Writing in the Disciplines

WORKSHOP

FSCJ
Florida State College at Jacksonville
Presenters

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  Associate of Arts – Florida State College at Jacksonville
  Bachelor of Arts in Mathematics – University of North Florida
  Master of Science in Mathematics – University of North Florida

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  Bachelor of Health Science–University of Florida
  Master of Special Education–University of North Florida
  Occupational Therapy Doctorate–University of St. Augustine
About DeafTEC

Technological Education Center for Deaf & Hard-of-Hearing Students

Serves as a resource for:

- high schools & community colleges that educate D/HH students in STEM-related programs
- employers hiring D/HH individuals

DeafTEC has affiliate partnerships to improve access to technological education and employment for D/HH individuals.
Increased Participation in the STEM Labor Force

Deaf/hh High School Grads

- Non-STEM: 55.00%
- STEM: 85.19%

44% not participating

Deaf/hh College Grads

- Non-STEM: 74.78%
- STEM: 7.8% not participating

25.22% not participating

Reference: U.S. Census Bureau American Community Survey.
Retrieved from dataferrett.census.gov
Lower Unemployment Rates in STEM

<table>
<thead>
<tr>
<th></th>
<th>Deaf/hh High School Grads</th>
<th>Deaf/hh College Grads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-STEM</td>
<td>9.69%</td>
<td>6.53%</td>
</tr>
<tr>
<td>STEM</td>
<td>5.11%</td>
<td>5.02%</td>
</tr>
</tbody>
</table>

Writing in the Disciplines

What is the primary reason you hesitate to assign more writing in your (STEM) classroom?
Issues of Resistance: Group Discussion
Writing in the Disciplines

**Writing at the beginning of class**

- Gives students time to think
- Gives students time to focus
- Decreases competition between faster and slower responders
- Provides additional writing practice
Writing at the **beginning of class** examples:

- What does it mean when the reading says ...?

- Which example in this chapter for homework or in the previous lecture is the most helpful in understanding the topic and why?

- Ask students to comment on a controversial point
Writing during class examples:
(Bloom’s Taxonomy- Understanding)

• Tell me what is confusing you right now

• Write about the strategies you used to figure out something in the text you found confusing
Writing in the Disciplines

Writing at the end of class examples: (Bloom’s Taxonomy—Remembering and Understanding)

• Write a question and submit it on a piece of paper to be used for review in the next class.

• What’s the most important thing you learned today?

• What continues to baffle you about the topic?
<table>
<thead>
<tr>
<th>Help Desk Rubric</th>
<th>Has no errors</th>
<th>Has 1-3 errors</th>
<th>Has 4-7 errors</th>
<th>Has 8-11 errors</th>
<th>Numerous errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearly understandable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Professional word choice</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Follows sequence</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete Sentences</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct Word Order</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completeness/all steps</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Completeness/all steps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Points</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Jermaine, you did a great job running this procedure. On your second draft focus on making sure all steps are covered. If necessary ask a friend to try your steps. This will help you find the gaps. I'm sure your next draft will improve if you work on that area.

Comments

Total 21
Rubrics

• General vs. task specific
• Make a rubric for each assignment
• Keep them simple, easy to understand, and easy to use.
• Check out: http://rubistar.4teachers.org/ for a FREE rubric maker!
## Writing in the Disciplines

### Math Rubric

<table>
<thead>
<tr>
<th>Neatness</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework is in an orderly packet and is incredibly neat, with no tears or smudges</td>
<td>Homework is in an orderly packet and is neat, with few tears or smudges</td>
<td>Homework is in a packet with several tears and smudges</td>
<td>Homework is disorderly with many tears and smudges</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Completion</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the assigned work is complete</td>
<td>Most of the assigned work is complete</td>
<td>Some of the assigned work is complete</td>
<td>Student did not hand in homework</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timeliness</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework was received on the due date</td>
<td>Homework was received 1 day late</td>
<td>Homework was received 2 days late</td>
<td>Homework was received 3 or more days late</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the answers are correct</td>
<td>Most of the answers are correct</td>
<td>Some of the answers are correct</td>
<td>Few to none of the answers are correct</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Shown</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>All steps for solving problems are meticulously shown</td>
<td>Most steps for solving problems were meticulously shown</td>
<td>Some steps for solving problems were missing</td>
<td>Student did not show any work</td>
<td></td>
</tr>
</tbody>
</table>
Planning

- Consider slowing the pace at which new material is presented
- Identify main point(s) for the lesson
  - **Focus on the main point(s)**
- Find or create visual representations of concepts
- Carefully consider English words and grammar
- What signs or gestures might support learning this concept?
Room Set Up

Can students see...
- what the teacher is presenting?
- all the other students participating in the discussion?
Drawings: You don’t have to say it

- Use visual representations of concepts wherever possible
- Good reference for interpreters, students remember better
- Make use of color!

**Event A:** student is “wearing glasses”
= \{ Heidi, Charlie \}
Step-by-Step

Step 1.

<table>
<thead>
<tr>
<th>$4x + 5x + 1$</th>
<th>$18 + 2 - 1$</th>
<th>Combine “like” terms that are on the same side</th>
</tr>
</thead>
<tbody>
<tr>
<td>$9x + 1$</td>
<td>$19$</td>
<td>On the left side, combine the $x$ terms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On the right side, combine the # terms</td>
</tr>
</tbody>
</table>

Step 2.

<table>
<thead>
<tr>
<th>$9x + 1$</th>
<th>$19$</th>
<th>Combine “like” terms that are on different sides</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-1$</td>
<td>$-1$</td>
<td>Combine +1 on the left with 19 on the right.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How? Add the opposite of +1 to each side.</td>
</tr>
</tbody>
</table>

$9x = 18$

Step 3.

<table>
<thead>
<tr>
<th>$9x$</th>
<th>$18$</th>
<th>“Isolate” $x$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$9$</td>
<td>$9$</td>
<td>Divide by 9 on both sides</td>
</tr>
<tr>
<td>$x$</td>
<td>$2$</td>
<td></td>
</tr>
</tbody>
</table>

- Use a visual approach to show and explain.
English Words

- Choose a simpler word or phrase to make the same point.
  - For example, instead of cardiologist, use heart doctor.

- Add a visual to explain the new word.
  - Researchers examined length of the first metacarpal bone and height for a random sample of people.
Math Resources

RESOURCES

Best Practices for Teaching (ClassACT)
Employer Resources
Writing in the Disciplines

Math Resources

Math Video Tutorials
Teaching Math to Deaf Students
Using Cooperative Learning Groups

STEM Careers
Deaf and Hard-of-Hearing STEM Professionals

STEM ASL Video Dictionary

Some resources are considered especially fitting to use in the mathematics education of deaf and hard-of-hearing students specifically for deaf and hard-of-hearing learners while others help with the instruction of deaf students in mainstream classes. There is a variety of print and online materials, many which give students access to involving reading, writing, sign language and other means of communication. The intent of these teachers and tutors of deaf/hh students with instructional avenues and ideas that stress problem solving in mathematics learning.
Gary Blatto-Vallee, a math and science instructor at the National Technical Institute for the Deaf, is presenting a DeafTEC video series that will guide you through a variety of mathematical exercises. All lessons in the series will be signed in American Sign Language (ASL) and will be voice-dubbed. To learn more about this video series or to contact DeafTEC, visit their website.
Math Videos

Solving Linear Equations with One Variable

Lesson Outline

- Solving Linear Equations
- Solving Linear Equations with Fractions
- Solving Linear Equation with Fractions and Grouping Symbols
- Practice Problems

- Solving Linear Equations with Two Variables
  - Solving for \((x,y)\) in table
  - Graphing linear equations with ordered pairs \((x,y)\)
  - Plotting points for a linear equation using a table of values
  - Slope on the X and Y plane
  - Using the slope formula
  - Slope–Intercept form of linear equations
  - Slope & Intercept from linear equations
  - Parallel lines
  - Perpendicular lines
  - Practice Problems

- Working with Polynomials
  - Multiplying Polynomials
    - Multiplying Polynomials #1
    - Multiplying Polynomials #2
    - Special Products #1
    - Special Products #2
Solve the system of equations below using the graphing method.

1. \( y = 2x + 1 \)
2. \(-4x + 2y = 10\)
Teaching Math to Deaf Students

Math Word Problems

Word Problem Analysis Template - form developed by Dawn Kidd. Also available as a PDF.

Miscellaneous Resources

1. VoiceThread: online way for teachers and students to communicate via video or print.

ASL/Math Dictionaries

1. Texas Math Sign Language Dictionary - Texas School for the Deaf
2. Math Signs, by Chris Kurz on YouTube
   1. Numbering System
   2. Algebra
   3. Trigonometry

Print Math Dictionaries

Illustrated Maths Dictionary, by Judith de Klerk.

Math Concept Description in ASL