FLYING CLOUD SOLUTIONS

USEFUL EXCEL GAMIFICATION FUNCTIONS

Game mechanics provide pathways for participants toward set goals. Many of the mechanics used in games are based on logical formulas, simple IF/THEN/ELSE statements that provide feedback, progress, and regression based on participant actions. Mathematical statements are also important as they help maintain participant currency, progress bars, experience points, among other numerical attributes that may be included within game mechanics. These functions among others are compiled here as formulas we most use to drive the data behind the scenes in games.

LOGIC:

- **IF():** Allows you to develop logical comparisons between a value and what you expect. Essentially, IF (logic, Value TRUE, Value FALSE)
- **AND()**: Extends logical arguments by combining several statements to test for TRUE.
- **OR()**: Extends logical arguments by separating several statements to provide a value of TRUE if any of the statements are met.
- **NOT()**: Returns the reversed logical value.
- **IFS()**: Checks whether one or more conditions are met and returns the value that corresponds to the first TRUE condition. This can take the place of multiple IF statements.

MATH:

- **COUNT():** Counts the number of cells containing values.
- **COUNTIF():** Counts the number of cells containing values that logically are TRUE based on provided logical argument.
- **COUNTIFS():** Counts the number of cells containing values that logically are TRUE based on several logical arguments.
- **SUM():** Adds numbers within a provided range of cells. Remember also that you can subtract by simply turning a value to negative.
- **SUMIF():** Adds numbers within a provided range of cells that are TRUE based on a logical argument.
- **SUMIFS():** Adds numbers within a provided range of cells that are TRUE based on several logical arguments.

You may come to notice that these functions are rarely used in isolation. Often writing formulas requires stringing together multiple functions to meet the objective you intend. For instance, if you are trying to level up a participant based on their current experience, you may use a formula like:

IF(SUM([Experience Point Column]>=100, “LEVEL 2,” “LEVEL 1”))

RANDOMIZATION:

- **RAND():** Returns a random number that is greater than or equal to 0 and less than 1.
- **RANDBETWEEN():** Returns a random number that is between a bottom and top range.

LEADERBOARD:

- **RANK():** Returns the rank of a number within a set of numbers.

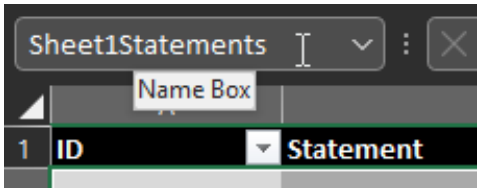
LOOKUP/REF:

Become familiar with Lookup/Ref functions as these can help search for and provide specific values. Specifically, LOOKUP() and its variants INDEX(), and MATCH() are extremely useful functions to copy corresponding cells from a set of data being referenced such as when an action may purchase an item listed within a separate table of possible items for purchase. You will need to reference the item and attributes such as cost, description, or other associated data.

- **INDEX():** Returns either the value or the reference to a value from a table or range.
- **LOOKUP():** Returns a value from a range (one row or one column from an array.
- **VLOOKUP(), HLOOKUP(), or XLOOKUP():** Performs lookup function by searching a column, row, or either vertical or horizontal lookup.
- **MATCH():** Searches for a value in an array and returns the relative position of that

THE TABLE BENEFIT:

It is always a best practice where possible to group connected content within tables. This allows you to "Name" the table and quickly reference the table and column by name rather than by row and column numbers and letters.



Thus, providing the full sum of a column within any cell outside of the table will clean up to:

=SUM(TableName[ColumnHeader])

Excel will also help suggest from the name list as you type in a function.

Tables also allow for you to take advantage of the "Relationships" feature that can be found under "Data" to form management models to help automate some of the above functions for you.