**Subject area/course**: Science/Physics

**Grade level/band**: 11-12

**Task source**: Educational Policy Improvement Center (EPIC)

**NFL Ready**

**STUDENT INSTRUCTIONS**

1. **Task context**:

Every school has their favorite quarterback. Some of those quarterbacks have a wonderful throwing game while some have an excellent running game; an elite few have the entire package.

You have been selected by the NFL to scout out some of the best quarterbacks in college football. The NFL team you are working for has determined that speed is of critical importance. The faster the ball is thrown downfield, the more points teams can score. The primary interest of NFL teams is selecting a throwing quarterback who can throw the ball with a high rate of speed. They feel that all other weaknesses can be overcome. Your job is to select and evaluate one candidate for this position from the best throwing quarterbacks in college football who are eligible for the NFL draft (even if they have not been announced yet). You will need to compare your candidate against one of the best throwing quarterbacks in the NFL.

You have been hired for your keen analytical skills. You will, of course, notice that the speed of the ball leaving the quarterback’s hand is not a published statistic. You will have to review video footage to determine how far the quarterback can throw the ball and the amount of time the ball is in the air. Usually, when we say a quarterback threw 50 yards on a play, it only means that he threw it to a receiver who ran forward until he was tackled, for a total gain of 50 yards. That means that a quarterback could just be throwing balls 5-10 yards, for example, while the receivers do the work from there. You will need to carefully review statistics and video footage in order to gather accurate data.

Evaluation of the path of flight of the ball will involve a discourse on kinematics. It will be critical that you accurately determine the displacement of the ball, which will involve analyzing the video footage using vector components.

1. **Final product**:

After developing a problem-solving strategy and your hypothesis, research your favorite college quarterback’s throwing ability and identify your quarterback’s maximum throwing speed. Then, write a 3-page proposal to your NFL team that confirms or rejects your belief that your favorite college quarterback should play in the NFL. Use evidence from your quarterback’s statistics as well as current NFL quarterback statistics to explain your results. Make sure that you explain how you calculated the maximum throwing speed of the football players.

 Your paper should:

* Describe any limitations of the study
* Use discipline-specific vocabulary
* Include correctly formatted in-text citations and a Works Cited page
* Be peer edited and revised before submission

**Additional Information**

1. **Knowledge and skills you will need to demonstrate on this task:**
* Understand two-dimensional kinematics and how to solve problems numerically
* Analyze video for distance and time then use this information to determine the throwing speed of the quarterback
* Research to find video clips from which you can gather appropriate data
* Research to determine the distances on a football field
* Generate a testable question, make a hypothesis, analyze data and support or refute your hypothesis in a three page, peer-edited paper
* Synthesize and evaluate your experimental evidence to make recommendations about a player’s suitability for the NFL
* Provide constructive feedback to your peers on their draft lab reports and take into consideration feedback they provide you
1. **Materials needed:**
	* You will need access to video footage of NFL and college football players. This video footage should be easily accessible on the Internet.
	* An introductory physics textbook may be helpful in solving necessary kinematics equations.
	* Video analysis software (such as Capstone) may be useful in analyzing video clips as long as the motion occurs in a constant frame.
2. **Time requirements:**

This task will take approximately 3-4 hours to complete. Your teacher will provide additional details regarding deadlines and due dates.

1. **Scoring:**

Your work will be scored using the College and Career Ready (CCR) Task Bank Scoring Rubric. You should make sure you are familiar with the language that describes the expectations for proficient performance.