

# SUBTERRANEAN MINING



## ITEM ANALYSIS STUDY

Go to COMPASS Data Management website (<https://compass.esc7.net>) and go to teacher reports. Click on “Teacher Packet”. You will want to go to TGESI, Mathematics, 5<sup>th</sup> Grade, April 2004, Teacher9852 – print all reports.

1. As a group, generally interpret and discuss what is found in each of the reports.
  - a. Student Response Report
  - b. Item Analysis Reports – 2 representations
2. *For the 7 questions of Objective 4 ONLY*, fill out the Item Analysis form.
3. As a group, read each question and interpret the “% of Students Choosing Each Answer”, and speculate the “Error Analysis”.
4. As a group, discuss what other information would be used to better clarify the “error analysis,” and where the teacher needs to intervene (Instructional Intervention Plan).

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1. As a group, generally interpret and discuss what is found in each of the reports.
    - a. Objective Mastery Reports – 3 representations
    - b. Student Expectation Mastery Reports – 3 representations
- For Objective 4 ONLY (As a group, use handout to answer these questions):*
2. What prior content knowledge appears to be missing, and must be taught before instruction?
  3. What SE’s are not mastered by most students and must be taught explicitly.
  4. What SE’s must be reviewed and maintained?
  5. What SE’s were mastered by most students? What must the teacher do for students not meeting the expected level of mastery for these SE’s.
  6. How can we address the needs of the students who failed to master most SE’s.





# Item Analysis Demo Middle School

Subject: Mathematics Grade: 08 Language: English Administration: April 2004  
 Questions: 50 Met Strd Raw: 28/50 Met Strd Scale: 2057 Cnd Perf Raw: 45/50 Cnd Perf Scale: 2400

Students Tested: 211

#	Objective/Student Expectation	Correct	A/F	B/G	C/H	D/J	E/K	Blank
1	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.5A-estimate, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations	B	17 8%	189 90%	0 0%	4 2%	0 0%	0 0%
2	Obj 3 - Demonstrate an understanding of geometry and spatial reasoning. SE Math-Gr8_8.7D-locate and name points on a coordinate plane using ordered pairs of rational numbers	H	5 2%	7 3%	190 90%	8 4%	0 0%	0 0%
3	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.1D-express numbers in scientific notation, including negative exponents, in appropriate problem situations using a calculator	C	8 4%	73 35%	124 59%	6 3%	0 0%	0 0%
4	Obj 5 - Demonstrate an understanding of probability and statistics. SE Math-Gr8_8.12C-construct circle graphs, bar graphs, and histograms, with and without technology	G	1 0%	160 76%	4 2%	46 22%	0 0%	0 0%
5	Obj 3 - Demonstrate an understanding of geometry and spatial reasoning. SE Math-Gr8_8.7B-use geometric concepts and properties to solve problems in fields such as art and architecture	A	191 91%	10 5%	5 2%	4 2%	0 0%	0 0%
6	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.2A-select and use appropriate operations to solve problems and justify the selections	J	26 12%	8 4%	11 5%	166 79%	0 0%	0 0%
7	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.4A-generate a different representation given one representation of data such as a table, graph, equation, or verbal description	A	168 80%	14 7%	17 8%	12 6%	0 0%	0 0%
8	Obj 5 - Demonstrate an understanding of probability and statistics. SE Math-Gr8_8.13A-evaluate methods of sampling to determine validity of an inference made from a set of data	J	30 14%	46 22%	35 17%	100 47%	0 0%	0 0%
9	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.15A-communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models	B	21 10%	136 64%	9 4%	45 21%	0 0%	0 0%
10	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.16A-make conjectures from patterns or sets of examples and nonexamples	F	170 81%	20 9%	14 7%	7 3%	0 0%	0 0%
11	Obj 5 - Demonstrate an understanding of probability and statistics. SE Math-Gr8_8.12B-draw conclusions and make predictions by analyzing trends in scatterplots	D	21 10%	2 1%	4 2%	184 87%	0 0%	0 0%

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#	Objective/Student Expectation	Correct	A/F	B/G	C/H	D/J	E/K	Blank
12	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.14B-use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness	J	33 16%	24 11%	14 7%	140 66%	0 0%	0 0%
13	Obj 4 - Demonstrate an understanding of the concepts and uses of measurement. SE Math-Gr8_8.8A-find surface area of prisms and cylinders using concrete models and nets (two-dimensional models)	D	8 4%	71 34%	26 12%	106 50%	0 0%	0 0%
14	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.5A-estimate, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations	F	122 58%	44 21%	30 14%	15 7%	0 0%	0 0%
15	Obj 3 - Demonstrate an understanding of geometry and spatial reasoning. SE Math-Gr8_8.6A-generate similar shapes using dilations including enlargements and reductions	C	7 3%	107 51%	83 39%	14 7%	0 0%	0 0%
16	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.2C-evaluate a solution for reasonableness	J	9 4%	21 10%	30 14%	151 72%	0 0%	0 0%
17	Obj 4 - Demonstrate an understanding of the concepts and uses of measurement. SE Math-Gr8_8.9A-use the Pythagorean Theorem to solve real-life problems	C	13 6%	60 28%	130 62%	8 4%	0 0%	0 0%
18	Obj 5 - Demonstrate an understanding of probability and statistics. SE Math-Gr8_8.12A-select the appropriate measure of central tendency to describe a set of data for a particular purpose	F	99 47%	18 9%	72 34%	22 10%	0 0%	0 0%
19	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.4A-generate a different representation given one representation of data such as a table, graph, equation, or verbal description	D	20 9%	16 8%	48 23%	127 60%	0 0%	0 0%
20	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.14B-use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness	H	90 43%	4 2%	96 45%	21 10%	0 0%	0 0%
21	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.3B-estimate and find solutions to application problems involving percents and proportional relationships such as similarity and rates	A	124 59%	82 39%	0 0%	0 0%	0 0%	0 0%
22	Obj 3 - Demonstrate an understanding of geometry and spatial reasoning. SE Math-Gr8_8.7C-use pictures or models to demonstrate the Pythagorean Theorem	H	26 12%	28 13%	149 71%	8 4%	0 0%	0 0%
23	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.3A-compare and contrast proportional and non-proportional relationships	A	185 88%	14 7%	2 1%	10 5%	0 0%	0 0%

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#	Objective/Student Expectation	Correct	A/F	B/G	C/H	D/J	E/K	Blank
24	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.3B-estimate and find solutions to application problems involving percents and proportional relationships such as similarity and rates	F	131 62%	36 17%	17 8%	27 13%	0 0%	0 0%
25	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.1A-compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals	C	53 25%	45 21%	96 45%	17 8%	0 0%	0 0%
26	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.14A-identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics	G	58 27%	52 25%	41 19%	60 28%	0 0%	0 0%
27	Obj 3 - Demonstrate an understanding of geometry and spatial reasoning. SE Math-Gr8_8.6B-graph dilations, reflections, and translations on a coordinate plane	C	18 9%	9 4%	161 76%	23 11%	0 0%	0 0%
28	Obj 4 - Demonstrate an understanding of the concepts and uses of measurement. SE Math-Gr8_8.10A-describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally	H	88 42%	20 9%	94 45%	9 4%	0 0%	0 0%
29	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.16B-validate his/her conclusions using mathematical properties and relationships	C	34 16%	13 6%	147 70%	17 8%	0 0%	0 0%
30	Obj 5 - Demonstrate an understanding of probability and statistics. SE Math-Gr8_8.11A-find the probabilities of compound events (dependent and independent)	F	70 33%	62 29%	29 14%	50 24%	0 0%	0 0%
31	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.15A-communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models	D	14 7%	17 8%	13 6%	167 79%	0 0%	0 0%
32	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.5B-use an algebraic expression to find any term in a sequence	G	31 15%	107 51%	31 15%	42 20%	0 0%	0 0%
33	Obj 4 - Demonstrate an understanding of the concepts and uses of measurement. SE Math-Gr8_8.8C-estimate answers and use formulas to solve application problems involving surface area and volume	D	25 12%	73 35%	15 7%	98 46%	0 0%	0 0%
34	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.14C-select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwa	F	126 60%	44 21%	18 9%	23 11%	0 0%	0 0%



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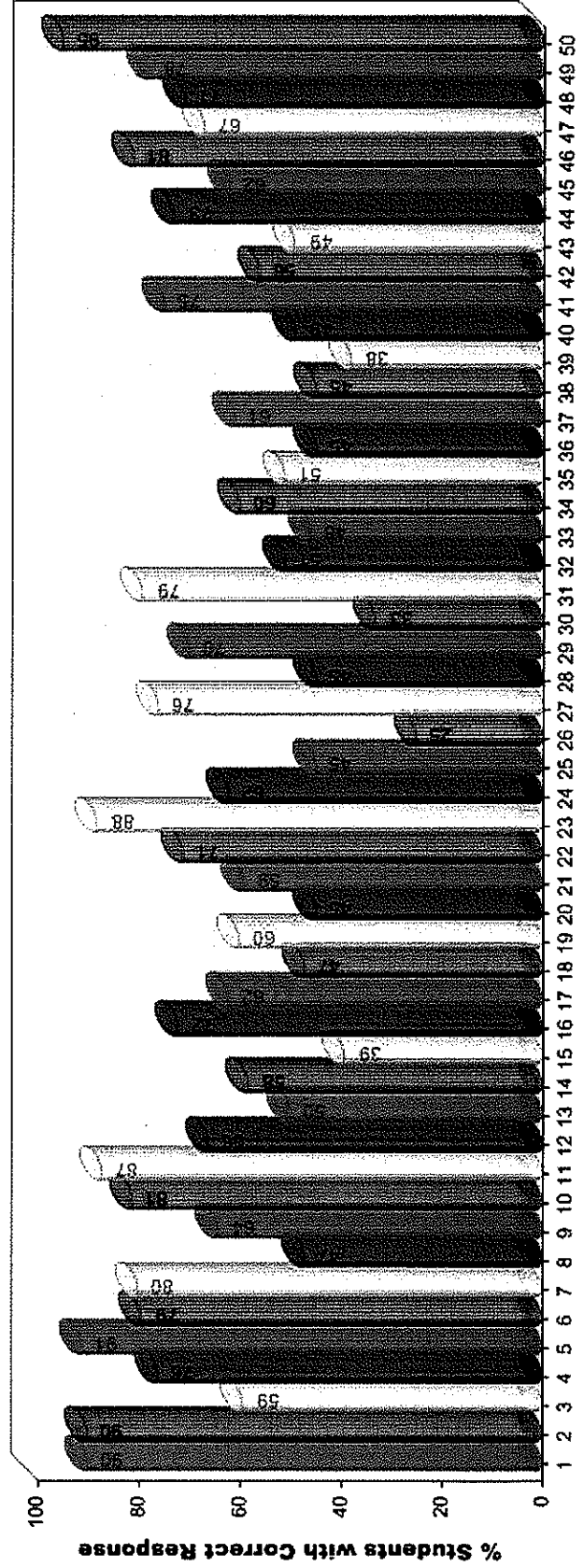
#	Objective/Student Expectation	Correct	A/F	B/G	C/H	D/J	E/K	Blank
35	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.2B-add, subtract, multiply, and divide rational numbers in problem situations	D	10 5%	20 9%	73 35%	108 51%	0 0%	0 0%
36	Obj 4 - Demonstrate an understanding of the concepts and uses of measurement. SE Math-Gr8_8.9B-use proportional relationships in similar shapes to find missing measurements	G	94 45%	95 45%	13 6%	9 4%	0 0%	0 0%
37	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.2D-use multiplication by a constant factor (unit rate) to represent proportional relationships; for example, the arm span of a gibbon is about 1.4 times its height, $a = 1.4h$	D	12 6%	57 27%	13 6%	129 61%	0 0%	0 0%
38	Obj 3 - Demonstrate an understanding of geometry and spatial reasoning. SE Math-Gr8_8.7B-use geometric concepts and properties to solve problems in fields such as art and architecture	G	67 32%	96 45%	40 19%	8 4%	0 0%	0 0%
39	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.5B-use an algebraic expression to find any term in a sequence	C	35 17%	66 31%	80 38%	30 14%	0 0%	0 0%
40	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.1B-select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships	F	104 49%	46 22%	26 12%	34 16%	0 0%	0 0%
41	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.16B-validate his/her conclusions using mathematical properties and relationships	D	5 2%	9 4%	38 18%	159 75%	0 0%	0 0%
42	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.1C-approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations ( $\pi$ , square root of 2)	G	74 35%	118 56%	14 7%	5 2%	0 0%	0 0%
43	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.1D-express numbers in scientific notation, including negative exponents, in appropriate problem situations using a calculator	C	3 1%	15 7%	103 49%	90 43%	0 0%	0 0%
44	Obj 3 - Demonstrate an understanding of geometry and spatial reasoning. SE Math-Gr8_8.7A-draw solids from different perspectives	J	54 26%	1 0%	2 1%	154 73%	0 0%	0 0%
45	Obj 5 - Demonstrate an understanding of probability and statistics. SE Math-Gr8_8.13B-recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis	A	131 62%	10 5%	43 20%	26 12%	0 0%	0 0%



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#	Objective/Student Expectation	Correct	A/F	B/G	C/H	D/J	E/K	Blank
46	Obj 6 - Demonstrate an understanding of the mathematical processes and tools used in problem solving. SE Math-Gr8_8.14C-select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backward	H	18 9%	10 5%	170 81%	13 6%	0 0%	0 0%
47	Obj 1 - Demonstrate an understanding of numbers, operations, and quantitative reasoning. SE Math-Gr8_8.2B-add, subtract, multiply, and divide rational numbers in problem situations	D	25 12%	13 6%	30 14%	142 67%	0 0%	0 0%
48	Obj 2 - Demonstrate an understanding of patterns, relationships, and algebraic reasoning. SE Math-Gr8_8.3A-compare and contrast proportional and non-proportional relationships	H	13 6%	24 11%	150 71%	24 11%	0 0%	0 0%
49	Obj 5 - Demonstrate an understanding of probability and statistics. SE Math-Gr8_8.11B-use theoretical probabilities and experimental results to make predictions and decisions	C	6 3%	26 12%	164 78%	15 7%	0 0%	0 0%
50	Obj 5 - Demonstrate an understanding of probability and statistics. SE Math-Gr8_8.12B-draw conclusions and make predictions by analyzing trends in scatterplots	F	200 95%	4 2%	1 0%	6 3%	0 0%	0 0%



# Mathematics: “Drill-down” Analysis

1. Determine the gaps in the instructional program by identifying the TAKS Mathematics objectives (1-6) with the percent of students not meeting minimum expectations or not meeting your standards.
2. Using the classroom item analysis, analyze the TAKS data to determine the questions with the largest number of students selecting the same wrong answer and ask questions listed below about the relationship between the data and the TAKS question:
  - a) Are the students selecting an answer choice without solving the problem situation? Ex: Matching all the numbers in the problem with the answer choice that has all the same numbers.
  - b) Are the students misreading the problem, graph, table, chart, or model and selecting an answer based on their misinterpretation?
  - c) Which specific student expectation from the state curriculum is the question testing? Are students missing one specific student expectation more than another one? Is the skill/concept introduced at this grade level or the previous grade level?
  - d) Are the students confusing the operations? Are students looking for a “key word” in the complex problem situation and selecting an operation based on this word? Ex: Words and phrases like “in all,” “total,” and “altogether” are in subtraction, multiplication, or division problems and some students are selecting addition based on this word instead of the correct operation.
  - e) Are the students only working one step on two-step problems or two steps in three step problems?