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| *Apprenticeship Name* | **Data Dunkers/Data Science for Everyone** |

**Unit Plan**

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| *Please provide an overview paragraph about the curriculum here. Please include the following:*   * *What are the goals of the apprenticeship?* * *Why is this apprenticeship important and relevant to a student’s education, personal growth and goals?* |
| **Goals**   * **WOW Vision:** **Data Fair!** SWBAT **collect and analyze data** from throughout the semester **one of three topics from which the student may choose** (**Entertainment, Athletics, and Sciences (\*though I am having a hard time figuring out a WOW for this category\***).   + **In addition to their WOW showcases, students will record their development process and all data analyzed throughout the semester on a Wordpress blog.**   + **Entertainment:**     - Students will **collect data from his or her class** regarding his or her **taste in film and television**.     - From this, the student will **select three specific students**, **develop graphs and statistics** regarding the three students’ tastes **to cross-reference** with those of the other students (or other existing and accessible databases)     - From these data, students **will create a poster** displaying a **Netflix-like “Recommended for you” banner** of films and television that would, based on the data analyzed, suit the selected three students’ taste.       * Supporting data in pursuit of this goal would be on display, including **graphs, surveys, figures, and the student’s work on the Wordpress blog**.   + **Sports:**     - Students will choose **one College Football team** to follow in the weeks leading up to the WOW.     - In the weeks leading up to the WOW, Students will collect the **team’s statistics** from the past and developing season.       * Using these data, the student will develop an argument or pitch to give to **a prospective NFL recruiter (parents)**, highlighting the important facts and statistics that would make particular players important to a professional team.       * As with the **Entertainment** section, supporting data will be on display, **including graphs, figures, individual statistics**, and the students’ work on the **Wordpress blog**. * To teach Eighth Graders the basics of Data Sciences and data analysis, how to apply these skills to everyday life situations, and how to couple these skills with relevant technology—specifically Microsoft Azure. * To be put glibly, the goal of this apprenticeship is to answer the ever-present question in Math Class: “When are we ever going to use this?”   + Data Analysis has applications in almost every field:     - **The Sciences**, while a given, rely deeply on Data Analysis     - Data Collection and Analysis allows entertainment services such as **Netflix**, **Pandora** and **Spotify** to better identify one users’ preferences out of millions, by analyzing a user’s individual data and cross-referencing it with the related data of other users.     - **Video Game Developers** use tools associated with their **online games** to analyze popular aspects of their games, allowing insight into focus areas for future game development (features, multiplayer, etc.) See: Minecraft     - **Every professional sport** tracks player statistics in order to better determine the most effective methods of training throughout a year. Additionally, analysis of player data allows coaches to determine the demand for specific players based on his or her skill, which largely determines the outcomes of trades and drafts.       * Also: **Fantasy Sports (Football, Baseball, etc.)** uses almost exclusively developing player statistics throughout a season in order to function. Not only is this a popular form of American sports-related entertainment, but it has become a source of income for many Americans, through online services such as **draftkings.com.** * For Eighth Graders Specifically (*Retrieved from an Outline from Heather Shapiro (CT))*:   + EXPRESSIONS AND EQUATIONS     - Understand the connections between proportional relationships, lines, and linear equations..   + FUNCTIONS     - Define, evaluate, and compare functions.     - Use functions to model relationships between quantities.   + STATISTICS     - Investigate patterns of association in bivariate data. |
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| **21st Century Skill** |
| *Choose one 21st century skill that this apprenticeship will focus on: communication (choose sub-standard), collaboration, problem solving, innovation.*  Problem Solving (Strand 1) |

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| **WOW!** |
| *Describe your product, performance or presentation? How will students demonstrate authentic mastery? In GRASPS format*  GOAL: Develop three “Recommended for you” banners, similar to Netflix or Amazon Prime, reflecting effective analysis of the data collected from classmates and databases/Develop a pitch or argument, supported by relevant player data, convincing NFL recruiters (parents) to draft select members of the team.  ROLE: Entertainment: Content Organizer/Sports: Statistic analyst/Coach  AUDIENCE: Parents and peers  SITUATION: Browsing a Netflix queue/An NFL draft meeting.  PRODUCT OR PERFORMANCE: Three statistically personal “Recommended for you” Queues, arranged in a visually appealing manner/A verbal argument supported by data analysis  STANDARDS FOR SUCCESS: Achievement of the above goals in a complete manner. |

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| **Unit Overview** | | | |
| Week | Activities | Week | Activities |
| 1 | Introduction and demos to explain data science | 6 | Collecting data/creating surveys |
| 2 | Set up in the cloud | 7 | Begin analyzing AzureML project |
| 3 | Introduction to AzureML | 8 | Continue working on project |
| 4 | AzureML Lab | 9 | Work with other teams |
| 5 | Data Visualizations | 10 | Next steps/Final Wrap up |

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| Unit Guide | | | |
| Week | Lesson Objectives | Knowledge | Activities and Materials |
| 1 | * Teach students about science, math and programming and how they relate. * Discuss what data science is | * How STEM paths relate and why they are important. * What is the science in data science?   + Real world examples   + Reading Graphs   + Framing the problem   + In/dependent Variables * What is the data/math in data science?   + Features   + Variable Selection   + Modules and judging accuracy (random guessing benchmark)   + Tools/Languages | * + Powerpoints and videos to demonstrate how data science principles already exist in the students’ lives   + Pretest to understand what the students know already about math principles |
| 2 | * What is the cloud? * Introduce Microsoft Azure | * Learn a high level overview about the technology behind Azure | * Azure Account Setup (Class 2)   + Creating free Microsoft Azure Account via DreamSpark/Imagine   + Activating Azure and create Dev Journals using WordPress |
| 3 | * Introduction to AzureML | * How to import data * Where to find data sources * Choosing features * Model Creation better than random guessing * Interpreting results | * Step by step walkthrough of using AzureML |
| 4 | * AzureML lab | * Get comfortable with the AzureML workspace |  |
| 5 | * Data Visualizations | * What programs are available for visualizations | * Play around with the online app, RAW (<http://raw.densitydesign.org/>) * See what students can make in excel |
| 6 | * Form groups and collect data for the Wow Projects | * Collaboration * How to collect data * Creating surveys | * Create surveys for students on what they would like to know for the entertainment/sports categories |
| 7 | * Begin analyzing projects in AzureML |  |  |
| 8 | * Continue working on projects/ Creating WOW Banners |  |  |
| 9 | * Work with other teams to find out what they are doing |  |  |
| 10 | * Next steps in data science | * Reiterating why the topic is important * What opportunities there are for the future |  |