

What Makes a Quality Open-Ended Item?

- ☐ Does the item align to the standard?
- ☐ Is the item worth 4 points? (Partial credit may be accepted.)
- ☐ Does the item consist of 2–4 parts?
- ☐ Does the item avoid ‘follow-through’ errors?
- ☐ Does the item have a DOK of 3? (Student uses reasoning and develops a plan or a sequence of steps; item has some complexity and generally takes 10 minutes or more to complete.)
- ☐ Is the item grammatically correct?
- ☐ Is it possible to write the item using only the present tense?
- ☐ Is the item written in the third person? (The prompts to the students can be in the second person.)
- ☐ Is the context relevant to the grade?
- ☐ Is the item free of bias? (Ask yourself if your item would be more advantageous to one group over another. If it would be, then it is biased.)
- ☐ Is the context of the item overused?
- ☐ Is the level of rigor increasing from part to part?
- ☐ Does each part utilize different skills, as opposed to requiring the same problem-solving strategy as previous parts?
- ☐ Is the source of challenge the math being assessed or something else?
- ☐ Is the probability a student guesses the correct answer less than 25%?

Bloom's Taxonomy

Categories		Definition	Math Action Words
Knowledge	1.0	Student remembers, recalls appropriate previously learned information	Define; identify; name; select; state; order; one step
Comprehension	2.0	Student translates, comprehends, or interprets information based on prior learning	Convert; estimate; explain; express; factor; generalize; give example; identify; indicate; locate; picture graphically
Application	3.0	Student selects, transfers, and uses data and principles to complete a task or problem with a minimum of direction	Apply; choose; compute; employ; interpret; graph; modify; operate; plot; practice; solve; use; three or more steps
Analysis	4.0	Student distinguishes, classifies, and relates the assumptions, hypotheses, evidence, or structure of a statement or question	Compare; contrast; correlate; differentiate; discriminate; examine; infer; maximize; minimize; prioritize; subdivide; test
Synthesis	5.0	Student originates, integrates, and combines ideas into a product, plan or proposal that is new to him or her	Arrange; collect; construct; design; develop; formulate; organize; set up; prepare; plan; propose; Create experiment and record data
Evaluation	6.0	Student appraises, assesses, or critiques on a basis of specific standards and criteria	Appraise; assess; defend estimate; evaluate; judge; predict; rate; validate; verify

Webb's Depth of Knowledge

Categories		Definition	Math Action Words
Recall	1.0	Student recalls facts, information, procedures, definitions	Define; identify; name; select; state; order; one step
Basic Application of Skill / Concept	2.0	Student uses information, conceptual knowledge, procedures	Apply; choose; compute; employ; interpret; graph; modify; operate; plot; practice; solve; use; two or more steps
Strategic Thinking	3.0	Student uses reasoning, develops a plan or sequence of steps; has some complexity; Generally takes 10 minutes or more to do	Compare; contrast; correlate; differentiate; discriminate; examine; infer; maximize; minimize; prioritize; subdivide; test
Extended Thinking	4.0	Student conducts an investigation, needs time to think and process multiple conditions of problem or task Requires more than 10 minutes to do non-routine manipulations	Arrange; collect; construct; design; develop; formulate; organize; set up; prepare; plan; propose; Create experiment and record data

Checklist for Item Writing

- ☐ Item should have context.
- ☐ Content aligns to grade level (may address more than 1 standard).
- ☐ Context is grade appropriate, reasonable and not overused.
- ☐ When using a real-world context, data and information are authentic.
- ☐ There is only 1 correct answer given (MCs).
- ☐ The math is correct.
- ☐ Item is written in concise and precise language, using simple sentences.
- ☐ The stem is in the form of a question (MCs).
- ☐ The item is grammatically correct.
- ☐ The item uses third-person speech (does not use “I” or “you”).
- ☐ The item uses the present tense when possible.
- ☐ The item is free of bias. (Ask yourself if your item is more advantageous to one group over another. If it is, then it is biased.)
- ☐ MC items have 3 plausible distractors with valid distractor rationales.
- ☐ Distractors reflect plausible mistakes students might make, not tricks, distractions, or hints.
- ☐ The item avoids the phrase “of the following” (or similar wording).
- ☐ The item is not phrased as a “**not**” question (exceptions include Geometry and Probability).
- ☐ When a graphic is used, it must connect to the context and add value to the item.
- ☐ When a graphic is used, it must be as clear and simple as possible, with the correct labeling if necessary.

OE Example Item

Item Writer Name: Darren Slack	Grade: 3
Standard: D-M.1	Mathematical Practice(s): 1, 2, 6
DOK: 3	Estimated Difficulty: Medium
Calculator: NC	Points: 4

Comment: (If a source for real-world information was used, please include it here.)

Prompt/Stem

Don baked cookies for a bake sale.
He sold the cookies for 20¢ each.

- A. Write two different groups of coins that someone could use to pay exactly 20¢ for a cookie.

At the bake sale, Don sold each plate of cookies for the same amount.
Holly paid the exact amount for one plate of cookies using the money shown below.
<Insert graphic of 2 one-dollar bills, 1 quarter, and 2 nickels.>

- B. How much did Holly pay for the plate of cookies? Show or explain all your work.

Judy also bought one plate of cookies.
She paid with 1 five-dollar bill.

Don gave her 2 one-dollar bills, 1 quarter, 2 dimes, and 4 nickels as change.

- C. Explain how you know that the amount of change Don gave her is incorrect. Include the correct amount of change Don should have given Judy in your explanation.

Item # **DMS_111**

Grade: **3**

Assessment Anchor this item will be reported under:

M03.D-M.1 Solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses, and lengths of objects.

Specific Anchor Descriptor addressed by this item:

M03.D-M.1.3 Count, compare, and make change using a collection of coins and one-dollar bills.

Scoring Guide:

Score	In this item, the student –
4	Demonstrates a thorough understanding of how to solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses, and lengths of objects by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding how to solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses, and lengths of objects by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of how to solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses, and lengths of objects by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of how to solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses, and lengths of objects .
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.
Non-scorables	B – Blank, entirely erased or written refusal to respond F – Foreign Language K – Off-task U – Unreadable

Top Scoring Student Response And Training Notes:

Score	Description
4	Student earns 4 points.
3	Student earns 3.0 – 3.5 points.
2	Student earns 2.0 – 2.5 points.
1	Student earns 0.5 – 1.5 points. OR Student demonstrates minimal understanding of how to solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses, and lengths of objects .
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

A.

What?	Why?
<p>Answers may vary. Accept any two combinations of coins that equal 20 cents.</p> <p>Sample Response: Two dimes One dime and two nickels</p>	

(1 score point)

½ point for each correct answer

B.

What?	Why?
\$3.35	<p>Sample Response: 3 one-dollar bills = \$3.00 1 quarter = \$0.25 2 nickels = <u>\$0.10</u> Total: \$3.35</p> <p>OR First, I added the dollar bills together to get \$3.00. The quarter is \$0.25. Since a nickel is \$0.05, the two nickels add up to \$0.10. I added these amounts together to get \$3.35.</p>

(1 score point)

½ point for correct answer

½ point for complete support

C.

What?	Why?
	<p>Sample Explanation: Since the price of one plate of cookies is \$3.35, Don should have given Judy only \$1.65 in change. However, he gave her 2 one-dollar bills instead of only 1.</p>

(2 score points)

1 point for complete explanation

1 point for the correct amount of change

OE Template

Item Writer Name:	Grade:
Standard:	Mathematical Practice(s):
DOK:	Estimated Difficulty:
Calculator:	Points:

Comment:

Prompt/Stem

Rubric Template

Item #

Grade:

Assessment Anchor this item will be reported under:

Specific Eligible Content addressed by this item:

Scoring Guide:

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3	Demonstrates a general understanding of by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of by correctly performing a significant portion of the required task.
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A.

What?	Why?

(score points)
 point for correct answer
 point for complete support

B.

What?	Why?

(score points)
 point for correct answer
 point for complete support

C.

What?	Why?

(score points)
 point for correct answer
 point for complete support

D.

What?	Why?

(score points)
 point for correct answer
 point for complete support

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C.

What?	Why?

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What?	Why?

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C.

What?	Why?

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What?	Why?

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A.

What?	Why?

(score points)
 point for correct answer
 point for complete support

B.

What?	Why?

(score points)
 point for correct answer
 point for complete support

C.

What?	Why?

(score points)
 point for correct answer
 point for complete support

D.

What?	Why?

(score points)
 point for correct answer
 point for complete support

OE Template

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What?	Why?

(score points)
 point for correct answer
 point for complete support

B.

What?	Why?

(score points)
 point for correct answer
 point for complete support

C.

What?	Why?

(score points)
 point for correct answer
 point for complete support

D.

What?	Why?

(score points)
 point for correct answer
 point for complete support

MC Template

Item Writer Name:	Grade:
Standard:	Mathematical Practice(s):
DOK:	Estimated Difficulty:
Calculator:	Points:

Comment:	
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Prompt/Stem

Answer Options	
Key:	
Option A.	
Rationale:	
Option B.	
Rationale:	
Option C.	
Rationale:	
Option D.	
Rationale:	

MC Template

Item Writer Name:	Grade:
Standard:	Mathematical Practice(s):
DOK:	Estimated Difficulty:
Calculator:	Points:

Comment:	
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Prompt/Stem

Answer Options	
Key:	
Option A.	
Rationale:	
Option B.	
Rationale:	
Option C.	
Rationale:	
Option D.	
Rationale:	

MC Template

Item Writer Name:	Grade:
Standard:	Mathematical Practice(s):
DOK:	Estimated Difficulty:
Calculator:	Points:

Comment:	
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Prompt/Stem

Answer Options	
Key:	
Option A.	
Rationale:	
Option B.	
Rationale:	
Option C.	
Rationale:	
Option D.	
Rationale:	

MC Template

Item Writer Name:	Grade:
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Comment:	
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Prompt/Stem

Answer Options	
Key:	
Option A.	
Rationale:	
Option B.	
Rationale:	
Option C.	
Rationale:	
Option D.	
Rationale:	

MC Template

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Prompt/Stem

Answer Options	
Key:	
Option A.	
Rationale:	
Option B.	
Rationale:	
Option C.	
Rationale:	
Option D.	
Rationale:	