Welcome to Critical Math, a series of reports that describes applications of mathematics to everyday life. Critical Math is a partnership between the students in Math Appreciation classes at New Mexico State University and KRWG radio. On today’s installment of Critical Math, The research for today’s topic was conducted by NMSU students: NAMES DELETED Today’s topic on Critical math is UPC codes.

The acronym UPC stands for Universal Product Code and is found on almost every grocery item. UPCs consist of a twelve digit code that uses two blocks of five digits that are preceded and followed with a single digit. The first six numbers identify the country and the manufacturer of the product, and the next five identify the product itself.

I purchased a can of tomato soup with UPC 0 5 1 0 0 0 0 0 0 1 1 8. Underneath this code write the numbers 3, 1, 3, 1 etc. in alternating sequence. Now multiply down and add the numbers across. The total will be 20, a multiple of 10, which is consistent with all UPC codes. Since the total is divisible by 10, the UPC is considered valid.

UPC’s are designed to detect errors. If any digit is scanned incorrectly, the result will not be a multiple of 10. The scanner will beep, and the operator will have to re-scan the item. The final number is the check digit. It is designed so that the UPC calculations will result in a multiple of 10.

The UPC will catch all single digit errors and most errors in which successive digits are switched. Find a UPC in which successive digits differ by 5. Switch the first two digits and calculate. What do you find?

UPC code researched by NAMES DELETED for the series Critical Math, a partnership between the students in Math Appreciation classes at New Mexico State
University and KRWG radio. I’m Charles Winnicki, producer of Critical Math. Next week at this time on KRWG Las Cruces, we’ll explore: