# BRAIN HACKERS APP DEVELOPMENT CURRICULUM

# Lesson 5
## Metric Conversion App – Math Operations

**SUMMARY**

This lesson introduces the use of math operations. A metric conversion app will be created with which a user may enter values in English units and convert to metric units.

***Key Concepts***
**Math Operations** – instructions that involve mathematical calculations

**DESIGNER WORKSPACE**

- Place a Label at the top of the screen – NOTE: this Label will serve as a Title
    - Set the FontSize to Bold and adjust the TextSize so the Label is prominent
    - Enter the text, "Metric Conversion"

***Helpful Tips***
A prominent title helps to distinguish an app from other apps as users switch between apps or if they launch the app unintentionally

- Insert a second Label
    - Adjust the FontSize size so the Label is readable, but the FontSize is not as large as the Title
    - Enter the text, "English to Metric Conversion"
- Insert a Table
    - Set the Table so there are four columns and two rows
    - Set the Width to Fill Parent
    - Place a TextBox in each row of the first column of the table,

        - In the first TextBox, change the Hint to “inches”
        - In the second TextBox, change the Hint to “miles”
    - Place a Button in each row of the second column – NOTE: one Button will be for inches conversion and the other Button will be for miles conversion
        - Change the Text on each Button to, “Convert”
    - Place a Label in each row of the third column – NOTE: this Label will initially be blank and will provide space in which the answer to the metric conversion will be displayed
        - Delete the Text  for each Label
        - Change the TextAlignment for each Label to, “Right”
    - Place a Label in each row of the fourth column – NOTE: this Label will indicate the units of the conversion
        - Change the Text for the first Label to, “centimeters”
        - Change the Text for the second Label to, “kilometers”
    - Adjust the Width in pixels for the components placed in the Table to achieve an attractive layout
- Place a Button below the Table
    - Change the text on the Button to, “Clear”

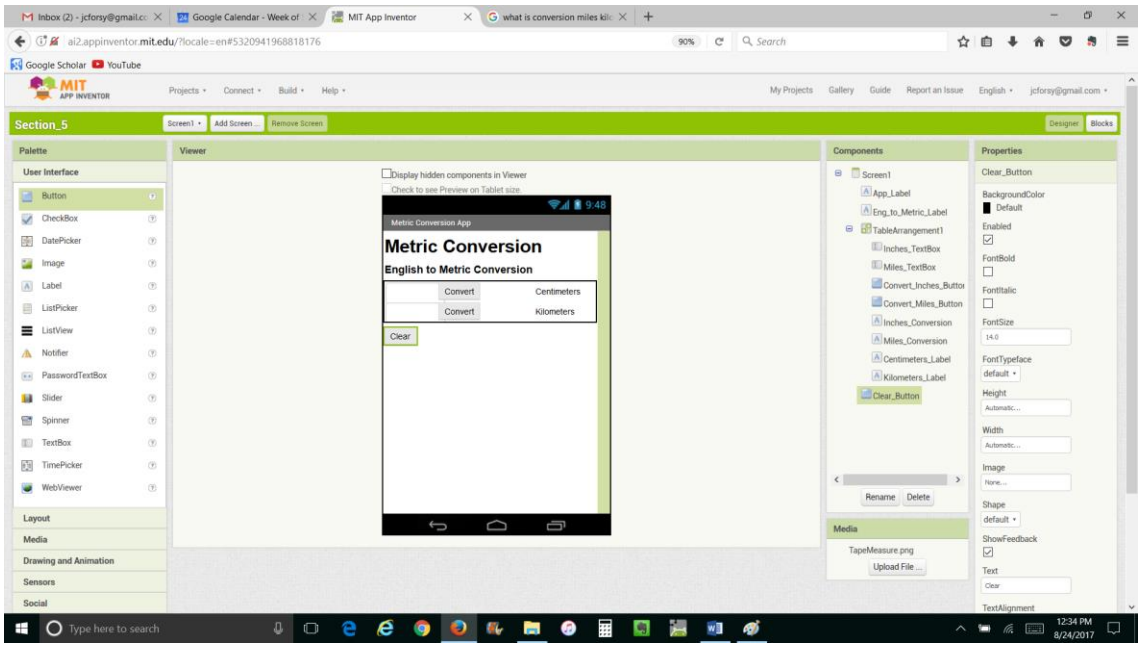


**FIGURE 1**.  This image shows how the Designer workspace should appear.

**BLOCKS WORKSPACE**

- Insert a ***when ___ .Click do*** block for the inches conversion button
    - Insert a ***set ___ .Text*** for the inches conversion Label
        - From the Math blocks, attach a multiplication block
            - In the first slot of the multiplication block, insert a ***___.Text*** block for the inches TextBox – NOTE: this block takes the user entry as the first item for the multiplication operation
            - In the second slot of the multiplication block, insert a number block from the Math blocks
                - Change the number to, “2.54”

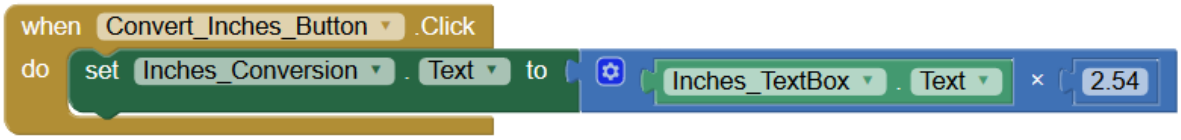


**FIGURE 2**. The math block should insert the answer from calculating the conversion into the Label for the results of the conversion

- Repeat the previous steps for the miles to kilometers conversion with the mathematical conversion being to multiply the number of miles entered by “1.61”
- For the Clear Button, add a ***when ___ .Click do*** block – NOTE: this block will clear the user entries so can perform a new calculation
    - Insert a ***set ___ .Text to*** block for the inches TextBox
        - Attach a text string with no text
    - Repeat the previous step for the miles TextBox
    - Insert a ***set ___ .Text to*** block for the inches conversion Label
        - Attach a text string with no text
    - Repeat the previous step for the miles conversion Label

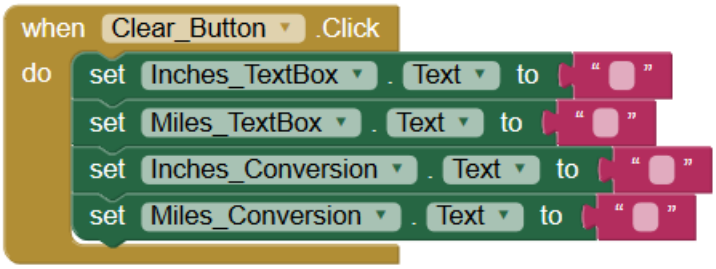

**FIGURE 3**. The Clear button should replace the text in both TextBoxes and both answer Labels with empty text strings

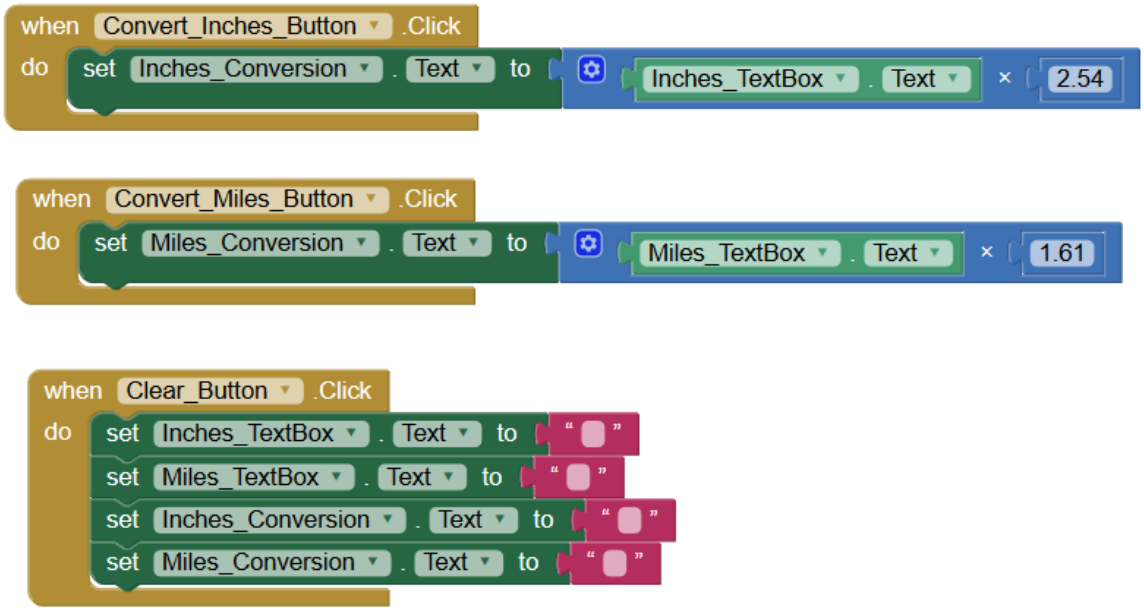


**FIGURE 4**. This image shows how the Blocks screen should appear

**METRIC CONVERSION APP EXERCISE**

Expand the current app to convert from metric to English distances, or to calculate other metric conversions, or create a new app that performs other types of calculations.