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**Engaged Learning Project**

**Title of Project:** “Fantasy Football Math”

**Subject(s):** Coordinate Algebra Support

**Grade Level(s): 9**

**Abstract:**

Working in groups of four and collaborating with coaches and players from a local university, students will be managing a fantasy football team that they will select from actual NFL players. The students have a budget that they must stay under when selecting their players and must decide which players to start each week based on analysis of their stats from the weeks before. The students will assume the adult role of managing a budget and managing players/workers as they try to score the most points each week. Students will learn to read box scores after the games each week and must compute their weekly scores by utilizing an equation. The teacher will participate in the project by selecting her own team and competing with the students. At the end of the season, students will have an awards banquet at which various awards will be given including Overall Championship Team, Coaches’ Pick, Fan Favorite, and other awards designed by students and outside collaborators. Prizes may include school spirit wear, tickets to local college football games, or gift cards donated by local merchants. Individuals who served as consultants will be invited to attend the banquet.

**Learner Description/Environment:**

This project will be implemented in a coordinate algebra support class because it is the only class where there is the time to devote to such an ambitious project. The students in the classes were selected for support class because they have struggled with math in the past. These students need something to be excited about in math because quite a few of them do not like it. Many of these students are special education students with IEPs. A large portion of our students at our school are on free or reduced lunch and the only access they have to technology is at the school. All of the students are currently enrolled in two math classes, which are the coordinate algebra class, and the support class. The support class does not have a set curriculum other than it is to support the learners and help to make them more successful in the regular math course. Our hope is that we can work on some of the skills these students are deficient in using the fantasy football and the math involved.

The teams will be carefully balanced to include students with football knowledge who can help the others learn the basics, strong readers to support those with weaker skills, students with relatively strong math and/or calculator skills to support those who are the weakest in math, and students who are technologically savvy. This should help keep teams from having an unfair advantage and should allow the students to start on a more level playing field.

**Time Frame:**

The unit will run for the entire first semester of school with one day a week devoted to fantasy football and calculating and analyzing scores. The project may be extended into the next semester until after the Super bowl in early February.

**Learner Performances:**

We want the students to be able to discuss why they selected the players and explain ways to analyze the player choices available when selecting players for a game. We also want the students to be able to apply these skills to other situations in life where they may have to make a decision based on previous data. The students will be compiling and analyzing data. They will synthesize the data and create a web page. Ultimately, they will evaluate their choices to make recommendations for next year's team. The Bloom’s taxonomy level for this project is Evaluation, which is the highest level.

**Standards Assessed:**

MCC9‐ 12.A.SSE.1 Interpret expressions that represent a quantity in terms of its context.

MCC9‐ 12.S.ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).

MCC9‐ 12.S.ID.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

MCC9‐ 12.S.ID.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

MCC9‐ 12.S.ID.4 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

 MCC9‐ 12.S.CP.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).

MCC9‐ 12.S.CP.5 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.

**Nets-s: 1** Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

**Nets-s: 2** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

**Net-s: 3** Students apply digital tools to gather, evaluate, and use information.

**Net-s: 4** Students use critical thinking skills to plan and conduct research, manage projects, solve Problems, and make informed decisions using appropriate digital tools and resources

**The “hook” or Introduction**:

The unit will be introduced using the following video about the Falcons team staring Samuel L Jackson and Atlanta celebrities found at: <http://www.youtube.com/watch?v=DXs8vZEAcL8>. The project should be interesting and motivating to students because most students are interested in football or know someone who is interested in football. It is also highly motivating because the data is constantly changing because it depends on the games played every week. Some students know adults who play fantasy football or may play fantasy football themselves.

**Process:**

Week 1: Students are introduced to fantasy football and draft a team. The teacher will introduce the concept of a fantasy football team through a couple of videos shown in class on both the Falcons football team and playing fantasy football. The students will then draft a fantasy football team based on current real players in the NFL and a salary cap to prevent students from picking the best player at each position. The students will do research on their team both at school using the Internet and at home using resources available there. The students will also select their starting lineup for week 1. The teacher and the students will practice calculating points and reading box scores for a sample team in order to be prepared to calculate points for their individual teams.

For each week during the regular football season the students will select a starting lineup of the players they think will score them the most points. Once all of the games are played for the week, the students will use the Internet to find the box score for each of their players and calculate the number of points earned for their fantasy football team. Each week, the teacher will post the points earned by each fantasy football team so that students can see the current standings. Students will keep all of their information in a journal where they will calculate the points and write a reflection of how they feel their team did the previous week and what changes they will make this week based on the data they calculated. Students will also calculate the mean and standard deviation of the point totals for the entire class. The students will also create different graphical representations of the data each week, a histogram, box plot, or dot plot. Every week a new graph will be created in order to compare from week to week how the class as a whole is doing with their players. The students will make conclusions based on the data as to whether they think the class is getting better at selecting a starting lineup each week.

The students would continue to play and calculate their team's scores through the end of the 1st semester of school. After that time the playoff start and not all of the students’ players may be active in the playoffs. During the first part of the 2nd semester, the students will start to compile their information and begin to create their web page for their football team. They are required to make a website that shows the week by week stats of each of their players as well as an analysis of how they think each player performed during the season. The students must also give a recommendation as to whether they would keep that player on their team next season.

**Product**:

Students will create a web page for their fantasy team that will include all of the players that they drafted. The students will post the player’s stats from each week and analyze how effective they felt their players were through the season and whether they would keep them on their team for next year. The product will be assessed based on a rubric created with input from the students.

**Technology Resources/Management:**

Students will need access to computers with Internet and web page authoring software. Students will also be learning to use a calculator for statistical analysis. Students will be required to create a web page for their fantasy team at the end of football season.

This will require them to use the computer with website authoring software. The students will have to learn to use new software and how to analyze new data, which will be challenging and all of the math that the students will be doing will be standards-based. The learning is authentic because it is a real-life situation that many team owners have to analyze the statistics of their players to determine if they should keep them on the roster from season to season. The students are picking the teams and selecting starting rosters each week. They will also be in charge of their website which could take on different aspects based on what they find interesting. The project is multidisciplinary because it involves aspects of business education, math, and sports. The students are taking on the role of explorer by trying out different combinations of starting lineups to see what works, the role of teacher by helping to teach each other about football and how to calculate the statistics, and the role of producer by producing a website about their team.

Each week one of the students on each team will be the official statistician who will learn the process for calculating the stats and then teach other students how to make the calculations. Once the statistics for the team are calculated and agreed upon by the team, they will be posted in a weekly “Scoreboard” section of the team’s website.

Coaches from a local university will visit the class to speak with the students about football and what is like to manage a football team, both a real team and a fantasy team. Each team will be paired with a coach or player from the university team who will act as a consulting coach throughout the fantasy season. These outside coaches will collaborate with the student teams on a bi-weekly basis to review their picks and discuss their stats. Collaboration with the outside experts will be done via skype, email, or through the students’ websites.

Our media specialist will be coming to the lab to help the students make their webpage during the second week of the projects. Teams will collaborate to design their site to include a journal page, a weekly scoreboard page, a Play-of-the-Week page, and a Line-up page. Student may also decide on other pages to present information that they think is important or interesting.

Potentially, the students will share their work and compete against students at another high school in the same county.

The students will have access to their own calculator or they have access to an online app if they bring their own technology. Students could also access information by going to the computer lab or using one of the classroom computers. Students will have to access the Internet via the school Wi-Fi in order to regulate the sites that be are being visited. Teachers will also have to be constantly checking that the students are on appropriate and content related sites.

**Student Skill Development:**

Students need basic math skills to get started. Students will develop calculator skills. They will learn how to create a basic website. Teachers can create a screen cast of how to use the calculator to help students learn to use it on their own. The teacher can walk them through the statistical analysis of their fantasy football team for the students to have step-by-step instructions on how to use the calculator.

**Adaptations for Special Needs:**

For students with vision disabilities, a large-screen monitor will be available. Alternatively, digital text can be enlarged. Copies of worksheets will be available in a font appropriate to the student's needs. Text-to-speech software will be utilized for students with more significant vision impairment as well as for students with reading disabilities. For students with hearing disabilities, sub-titles or scripts will be available to accompany audio portions of the project.

If there are students with physical disabilities in the class, the classroom will need to be arranged to allow access to equipment and resources. The Special Education Department will provide adaptive keyboards and other assistive technology, as needed.

English Language Learners will need a word-to-word dictionary. We will have to make sure that they understand American football terms and the basics of how teams are structured.

ELL and SWD will be placed in groups with students who can serve as peer tutors.

Because math support class is designed for students who need remediation and acceleration, it is unlikely that there will be students who are gifted. If the project were used with other students, gifted students could be assigned to comparing everyone’s player stats and determine who had the most effective team during the season.

**Assessment:**

Students will be completing an online journal every week that the teacher will be checking along the way. Students will have a rubric for the journal entries and for the website at the end. Because the journal is online, students will be able to use feedback to correct their work. In the journal, students will perform statistical calculations as assigned.

Assessment will include:

Weekly Calculations Rubric

Website Design Rubric

Outside Experts Assessment (completed by consultants)

**Supporting Materials**:

Introduction Video: <http://www.youtube.com/watch?v=DXs8vZEAcL8>.

Calculator Tutorial: <http://www.youtube.com/watch?v=Kdu2W_jjLZ8>

Online Translator: <http://translation2.paralink.com/>

American Football for ELL: <http://www.elcivics.com/lifeskills/football-lesson-1.html>

<http://www.talkenglish.com/LessonDetails.aspx?ALID=691>

Text-to-Speech:

h[ttp://www.naturalreaders.com/index.php?gclid=CIix24S0w7MCFQ2znQodxW0ANw](http://www.naturalreaders.com/index.php?gclid=CIix24S0w7MCFQ2znQodxW0ANw)