GOLD SEAL LESSON Template

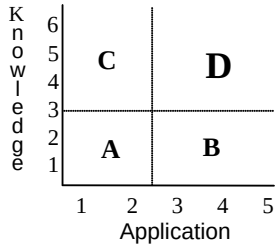
VARIABLE DATA PRINTING WITH IMPOSITION

Subject

Communication Technologies

Grade Level
11/12

Rigor/Relevance Framework



Instructional Focus

This lesson plan addresses the following state approved competencies:

- Design artwork and size for layouts including brochures, newsletters, flyers, web pages and other new media and publications.
- Create media products including: text graphics and other media, within a process that incorporates planning, content development, organization/design & layout, revision, editing, and production.
- Demonstrate use of word processing, database, spreadsheet, multimedia software, and Internet resources in the planning, organization and production of media projects.
- Work with clients to define their needs in the production of media products. Identify project scope, output, production and schedules. Write plans based for production assignments including budget, storyboard or outline, equipment needs, material needs, and scheduling.
- Use industry standard equipment, hardware and software within the desktop publishing and electronic publishing industries. Define functions and relationships between equipment, hardware, and software.

Student Learning

Students will be able to produce variable data documents with the documents multiply imposed on printed sheet. Output would be cut to size and set for delivery with a minimum of hand sorting. The application of this would be printing of numbered raffle tickets or theater seat tickets. Ideally, this full class lesson is timed to correlate to actual production of such a print job through our in class micro-business.

Working in teams, students will

- Design print piece to size specifications and information specifications using any industry standard software of their choice, including allocating space for variable data.
- Create and or manipulate data source to output records in a print order that minimizes need for hand sorting. (Excel spreadsheet most commonly used; databases also acceptable if students are fluent in them)
- Set up and perform data merge in either MS Word or Adobe InDesign; observe process in the other software in order to see how the same

process uses different terminology in alternate software.

If lesson is associated with an actual production job:

- Entire class will select the version that best meets the client's needs, with edits if necessary. Team submits to client a proof for approval. Upon approval, run print job, cut, package, deliver, and invoice.
- Students not assigned to production are scheduled to work on subsequent variable data jobs.

If lesson is not associated with an actual production job:

- Students run & cut first few pages of job as a sample of output.

Performance Task

Session 1 Lecture / discussion

1) Present concept of variable data printing; provide common examples to which students have been exposed. (form letters, report cards, tickets, etc.)
2) Explain need for "shell" document (merge document) which can be graphic or text or a combination. Document can be a full page or can be multiple documents imposed on one sheet (to be cut into individual documents.
3) Explain need for "data source" spreadsheet that contains data in labeled columns.
4) Describe merge process.

Session 2 Small group activity 1

1) Provide students with ticket specifications:
    - Background on the ticket's intent (raffle ticket, theater ticket etc.)
    - Information on event or organization to support good design choices (example – "don't use Old English font faces for the technology club.")
    - Size of ticket
    - Information on ticket
2) Instruct students to develop the ticket, using software of their choice. Textual elements must be easily readable and follow conventions for spelling, grammar, punctuation and capitalization. Proofread carefully.
3) Instruct groups to include appropriately sized area for variable data.

Session 2 Small group activity 2

1) Explain that the sorting of the data for output, needs to correlate to the order in which tickets would be cut and sorted.
   "If your list is in numerical order from one to one hundred, and you're printing six tickets per page, tickets numbered 1-6 will be on sheet 1; tickets 7-12 will be on sheet 2, and so on. This will require you to hand sort the tickets after printing. "
2) Explain that there is no simple sorting function or formula that will produce the list that will print cards in "stacked" order. Instead, an ALGORITHM is needed. Explain the concept of an "algorithm" a step-by-step procedure or set of rules for performing calculations. Towards solving a particular problem.
3) Using the worksheet "Sorting Data for Imposed Printing," and

cards representing pages and cut lines as manipulatives, each group should figure out how to write formulas that will get the record numbers in the correct printing order. *

4) Students will produce spreadsheet that will function as data source.

*** Note on embedded math instruction:**
The associated math standard is at the upper high school level. It assumes that students *as a group* will have skills needed to develop the required series of expressions. Some students will see, understand and be able to express the patterns mathematically; some will have problems in expressing or even comprehending the patterns. For students with below grade level math skills, working within the group enables **exposure** to the math and problem solving skills. Use of manipulatives increases the likelihood that weaker students will, at minimum understand, that a number pattern evolves in a spreadsheet to make the output possible.

Accommodations for students working independently on future variable data print jobs could be as follows:
Basic math students (Students working on basic computation skills, fractions & decimals) – provide fully sorted data source file.
Intermediate math students (Students currently learning basic algebra and problem solving) – provide opportunities to work through parts of the process with support – either first page formulas **or** fill pattern instead of both in one exercise.

Session 4 Small Group Activity 3

1) Using the step by step instructions for setting up a data merge in Word or InDesign, each group will set up the merge document.
2) To test the merge setup, each group will perform the merge to either a pdf file or word document. Print and cut a sample selection of the first three pages.

Common Core State Standards

CCSS.Math.Content.HSN-Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
CCSS.ELA-Literacy.CCRA.L.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CCSS.ELA-Literacy.CCRA.L.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Scoring Guide

VARIABLE DATA PRINTING WITH IMPOSITION RUBRIC – GROUP ASSESSMENT

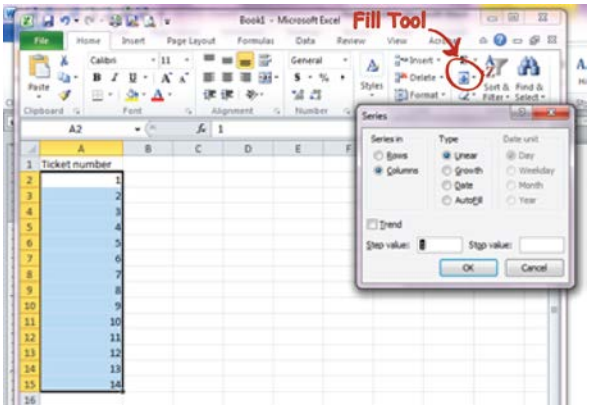
Ready for the real world - Fully competent in theory and practice	**Able to produce work in this skill set**	**Marginally able to produce work in this skill set**	**Needs further development in this skill set**
Project work is accompanied by evidence of planning of the document and the data source. Includes completed data worksheet **plus** notes and or drafts and or sketches.	Project work is accompanied by evidence of planning including a completed data worksheet.	Little evidence of planning as demonstrated by incomplete data worksheet.	No evidence of planning accompanies the project.
Project includes all required informational elements with no apparent grammar, usage, spelling or punctuation errors. (Excellent readability) Size specifications are met. Layout demonstrates application of design elements that contribute to visual appeal.	Project includes all required informational elements with no apparent grammar, usage, spelling or punctuation errors. (Excellent readability) Size specifications are met.	Project includes all required informational elements and meets or nearly meets size specifications. Work shows two or fewer errors in grammar, usage, spelling or punctuation errors that do not interfere with the document's output or function.	Project does not include all required informational elements or does not meet size specifications. OR has errors that interfere with the document's output or function.
Variable data elements function properly and would produce output with few or no cutting/sorting issues A quality algorithm employing formulas fully manages data sorting.	Variable data elements function properly and would produce output with few or no cutting/sorting issues. There is evidence of data sorting via algorithm, but manual corrections are evident.	Variable data elements produce output that would include all required documents.	Variable data strategy does not produce required output.

Attachments/ Resources

See Below

Submitted by: Barbara Gorbaty, Southwest VT Career Development Center, bgorbaty@svcdc.org

Sorting data for variable data printing



In Excel, it is easy to generate an ordered list of numbers that can be used as variable data or can be used to sort variable data.

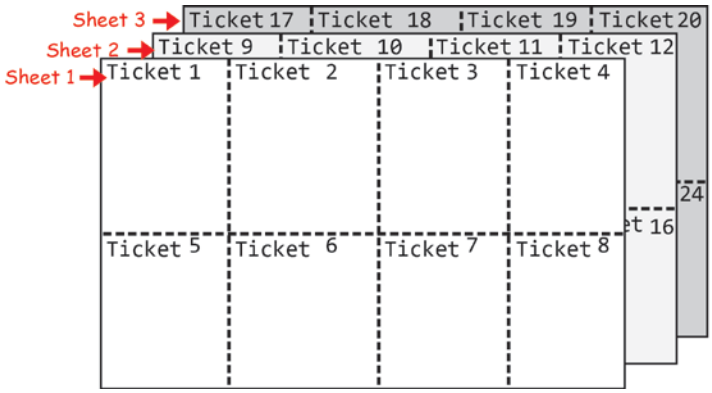
Method 1. Insert the first number⇨ Select the range of cells⇨ Use fill tool⇨ Select series (adjust settings to desired output)

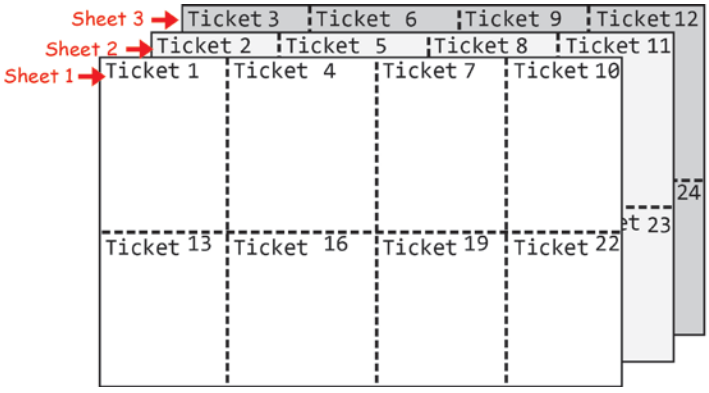
Method 2. Insert the first number⇨ go to cell below enter formula such as "=A2+1" ⇨select the range of cells starting with formula⇨Use fill tool to fill down.

However, if you merge this into an imposed document the record numbering will go across the sheet then down

You would then have to hand sort the numbered documents after cutting.

No big deal with 24 tickets, but what about 500 or 5000?





Wouldn't it be better to have the spreadsheet do the sorting?

To do this, you need to see the **pattern** of the numbers and write it as a **series of formulas**.

Notice that one formula won't make this happen. Instead, you'll need an **ALGORITHM**, a series of formulas, to solve the problem.

Use the worksheet and the blank ticket number cards to figure out how to make a number pattern work.

Hint: The number of tickets per page AND the total number of cards you'll be printing are VERY important numbers – You'll need these to figure out how many pages you will need to print.

Problem 1:

You have to print 12 numbered tickets, four per page.

Number of tickets _____

Number per page _____

How many pages will you need? _____

How did you figure out the number of pages you'll need?

_____

Note: answers are shown in blue below – these would not be on student worksheet.

Cell on spreadsheet	What is the order the numbers need to be in?	If you called the first number "X", what would the formula be to show the changes in the first four numbers	Continue the pattern here: Notice how the number jumps back to a lower number after the first four numbers (the first page)	If you use cell references, you can simplify the formulas after you figure out the first page
A 1	1	A1 =X		A1 =X
A2	4	A2 =X+3		A2 =X+3
A3	7	A3 =X+6		A3 =X+6
A4	10	A4=X+9		A4=X+9
A5	2		A5=X+1	=A2+1
A6	5		A6=X+1+3	=A3+1
A7	8		A7=X+1+6	=A4+1
A8	11		A8=X+1+9	=A5+1
A9	3		A9=X+1+1	=A6+1
A10	6		A10=X+1+1+3	=A7+1
A11	9		A11=X+1+1+6	=A8+1
A 12	12		A12=X+1+1+9	=A9+1

Once you reach this formula the spreadsheet can calculate the rest with fill down

Problem 2:

You have to print 36 numbered tickets, six per page.

Number of tickets _____

Number per page _____

How many pages will you need? _____

How many rows will you need before the repeating formula starts? _____

How many total spreadsheet rows will you need?_____ (notice that this is the same as the number of tickets)

Write the formulas for page 1 in the correct spaces. Write the formula for the first record on page 2,then draw an arrow to show "fill down"	A1	1
	A2	=
	A3	=
	A4	=
	A5	=
	A6	=
	A7	=
	A8	=
	A9	=

Problem 3:

You have to print 360 numbered tickets, six per page

Number of tickets _____

Number per page _____

How many pages will you need? _____

How many rows will you need before the repeating formula starts? _____

How many total spreadsheet rows will you need?_____

Write the formulas for page 1 in the correct spaces. Write the formula for the first record on page 2,then draw an arrow to show "fill down"	A1	1
	A2	=
	A3	=
	A4	=
	A5	=
	A6	=
	A7	=
	A8	=
	A9	=
	A10	=
	A11	=
	A12	=
	A14	=

Problem 4

Use the numbers from your actual ticket project:

You have to print _____numbered tickets,_____ per page

Number of tickets _____

Number per page _____

How many pages will you need? _____

How many rows will you need before the repeating formula starts? _____

Write the formulas for page 1 in the correct spaces. Write the formula for the first record on page 2,then draw an arrow to show "fill down"	A1	1
	A2	=
	A3	=
	A4	=
	A5	=
	A6	=
	A7	=
	A8	=
	A9	=
	A10	=
	A11	=
	A12	=
	A14	=

BONUS QUESTION

Do you have to start with ticket # 1?

You have to print 400 numbered tickets, 8 per page. ***The first ticket number should be 433.***

Number of tickets _____

Number per page _____

How many pages will you need? _____

How many rows will you need before the repeating formula starts? _____

What will the first ticket number be? _____

What will the last ticket number be?_____

Write the formulas for page 1 in the correct spaces. Write the formula for the first record on page 2,then draw an arrow to show “fill down”	A1	
	A2	=
	A3	=
	A4	=
	A5	=
	A6	=
	A7	=
	A8	=
	A9	=
	A10	=
	A11	=
	A12	=
	A14	=