Table 1: *Math Descriptors* – Applying Depth of Knowledge Levels for Mathematics (Webb, 2002) & NAEP 2002 Mathematics Levels of Complexity (M. Petit, Center for Assessment 2003, K. Hess, Center for Assessment, updated 2006)

	Level 1		Level 2		Level 3	Level 4
	Recall		Skills/Concepts		Strategic Thinking	Extended Thinking
a.	Recall, observe, or	a.	Classify plane and three	a)	Interpret information from	a) Relate mathematical
	recognize a fact,		dimensional figures		a complex graph	concepts to other content
	definition, term, or	b.	Interpret information	b)	Explain thinking when	areas
	property		from a simple graph		more than one response is	
b.	Apply/compute a	c.	Use models to represent	١.	possible	b) Relate mathematical
	well-known algorithm		mathematical concepts	c)	Make and/or justify	concepts to real-world
	(e.g., sum, quotient)	d.	Solve a routine problem		conjectures	applications in new
c.	Apply a formula		requiring multiple	d)	Use evidence to develop	situations
d.	Determine the area or		steps/decision points, or		logical arguments for a	
	perimeter of		the application of		concept	c) Apply a mathematical
	rectangles or triangles		multiple concepts	e)	Use concepts to solve	model to illuminate a
	given a drawing and	e.	Compare and/or contrast		non-routine problems	problem, situation
	labels		figures or statements	f)	Perform procedure with	
e.	Identify a plane or	f.	Construct 2-dimensional		multiple steps and	d) Conduct a project that
	three dimensional		patterns for 3-		multiple decision points	specifies a problem,
	figure		dimensional models,	g)	Generalize a pattern	identifies solution paths,
f.	Measure		such as cylinders and	h)	Describe, compare, and	solves the problem, and
g.	Perform a specified or		cones		contrast solution methods	reports results
	routine procedure	g.	Provide justifications for	i)	Formulate a mathematical	
	(e.g., apply rules for		steps in a solution		model for a complex situation	e) Design a mathematical model to inform and solve
1,	rounding) Evaluate an	h.	process		Provide mathematical	
h.	expression	i.	Extend a pattern Retrieve information	j)	justifications	a practical or abstract situation
i.	Solve a one-step word	1.	from a table, graph, or	k)	Solve a multiple- step	Situation
1.	problem		figure and use it solve a	K)	problem and provide	f) Develop generalizations
j.	Retrieve information		problem requiring		support with a	of the results obtained and
١,٠	from a table or graph		multiple steps		mathematical explanation	the strategies used and
k.	Recall, identify, or	j.	Translate between tables,		that justifies the answer	apply them to new
1	make conversions	١,٠	graphs, words and	1)	Solve 2-step linear	problem situations
	between and among		symbolic notation	-/	equations/inequalities in	proording strongers
	representations or	k.	Make direct translations		one variable over the	g) Apply one approach
	numbers (fractions,		between problem		rational numbers.	among many to solve
	decimals, and		situations and symbolic		interpret solution(s) in the	problems
	percents), or within		notation		original context, and	1
	and between	1.	Select a procedure		verify reasonableness of	h) Apply understanding in
	customary and metric		according to criteria and		results	a novel way, providing an
	measures		perform it	m)	Translate between a	argument/justification for
1.	Locate numbers on a	m.	Specify and explain		problem situation and	the application
	number line, or points		relationships between		symbolic notation that is	
	on a coordinate grid		facts, terms, properties,		not a direct translation	
m.	Solve linear equations		or operations	n)	Formulate an original	NOTE: Level 4 involves
n.	Represent math	n.	Compare, classify,		problem, given a situation	such things as complex
	relationships in words,		organize, estimate, or	0)	Analyze the similarities	restructuring of data or
	pictures, or symbols		order data		and differences between	establishing and
0.	Read, write, and				procedures	evaluating criteria to
	compare decimals in			p)	Draw conclusion from	solve problems.
	scientific notation				observations or data,	
				<u> </u>	citing evidence	