

Diagnostic Assessments for THE MATH CONNECTION

“When are we ever going to *USE* this
MATH?”



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Diagnostic Assessment Instructions

When Are We Ever Going to USE This MATH?

Diagnostic

Constructed Response /Day 1

Duration:

One 90-minute class period

Standard (s) Assessed:

LA.A.1.4.3, LA.A.2.4.4, LA.B.1.4.2, LA.B.1.4.3, MA.A.1.4.2, MA.A.1.4.3

Nets for Students

1.1 and 5.1

Description of Assessment Activity:

The diagnostic assessment is designed to determine student's proficiency level in computer skills, writing skills, and problem solving mathematical skills. Part 1 - Computer Skills consists of a checklist identifying the student's comfort zone with the computer operating system and the Internet. The student is also required to launch an Internet browser, search for, and print a pre-selected document. Part 2 - Writing Skills provides a writing sample of each student's ability to organize and focus on a purposeful idea. Students edit their own work for correct grammar, punctuation, and spelling. Part 3 - Mathematical Skills in the Real World consists of word problems related to mathematics concepts and skills set in real-world context. (Note: Irrational and complex numbers will not be assessed in this unit.)

The teacher records results of the diagnostic assessment using specially designed rubrics included in the Unit Plan Assessment File. These results provide information needed to drive the instruction.

The Student Computer Skills Self-Check Rubric allows students to review what they already know and recognize what they need to know relative to computer skills. The Teacher Checklist for Part 1 – Computer Skills lets the teacher obtain a broad overview of computer literacy for the entire class. An Evaluation Rubric for Part 2 – Writing Skills offers students the necessary writing criteria for purpose, insight, and editing. The Answer Key to Part 3 – Mathematical Skills in the Real World provides information for checking students' accuracy and reasoning ability in problem solving. The Evaluation Rubric for Mathematical Skills – Part 3 offers criteria for justifications/explanations and a skills checklist. Emphasis is placed on students justifying their answers, as well as accuracy in computations.

NOTE: Decide on the best plan for administering the diagnostic before the day of the assessment. Part of the computer skills check is written and part is performance. The atmosphere of the individual classroom and availability of computer technology will lend itself to the best arrangement. If necessary, divide the class into groups and rotate through the available computers. If computer labs are available, administer the computer portion in the lab and the other two parts in the regular classroom.

Teacher Directions:

1. Introduce the students to the unit, **When Are We Ever Going To USE This MATH?** See Lesson 1 for instructions prior to beginning the unit and introduction.
2. Prepare the students for the diagnostic assessment by explaining that this serves as a learning tool for the teacher to acquire prior knowledge of each student's computer skills, writing skills, and mathematical skills before beginning the unit. Encourage students to do their best and answer as many questions as they can.
3. Emphasize that this is a "no stakes" assessment and will not be graded! This will eliminate "assessment anxiety" and allow students to relax and just be honest about their answers.
4. The computer skills part of the diagnostic assessment is in two parts. One part is written and one part is performance at the computer.
5. Write the instructions for the performance part of the diagnostic on the board or display the instructions on the overhead. The instructions are: Launch a Web browser, search for **The Ten Commandments of Math** (student or classroom version), and print a copy.
6. Distribute the diagnostic assessment. The assessment should take approximately 50 – 60 minutes depending upon the student's entry level into the class.
7. Collect the diagnostic assessments as students finish the written part.
8. Instruct students to report to a computer to complete the performance portion of the computer skills check. This procedure may vary depending on the number of computers available in the classroom.
9. Use a check sheet to record each student's proficiency in using an efficient search method to locate and print a copy of **The Ten Commandments of Math**. Allow approximately 10 minutes for students to complete this task. Remember, this is diagnostic and students must demonstrate using efficient search methods.
10. Tell students to keep the copies of **The Ten Commandments of Math** in the folders for future reference.

Following the diagnostic assessment:

1. Give each student the Student Computer Skills Self-Check Rubric (see Unit Plan Assessment File) to rate themselves in computer skills as 1) Novice, 2) Basic, 3) Proficient, or 4) Advanced. If time allows, facilitate a discussion about the requirements for each of these levels. Then ask students to reevaluate in the event they did not understand the terminology. Ask for a show of hands in each category.
2. At the end of the day, use the Teacher Checklist for Part 1 – Computer skills provided in the Unit Plan Assessment File to record the class' level of ability in computer skills. Use the Evaluation Rubric for Part 2 – Writing Skills provided in the Unit Plan Assessment File to score each student's writing ability. Use the Answer Key to Part 3 – Mathematical Skills in the Real World and the Evaluation Rubric for Mathematical Skills – Part 3 provided in the Unit Plan Assessment File to score and evaluate the mathematical skills.
3. Use the diagnostic assessments and rubrics to drive the instruction until the completion of the project.

At the completion of the unit:

1. Return the diagnostic assessments to the students at the completion of the project once the final evaluation has been completed, scored, and recorded for grading purposes.
2. Engage students in discussion reflecting on their accomplishments throughout the project while reviewing the diagnostic assessment.

Student Directions:

1. Work quietly and independently on the diagnostic assessment since this is reflective of your prior knowledge and is a NON-GRADED assignment. Do your best and try to answer as many of the questions as you can.
2. All work must be completed in pencil.
3. All *necessary* explanations and work must be shown according to the directions.
4. When the written part is finished, put down your pencils, turn in your papers, and report to a computer to complete the performance part of the computer skills check.
5. Refer to the directions written on the board or overhead. The instructions are: Launch a Web browser, search for The Ten Commandments of Math (student or classroom version), and print a copy.
6. You have a maximum of 10 minutes to complete the task at the computer.
7. Be sure the teacher records your completion of the performance task at the computer.
8. Return to your regularly assigned seat.

Following the diagnostic assessment:

1. Using the Student Computer Skills Self-Check Rubric rate yourselves in computer skills as 1) Novice, 2) Basic, 3) Proficient, or 4) Advanced. Indicate with a show of your hand in which category you fall following the direction of the teacher. Make a mental note where your classmates fall for future help and guidance when encountering new or difficult tasks.
2. Place computer skills self-checks in your folders and leave with the teacher for distribution the following day.

Scoring Method and Criteria:

Rubrics are provided in the Unit Plan Assessment File to record each student's level of ability in computer skills and writing skills. An answer key and evaluation rubric are also provided to assess the mathematical skills. Vocabulary is embedded throughout the unit plan allowing students to refine vocabulary for interpersonal, academic and workplace situations.

DIAGNOSTIC ASSESSMENT

“When Are We Ever Going To Use This Math?”

Name: _____

Date: _____

This diagnostic assessment is designed to determine the level of proficiency in computer skills, writing skills, and problem solving mathematical skills.



Part 1 – Computer Skills

Nets for Students: 1.1 & 5.1

Goal 3 Standards: Standard 1 – Information Managers

1. Check **yes** or **no** identifying whether or not you feel comfortable with each of the following criteria.

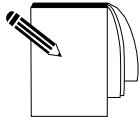
Operating System:

- Use active desktop to browse and manage files and folders. ___yes ___no
- Open & close a Word document. ___yes ___no
- Use menu bars and execute menu commands. ___yes ___no
- Use Dialog Boxes. ___yes ___no
- Use Toolbars. ___yes ___no
- Open multiple programs. ___yes ___no
- Switch between multiple programs. ___yes ___no
- Save to a file or folder. ___yes ___no
- Save to a disk. ___yes ___no
- Print a document. ___yes ___no

Internet:

- Launch the Web browser. ___yes ___no
- Locate sites by address (URL). ___yes ___no
- Navigate Web pages. ___yes ___no
- Print a page from the Web. ___yes ___no

2. Launch an Internet browser and search for ***The Ten Commandments of Math***, and print one copy. Turn in with your completed diagnostic test.



Part 2 - Writing Skills

Sunshine State Standards: LA.B.1.4.2 & LA.B.1.4.3

Name: _____

Date: _____

Write a paragraph (at least 5 sentences) on ***“What I Want To Be When I Grow Up”***. Make sure your writing is organized and focuses on purposeful ideas. Before turning in your paper, edit your work for correct spelling, punctuation, and grammar. Work must be legible, so be sure all writing is neatly done.



Part 3 - Mathematical Skills in the Real World

Sunshine State Standards: MA.A.1.4.2, MA.A.1.4.3, LA.A.1.4.3, & LA.A.2.4.4
Goal 3 Standards: Standard 3 - Numeric Problem Solvers

Name: _____

Date: _____

Directions: Who *USES* math anyway? In the blank at left, identify an occupation that might be related to the real-world problem. Complete each of the following problems. Show justifications or give explanations for answers! Answers only are NOT acceptable!

1. _____: The mean distance from Earth to the Sun is about ninety-three million miles. Express the difference in the distances as an **integer** and in **scientific notation**.
2. _____: A teller at a local bank handled weekly deposits into money market accounts in the following amounts: \$8,000, \$18,000, \$13,000, \$21,000 and \$7,000. The bank's goal is for each teller to handle at least \$50,000 in deposits per week. Did the teller meet the bank's goal?
3. _____: An agent has placed newspaper ads of $6\frac{1}{2}$ c.i. (column inches), $5\frac{3}{4}$ c.i., $4\frac{3}{4}$ c.i., and 5 c.i. At the rate of \$8 **per half** column inch, find the **total** cost of the ads.
4. _____: Three hundred shares of stock are purchased at \$37 $\frac{1}{2}$ per share and sold at \$49 $\frac{1}{8}$ per share. What is the amount of rise per share in the stock market value? Leave answer rounded to the nearest cent.
5. _____: Find the **total** bill for a job in which materials cost \$678.12 and labor amounted to 16 $\frac{1}{2}$ hours at \$32 **per** hour.

6. _____: A doctor orders 0.2 gram of nicotinic acid for a patient. This medication is only available in 0.05-gram tablets. The doctor's nurse gave the patient a single dose consisting of 3 tablets. Is this quantity sufficient to meet the doctor's orders?
7. _____: The payroll supervisor must compute the amount of withholding tax to **deduct** from every employee's check. An employee making \$475.50 **per** week before taxes must pay \$4450.68 withholding tax over the course of the year.
- How much withholding tax must be paid **per** week?
 - What **percent** of the weekly pay is tax?
8. _____: A tail lamp assembly retails for \$78.40. A parts house offers the assembly to the mechanic at a 35% discount off the retail price. How much does the mechanic pay for the assembly?
9. _____: Programmers must give instructions to the computer by writing a general **formula** that the computer can apply to specific cases. State a **formula** for finding the **average** of four numbers, a , b , c , and d .
10. _____: Mr. Johnson, a certified public accountant, handled in excess of \$3 ½ billion in tax claims for the year. Express this number in scientific notation.

Problems adapted from When Are We Ever Gonna Have To Use This?, Updated third Edition, Hale Saunders, Dale Seymour Publications (1988).

Student Computer Skills Self-Check Rubric

Nets for Students: 1.1 and 5.1 Name _____

This rubric is designed for you to examine certain computer skills and rank yourself according to levels of proficiency. This is an excellent tool to allow you to review what you already know and recognize what you need to know in order to complete the learning process. For each skill place a check (✓) inside the square (☐) for your level.

Computer Skills	Level 4: Advanced	Level 3 Proficient	Level 2: Basic	Level 1: Novice
1. Basic Computer (Operations)	Can run multiple programs simultaneously. Feels confident in teaching others ☐	Can use most of the operating system tools ☐	Can use a computer to run a few specific, pre-loaded programs ☐	Cannot use a computer ☐
2. Basic Computer	Can demonstrate correct keyboarding skills ☐	Can use good keyboarding technique in daily work ☐	Can use good keyboarding technique sometimes in daily work ☐	Cannot use good keyboarding technique in daily work ☐
3. File Management	Can apply saving process to multiple documents ☐	Can save to correct drive and folder without assistance ☐	Can save to correct drive and folder with assistance ☐	Cannot save to correct drive and folder ☐
4. File Management	Can apply knowledge of file finding to hidden documents ☐	Can find own saved file without assistance ☐	Can find own saved file with assistance ☐	Cannot find own saved file ☐
5. Word Processing	Can apply spell check and grammar check within multiple documents ☐	Can use spell check and grammar check without assistance ☐	Can use spell check and grammar check with assistance ☐	Cannot use spell check and grammar check ☐
6. Word Processing	Can apply formatting to multiple changes within a document ☐	Can change the format of a document without assistance ☐	Can change the format of a document with assistance ☐	Cannot change the format of a document ☐

Computer Skills	Level 4: Advanced	Level 3 Proficient	Level 2: Basic	Level 1: Novice
7. Word Processing	Can apply knowledge of print menu items and help others <input type="checkbox"/>	Can print to correct printer or set number of copies without assistance <input type="checkbox"/>	Can print to correct printer or set number of copies with assistance <input type="checkbox"/>	Cannot print to correct printer or set number of copies <input type="checkbox"/>
8. Internet	Can apply knowledge about Internet navigation to multiple situations <input type="checkbox"/>	Can reach Internet site of choice without assistance <input type="checkbox"/>	Can reach Internet site of choice with assistance <input type="checkbox"/>	Cannot reach Internet site of choice <input type="checkbox"/>
9. Internet	Can print image and text from Internet and help others <input type="checkbox"/>	Can print image and text from Internet without assistance <input type="checkbox"/>	Can print image or text from Internet with assistance <input type="checkbox"/>	Cannot print image or text from Internet <input type="checkbox"/>

Record each level of proficiency below:

Student Level:

- 1. Basic Computer (operations) _____
- 2. Basic Computer (keyboarding) _____
- 3. File Management (saving) _____
- 4. File Management (finding saved files) _____
- 5. Word Processing (spell/grammar check) _____
- 6. Word Processing (formatting) _____
- 7. Word Processing (printing) _____
- 8. Internet (using browser) _____
- 9. Internet (printing/transferring text) _____

Teacher Checklist for Part 1 – Computer Skills

Nets for Students: 1.1 and 5.1

Use tally marks to indicate the number of students who indicated **yes** or **no** in each of the following categories. This will give you a broad overview of the level of computer literacy for the entire class. If only a few students answered **no** in any one category, a seating chart could be made so those students would be seated next to students who indicated **yes** to the skill.

Operating Systems	Yes	No
Use active desktop to browse and manage files & folders		
Open & close a Word document		
Use menu bars & execute menu commands		
Use dialog boxes		
Use toolbars		
Open multiple programs		
Switch between multiple programs		
Save to file or folder		
Save to a disk		
Print a document		
Internet	Yes	No
Launch the Web browser		
Locate sites by address (URL)		
Navigate Web pages		
Print a page from the Web		

Teacher comments:

Evaluation Rubric for Part 2 – Writing Skills

LA.B.1.4.2 and LA.B.1.4.3



Name: _____

Teacher: _____

Date: _____

Title of work: Diagnostic Test

Criteria					Rating
	4 Outstanding	3 Acceptable	2 Fair	1 Unacceptable	
Focus/Purpose	Information is in logical, interesting sequence which reader can follow.	Information is in logical sequence which reader can follow.	Information is not in logical sequence and is difficult to follow.	Information is totally out of sequence. Reader cannot follow.	_____
Insight	Student demonstrates full knowledge (more than required).	Student is at ease with content, but fails to elaborate.	Student is uncomfortable with content but is able to demonstrate basic concepts.	Student does not have grasp of information.	_____
Editing*	Writing contains no editing errors.	Writing contains no more than three editing errors.	Writing contains 4 to 9 editing errors.	Writing contains 10 or more editing errors.	_____

***Editing includes the following:**

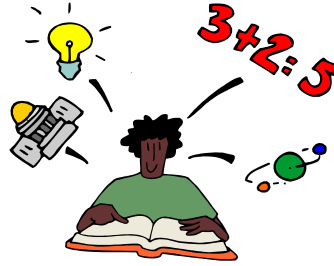
- Correct spelling
- Correct punctuation – including commas, colons, and common uses of semicolons
- Correct capitalization
- Correct sentence formation
- Correct instances of possession

Teacher Comments:

Answer Key to Part 3 – Mathematical Skills in the Real World

- Astronomer or Scientist** Ninety-three million as an integer = 93,000,000
93,000,000 in scientific notation = 9.3×10^7
- Banker** Find the sum: $8,000 + 18,000 + 13,000 + 21,000 + 7,000 = \underline{\$67,000}$
Answer: Yes, the teller met the bank's goal because 67,000 is greater than 50,000.
- Advertising Agent** Convert \$8 per half column inch to \$16 per column inch.
Find the total number of column inches: $6 \frac{1}{2} + 5 \frac{3}{4} + 4 \frac{3}{4} + 5 = 22$ c.i.
Multiply the total # of column inches by \$16.
Answer: \$352 Total Cost
- Stockbroker** Find the difference in the price of the stock per share: $\$49 \frac{1}{8} - 37 \frac{1}{2} = \$49 \frac{1}{8} - 37 \frac{4}{8} = \$48 \frac{9}{8} - 37 \frac{4}{8} = \$11 \frac{5}{8}$ rise per share
Answer: \$11.625 \approx \$11.63 Rise per Share
- Carpenter** Convert $16 \frac{1}{2}$ to 16.5, then calculate the cost for the labor: $16.5 \times 32 = \$528$
To find the total bill for the job, add the cost of materials to the labor: $\$678.12 + \528
Answer: \$1206.12
- Nurse** 0.05 gram = 1 tablet $0.05 \times 3 = 0.15$ gram of nicotinic acid. The patient needs 0.2 gram.
Answer: No, 3 tablets would supply only 0.15 gram of nicotinic acid which is not enough.
- Payroll Supervisor** a. There are 52 weeks in a year. Therefore, $\$4450.68 \div 52 = \underline{\$85.59}$ per week
b. n% of \$475.50 is \$85.59
 $475.5n = 85.59$
 $n = 0.18$
Answer: 18%
- Auto Mechanic** Discount means to subtract. Find the amount of discount, then subtract from the retail price.
Amount of discount: $\$78.40 \times 35\% = \27.44
Cost to the mechanic: $\$78.40 - 27.44 = \underline{\$50.96}$ (Answer)
- Computer Programmer** Since average means to add the numbers and divide by the number of numbers, then
Answer: $\frac{a + b + c + d}{4} = \text{average of 4 numbers}$
- Income Tax Specialist** $\$3,500,000 = \underline{3.5 \times 10^6}$

Evaluation Rubric for Part 3 – Mathematical Skills



Name: _____

Date: _____

Justification/Explanation Criteria					Rating
	4 Outstanding	3 Acceptable	2 Fair	1 Unacceptable	
Understands Vocabulary (L.A.A.1.4.3)	Student demonstrates complete understanding of math vocabulary terms.	Student demonstrates understanding of most math vocabulary terms.	Student has difficulty with vocabulary and asks teacher to define words.	Student does not understand majority of math vocabulary terms and does not ask for help.	_____
Understanding/ Reasoning (M.A.A.1.4.3)	Student answers all of the problems with clear explanation*.	Student answers majority of the problems with clear explanation.	Student can arrive at the correct answer but cannot explain how the answer was obtained.	Student does not have a clue what the problem is asking.	_____

*This is demonstrated through the student's ability to explain rather than just give an answer.

Skills Checklist: (M.A.A.1.4.2 and M.A.A.1.4.3)

Place a check (✓) in the appropriate column beside each skill	Correct Answer	Correct Explanation	Incorrect Answer or Explanation	No Attempt
1. Basic Arithmetic Integers (# 1, 2) 2. Fractions (# 3, 4) 3. Decimals (# 5, 6) 4. Percents (# 7, 8) 5. Scientific Notation (# 1, 10) 6. Symbolic Representation (#9)	<ul style="list-style-type: none"> • _____ • _____ • _____ • _____ • _____ • _____ 	<ul style="list-style-type: none"> • _____ • _____ • _____ • _____ • _____ • _____ 	Ans. Proc. <ul style="list-style-type: none"> • _____ • _____ • _____ • _____ • _____ • _____ 	<ul style="list-style-type: none"> • _____ • _____ • _____ • _____ • _____ • _____

Note: The numbers beside each skill represent the problem number from Part 3.