Using Excel to Build Simulations, Games, Interactive Tests, and Animations

Baltimore, MD

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Using Excel to Build Fun and Educational Activities

This presentation will explore simulations, games, interactive tests & quizzes that are created with one application- Excel.

In the age of financial cutbacks, it is refreshing to know media options can be built within one application most schools have—Excel.
General Outcomes:

- Explore how to deliver content in creative interactive ways with Excel.
- View and explore the possibilities to
- Create:
  - an interactive quiz or test,
  - a game
  - a simulation
  - and be able to teach students how to do so as well
Specific Skills:

1. Utilization of more advanced Excel features
2. Utilization of existing Excel templates (you add the content)
3. Build an interactive test/quiz
4. Build a game with educational content
5. Build a simulation with educational content
Getting Started

- Introductions
- Where are we with Excel?
- Needs and Interests
- Excel Basics/Overview
  - If needed
Examples- “The Metamorphosis of Dry Content into Exciting Topics”
Examples

Crossword Puzzle

When you go to a cell with a red triangle, the question will pop up. Type your answers. Wrong letters turn red.

May 3, 2006

MICCA2006 - Excel
The Anatomy of the Human Digestive System

Click beside the beginning of each arrow and read the clue. Enter your answer to see if you're correct.
Some Other Examples

- Interactive Matching w/Excel
- Pizza Calculator
- How much do you weigh on other planets
- Doing a calendar in Excel
- Self Clear Planet Quiz
- Excel calculations with Fun
- Temperature Converter with Excel
- Advanced Games
- Excelets
Time Check

• If time explore more at:
  http://www.edtechoutreach.umd.edu/HowTo/excel.html#gaming

• Next, let’s walk through making a Short Quiz/Test together
Quiz/Test Together

- Open Excel-Blank worksheet
- File→New→Blank
# Quiz/Test Together

Type in the questions and possible answers (see handout)

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Answer1</th>
<th>Answer2</th>
<th>Answer3</th>
<th>Answer4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where is MICCA being held this year?</td>
<td></td>
<td>Baltimore</td>
<td>MD</td>
<td>Maryland</td>
<td>baltimore</td>
</tr>
<tr>
<td>Have you ever been to a MICCA conference before?</td>
<td></td>
<td>Yes</td>
<td>yes</td>
<td>No</td>
<td>no</td>
</tr>
<tr>
<td>Where (state) is the 2007 MICCA being held?</td>
<td></td>
<td>Maryland</td>
<td>MD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*May 3, 2006 MICCA2006 - Excel*
Instructions

In the Response Cell the test taker puts in their answer

for each question we want to set up a formula to "tell Excel"—if they answer this way say this, otherwise by default it will state FALSE

Let's Try!

In cell I3 TYPE: =OR(D3=E3,D3=F3, D3=G3, D3=H3)

What does this mean?
If what they type in cell D3 is equal to E3,F3,G3, or H3 (or how many answers you decide)
### NECC Quiz

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Answer1</th>
<th>Answer2</th>
<th>Answer3</th>
<th>Answer4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Where is MICCA being held this year?</td>
<td></td>
<td>Baltimore</td>
<td>MD</td>
<td>Maryland</td>
<td>baltimore</td>
</tr>
<tr>
<td>2 Have you ever been to a MICCA conference before?</td>
<td></td>
<td>Yes</td>
<td>yes</td>
<td>No</td>
<td>no</td>
</tr>
<tr>
<td>3 Where (state) is the 2007 MICCA being held?</td>
<td></td>
<td>Maryland</td>
<td>MD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In cell I3 TYPE:  
\[ \text{=OR(D3=E3, D3=F3, D3=G3, D3=H3)} \]

In cell I4 TYPE:  
\[ \text{=OR(D4=E4, D4=F4, D4=G4, D4=H4)} \]

In cell I5 TYPE:  
\[ \text{=OR(D5=E5, D5=F5)} \]

See Handout or view this PPT slide
Put an equation in the cell in column J which tells what to do if the answers match.

Example =IF(I3,"Great Job!","")
Example =IF(I4,"Great Job!","")
Example =IF(I5,"Great Job!","")

What does this mean?
If the student answered correctly, then the cell will fill with the text message "Great Job!" otherwise it will show nothing.

When working on your own you can set several different answers/different formulas.
<table>
<thead>
<tr>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NECC Quiz</td>
<td>Question</td>
<td>Response</td>
<td>Answer1</td>
<td>Answer2</td>
<td>Answer3</td>
<td>Answer4</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Where is MICCA being held this year?</td>
<td></td>
<td></td>
<td>Baltimore</td>
<td>MD</td>
<td>Maryland</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Have you ever been to a MICCA conference before?</td>
<td></td>
<td></td>
<td>Yes</td>
<td>yes</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Where (state) is the 2007 MICCA being held?</td>
<td></td>
<td></td>
<td>Maryland</td>
<td>MD</td>
<td></td>
</tr>
</tbody>
</table>

Highlight the columns which contain the possible answers and the OR equation (columns E, F, G, H, I)

****Leave Column J so students can see the response "Great Job!"

Choose the Format menu, select Columns and then select Hide

See Handout or view this PPT slide
<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Where is MICCA being held this year?</td>
<td>MD</td>
</tr>
<tr>
<td>2. Have you ever been to a MICCA conference before?</td>
<td>No</td>
</tr>
<tr>
<td>3. Where (state) is the 2007 MICCA being held?</td>
<td>VA</td>
</tr>
</tbody>
</table>

You can also add images and text boxes - just like in Word

Try The quiz
Format -> Column -> Hide
Format -> Column -> Unhide

See handout or view this PPT slide
Steps to Make a Clear Button

- To Make a **Clear** button – you will be making a button to implement a macro
  - A macro is a “recording” of a set of steps
  - To work, macros must be enabled on the spreadsheet (this might not be true by default)
- Before you make the Macro - SAVE
Clear Button

- **Show Forms Menu**
  - Right click on toolbar area, make sure **Forms** is checked
- **Click on the button icon**, use your crosshair mouse pointer to click and draw a button
- You will be prompted to name the macro that is to be associated with this button, following this you will have the chance to record the macro.
  - Change the Name of the Macro
  - Click Record
  - Clear each of the answers which you entered into the Responses cells in Response Column
  - Click “Stop” Button
  - Right Click on Button and click on **Edit Text**
  - Change button name to **Clear**
  - Save your worksheet. In the future clicking on the button will clear answers a student entered. I suggest naming the button "Clear."
Game Together: Drag and Drop Feature in Excel

Fostering Literacy Using Excel

Presenting ways to use Excel in language arts classes

The following activities are presented as ways to use spreadsheets in language arts classes:

- Each activity relies on the drag and drop feature of Excel
- Word Wall - drag words to form simple sentences
- Language - match foreign words with their English equivalents
- Sequencing - arrange items in a story
- Fill-in - Drag correct words into sentences to fill in the blanks

Note: Each time an activity is completed, use the undo arrow to reset the worksheet back to its original condition.
Game Together

- Open Excel-Blank worksheet
Make a Board Game
## Make a Board Game

- Choose cells to designate path by filling with a color
  - may also choose border option
- Label Start and Finish
  - I chose the auto shapes w/ text for finish
- Add questions to each cell through Text Box and Arrows
- Enter correct answers and format cells (color/bold etc.)
Make a Board Game

- **To Check Answers**
  - Becomes tricky since Drag/Drop rewrites contents of cells
  - Solution – Use a macro to enter the conditional formatting

- **Problem**
  - Drag/Drop overwrites comments with question
  - How would you redo this?
Make a Simulation Together

Temperature Converter

Enter a temperature reading in one of the yellow boxes.

Convert Fahrenheit to Celsius

The Celsius Temperature is:

=\left(\frac{5}{9}\right) \left(D_8 - 32\right)

Convert Celsius to Fahrenheit

The Fahrenheit Temperature is:

=\frac{9}{5}D_16 + 32

Enter numbers into the yellow boxes only. NOT the grey boxes.

When you are finished, close Excel without saving changes.

See Handout
Make a Simulation Together

- Enter text in cells and format (color, bold, borders)
- For each of the blue cells enter the appropriate formula
- Add clip art or other images

- **Make a Thermometer**
  - Make ranges (Edit – Fill: Use Linear)
  - Paste formula into cell (Hide Values – color white)
  - Use Conditional Formatting
Visual Simulation

<table>
<thead>
<tr>
<th>Temperature Converter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Convert Fahrenheit to Celsius</strong></td>
</tr>
<tr>
<td>Enter a temperature reading in one of the yellow boxes.</td>
</tr>
<tr>
<td>The Celsius Temperature is:</td>
</tr>
<tr>
<td><strong>Convert Celsius to Fahrenheit</strong></td>
</tr>
<tr>
<td>Enter numbers into the yellow boxes only - NOT the gray boxes.</td>
</tr>
<tr>
<td>When you are finished—close Excel without saving changes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temp</th>
<th>F</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;212</td>
<td>212.0</td>
<td>100.0</td>
</tr>
<tr>
<td>202.6</td>
<td>94.7</td>
<td></td>
</tr>
<tr>
<td>193.1</td>
<td>90.5</td>
<td></td>
</tr>
<tr>
<td>183.6</td>
<td>84.2</td>
<td></td>
</tr>
<tr>
<td>174.1</td>
<td>78.9</td>
<td></td>
</tr>
<tr>
<td>164.6</td>
<td>73.7</td>
<td></td>
</tr>
<tr>
<td>155.2</td>
<td>68.4</td>
<td></td>
</tr>
<tr>
<td>145.7</td>
<td>63.2</td>
<td></td>
</tr>
<tr>
<td>136.2</td>
<td>57.9</td>
<td></td>
</tr>
<tr>
<td>126.7</td>
<td>52.6</td>
<td></td>
</tr>
<tr>
<td>117.3</td>
<td>47.4</td>
<td></td>
</tr>
<tr>
<td>107.8</td>
<td>42.1</td>
<td></td>
</tr>
<tr>
<td>98.3</td>
<td>36.8</td>
<td></td>
</tr>
<tr>
<td>88.8</td>
<td>31.6</td>
<td></td>
</tr>
<tr>
<td>79.4</td>
<td>26.3</td>
<td></td>
</tr>
<tr>
<td>69.9</td>
<td>21.1</td>
<td></td>
</tr>
<tr>
<td>60.4</td>
<td>15.8</td>
<td></td>
</tr>
<tr>
<td>50.9</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>41.6</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>32.0</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

Enter more about temperature conversion.
Next Steps

- Resources can be found at [http://www.edtechoutreach.umd.edu/HowTo/excel.html#gaming](http://www.edtechoutreach.umd.edu/HowTo/excel.html#gaming)
- Once you have completed your own activities-send to me via email dpruitt@umd.edu and I will add to the resource site (make sure you include your name and contact information)
- Evaluations Please (MICCA and my own)
- Would you like to receive more information/resources about this topic?
- Would you be interested in being a reviewer for publications (article/book) on this topic?
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