



Topic: Writing up Math in English

Grade : 7th

An integrated lesson plan covering 3 sessions of approximately 50 minutes each.



Lesson-Planning Approach

Some learners perceive their “world” as a whole, where all things are interconnected and dependent upon each other. These “integrated” students face major challenges in coping with our dominant educational, social, and economic systems, which tend to present information in a linear fashion without the necessity of integration into meaningful context. Integrated students are at-risk of failing as they attempt to grasp information in ways that do not match their experience. Among large populations of at-risk students are many from Native American and similar cultures that do not regard their world as a sum of parts but as a blend of all that they experience.

This lesson plan does include some traditional, linear approaches to delivering information (checklists, rules, analysis, problem solving and organization). In addition to the traditional, linear delivery of information, this lesson plan also includes some of the following strategies, designed to appeal to at-risk students as they learn academic/life skills:

- Integration of technology
- Story telling/anecdotal information
- Non-competitive group and team work
- Performance-based assessment and rubrics
- Visual presentations and practice through technology and other means
- Project-based assignments that integrate family and community
- Activities appealing to multiple intelligences (Gardner)

Lesson Overview

This lesson is designed to teach students how the skills they learn in English should carry over into all their subjects including Math. It is important for students to learn that writing for their other subjects, especially Math is a different type of writing requiring the technical use of vocabulary for that subject accurately. Students will write up story problems stating the situation, stating the problem to be solved, explaining the process used to solve the problem, and state the answer.

Lesson Objectives

Project Objectives: When students complete this session, they will be able to...

- To produce a Microsoft Word 2000 document journal with relevant clipart and formatting.
 - use a full range of strategies to comprehend technical writing
 - use background knowledge of subject and text structure to make complex predictions of content and purpose of the text
 - choose vocabulary and figures of speech that communicate clearly
 - draft, revise, edit, and proofread for a legible final copy
 - apply skills in analysis, synthesis, evaluation, and explanation to their writing and speaking
 - write in math using the technical vocabulary of the subject accurately

Integration of Other Functional/Academic Skills: (Critical thinking is required throughout the lesson.)

- Math:
 - Make a table
 - Find patterns
 - Figure out area
 - Measure
 - Reduce fractions
 - Make a fraction & change to a decimal
 - Create a Time-line

Strategies to Address Native Americans and At-Risk Students

- Explain purpose of the lesson.
- Present whole picture of skill before isolating component skills/concepts.
- Be highly structured and predictable.
- Provide constant structure.
- Recognize and build on learners' strengths and prior knowledge.
- Simplify language but not content.
- Reinforce main ideas and concepts through rephrasing rather than through verbatim repetition.
- Allow time to respond.
- Work with an aide or the Resource teacher.
- Create outcome-based assessments.

Colorado State Standards

- Students read and understand a variety of materials.
- Students write and speak for a variety of purposes and audiences
- Students write and speak using conventional grammar, usage, sentence structure, punctuation, capitalization, and spelling.
- Students apply thinking skills to their reading, writing, speaking, listening, and viewing.

- Students read to locate, select, and make use of relevant information from a variety of media, reference, and technology sources.

Websites

Required: none

Support:

<http://school.discovery.com/lessonplans/programs/islandsofmystery/index.html>

www.schoolzone.co.uk/pip/search/results.asp

Pre-requisites

- To be able to read and solve the story problems in the 7th grade math book.
- Successfully completed Math story problems that have been worked together and written up as a class in English.
- Completed math problems for the project

Required Materials

- “Passport to Mathematics” book 2, McDougal Littell
- The six story problems that they have already completed in Math class.
- “Motel of the Mysteries” by David Macaulay ISBN 0-395-28425-2

Suggested Materials

- “Intrigue of the Past” Project Archaeology, United States Department of the Interior Bureau of Land Management

Handouts

- Story problems (handout 1)
- Activity checklist (handout 2)
- MS checklist (handout 3)
- Lesson Rubric (handout 4)

Required Equipment/Technology

- Overhead projector
- Classroom computers

THE LESSON

Note: Students do not learn from what you do but from what you have them do.

Preparation

Activity	Instructor Notes
Discuss what archeology involves.	Share a story "Motel of the Mysteries" by David Macaulay ISBN 0-395-28425-2
Review the steps in writing up a math problem.	After solving the story problem, students write the process up in the following steps: <ul style="list-style-type: none"> ▪ State the situation ▪ State the problem to be solved ▪ Explained the process used to solve the problem ▪ State the answer
Look over and discuss handouts.	Go through each handout and allow questions & clarifications.

Presentation

Watch the Power Point presentation on what is involved in the project.	Present Power Point presentation on project. Discuss the six different problems and what is involved in writing up each one. Ask for questions.
Look at an example of a student's work from a previous year.	By sharing a previous students work, the kids can get a good look at how creative they can be.

Performance and Practice

Part I – 1 to 2 days

Instructions for students	Teacher notes
Using the correct answer for the 1 st problem about the ancient Aztec pyramid, you will write up the problem.	Since this is the first problem, outline the steps involved on the board. <ul style="list-style-type: none"> I – state the situation <ul style="list-style-type: none"> - use the first sentence of the story problem II – state the problem to be solved <ul style="list-style-type: none"> - # of blocks in the bottom layer when..... III – process used <ul style="list-style-type: none"> - use the process of squaring IV – state the situation <ul style="list-style-type: none"> -The number of blocks found in the bottom layer are.....

Using the correct answer for the 2 nd problem about the ancient city in Greece, you will write up the problem.....continue this process with the other four problems.	Monitor the classroom so you are available for individual help.
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Part II – 1 day

Complete the Ms Word checklist with your teacher.	If students do not know MS Word, work with them through the MS Word Checklist (Handout 3) so that they can write the final draft of the journal in MS Word. Clip can be added.
Write the final draft of the journal in MS Word and turn it in. Clip can be added.	Collect student work and congratulate everyone on a great achievement by reviewing the objectives and noticing accomplishments in each area. Complete the rubric on each student.

Lesson Assessment Strategy (Formative – As the lesson progresses)

Preparation, Presentation and Overall Implementation (Instructor)

1. Are the instructions and expectations for the class clear from the beginning?
2. Am I spending sufficient time on modeling the skills I want students to acquire?
3. Is there enough variety in the lesson to appeal to most learning preferences?
4. Are students “connecting” to lesson objectives? How?
5. How is this lesson “integrated”?

Performance and Practice (Student)

1. Do all students have the skills to follow instructions? If not, what measures am I taking to address the challenge?
2. How are students performing? Are all of them able to meet 80% of the lesson objectives? If not, what am I doing to help them achieve more?

Technology

1. How are students reacting to the technology, and what do I need to remember when I teach this lesson again?

Handouts

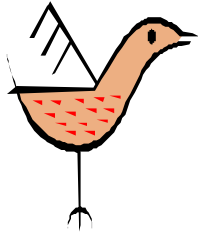
PROJECT ARCHAEOLOGIST PROBLEMS

- You are an archaeologist uncovering an ancient Aztec pyramid. It is made from stone blocks with 1 block on top, 4 blocks in the next layer, and so on. The stones in each layer are arranged as shown below. Write an expression for the number of blocks in layer n . There are 20 layers in the pyramid. How many blocks are in the bottom layer? Record your results in your journal.
- You and four other archaeologists are uncovering an ancient city in Greece. To organize a dig of 500 square feet, you will mark off five rectangular regions of the same size. You want each region to have whole number dimensions. Find all the possible dimensions of the rectangles that you could use. Of these, which sizes would be best to work in? Record your answer and explain your reasoning in your journal.
- At an archaeological dig, you find a large pot containing 36 small clay figures of deer and 24 small clay figures of buffalo. From the painting on the outside of the pot, you think that the figures may have been used in a ceremony in which each participant had the same number of deer and the same number of buffalo. How many people could have participated in a ceremony in which all 60 clay figures were used? Explain your reasoning in your journal.
- In order to classify the arrowheads shown below, you need to know their lengths. Use a ruler to measure the lengths of the arrowheads to the nearest sixteenth of an inch. Write the lengths in simplest form.
- Suppose you found this pottery in a museum storeroom. It is your job to classify it. You know that pottery from Caribbean Indians has 3 legs, pottery from the Incan Indians has geometric designs, and pottery from the Zuni Indians has figures of deer. Write the fraction that represents the portion of each type. Then write the fraction as a decimal.
- Archaeologists have discovered important events in ancient Egypt and their dates. Use a time line to organize the dates. Record your results in your journal.
 - 2650 BC The first pyramid was built for King Zoser
 - 3100 BC King Menes united Lower and Upper Egypt
 - 1436 BC Egyptian empire ruled Palestine and Syria.
 - 30 BC Cleopatra VII died and Rome took over Egypt
 - 1070 BC Egypt began to decline as a great nation
 - 332 BC Alexander the Great founded Alexandria

Activity Checklist

Handout 2

Using the correct answer for the 1 st problem about the ancient Aztec pyramid, you will write up the problem.	
Using the correct answer for the 2 nd problem about the ancient city in Greece, you will write up the problem.....	
Using the correct answer for the 3 rd problem about the ancient pot with the clay figures, you will write up the problem.	
Using the correct answer for the 4 th problem about classifying arrowheads, you will write up the problem.	
Using the correct answer for the 5 th problem about classifying pottery, you will write up the problem.	
Using the correct answer for the 6 th problem about creating a timeline for ancient Egypt, you will write up the problem.	
Complete the Ms Word checklist with your teacher	
Clip art can be added.	
Write the final draft of the journal in MS Word and turn it in.	



INTEGRATING TECHNOLOGY

Word I Check List for Math in English

Session Objectives: (1) to explore Microsoft Word 2000 and apply its basic features

Skills Checklist

<input type="checkbox"/> Open Microsoft Word 2000	
<input type="checkbox"/> Navigate menu and toolbars bars (Alt-Tab; Set Up; Tool Options)	
<input type="checkbox"/> Create new document – blank document	
<input type="checkbox"/> Format text – style (bold, italic, underline)	
<input type="checkbox"/> Format text - justification	
<input type="checkbox"/> Copy / paste, Find/Replace	
<input type="checkbox"/> Insert picture from Clip Art Gallery	
<input type="checkbox"/> Insert bullets	
<input type="checkbox"/> Insert symbol	
<input type="checkbox"/> Save document as a DOC file	

Notes:

Lesson Rubric

Handout 4

Rubric for Writing up Math in English

Criteria: specific behaviors, products, and qualities we are looking for in a student's work	In Progress	Basic	Proficient	Advanced
Organization & Format	The information is in an order that is confusing. The paragraphs remotely resemble the assigned format because it is out of order or missing parts.	The information is in an order that makes sense most of the time. The paragraphs come close to following the correct format but is either out of order or missing a part.	The information is in an order that makes sense. The paragraphs follow the correct format.	The information tells things in an order that is interesting. The paragraphs follow the correct format and include extra details.
Writing Conventions	Mistakes really get in the way of understanding the writing. There is no real evidence that this paper has been proofread or edited.	There are numerous mistakes in the final draft.	If you had proofread the paper better, you would have caught the few remaining mistakes.	Even careful reading reveals no glaring errors. The paper reads as if you spent lots of time proofreading and editing.
Art work in Journal	Little planning. Messy with smudges & eraser marks. Poor use of space. Shows little effort.	Some planning. Fairly neat but not very appealing. Fair use of space. Shows some effort.	Planned. Neatly done with color. Tried to use space well. Time & effort was invested.	Well planned. Neatly done with appealing colors. Uses space well. Shows that time, effort & creativity was invested.