**September Rich Math Problem: Bucky the Badger**

**Developed by Bryan Passwater and adapted from Dan Meyers**

**September 2016**

This task will allow students of all abilities to engage, collaborate, problem solve, and contribute toward solving an interesting and rich problem.

**Mathematical Process Standards (Common Core)**:

MP2: Reason abstractly and quantitatively by using multiple forms of representation to make sense of and understand mathematics.

MP3: Describe and justify mathematical understandings by constructing viable arguments, critiquing the reasoning of others and engaging in meaningful mathematics discourse.

MP4: Contextualize mathematical ideas by connecting them to real-world situations. Model with mathematics.

**Introduction**:

The University of Wisconsin mascot, Bucky the Badger, does pushups each time the Wisconsin football team scores. Not only does he do push-ups after each score, he does as many pushups as the current total score. If Wisconsin has 17 points and scores a touchdown to bring their score to 24 points, Bucky would do an additional 24 pushups. A few years ago, Wisconsin played Indiana University and scored an astounding 84 points! In this task, students work collaboratively in small groups to determine the total number of pushups that Bucky did during the Wisconsin vs. IU football game.

**Description/Instructions**:

Students will engage in an estimation activity to develop conception of numbers and reinforce numeral operation fluency. It is also an activity that includes problem solving, reasoning and modeling using mathematics. Detailed instructions are on the following page. This problem is from Dan Meyer’s Three Act Math. All video clips and instructions can be found at:

http://mrmeyer.com/threeacts/buckythebadger/

Students will watch a brief clip describing the Bucky the Badger problem and then work in small groups to try and determine the total number pushups Bucky did during the Wisconsin vs. IU football game. Students will quickly realize that they do not have enough information to solve the problem and will ask you for additional information. You will be able to share a follow up clip and image to help answer the questions of how many TDs and FGs Wisconsin scored in the game and the order that they were scored. Once students work in their groups to determine the answers, you will play the third and final clip to give the answer and expose a possible conspiracy theory!

**Teacher Instructions:**

**Note:** This task has 3 Acts. All three acts are including in the link below.

Act 1

1. Play the initial clip of Bucky the Badger.

<http://mrmeyer.com/threeacts/buckythebadger/>

1. Following the initial clip, ask students to guess how many push-ups Bucky the Badger had to perform in the course of the game.

Note: If a student responds by saying 83, then you will need to re-explain the problem and how the number of pushups is calculated.

1. Ask several students for their approximations before splitting students into small groups of 3 or 4 to further explore this question.

Have students address the following questions and construct viable arguments and critique the reasoning of others as they address these questions.

* Restate the Bucky the Badger problem in your own words.
* About how many total push-ups do you think Bucky did during the game?
* What is a number you know is too high?
* What is a number you know is too low?

Act 2

In their small groups, students should quickly realize that they do not have enough information to solve the problem. This leads to the question:

What information will you need to get an answer?

1. Play the 2nd clip (act two) at the link above.
2. Show the image of the “order of touchdowns and field goals”
3. Let students work in their small groups to try and figure out how many TOTAL pushups Bucky did during the game.

Act 3

1. Play the final clip (Act three) at the link at the top of this page.
2. Discuss students’ final mathematical ideas about the problem