

Name: _____ Date: _____

Universal Product Codes (UPC) or as we know them, BAR CODES!

What are they?

- A UPC is a 12 digit code generally used to identify a product.
 - Can also be used as coupons
 - Why use a UPC instead of just a price tag?
 - Can change price in computer easily
- Universal PRODUCT Code not Universal PRICE code
 - If you decided to change the price of an item you would have to buy new bar codes on everything!
- The actual BARS are computer generated by the numbers. This is a whole separate computer science algorithm which we will not get into for this class but you are welcome to look it up!



Parts of the code

- The 12 digits are broken up into the following

Manufacturer Number (6 digits)

- A company (manufacturer) is assigned a specific code that is used for all of their products
- For example every product issued by Frito-Lays will start with 028400

Product Number (5 digits)

- A number specific to a single product the manufacturer sells
- Each product in the Frito-Lays company has a specific product number, for example a 2 oz bag (vending machine sized) of flaming hot crunchy Cheetos has the product number 04791

Check Digit (1 digit)

- The check digit is determined by the values of the manufacturer and product numbers
- The check digit of a the 2 oz bag of flaming hot Cheetos is 3 (how to determine what the check digit should be will be explained in the next section)



How to determine if a code is valid

- The purpose of a check digit is to guard against input errors or fraud
- In order for the code to be valid it must follow the following rule:
 - 1) Multiply the first digit by three and continue to multiply every other digit by three.
 - 2) Sum all 12 numbers
 - 3) The **sum** must end in a 0 to be valid. NOTE- that does not mean the check digit is zero but rather, that when you add all 12 values the final answer will end in zero, for example 70 or 110.

Practice:

- 1) 058206488269 is an example of a valid UPC code. Using the rule above, prove that it is valid. Show work! (Hint... 110).

- 2) Prove that the code 188114771211 is valid

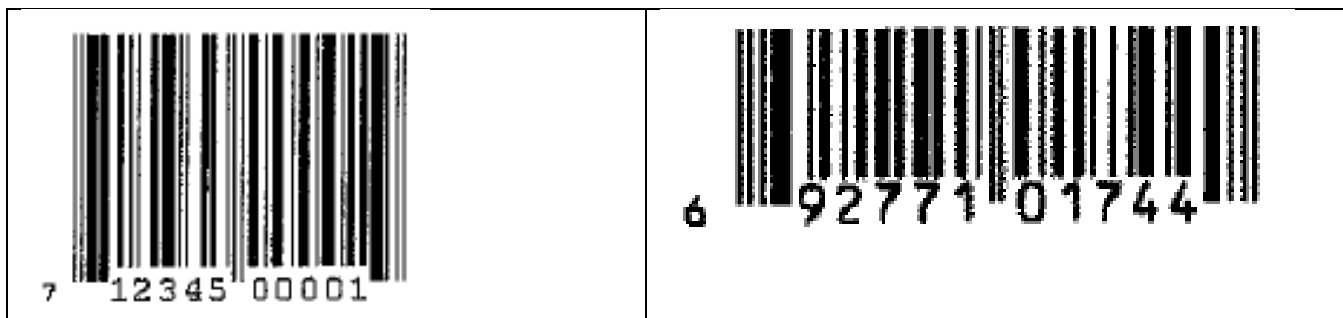
- 3) Prove that the code 052200488265 is INVALID

- 4) You and your friend just started a company selling custom socks with mums on them and you are creating UPCs for your product. You have your manufacturer number and your product code but need to determine what the check digit is. Given the first 11 digits (38137009213) what would the LAST digit (the check digit) need to be in order to make the UPC valid?

- 5) Determine if each of the following codes are valid



- 6) The two codes listed below are missing their check digit. Determine what the check digit should be in order to make the codes valid



Get Creative and Create a company! (and a couple products)

Come up with a company that would sell multiple items. For example Coca-Cola as a company sells MANY different types of soda. Create a name for your company as well as three possible products that your company would sell. Come up with a manufacturer number (that will be the first 6 digits of each of your products), 3 different product numbers (the next 5 digits of the code) and lastly determine the check digit needed to make each of your codes valid. It does NOT have to be food related, I just gave the Coke and Cheeto example because we have those at the vending machines here at school.

Company Name:_____

What do you sell?_____

Tagline/Slogan for your company_____

What are your three different products?

1) _____

2) _____

3) _____

Manufacturer Number:_____

Product number- product one _____ Check digit- product one_____

Product number- product two_____ Check digit- product two_____

Product number- product three_____ Check digit- product three_____

Now show me what you got! On a separate page (pages if you want/need more space) create an advertisement for your company! Think of it like a billboard or the ad on a side of a webpage. Make sure it is visually appealing by making it neat, using color, and having a slogan(s). You can use computer paper/construction paper and all the markers, crayons and colored pencils are in the cabinets next to the bookshelf. Help yourself- just clean up after yourself! (Note- you do not need to write the UPC on your ad, think about it- do you see barcodes on billboards?)