and these colors cost extra. If the green turf is \$4.00 per/square foot and the additional colors are \$5.50 per/square foot, how much will the entire artificial turf cost?

12. Your school is going to have a fundraiser to cover the costs of the artificial turf and the safety fence for the new football field. For every \$50.00 fruit basket that is sold, the school will keep \$37.50. At that rate, how many fruit baskets does each of the 680 students in your school need to sell in order to pay for both the turf and the fence? Round to the nearest whole number.

Part 2

At the College Football Hall of Fame, there is an open activity space at the end of your tour that simulates college football fields everywhere. The space, which is almost as long as a college football field is wide, measures 53 yards long and 27 yards wide. How does that compare to a full-size field? Let's find out!

1. What is the ratio for comparing the length of this field to a regulation college football field including the end zones? Round to the nearest hundredth.

Name _____ Class _____ Date _____

2. Convert the ratio for the length of the field in the College Football Hall of Fame to a percentage and complete this statement.

The field at the Hall of Fame will be _____% as long as a college football field.

3. Using the scale you just established for the length of this field, how long would each end zone be?

4. What is the ratio for comparing the width of this field, 27 yards, to a real college football field? Round to the nearest hundredth.

5. Convert the ratio for the width of this field to a percentage and complete this statement. Round to the nearest whole number.

The field at the Hall of Fame will be _____% as wide as a college football field.

6. What is the area of the practice field? What is the total area of a real college football field?

7. Convert the ratio for the width of this field to a percentage and complete this statement. Round to the nearest whole number.

The area field at the Hall of Fame will be _____% the size of a college football field's area.

Name _____

Class _____

Date _____

The Extra Point

College football entered Canada through McGill University in Montreal. Football in Canada has much in common with its counterpart here in the United States, but there are a few key differences including the size of the ball and the number of players on a team. Find the dimensions of a modern Canadian football field. How does it compare to those in the United States? Calculate the size differences in the areas of the end zones and the playing fields as a whole.

IT'S A FOOTBALL FACT!

Nicknamed "Smurf Turf," Boise State University installed the first blue artificial turf on their playing field at Bronco Stadium in 1986. Look for the sample piece taken from their turf in *Fans' Game Day* at the College Football Hall of Fame. At Eastern Washington University, the football team plays their home games on a bright red field called "The Inferno."

IMAGE SUGGESTIONS

- Photo of Boise State's blue field or of the "smurf turf" sample on display at the Hall, with identifying caption
- Photo of the field area at the Hall of Fame
- Diagram of a football field, with standards lines/yardage marked
- An image of the reproduction of the early, round football, with this caption: When this round football was used, the game was played on a field 120 yards long and 75 yards wide and the game was played with 25 players on each side.

Lesson 4: Football Fabrics

Teacher Instruction

It's hard to imagine any football game without everyone—players and fans alike—dressed in the colors of their favorite school. Can you imagine a Georgia-Georgia Tech game without seas of red and white or gold and blue? Did you know that game days were not always so vibrant, either in the stands or on the field? Even the football players' uniforms were not necessarily in the school colors, and sometimes they barely resembled what we think of as football uniforms at all.

Natural materials—cotton, wool, leather—were the fabrics of choice for everything in the early days of college football including jerseys, pants, socks, pads, and helmets. In “Evolution of Equipment” at the College Football Hall of Fame, complete uniforms from 1920 (worn by Hall of Famer Ed “Brick” Travis at Missouri) and 1942 (worn by Hall of Famer Dave Schreiner at Wisconsin) show your students how much uniform technology and engineering have changed. There, you will also see leather helmets like the one from 1901 worn by Columbia star athlete Harold Hathaway Weeks and jerseys that look more like sweaters, like the letter jersey worn by C. Everett “Ev” Bacon of Wesleyan in 1912.

Today, what you see on the field is usually a form of polyester. Polyester is a man-made fabric woven with fibers that come from chemicals like ethylene glycol and terephthalic acid found in oil. Beginning in the 1940s and 1950s, chemists learned that these petroleum-based fibers can be used to make almost anything you could think of, from water bottles to dresses to film.

While playing football, or during any strenuous activity, the sweat your body produces to keep

your temperature stable can soak into your clothing. While it may seem like a uniform made from a fabric that can absorb as much sweat as possible would help keep you cool, these fabrics also tend to hold on to the moisture instead of allowing it to evaporate quickly. The faster a garment can evaporate water or sweat, the quicker it will dry. The ideal football fabric needs to “wick” well. This means it should be able to quickly pull the sweat away from your skin and allow it to evaporate rapidly before it becomes saturated. Even in cold weather, the moisture needs to be wicked away before it starts to cool down too much and potentially cause hypothermia. You can compare the latest in football fabric technologies from Under Armour® to the older, flannel and cotton jerseys as part of the “Evolution of Equipment” in *Building a Champion*.

Once new fabrics with polyester fibers were invented, why did they become the preference for sports uniforms? What makes a particular kind of fabric a better choice for wearing in a football game? Why are they not made from the same materials as the clothes you wear every day? In this activity, your students will conduct an experiment using samples from four different kinds of fabrics to solve these football fabric mysteries.

Step-by-step procedures are included in the Student Activity pages to lead your class through predicting a hypothesis, testing samples, analyzing results, and drawing conclusions. Your students should work in groups of at least four students—one to handle each of the sample fabrics. If there is a fifth student, he or she can be the group's recorder. Each group will get a set of four fabric squares.

Precut all of the squares to be the same size. For the four fabric samples, one should be from a t-shirt with cotton, one from jeans or denim, one from an actual sports jersey or uniform made from polyester, and one with wool in it. Using four different colors will help the students stay organized. You can find garments for this lesson plan at thrift shops or enlist the help of parent volunteers for donations of used clothing.

Record the contents of each sample from the garment, to provide for your students later. As a class, number the fabric squares together at the beginning of the experiment so all of the groups have the same samples for each square number. Designate the cloth from the t-shirt as #1, denim as #2, sports jersey or uniform as #3, and wool as #4. Each group gets one complete

set of the four fabric squares. However, do not let the class know ahead of time what the samples are. Depending on the nature of your class, it may be easier to number the fabric squares in advance.

Your students will be submerging the fabric samples in water, weighing them, hanging them to dry, and reweighing them at specific intervals. Set up a clothes line on one side of the room for all the groups to hang their drying samples with the clothespins. This can be easily done by tacking twine up to your classroom bulletin boards. You can also have students hang their samples from the marker tray on the white board. Place towels on the floor under the hanging samples to catch any extra water.

Supplies

- 4 squares of fabric per group
- Dictionary
- Scale
- Permanent marker (Sharpie®)
- Bucket, bowl, or sink with water
- 4 clothespins
- Clock or timer
- Graph paper
- Clothesline
- Towel

ANSWER KEY

Part 3

The results of the experiment will depend on the specific contents and sizes of your square fabric samples. Although exact answers and measurements will vary, natural fabrics absorb more water than synthetics and take longer to dry. Of the four fabric samples, the one from the sports jersey should dry the fastest because it is made from polyester or at least more polyester than any of the other fabrics even if they are blends.

Part 4

1. literally, “fear of water;” not attracting water, resists getting wet
2. attracts water, absorbs water readily
3. those that are all or mostly natural fibers like cotton and wool, because they took on more water
4. those that are all or mostly synthetic fibers, like polyester, because they took on less water
6. #3, because it is polyester
7. Answers will vary; possible responses include a bath towel or paper towel, sponge, or baby diaper.

Football Fabrics

Student Activity

It's hard to imagine any football game without everyone—players and fans alike—dressed in the colors of their favorite school. Can you imagine a Georgia-Georgia Tech game without seas of red and white or gold and blue? Did you know that game days were not always so vibrant, either in the stands or on the field? Even the football players' uniforms were not necessarily in the school colors, and sometimes they barely resembled what we think of as football uniforms at all.

Natural materials—cotton, wool, leather—were the fabrics of choice for everything in the early days of college football including jerseys, pants, socks, pads, and helmets. In the "Evolution of Equipment" at the College Football Hall of Fame, complete uniforms from 1920 (worn by Hall of Famer Ed "Brick" Travis at Missouri) and 1942 (worn by Hall of Famer Dave Schreiner at Wisconsin) in "Evolution of Equipment" show you how much uniform technology and engineering have changed. There, you will also see leather helmets like the one from 1901 worn by Columbia star athlete Harold Hathaway Weeks and jerseys that look more like sweaters, like the letter jersey worn by Everett "Ev" Bacon of Wesleyan in 1912.

Today what you see on the field is usually a form of polyester. Polyester is a synthetic fabric woven with fibers that come from chemicals like ethylene glycol and terephthalic acid found in oil. Beginning in the 1940s and 1950s, chemists learned that these petroleum-based

fibers can be used to make almost anything you could think of, from water bottles to dresses to film.

While playing football, or during any strenuous activity, the sweat your body produces to keep your temperature stable can soak into your clothing. While it may seem like a uniform made from something that can absorb as much sweat as possible would help keep you cool, the opposite is true. These fabrics hold on to the moisture instead of allowing it to evaporate quickly. The faster a garment can evaporate water or sweat, the quicker it will dry. The ideal football fabric needs to "wick" well. This means it should be able to quickly pull the sweat away from your skin and allow it to evaporate rapidly before it becomes saturated. Even in cold weather, the moisture needs to be wicked away before it starts to cool down too much and potentially cause hypothermia. You can compare the latest in football fabric technologies from Under Armour® to the older, flannel and cotton jerseys as part of the "Evolution of Equipment" in *Building a Champion*.

Once new fabrics with polyester fibers were invented, why did they become the fabric of choice for sports uniforms? What makes a particular kind of fabric better for wearing in a football game? Why can't you just wear your every day clothes on the football field? Let's conduct an experiment and solve these football fabric mysteries!

Words to Know: *absorption, chemist, evaporate, fabric, fiber, garment, hydrophilic, hydrophobic, hypothermia, jersey, petroleum, saturated, synthetic, wick*

Supplies

- 4 squares of fabric from your teacher
- Dictionary
- Scale
- Permanent marker (Sharpie®)
- Bucket, bowl, or sink with water
- 4 clothespins
- Clock or timer
- Graph paper

Part 1: Predict

1. Follow your teacher’s instruction to number each fabric sample #1 - #4 with the marker.
2. In Chart #1, below, fill in the “Source?” column with your best guess about the kind of clothing from which you think each square came.
3. After you have made predictions about the source of each fabric, ask your teacher for the contents of each sample and complete the “Contents” column in Chart #1.
4. In the last column of Chart #1, identify each fabric as either natural (such as cotton, linen, wool, or silk), synthetic (such as polyester or nylon), or a blend of more than one kind. Check a dictionary if you are not sure of any of the contents.

Chart #1

Fabric Square	Source?	Contents	Natural, synthetic, or blend
#1			
#2			
#3			
#4			

Name _____ Class _____ Date _____

5. Based on your observations recorded in Chart #1, write a hypothesis to predict which of the four fabric samples will dry the most quickly and which will take the longest to dry. Include data from Chart #1 to support your hypothesis.

Part 2: Test

1. Assign one member of your group to each fabric square. Weigh your square of fabric on the scale and record its weight in grams in Chart #2 in the "Dry weight" column. Record the weights of the other three squares weighed by your teammates.
2. Submerge your square in the water for 20 seconds. After 20 seconds, remove it from the water and squeeze off enough excess water to stop it from dripping.
3. Weigh your wet square and record its weight in the "Wet weight" column in Chart #2.
4. Hang your square up to dry with a clothespin.
5. After ten minutes have passed, weigh your square again and record its weight in the "After 10 minutes" column in Chart #2. Re-hang your square.
6. Wait 10 more minutes, weigh your square, record the weight in the "After 20 minutes" column in Chart #2, and re-hang your square. Wait another 10 minutes and repeat the weighing process for "After 30 minutes."
7. Consult with your teammates and complete the chart for the other three fabric squares.

Name _____ Class _____ Date _____

Chart #2

Fabric square	Dry weight	Wet weight	After 10 minutes	After 20 minutes	After 30 minutes
#1					
#2					
#3					
#4					

8. (a) Which fabric weighed the least when dry? (b) Which fabric weighed the most when dry?

9. (a) Which fabric weighed the least when wet? (b) Which fabric weighed the most when wet?

10. (a) Which of the fabric samples was closest to its original dry weight after 10 minutes? (b) Which of the fabric samples was closest to its original dry weight after 20 minutes? (c) Which of the fabric samples was closest to its original dry weight after 30 minutes?

Part 3: Analyze

1. Subtract the "Dry weight" from the "Wet weight" for each square to see how much water it absorbed at the beginning of the experiment. Record those amounts in Chart #3, below, in the "Water absorbed" column.
2. Subtract the "After 10 minutes" weight from the "Wet weight" for each square to see how much water it lost after 10 minutes of drying. Record those amounts in Chart #3, in the "Water lost in 10 minutes" column.
3. Subtract the "After 20 minutes" weight from the "Wet weight" for each square to see how much water it lost after 20 minutes of drying. Record those amounts in Chart #3, in the "Water lost in 20 minutes" column.
4. Subtract the "After 30 minutes" weight from the "Wet weight" for each square to see how much water it lost after 30 minutes of drying. Record those amounts in Chart #3, in the "Water lost in 30 minutes" column.

Chart #3

Fabric square	Amount of water absorbed	Amount of water lost after 10 minutes	Amount of water lost after 20 minutes	Amount of water lost after 30 minutes
#1				
#2				
#3				
#4				

5. Create a line graph on the graph paper with the water amounts from Chart #3 on the y-axis and the drying times on the x-axis. Use four different colors to indicate the four different fabric samples on the same graph. Remember to make a key for the four colors.
6. (a) Which fabric absorbed the least water at the beginning? (b) Which fabric absorbed the most water at the beginning?

Name _____ Class _____ Date _____

7. (a) Which fabric had evaporated the least water at the 10 minute mark? (b) Which fabric had evaporated the most water at the 10 minute mark?

8. (a) Which fabric had evaporated the least water at the 20 minute mark? (b) Which fabric had evaporated the most water at the 20 minute mark?

9. (a) Which fabric had evaporated the least water at the 30 minute mark? (b) Which fabric had evaporated the most water at the 30 minute mark?

Part 4: Conclude

Compare the results of the experiment with your initial hypothesis from #5 in Part 1 and answer these questions, using the dictionary.

1. Define *hydrophobic*:

2. Define *hydrophilic*:

Name _____ Class _____ Date _____

3. Based on your experiment, which fabric samples were hydrophobic? How do you know?

4. Based on your experiment, which fabric samples were hydrophilic? How do you know?

5. Which fabric sample do you think would be best for a football uniform? Why?

6. What uses can you think of for a fabric that is highly hydrophilic?

7. Was your hypothesis from Part 1 correct? Why or why not?

Name _____

Class _____

Date _____

The Extra Point

Do you have a replica jersey from your favorite college football team? Bring it to class and check the contents on the shirt label. Do you think it is the same as the jersey your team wears on game day? Do you think it is made from the same materials as the modern "Performance Apparel" featured in *Building a Champion* at the College Football Hall of Fame? Why or why not? Are other sports' jerseys made from the same materials as football jerseys? Check the labels on a basketball, cheerleading, and soccer uniforms!

IT'S A FOOTBALL FACT!

In 1877, Princeton University player L.P. Smock developed the first real football uniform for his team. It was a laced-up jacket made of canvas and included thin, cloth pads.

IMAGE SUGGESTIONS

- The Fritz Crisler image from Evolution of Equipment rail or NFF photo of Crisler with caption: In 1921, future Hall of Fame coach Fritz Crisler wore a Chicago jersey that featured leather chest and arm coverings.
- Photo of leather smock reproduction on display at the Hall, with caption: Reproduction of leather smock, 1895.
OR
- Photo of Millersville University Football Team, 1890, with caption: The leather smocks worn by the Millersville players were the first football jerseys.
- One or more of the following, with identifying captions and years:
 - The complete uniform worn by Hall of Famer Ed "Brick" Travis at Missouri
 - The complete uniform worn by Hall of Famer Dave Schreiner at Wisconsin
 - 1901 helmet worn by Harold Hathaway Weeks
 - the letter jersey worn by Everett "Ev" Bacon of Wesleyan in 1912 OR NFF photo of Bacon

Lesson 5: The Favorite Field Trip—A Logic Puzzle

Teacher Instructions

In this lesson, your class will read a short story and solve a logic puzzle that matches three fictitious students with some of their favorite parts of the class field trip to the College Football Hall of Fame. Logic puzzles are a fun way to practice mathematical skills without using any numbers! You will be making deductions and establishing equalities similar to those used in algebra: if $A = B$ and $B = C$, then $A = C$.

To solve the puzzle, read each clue carefully. Use the answer grid to help you keep track of what you do and do not know. Because each student in the puzzle can only have one favorite gallery inside the College Football Hall of Fame and one favorite game change from the early days of college football, you will use the process of elimination to solve the mystery.

When you are able to match a student to one of his favorites, put a checkmark in the box formed at the intersection of the person's row

and the gallery's or game change's column. If a clue tells you that a person does NOT like something, then place an X in the box for that person and that particular topic. For example, the first clue says that William did not enjoy the *Quad*, the area at the beginning of the field trip, quite as much as he liked some of the other galleries. Therefore, the *Quad* is not going to be William's favorite. This first clue has been marked on the grid for you.

Keep reading the clues and marking an X on the grid for what you know is not true and a checkmark for what you know is true. When you finish all the clues and still have not completed the logic puzzle, read through the clues one at a time again. Once you make some basic deductions, you will discover new relationships and come closer to solving the puzzle. Be diligent! If you get stuck, check your grid to see if any connections have revealed themselves. Watch out for any trick plays!

ANSWER KEY

Henry – the Quad – head protector

William – Building a Champion – playing field size

George – Game Day– hiding the ball in clothes

The Favorite Field Trip—A Logic Puzzle

Student Activity

In this lesson, you will read a short story and solve a logic puzzle that matches three students with some of their favorite parts of the class field trip to the College Football Hall of Fame. Logic puzzles are a fun way to practice mathematical skills without using any numbers! You will be making deductions and establishing equalities similar to those used in algebra: if $A = B$ and $B = C$, then $A = C$.

To solve the puzzle, read each clue carefully. Use the answer grid to help you keep track of what you do and do not know. Because each student in the puzzle can only have one favorite gallery inside the College Football Hall of Fame and one favorite game change from the early days of college football, you will use the process of elimination to solve the mystery.

When you are able to match a student to one of his favorites, put a checkmark in the box formed at the intersection of the person's row

and the gallery's or game change's column. If a clue tells you that a person does NOT like something, then place an X in the box for that person and that particular topic. For example, the first clue says that William did not enjoy the *Quad*, the area at the beginning of the field trip, quite as much as he liked some of the other galleries. Therefore, the *Quad* is not going to be William's favorite. This first clue has been marked on the grid for you.

Keep reading the clues and marking an X on the grid for what you know is not true and a checkmark for what you know is true. When you finish all the clues and still have not completed the logic puzzle, read through the clues one at a time again. Once you make some basic deductions, you will discover new relationships and come closer to solving the puzzle. Be diligent! If you get stuck, check your grid to see if any new connections have revealed themselves. Watch out for any trick plays!

Words to Know: *brittle, deduction, elimination, grid, logic, mandatory*

The Story

On the bus ride home after their class field trip to the College Football Hall of Fame, three friends discussed everything they had seen and learned. Each friend had a different favorite gallery inside the College Football Hall of Fame and each friend had a different opinion on the most important rule change in the early years of college football.

Their teacher overheard their conversation on the bus and could not wait to tell the other teachers back at school how much the students enjoyed the field trip. But by the time they returned to school, the teacher could only remember parts of the friends' conversation. Help the teacher by reading the clues below and matching the students to their favorite parts of the field trip and to what they think are the most important changes to the game in college football's early years.

Students

- William
- Henry
- George

Favorite gallery

- *Fans' Game Day*
- *The Quad*
- *Building a Champion*

Favorite game change from the early days

- Illegal to hide the ball under clothing
- Mandatory head protection
- Playing field reduced to modern size: 120 by 53½ yards

The Clues

1. William did not enjoy the *Quad* quite as much as he liked some of the other galleries.
2. George's favorite gallery was *Fans' Game Day* because he liked the mascots, marching bands, and teams' traditions.
3. The student who enjoyed *Building a Champion* the most also wanted to learn more about when the size of the playing field became what it is today.
4. The student who likes the *Quad* best believes that mandatory head protectors was the most important change to way the game was played in the early days

		Game Change			Gallery		
		Head Protection	Illegal to hide ball	Field size	<i>The Quad</i>	<i>Building a Champion</i>	<i>Game Day</i>
Student	William				x		
	Henry						
	George						
Gallery	<i>The Quad</i>						
	<i>Building a Champion</i>						
	<i>Game Day</i>						

Name _____ Class _____ Date _____

Write the solution to the puzzle here.

Student	Gallery	Game Change

IT'S A FOOTBALL FACT!

Football players first began wearing leather helmets in 1892 and head protection became mandatory in 1939. In the College Football Hall of Fame, you will see leather helmets that are over a hundred years old!

IMAGE SUGGESTIONS

- Photo of these galleries/areas in the Hall, with identifying captions: The Quad, Building a Champion, and Game Day
- Early leather helmets, with identifying captions with years, for the football fact above
- NFF photo of early player wearing a leather helmet, with identifying caption such as:
 - Picture of Bobby Dodd in leather helmet: Hall of Fame member Bobby Dodd wore a leather helmet as quarterback at Tennessee before he became a coach at Georgia Tech.

Interdisciplinary Project Ideas

Make your field trip to the College Football Hall of Fame a school-wide event! Use these inquiry-based interdisciplinary activities and project ideas with your students to incorporate the College Football Hall of Fame into additional classes and content areas. Let's get everyone in the game!

1. The University of Notre Dame dominated college football in the 1920s. The university hired Knute "Rock" Rockne as coach in 1918. Under his guidance the Fighting Irish won three national titles and went undefeated five times. Coach Rockne, who was inducted into the College Football Hall of Fame in 1951, was a role model because of his strength of character as well as his strength as a coach. In 1922, he answered a letter from a YMCA in Indiana, inquiring about his attitude towards profanity in athletics. After you read the excerpt below, paraphrase (or explain in your own words) how Coach Rockne's responded to the letter. Why does he feel it is particularly important for coaches not to swear? How do you think Coach Rockne would feel about the use of profanity in sports today? What controversial issues in college football today do you think are comparable to the use of profanity in the 1920s?

I cannot see how there can be any beneficial results from any use of profanity. There is no need for a coach to use any because I believe he will hold the respect of his men and all others if he will abstain from profanity. A coach should maintain as high a standard as possible for his men so that there will be absolutely no excuse or tendency on the part of any of the athletes to give vent to their feelings through profane language. Profane language is an absolute detriment anywhere and it has no place in athletics of any kind.

IT'S A FOOTBALL FACT!

The great Hall of Fame coach Knute Rockne not only graduated from Notre Dame he was also an assistant chemistry professor before becoming their football coach.

IMAGE SUGGESTIONS

- [NFF photo of Knute Rockne](#)

2. As you see in *Fans' Game Day* at the College Football Hall of Fame, marching bands have long been a part of college football. They began taking center stage, or center field, in 1907 when the Purdue University band formed the letter "P" on the field. At a game that same year between the University of Illinois and the University of Chicago, the marching Illini band played what is considered to be the very first fight song during the very first halftime show. Do you know the fight song for your favorite college football team? See if it is included on the fight song Karaoke interactive in *Fans' Game Day*! Test your skills by playing "Name that Tune" with famous college fight songs. (Many songs can be found online, such as at <http://fightmusic.com/> or in iTunes or Amazon.)

Some schools' marching bands, like those from historically black colleges and universities (HBCU), are known for playing or performing a very specific style of music. Others range from

the intensely serious--the 400-strong Texas A&M Fightin' Aggie Band, which is known for its precision marching style and complex maneuvers to the very non-traditional: the Columbia University marching band has performed routines featuring such instruments as the hula hoop, broom guitar, and mailbox. Which are your favorite marching band songs? Working in groups, select the music and plan the choreography you would use to make your own one-of-a-kind half time show and present it to your class. Stop by the *Fight Song Karaoke* and then find the marching band part of the *Fans' Game Day* interactives on your visit to the Hall of Fame and share your talents!

IT'S A FOOTBALL FACT!

Morehouse College's marching band, the "House of Funk," has performed everywhere from the Super Bowl to Mardi Gras to the *Today Show*. The 110-member band is known for its innovative marching routines and visual effects. A Morehouse band uniform is featured in *Fans' Game Day* at the College Football Hall of Fame. Check it out!

IMAGE SUGGESTIONS

- [Photo of the Morehouse band uniform on display at the Hall, with identifying caption](#)

3. The United States entered World War II in 1941. Inspired by the sacrifices teenagers and young adults were making to fight for their country during the war, the famous early-American sportswriter Grantland Rice wrote the poem below, "A Tribute." Although he wrote about football instead of playing it, this legendary sportswriter provided early leadership for the formation of The National Football Foundation (NFF). He is a key part of the history of college football that you will learn about in *Building a Champion* at the Hall of Fame.

After you read Grantland Rice's poem, explain how you interpret his words. Who are "they"? What happens to them by the end of the poem? The poem first appeared on the program for a University of Georgia football game at the University of Tennessee at Chattanooga on November 2, 1945. What was going on in November 1945, related to the World War II?

"A Tribute"

They hit the line—and they hit hard—
And they ran the ends of fame.
They passed and kicked to the distant goal,
When they starred in the college game.

But they heard the bugles of war that called
To a rougher and tougher test,
And now they sleep under foreign sod,
The stars who have earned their rest.

They played the game in the good old way
That led to the bayonet's thrust.
They led the charge to the final goal
Which covers their golden dust.

IT'S A FOOTBALL FACT!

In 1943, many schools temporarily discontinued football because so many student athletes had left to fight in WWII.

IMAGE SUGGESTIONS

- [Photo of Grantland Rice](#)

4. Arizona State University football player Pat Tillman was inducted into the College Football Hall of Fame in 2010. On your school visit to the Hall of Fame, you can see a patch honoring him on a game jersey from Arizona State. Tillman played linebacker in college from 1994 to 1997. A hero on and off the football field, this scholar-athlete epitomizes the character required of members of the Hall. Inspired by the September 11, 2001, terrorist attacks on the United States, Tillman turned down a \$3.6 million contract to play with the Arizona Cardinals in order to become an Army Ranger in 2002 and fight for his country. He died in Afghanistan in 2004 from friendly fire. Many of the traits that made Tillman a leader on the football field and an accomplished student in the classroom also led him to defend his country. In 2002, Tillman said "Sports embodied many of the qualities I deem meaningful." What leadership skills and qualities do you think he brought with him from student-athlete to soldier?

IMAGE SUGGESTIONS

- [Photo of the Pat Tillman patch on display at the Hall, with identifying caption](#)
5. For a long time, the only sports in which women could realistically participate professionally were tennis and golf and at the collegiate level, there weren't many more choices. The "Title IX" Act, written in 1972 and revised in 1979, was designed to create greater gender equality in education but also applied to equality in sports and athletics programs at schools and universities. What sports teams can girls play on at your school? Has this changed recently? Research the latest reports and research on the long-term effects of Title IX to see how it has improved opportunities for female athletes around the country.

Puzzle Tiles: Red Blaik

The significance of Coach Earl “Red” Blaik’s contributions to college football can be seen in his coaching tree, featured at the College Football Hall of Fame. Great head coaches and programs attract—and in turn produce—great assistant coaches, who then become head coaches in their own right. Coach Blaik’s career as a head coach began at Dartmouth. However, he earned fame at the U.S. Military Academy where he coached three Heisman Trophy winners, sent 14 players to the College Football Hall of Fame and won two national championships. He led the greatest teams in Army history, including a 32-game winning streak from 1944 to 1947. The extent of his influence is seen in his “Coaching Tree” highlighted in *Building a Champion* at the College Football of Fame.

The advice Coach Blaik gave to his players and coaches applied to both football and life in general. He knew that success only comes with sacrifice and teamwork. He was inducted into the College Football Hall of Fame in 1964.

To solve this puzzle, rearrange the tiles below until the groupings of letters, spaces, and punctuations form two complete sentences—a quote from Red Blaik. Two tiles have already been placed to get you started. Begin by looking for the tiles that have a capital letter (one of those that will be the first tile) and for the tiles that have periods (one of those will be the last tile). Go! Fight! Win!

Words to Know: *artifact, inducted*

o f	i t u t	s u c c	T h e r
i s t	e ‘ s	e f o	h e p
o r k .	r d w	l t	u b s t
r h a	e s s .		

Name _____ Class _____ Date _____

Write your answer here:

		n	o	s						
--	--	---	---	---	--	--	--	--	--	--

			r	i	c	e			
--	--	--	---	---	---	---	--	--	--

IT'S A FOOTBALL FACT!

Twenty of Earl "Red" Blaik's assistant football coaches went on to become head coaches at other colleges and universities.

IMAGE SUGGESTIONS

- [Photo of Red Blaik](#)

Name _____

Class _____

Date _____

Word Search: Mascots

What is the mascot for your favorite college football team? Is it one of those featured in *Fans' Game Day* at the College Football Hall of Fame? Perhaps it is the Poets from Whittier College in California, the Fighting Student Princes from Heidelberg University in Ohio, or

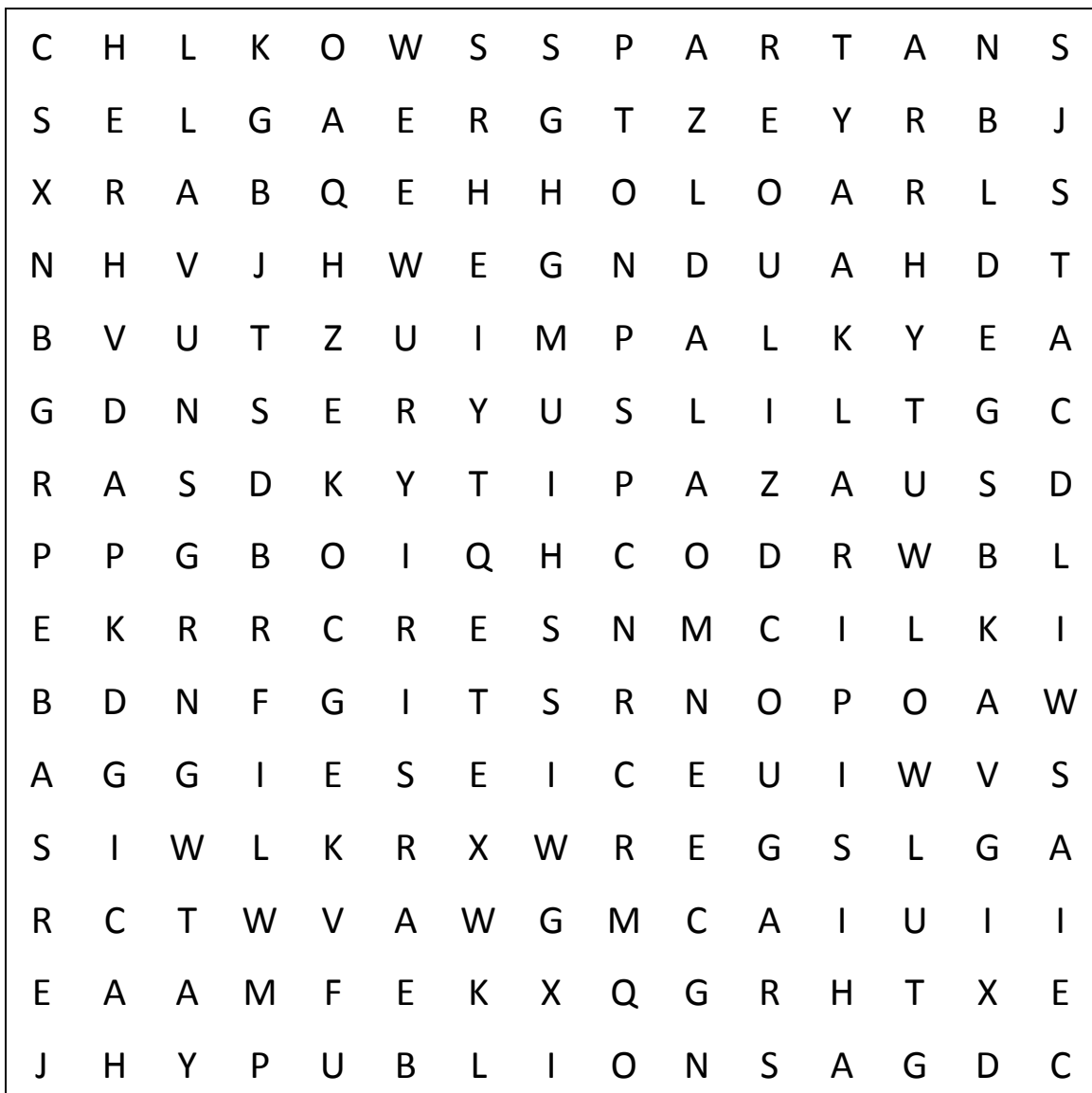
the Bees from St. Ambrose University in Iowa. The words you will be searching for in this puzzle are some commonly used NCAA football team mascots. Other often-used mascots include the Knights, Pioneers, and Warriors.

AGGIES
BEARS
BULLDOGS

COUGARS
EAGLES
HAWKS

HUSKIES
LIONS
PANTHERS

SPARTANS
TIGERS
WILDCATS



IT'S A FOOTBALL FACT!

In 1893, Navy's first goat, El Cid, was part of a mascot menagerie that included a gorilla, two cats, a bulldog and a carrier pigeon. By the early 1900s, he had a name—Bill—and the stage all to himself. Look for one of Bill's blue and gold wool blankets, from 1950, in *Fans' Game Day* at the College Football Hall of Fame!

IMAGE SUGGESTIONS

- Photo of the Navy goat blanket to go with football fact, above
- Photos of the full mascot costumes on display in the Hall, with identifying captions

Cryptogram: The First Bowl Game

The oldest college bowl game was first played in January 1902, to end the 1901 season, in Pasadena, CA and has been played continuously since 1916. The trophy awarded to the winner of this bowl game stands in *Why We Love College Football* at the College Football Hall of Fame. Except for 1942, when the game was moved to North Carolina out of fear of a Japanese attack after Pearl Harbor, this bowl game has been played in Pasadena, CA, in a

stadium that bears its name. What bowl game is it?

This puzzle is a cryptogram, a code in which letters have been replaced by numbers. You will decipher a sentence to reveal the name and nickname of the first bowl. Hints are provided and those letters have been filled in to get you started. Let's go bowling!

A	B	C	D	E	F	G	H	I	J	K	L	M
11						6						

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
	4					19						

T				O				O				
19	26	8		1	4	13	8	20	4	3	22	

I		T		
5	12	19	26	8

G		A			A				
6	1	11	7	10	10	11	10	10	24

O		T			A			
4	25	19	26	8	23	11	22	22

IT'S A FOOTBALL FACT!

Some college football bowl games that no longer exist include the Cigar Bowl, Glass Bowl, Oil Bowl, Raisin Bowl, Refrigerator Bowl and Salad Bowl.

IMAGE SUGGESTIONS

- Photos of early bowl games, with identifying captions

ANSWER KEY

Puzzle Tiles: There's no substitute for hard work. It is the price of success.

Word Search:

C	H	L	K	O	W	S	S	P	A	R	T	A	N	S
S	E	L	G	A	E	R	G	T	Z	E	Y	R	B	J
X	R	A	B	Q	E	H	H	O	L	O	A	R	L	S
N	H	V	J	H	W	E	G	N	D	U	A	H	D	T
B	V	U	T	Z	U	I	M	P	A	L	K	Y	E	A
G	D	N	S	E	R	Y	U	S	L	I	L	T	G	C
R	A	S	D	K	Y	T	I	P	A	Z	A	U	S	D
P	P	G	B	O	I	Q	H	C	O	D	R	W	B	L
E	K	R	R	C	R	E	S	N	M	C	I	L	K	I
B	D	N	F	G	I	T	S	R	N	O	P	O	A	W
A	G	G	I	E	S	E	I	C	E	U	I	W	V	S
S	I	W	L	K	R	X	W	R	E	G	S	L	G	A
R	C	T	W	V	A	W	G	M	C	A	I	U	I	I
E	A	A	M	F	E	K	X	Q	G	R	H	T	X	E
J	H	Y	P	U	B	L	I	O	N	S	A	G	D	C

OVER, DOWN, DIRECTION

- AGGIES 1, 11, E
- BEARS 6, 15, N
- BULLDOGS 14, 8, NW
- COUGARS 11, 9, S
- EAGLES 6, 2, W
- HAWKS 2, 15, NE
- HUSKIES 2, 4, SE
- LIONS 7, 15, E
- PANTHERS 1, 8, NE
- SPARTANS 8, 1, E
- TIGERS 13, 14, NW
- WILDCATS 15, 10, N

Cryptogram: The Rose Bowl is the granddaddy of them all.

A	B	C	D	E	F	G	H	I	J	K	L	M
11	20	16	10	8	25	6	26	5	2	15	22	23

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
7	4	12	21	1	13	19	17	14	3	18	24	9

COLLEGE FOOTBALL 101

Keep this reference guide handy as you introduce your class to the basics of college football. Be prepared to tackle their questions about the field, the player positions, the point system, and the College Football Hall of Fame itself. Get ready to play!

THE PLAYING FIELD

Field	Rectangle, 120 yards long by 53 1/3 yards wide
Sidelines	Borderlines on each side of the field, 6-feet wide
End zone	Part of the field inside the end line where touchdowns are scored, 10-yards wide
Goal line	Line that runs across the front of the end zone, 8-inches wide
Yard lines	A solid white line that runs across the 100 yards of playing area on the field every 5 yards, and includes a number every 10 yards
Hash marks	Short white lines on the field 53 feet and 4 inches in from the sidelines, spaced exactly 1 yard apart down the length of the 100 yard playing area 53 ft 4 in
Goal posts	Poles that designate the area for a field goal to score at the back of either end zone with a 10-foot vertical pole connected to a cross bar, 18 feet and 6 inches long, with upright poles on either end of the cross bar that are at least 22 feet tall
Coaches box	Area on the sidelines where the coaches and team members not playing must remain, between the 25-yard marks

IMAGE SUGGESTIONS

- Diagram of a field.

THE POSITION NAMES

Offense

Role	Position	
Offensive linemen	C	Center
	G or OG	Offensive guards
	T or OT	Offensive tackles
Backs & receivers	QB	Quarterback
	RB	Running backs (TB/tailback, HB/halfback, FB/fullback, WB/wingback, SB/slotback)
	WR	Wide receivers (split end, flanker, slot receiver)
	TE	Tight ends (H-back)

Defense

Role	Position	
Defensive linemen	DT	Defensive tackles (defensive guard, nose tackle/guard)
	DE	Defensive ends
Linebackers	MLB	Middle linebacker (inside linebacker)
	OLB	Outside linebacker (right outside, left outside)
Defensive backs	CB	Cornerback
	S	Safety (strong safety, free safety)

Special Teams

Role	Position	
Kickers	K	Placekicker
	H	Holder
	LS	Long snapper
	P	Punter
	PR	Punt returner
	KR	Kick returner

THE POINTS

Value	Play	Description
6	Touchdown	A player carries or catches the ball in the end zone
3	Field goal	A player kicks the ball through the goal posts, in place of a touchdown
2	Safety	A player is tackled in his own team's end zone
2	2-pt conversion	A player carries or catches the ball in the end zone after a touchdown
1	Extra point	A player kicks the ball through the end zone after a touchdown

THE HALL OF FAME

The National Football Foundation's College Football Hall of Fame represents the highest level of achievement for players and coaches and serves as a shrine for all of amateur football. Almost 5 million scholar-athletes have played college football since the first game on November 6, 1869, but less than a thousand have been inducted into the Hall of Fame. The criteria for eligibility are as follows (from www.cfbhall.com):

1. First and foremost, a player must have received first team All-America recognition by a selector recognized by the NCAA and utilized to comprise their consensus All-America teams.
2. A player becomes eligible for consideration by the NFF's Honors Court ten years after his last year of intercollegiate football played.
3. While each nominee's football achievements in college are of prime consideration, his post-football record as a citizen is also weighed. He must have proven himself worthy as a citizen, carrying the ideals of football forward into his relations with his community. Consideration may also be given for academic honors and whether or not the candidate earned a college degree.
4. In accordance to the 50-year rule*, players must have played their last year of intercollegiate football within the last 50 years. For example, to be eligible for the 2013 ballot, the player must have played his last year in 1961 or thereafter. In addition, current professional players and / or coaches are not eligible until retirement.

5. A coach becomes eligible three years after retirement or immediately following retirement provided he is at least 70 years old. Active coaches become eligible at 75 years of age. He must have been a head coach for a minimum of 10 years and coached at least 100 games with a .600 winning percentage*.

** Those players that do not comply with the 50-year rule may still be eligible for consideration by the FBS and Divisional Veterans Committees, which examine unique cases.*

THE AWARDS

IMAGE SUGGESTIONS

- NFF photo of John Heisman, with caption: The coveted Heisman Award for Most Outstanding Player in Division 1 is named for John Heisman. [OR any of the other guys on this list, with the identifying caption.]

Annual Player Awards

- Heisman Memorial Award – Outstanding Player
- William V. Campbell Trophy – Top Scholar Athlete
- Maxwell – Outstanding Player
- Walter Camp Award – Player of the Year
- Doak Walker Award – National Running Back Award
- Johnny Unitas Golden Arm Award—Outstanding Senior Quarterback
- Davey O’Brien Award – National Quarterback Award
- Fred Biletnikoff Award – Outstanding Wide Receiver
- John Mackey Award – Outstanding Tight End
- Outland Trophy – Outstanding Interior Lineman
- Vince Lombardi/Rotary Award – Outstanding Lineman
- Rimington Trophy – Outstanding Center
- Chuck Bednarik Award – Defensive Player of the Year
- Bronko Nagurski Award – Defensive Player of the Year
- Dick Butkus Award – Outstanding Linebacker
- Jim Thorpe Award – Outstanding Defensive Back
- Lou Groza Award – Place-kicker Award
- Ray Guy – Outstanding Punter
- Ted Hendricks – Defensive End of the Year
- Walter Payton Award – FCS Offensive Player of the Year
- Buck Buchanan Award – FCS Defensive Player of the Year
- Harlon Hill – NCAA Div II Outstanding Player
- Gagliardi Trophy – NCAA Div III Outstanding Player
- Danny Wuerffel Trophy – Top Citizen

Annual Coach Awards

- FWAA/Eddie Robinson Coach of the Year
- Liberty Mutual Coach of the Year
- Home Depot Coach of the Year

Recommended Reading

Check this out – of your school library! Before or after a class trip to the College Football Hall of Fame, you will want to use these lists as a starting point to create your own “Literary Hall of Fame” exploring the science, math, history and fun of college football. These books are divided by reading level into YOUTH: Elementary School, JUNIOR VARSITY: Middle School and VARSITY: High School, which is also appropriate for adults. Huddle up and start reading!

YOUTH

Elementary School: Grades 3 - 5

- Gibbons, Gail. *My Football Book*. HarperCollins, 2000.
- Gigliotti, Jim. *Kick-off: How Football Began*. Beach Ball Books, 2011.
- Golanty, Eric. *Ahead of Their Time*. Eric Golanty & Associates, 2010.
- Gordon, Samantha & Ari Breuning. *Sweet Feet: Samantha Gordon's Winning Season*. Walker Childrens, 2013.
- Herzog, Brad. *T is for Touchdown: A Football Alphabet*. Sleeping Bear Press, 2004.
- Jacobs, Greg. *The Everything Kids' Football Book: The all-time greats, legendary teams, today's superstars--and tips on playing like a pro*. Adams Media, 2010.
- Malott, Zachary. *I'm With the Team: My Summer with the Harvard Football Team*. CreateSpace Independent Publishing, 2009.
- Sports Illustrated. *Sports Illustrated Kids 1st and 10: Top 10 Lists of Everything in Football*. Sports Illustrated, 2011.
- Sports Illustrated. *Sports Illustrated Kids' Football Playbook: Games, Activities, Puzzles, and Fun!* Sports Illustrated, 2011.
- Stewart, Mark. *Touchdown: The Power and Precision of Football's Perfect Play*. Millbrook Press, 2009.
- Thomas, Keltie. *How Football Works (How Sports Work)*. OwlKids Books, 2010.
- Wiese, Jim. *Sports Science: 40 Goal-Scoring, High-Flying, Medal-Winning Experiments for Kids*. Wiley, 2002.

JUNIOR VARSITY

Middle School: Grades 6 – 8

- Barr, George. *Sports Science for Young People (Dover Children's Science Books)*. Dover Publications, 2011.
- Biskup, Agnieszka. *Football: How It Works (The Science of Sports)*. Capstone Press, 2010.
- Coffland, Jack. *Football Math: Touchdown Activities and Projects for Grades 4–8*. Good Year Books, 2005.
- DeCock, Luke. *Great Teams in College Football History*. Heinemann-Raintree, 2005.
- Frederick, Shane. *The Best of Everything Football Book (All-Time Best of Sports)*. Capstone Press, 2010.
- Frederick, Shane. *Football: The Math of the Game*. Capstone Press, 2011.
- Gardner, Robert. *Science Projects about the Physics of Sports*. Enslow Publishers, 2000.
- Goodstein, Madeline. *Sports Science Projects: The Physics of Balls in Motion*. Enslow Publishers, 1999.
- Hantula, Richard. *Science at Work in Football*. Marshall Cavendish Children's Books, 2011.

Hauser, Dan, Ed Turner, & Dan Gennantonio. *Antique Sports Uniforms & Equipment: Baseball - Football - Basketball 1840-1940*. Schiffer Publishing, 2008.

Sports Illustrated. *Sports Illustrated: The College Football Book*. Sports Illustrated, 2008.

VARSIITY

High School: Grades 9 – 12, Adult

- Beck, Stan. *College Sports Traditions: Picking Up Butch, Silent Night, and Hundreds of Others*. Scarecrow Press, 2013.
- Dosh, Kristi. *Saturday Millionaires: How Winning Football Builds Winning Colleges*. Wiley, 2013.
- Freedman, Samuel G. *Breaking the Line: The Season in Black College Football That Transformed the Sport and Changed the Course of Civil Rights*. Simon & Schuster, 2013.
- Gallian, Joseph A., ed. *Mathematics and Sports*. Mathematical Association of America, 2010.
- Gay, Thomas. *The Physics of Football: Discover the Science of Bone-Crunching Hits, Soaring Field Goals, and Awe-Inspiring Passes*. It Books, 2005.
- Goff, John Eric. *Gold Medal Physics: The Science of Sports*. The Johns Hopkins University Press, 2009.
- Koreivo, Stephen J. *Tales From The Tailgate: From the Fan who's Seen Them All*. AuthorHouse, 2011.
- Layden, Tim. *Blood, Sweat & Chalk: The Ultimate Football Playbook: How the Great Coaches Built Today's Game*. Sports Illustrated, 2010.
- Mac Cambridge, Michael, ed. *ESPN College Football Encyclopedia: The Complete History of the Game, unabridged*. ESPN, 2005.
- Miller, John J. *The Big Scrum: How Teddy Roosevelt Saved Football*. Harper, 2011.
- Oriard, Michael. *Bowled Over: Big-Time College Football from the Sixties to the BCS Era*. The University of North Carolina Press, 2009.
- Sporting News. *Every Saturday in Autumn: The Sporting News Presents College Football's Greatest Traditions*. McGraw-Hill/Contemporary, 2001.
- Sporting News. *Saturday Shrines: Best of College Football's Most Hallowed Grounds*. Sporting News, 2005.
- St. John, Allen & Ainissa G. Ramirez. *Newton's Football: The Science Behind America's Game*. Ballentine Books, 2013.
- Vizard, Frank. *Why a Curveball Curves: The Incredible Science of Sports (Popular Mechanics)*. Hearst, 2009.
- Watterson, John Sayle. *College Football: History, Spectacle, Controversy*. The Johns Hopkins University Press, 2002.
- Whittingham, Richard. *Rites of Autumn: The Story of College Football*. Free Press, 2001.

Touchdown Timeline

America was still recovering from the Civil War when Rutgers beat Princeton 6-4 on November 6, 1869, in New Brunswick, NJ, in what is considered to be the first college football game. Today, little if anything looks as it did then in either the nation or the game. Through world wars, social, political and economic progress and upheaval, college football grew steadily in appeal, and now counts its fan base at nearly 100 million people. Forecasting the nation's future is tougher than picking bowl game winners, but one thing is certain: Americans will always love college football!

AMERICAN HISTORY AND COLLEGE FOOTBALL

- 1865** **The Civil War ends and President Lincoln is assassinated.**
- 1869** The first college football game is played between Rutgers and Princeton in New Brunswick, NJ. This game uses a soccer-style round ball. The field is 120 yards long and 75 yards wide with 25 players on each side. The first team to score six goals wins.
- 1874** Harvard travels to Montreal to play McGill University in a game more akin to rugby than soccer where players were able to carry the ball. From this game, American football moves from a kicking game to one that features running and tackling.
- 1876** A cross bar is added to the goal posts at a height of 10 feet. It is still in use today. The number of players on each team is reduced to 15.
- 1883** **The Brooklyn Bridge opens.**
- 1880** The number of players is reduced to 11 on each side by Walter Camp, who also developed the line of scrimmage.
- 1888** Rules are changed to allow tackling below the waist.
- 1892** The Flying Wedge play or "V trick" is introduced by Harvard. The dangerous tactic remains legal for only one more season.

IMAGE SUGGESTIONS:

- **Flying Wedge Belt, 1890:** This belt helped players hang onto each other in the flying wedge, in which they formed a "V" shape and plowed down the field. The flying wedge was banned in 1894 along with similar formations considered dangerous.
- **Yale-Eaton Game Program, 1873**

- 1908** **Henry Ford introduces the Model T.**
- 1902** On January 1, the first Rose Bowl game is played at Pasadena's Tournament Park.
- 1905** The field is now marked with transverse lines every five yards running parallel to the sidelines. This checkerboard appearance gives the field a nickname that sticks: The Gridiron.
- 1905** President Theodore Roosevelt convenes a summit to address the concerns of some schools over violence and injuries resulting from "mass momentum" plays. Two rules committees merged to form what would become the NCAA, and made radical changes to increase player safety.
- 1906** The Intercollegiate Athletic Association (today's NCAA) is created.

- 1909** The first homecoming game takes place at Baylor University in Waco, Texas.
- 1917** **The U.S. enters World War I.**
- 1911** Rules are changed to make it illegal to hide the ball under clothing.
- 1912** The value of a touchdown is raised from five to six points and end zones are added.
- 1922** Rules are changed to bar players who are removed from the game in the first half from playing until the second half.

IMAGE SUGGESTIONS:

- **Hand Protector used by Adam Walsh, 1924:** Captain and an All-America center for 1924 national champion Notre Dame, Adam Walsh led the offensive line, known as the “Seven Mules,” that blocked for the famed “Four Horsemen” backfield.
- **Game Program & Ticket from Army-Navy Game, 1924**

- 1929** **The stock market crashes.**
- 1932** In order to protect players, the ball is ruled dead when any part of the ball carrier (other than hands or feet) touch the ground. Flying blocks and flying tackles are declared illegal.
- 1937** Numbers are required on both the front and back of the jerseys.
- 1939** All players must wear helmets.
- 1941** **The United States enters World War II.**
- 1941** The first penalty flag is introduced.
- 1943-45** Many schools temporarily discontinue football because so many players have gone off to fight the war. College teams regularly schedule games against service teams from military training bases.
- 1947** The National Football Foundation is created to promote amateur football and encourage leadership and academic excellence among American youth.
- 1951** The National Football Foundation establishes the College Football Hall of Fame and inducts its first class.

IMAGE SUGGESTIONS:

- **First Penalty Flag, 1941:** Youngstown State coach Dwight Beede devised the first penalty flag, but his wife Irma sewed it, becoming the Betsy Ross of college football. Before the flag, officials used horns or whistles to signal penalties.

- 1969** **Neil Armstrong walks on the moon.**
- 1957** A penalty for grabbing an opponent’s facemask is created. Two-point conversions are added the following year.
- 1965** In December, Nat Northington signs with Kentucky, becoming the first African-American football player to sign with an SEC school. Other schools in the South are still reluctant to sign African-American players.
- 1966** The first artificial surface, AstroTurf, is created and installed at the AstroDome in Houston, Texas. Players complain of serious rug burns.

IMAGE SUGGESTIONS:

- [UCLA Liberty Bowl Pennant commemorating the United States Bicentennial, 1976](#)
- [Medallion celebrating 100 years of College Football, 1969](#)

1976 **The United States celebrates its Bicentennial.**

1972 NCAA declares college freshmen eligible to play football.

1982 “Tearaway” jerseys are banned from the game.

1984 The Supreme Court rules that individual schools, not the NCAA, own the television rights to their college football games. This allows schools to sell their own television rights, which eventually leads to an explosion of college football on TV.

1989 **The Berlin Wall falls.**

1989 The NCAA bans the use of kicking tees for field goal attempts. Kickers are now required to kick the ball straight off the ground.

1990 Air Force running back, Chris Howard, is awarded the first NFF Campbell Trophy as college football’s top scholar-athlete.

1995 The NCAA further strengthens academic requirements with the passage of Proposition 16, which established minimum GPA and SAT scores. Prop. 16 increases minimum class requirements and creates a sliding scale that balances GPA with standardized test scores.

1996 Tie games are eliminated, and overtime rules are put in place starting with the 1995 bowl season. The first ever overtime game was the 1995 Las Vegas Bowl when Toledo beat Nevada, 40-37.

1999 Tennessee beats Florida State at the Tostitos Fiesta Bowl to win the first BCS National Championship.

2001 **September 11th terrorist attacks**

2002 Riddell develops a helmet designed to reduce concussions called the Revolution, similar to the Schutt DNA Pro Adult Helmet. A University of Pittsburgh Medical Center study says these types of helmets reduce concussions by 31%.

2006 The Bowl Championship Series (BCS) National Championship Game becomes a separate bowl game to determine the National Champion of the NCAA Division I Football Bowl Subdivision. Originally, the game rotated between the Rose, Fiesta, Orange and Sugar Bowls.

2010 Specific rules are put in place that do not allow a player with a possible concussion to return to the game until he has been cleared by medical personnel. The player must miss at least one play, even if he has been cleared by team doctors.

2012 Conference commissioners announce the formation of a four-team playoff, the first of its kind at the FBS level. The new entity is called the College Football Playoff and replaces the BCS.

2014 The 100th Rose Bowl Game is played in Pasadena, California.

IMAGE SUGGESTIONS:

- [NFF 50th Anniversary Coin](#)
- [Program, Ticket & Patch from first BCS Championship Game, 2006:](#) In 2006, the Bowl Championship Series (BCS) title game became an independent event—rotating at the sites of

the Fiesta, Orange, Sugar and Rose Bowls, but separate from the bowl games themselves. Florida beat Ohio State, 41-14, in a game hosted by the Fiesta Bowl.

Curriculum Correlations

We know how important it is for you to be able to justify field trips and document how instructional time is spent outside of your classroom. With that in mind, both the activities in this Teacher's Guide and the experiences your class will have at the College Football Hall of Fame have been directly correlated to the Common Core State Standards for Mathematics and English Language Arts along with the Next Generation Science Standards and the C3 Framework for Social Studies State Standards.

In addition you will find specific state requirements for: Alabama (Science, Physical Education, Arts Education/Music, Social Studies), Florida (Science, Physical Education, Music, Social Studies), Georgia (Science, Fine Arts/General Music & Band, Social Studies), North Carolina (Science, Physical Education, Arts Education/Music, Social Studies), South Carolina (Science, Physical Education, General Music, Social Studies), and Tennessee (Science, Physical Education, Music/Instrumental).

COMMON CORE STATE STANDARDS

Mathematics Content

Grade 6: CCSS.Math.Content.6.RP.A.1, CCSS.Math.Content.6.RP.A.2, CCSS.Math.Content.6.RP.A.3; CCSS.Math.Content.6.NS.B.2, CCSS.Math.Content.6.NS.B.3; CCSS.Math.Content.6.EE.A.1, CCSS.Math.Content.6.EE.A.2, CCSS.Math.Content.6.EE.A.4, CCSS.Math.Content.6.EE.B.5, CCSS.Math.Content.6.EE.B.6, CCSS.Math.Content.6.EE.B.7, CCSS.Math.Content.6.EE.C.9; CCSS.Math.Content.6.SP.A.1, CCSS.Math.Content.6.SP.A.2, CCSS.Math.Content.6.SP.A.3, CCSS.Math.Content.6.SP.B.4, CCSS.Math.Content.6.SP.B.5

Grade 7: CCSS.Math.Content.7.RP.A.1, CCSS.Math.Content.7.RP.A.2; CCSS.Math.Content.7.NS.A.1, CCSS.Math.Content.7.NS.A.2, CCSS.Math.Content.7.NS.A.3; CCSS.Math.Content.7.EE.A.2, CCSS.Math.Content.7.EE.B.3, CCSS.Math.Content.7.EE.B.4; CCSS.Math.Content.7.SP.B.3, CCSS.Math.Content.7.SP.B.4

Grade 8: CCSS.Math.Content.8.EE.B.5, CCSS.Math.Content.8.EE.C.7; CCSS.Math.Content.8.F.B.4; CCSS.Math.Content.8.SP.A.1, CCSS.Math.Content.8.SP.A.2, CCSS.Math.Content.8.SP.A.3, CCSS.Math.Content.8.SP.A.4

Mathematical Practice

CCSS.Math.Practice.MP1, CCSS.Math.Practice.MP2, CCSS.Math.Practice.MP3, CCSS.Math.Practice.MP4

English Language Arts

CCSS.ELA-Literacy.RH.6-8.1; CCSS.ELA-Literacy.RST.6-8.3, CCSS.ELA-Literacy.RST.6-8.4, CCSS.ELA-Literacy.RST.6-8.7; CCSS.ELA-Literacy.WHST.6-8.2, CCSS.ELA-Literacy.WHST.6-8.4, CCSS.ELA-Literacy.WHST.6-8.9

NEXT GENERATION SCIENCE STANDARDS

MS-PS1-3., MS-PS2-1., MS-PS2-2., MS-ETS1-1., MS-ETS1-2.

C3 FRAMEWORK FOR SOCIAL STUDIES STATE STANDARDS

By the end of Grade 8: D1.1.6-8., D1.5.6-8., D2.His.1.6-8., D2.His.2.6-8., D2.His.3.6-8., D2.His.14.6-8., D2.His.15.6-8., D3.1.6-8, D3.4.6-8., D4.1.6-8., D4.2.6-8.

ALABAMA

Science

Grade 8: 8.1, 8.8

Arts Education: Music

Grades 6 – 8: 12, 13, 14

Physical Education

Grade 7: 7.4

Grade 8: 8.3, 8.9

Social Studies

Grade 6: 6.6, 6.10, 6.14

Grade 7: 7.C.12

FLORIDA

Science

Grade 6: SC.6.N.1.1, SC.6.N.1.5, SC.6.N.1.6, SC.6.N.3.3, SC.6.N.3.4, SC.6.P.13.1, SC.6.P.13.3

Grade 7: SC.7.N.1.1, SC.7.N.1.4, SC.7.N.3.2

Grade 8: SC.8.N.1.1, SC.8.N.1.3, SC.8.N.1.6, SC.8.P.8.2, SC.8.P.8.4

Physical Education

Grade 6: PE.6.L.3.4, PE.6.L.3.5, PE.6.M.1.6

Grade 7: PE.7.C.2.1, PE.7.C.2.3, PE.7.C.2.7, PE.7.C.2.9, PE.7.L.3.4, PE.7.L.3.5

Grade 8: PE.8.C.2.8, PE.8.M.1.3

Music

Grades 6 – 8: MU.68.C.1.3, MU.68.C.3.1, MU.68.H.3.1, MU.68.S.1.2

Social Studies

Grade 7: SS.7.C.2.13

Grade 8: SS.8.A.1.2, SS.8.A.1.3, SS.8.A.1.5

GEORGIA

Science

Grade 6: S6CS3, S6CS4, S6CS5, S6CS9

Grade 7: S7CS3, S7CS4, S7CS5, S7CS9

Grade 8: S8CS3, S8CS4, S8CS5, S8CS9

Fine Arts: General Music

Grade 6: M6GM.5, M6GM.8, M6GM.9

Grade 7: M7GM.5, M7GM.8, M7GM.9

Grade 8: M8GM.5, M8GM.8, M8GM.9

Physical Education

Grade 6: PE6.2.

Grade 7: PE7.2.a

Grade 8: PE8.2.a, PE8.6.a

Fine Arts: Band

Beginning: MMSBB.5, MMSBB.8, MMSBB.9

Intermediate: MMSIB.5, MMSIB.8, MMSIB.9

Advanced: MMSAB.5, MMSAB.8, MMSAB.9

Social Studies

Grade 8: SS8H7, SS8H9, SS8H12

NORTH CAROLINA

Science

Grade 6: 6.P.2.3

Grade 7: 7.P.1.2

Physical Education

Grade 6: PE.6.MS.1.2

Grade 7: PE.7.MS.1.2

Grade 8: PE.8.MS.1.2

Arts Education: Music

Grade 6: 6.MR.1.1

Grade 7: 7.MR.1.3, 6.CR.1.2

Grade 8: 8.CR.1.2

Social Studies

Grade 7: 7.H.1.3, 7.C.1.2

Grade 8: 8.H.1.3

SOUTH CAROLINA

Science

Grade 6: 6.S.1A.1, 6.S.1A.2, 6.S.1A.3, 6.S.1A.4,
6.S.1A.5, 6.S.1A.6, 6.S.1A.7, 6.S.1A.8,
6.S.1B.1

Grade 7: 7.S.1A.1, 7.S.1A.2, 7.S.1A.3, 7.S.1A.4,
7.S.1A.5, 7.S.1A.6, 7.S.1A.7, 7.S.1A.8,
7.S.1B.1, 7.S.2B.1

Grade 8: 8.S.1A.1, 8.S.1A.2, 8.S.1A.3, 8.S.1A.4,
8.S.1A.5, 8.S.1A.6, 8.S.1A.7, 8.S.1A.8,
8.S.1B.1, 8.P.2A.1, 8.P.2A.2, 8.P.2A.3,
8.P.2A.4, 8.P.2A.5

Physical Education

Grades 6 – 8: Standard 2

General Music

Grade 6: MG6-2.5, MG6-5.3, MG6-6.4

Grade 7: MS7-2.5, MG7-5.3, MG7-6.2

Grade 8: MS8-2.5, MS8-5.3, MS8-6.4

Social Studies

Grade 7: 7-6.4

Grade 8: 8-6.5

TENNESSEE

Science

Grade 6: GLE 0607.Inq.2, GLE 0607.Inq.3, GLE 0607.Inq.5, GLE 0607.T/E.1

Grade 7: GLE 0707.Inq.2, GLE 0707.Inq.3, GLE 0707.Inq.5, GLE 0707.T/E.1, GLE 0707.11.4

Grade 8: GLE 0807.Inq.2, GLE 0807.Inq.3, GLE 0807.Inq.5, GLE 0807.T/E.1

Physical Education

Grades 6 – 8 Skilled Movement: A physically educated person demonstrates competency in motor skills and movement patterns needed to perform a variety of physical activities.

Grades 6 – 8 Movement Principles and Concepts: A physically educated person demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities.

Music: Instrumental

Grades 6 – 8: 4.1, 4.2