Name: _____

Assessment Questions

Module 1.0: Forces in Baseball

K = ½ MV2

1. Fill in the blank: As the velocity _____ the kinetic energy _____ (increases or decreases).

2. According to the equation: K=½ MV2. If a baseball was traveling at the velocity of 30 m/s with a mass of 0.145kg, what is the kinetic energy of the ball?
   a. 2.2 Joules
   b. 4.7 Joules
   c. 65.3 Joules
   d. 130.5 Joules

Module 2.0: Composition of a Baseball

1. True or False: The baseball structure and composition has maintained the same throughout time.

2. Post-test only: Would you want to play baseball during the 1800's? Why or why not? Support your opinion with evidence from the article and experiment.

3. Which of the following constraints would cause the baseball to undergo changes?
   a. Rubber or cork were no longer available materials.
   b. Players hit the ball too far.
   c. Manufacturing companies changed their process to be more effective.
   d. The bat technology changed and it damaged the ball during play.

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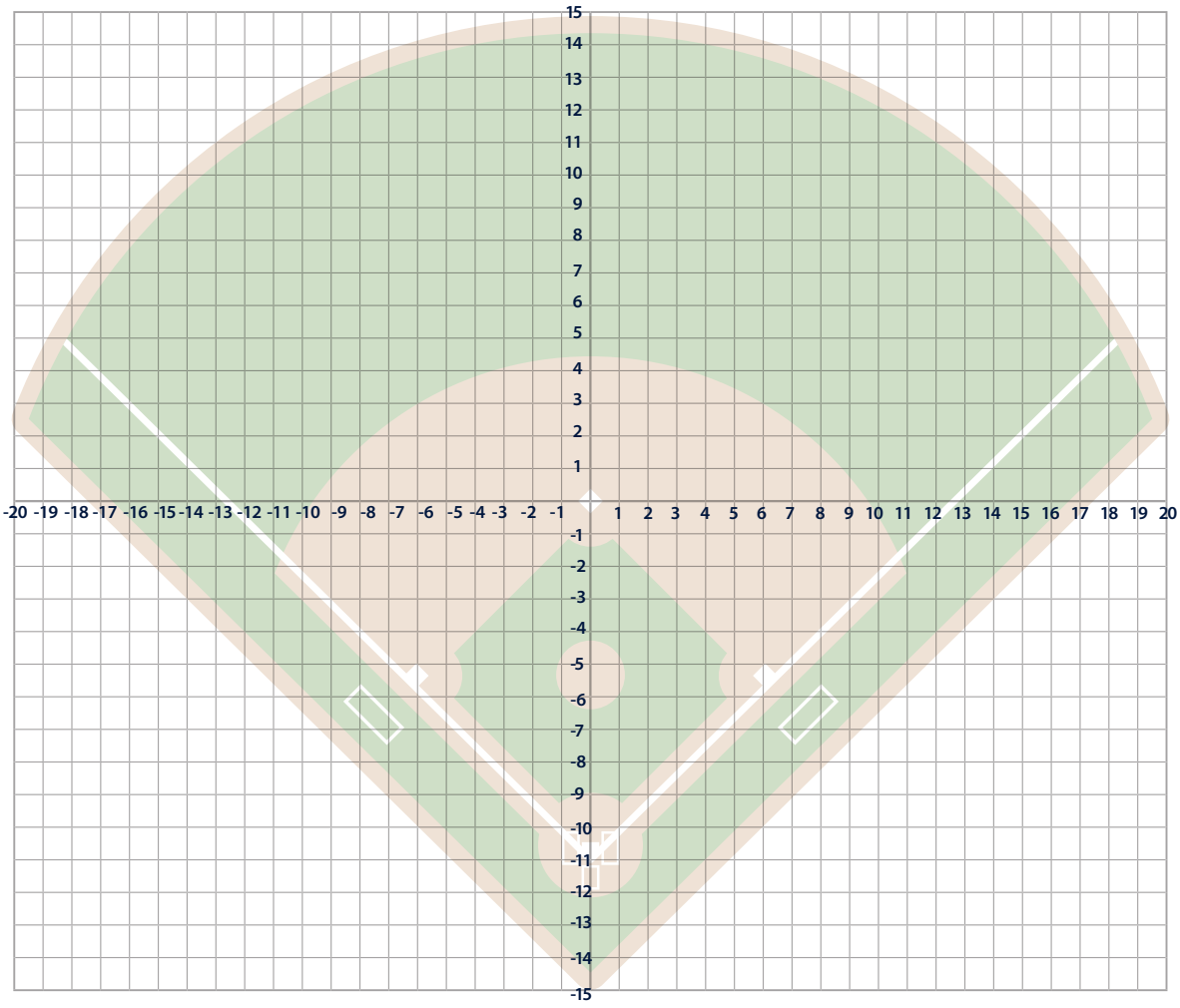
Assessment Questions



Module 3.0: The Field of Play

1. If the First Baseman ran to (11,-5) to catch a foul ball and then needed to throw to the Pitcher at (0,-5) to make the play. How far would they throw?
   a. -5
   b. 0
   c. 6
   d. 11

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Assessment Questions

2. Using the Pythagorean Theorem and the distance between the First Baseman and the Pitcher:
   (a) Per Question 1: Calculate (C), the distance between the First Baseman (11, -5) to the Catcher (0, -11).
   (b) The distance between the pitcher (0, -5) to the catcher (0, -11).
   a. 7
   b. 12.5
   c. 15.5
   d. 11

Module 4.0: The Art of Pitching

1. Calculate the force of the baseball traveling at a speed of 30m/s for 5 seconds. The mass of a baseball is 0.145 kg.
   a. 0.71 N
   b. 0.85 N
   c. 1 N
   d. 4.26 N

2. Which statement best describes the relationship between force and acceleration?
   a. As the force on a baseball increases, the acceleration will increase (when mass is constant).
   b. As the force on a baseball decreases, the acceleration will increase (when mass is constant).
   c. As the force on a baseball increases, the acceleration will decrease (when mass is constant).
   d. Acceleration and force are not related.

Module 5.0: Engineering a Pitching Machine

1. Which is the best reasoning: why do engineers, scientists and coaches need consistent and controlled data?
   a. They can make changes to their designs.
   b. They can draw conclusions on the root of the problem.
   c. They can see all the things challenging the outcome at once.
   d. They can record their data and present it.

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Assessment Questions

2. Put the steps of the Engineering Design Process for designing a pitching machine in order:
   a. Plan and build a prototype: Draw diagrams and build a device that will throw consistent pitches.
   b. Brainstorming and multiple designs for a solution.
   c. Identify the problem: Improving swing and hitting skills is difficult with the variables of a human pitcher.
   d. Redesign: Make changes to your design based on the data and practice.
   e. Test the prototype: Plan an experiment where you test the consistency of your prototype.
   f. Communicate: Present your idea and results to the class or team.

Module 6.0: Mechanics of a Swing

1. A high school scout is looking for a hitter who successfully gets a hit at least 0.35 of the time, or a batting average of .350. Which player would likely be of interest to the scout?
   a. Player 1: 1/6 hits
   b. Player 2: 2/8 hits
   c. Player 3: 1/9 hits
   d. Player 4: 7/20 hits

2. The probability of a batter getting hit by a pitch is 0.22. If you have 250 at-bats during a season, how many times would you likely get hit?
   a. 22
   b. 44
   c. 55
   d. 77

3. Bonus: True or False: Always wear your protective equipment when practicing or playing baseball!

Module 7.0: Player Statistics

1. True or False: Ratios can be used to compare the probability of a team's overall success.

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Assessment Questions

2. Which of the following teams has the greatest chance of winning?
   a. 4:3 odds
   b. 2:1 odds
   c. 10:8 odds
   d. 1:1 odds

Module 8.0: Advancements in Baseball

1. Choose the best answer: instant replay is an example of:
   a. New technology
   b. Different technology
   c. Technology produced as the game has evolved/changed.
   d. Dead technology

2. Gameplan technology can be used for the following:
   a. To view plays in real time in slow-motion.
   b. To view a play in slow-motion in real time.
   c. To effectively evaluate a player or team's talent.
   d. All of the above.

3. Bonus: True or False: The Brooklyn Giants and Cincinnati Reds were the first teams in MLB history in a televised game.