Grade 4 Mid Assessment - Teacher Resource

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Front Matter

This assessment includes 10 items from four CT topics (1 Decomposition item; 4 Variables; 3 Conditional items; 2 Repetition items). Six items (#1, #6, #7, #8, #9, and #10) use images of the Scratch interface and/or Scratch blocks.

Each item has an exemplar response(s) and a scoring guide and/or rubric included (and when applicable, other information to help with interpreting student responses). The scoring guidance and rubrics were developed by our project to assist in coding and interpreting student responses, and are explicitly focused on using student responses to make inferences about the relevant knowledge, skills, and abilities that we identified from the learning trajectories and built

into our item design process. As such, other end users of these assessment instruments may choose to adapt the scoring guidance and/or rubrics to match their purposes and students.

Two of these items (#4 and #9) have associated rubrics. Further details on these rubrics are provided in the items' details.

Items

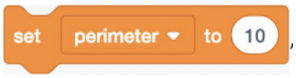
#01

Meta-data

- Item code: V.04.d
- Trajectory: Variable

Item

In Problem 1, circle True or False.

1) In this Scratch block, 

, Alt Text Description: [Variable block: sets a variable named perimeter to 10] "perimeter" is a loop.

- **True**
- **False**

Exemplar response(s)

False

Scoring Guidance

- True=0
- False= 1

Rubric(s)

None

#02

Meta-data

- Item code: C.01.a
- Trajectory: Conditional

Item

2) Which statement is a conditional?

A. If number is 10, then say “hello world”.
B. If number is 10.
C. Repeat 2 times: Say “hello world” for 2 seconds.
D. Say “hello world” for 2 seconds.

Exemplar response(s)

A

Scoring Guidance

- A=1
- B=0
- C=0
- D=0

Rubric(s)

None

#03

Meta-data

- Item code: DC.08.b
- Trajectory: Decomposition

Item

3) Decomposing means breaking something down into parts. Decompose the number 12 into equal parts.

Exemplar response(s)

Answers will vary. Sample answers:

- 6, 6
- 3, 3, 3, 3
- 4, 4, 4

Scoring Guidance

- Lists (or represents/draws) a set of equal values that sum to 12 (like the examples in exemplar responses) = 1
- Values aren't equivalent and/or don't sum to 12 = 0
- Note: If a student response indicates that the number of **equal** parts that should be used, that is enough to give credit (e.g, break 12 into 6 equal parts)

Rubric(s)

None

#04

Meta-data

- Item code: R.01.b
- Trajectory: Repetition

Item

4) Andre has 9 cookies to give away to his friends Sally, Val, and Lee.
He wants to give each friend an equal number of cookies.
Andre wrote instructions for how to give away the cookies.

Rewrite his instructions. Use the instruction “repeat 3 times” at least once.
Andre’s instructions:

- Give Sally 1 cookie
- Give Val 1 cookie
- Give Lee 1 cookie
- Give Sally 1 cookie
- Give Val 1 cookie
- Give Lee 1 cookie
- Give Sally 1 cookie
- Give Val 1 cookie
- Give Lee 1 cookie

Exemplar response(s)

Answers will vary. Sample answers:
Example 1:

1. Repeat 3 times:
    a. Give Sal 1 cookie
    b. Give Val 1 cookie
    c. Give Lee 1 cookie

Example 2:

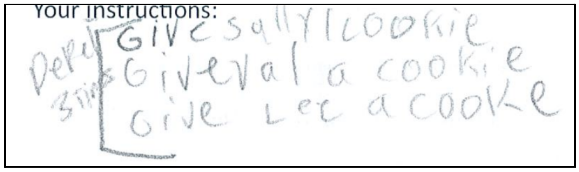
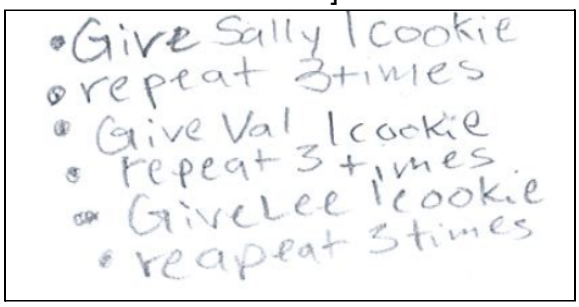
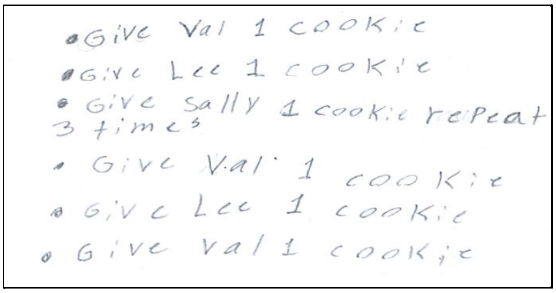
1. Repeat 3 times:
    a. Give Sal 1 cookie
2. Repeat 3 times:
    a. Give Val 1 cookie
3. Repeat 3 times:
    a. Give Lee 1 cookie

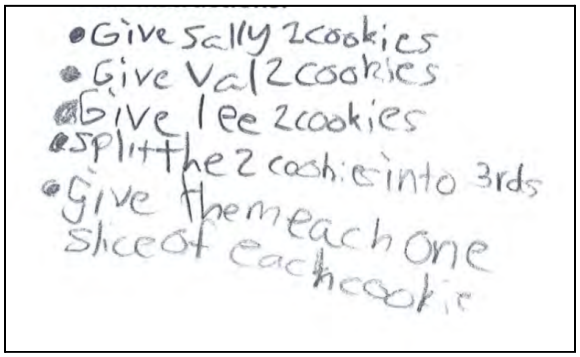
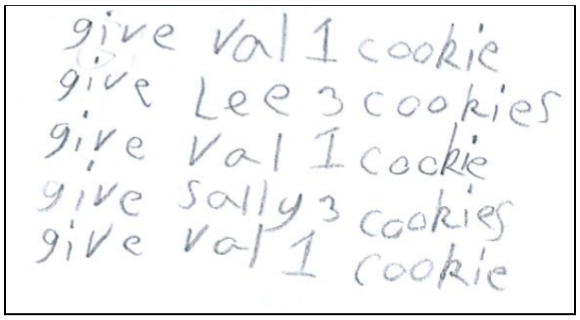
Scoring Guidance

See Rubric

Rubric(s)

This rubric allows partial credit to allow for student responses that seem to demonstrate some understanding of using repetition in their instructions, but their specific instructions would not achieve the intended outcome.

	Description	Example
2	Instructions use the command “repeat 3 times” and produce the intended outcome. (Can include “repeat 3 times” instruction either before or after the command(s) to be repeated.)	 Alt Text Description: [The student’s written response provides the following steps: Repeat 3 times: ● Give Sally 1 cookie; ● Give Val 1 cookie; ● Give Lee 1 cookie]  Alt Text Description: [The student’s written response provides the following steps: ● Give Sally 1 cookie ● Repeat 3 times; ● Give Val 1 cookie ● Repeat 3 times; ● Give Lee 1 cookie ● Repeat 3 times]
1	Shows understanding of repetition to get desired results through word explanation or drawings, but instructions won’t produce the intended outcome.	

		Alt Text Description: [The student's written response provides the following steps: ● Give Val 1 cookie ● Give Lee 1 cookie ● Give Sally 1 cookie repeat 3 times ● Give Val 1 cookie ● Give Lee 1 cookie ● Give Sally 1 cookie]
0	Incorrect use of repetition concept, or no demonstration of repetition concept to achieve the intended outcome*.	 Alt Text Description: [The student's written response provides the following steps: ● Give Sally 2 cookies ● Give Val 2 cookies ● Give Lee 2 cookies ● Split the 2 cookies into 3rds ● Give them each one slice of each cookie]  Alt Text Description: [The student's written response provides the following steps: ● Give Val 1 cookie ● Give Lee 3 cookies ● Give Val 1 cookie ● Give Sally 3 cookies ● Give Val 1 cookie]

*Responses which include drawings must demonstrate repetition to achieve the intended outcome

#05

Meta-data

- Item code: C.02.e
- Trajectory: Conditional

Item

5) What sound (or sounds) will play if you run this code?

If 5 < 8, then play a “pop” sound.
If 5 > 7, then play a “bing” sound.

Exemplar response(s)

Pop

Scoring Guidance

- "pop" = 1; "bing", anything else = 0
- if students don't definitively indicate that the "pop" sound plays, score it as 0.

Rubric(s)

None

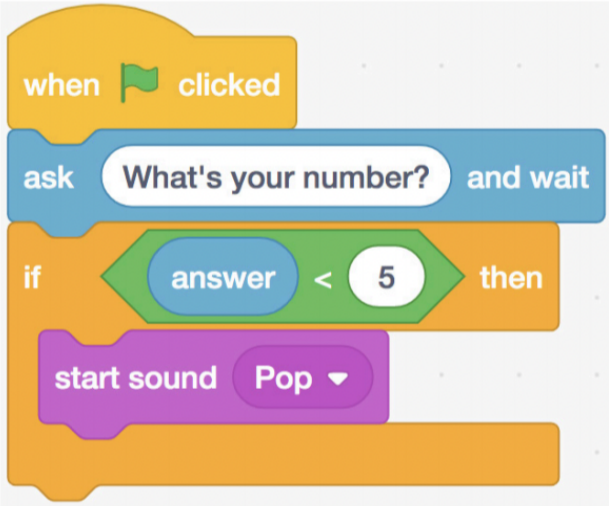
#06

Meta-data

- Item code: C.03.b
- Trajectory: Conditional

Item

6) If you run the code below, will the “pop” sound play if the user inputs 2?



Alt Text Description: [A script displays blocks in the following order:

1. Event block: when the green flag is clicked
2. Sensing block: asks user to input a value (asks “What number do you guess”?)
3. Control block:
    a. This if-then control block contains a condition and an action
    b. Condition: An operator block that tests whether a user input value is less than 5
    c. Action: A sound block plays sound “pop”]

Exemplar response(s)

Yes

Scoring Guidance

- Yes=1
- No=0
- If students don't definitively indicate that the "pop" sound plays code as 0

Rubric(s)

None

#07

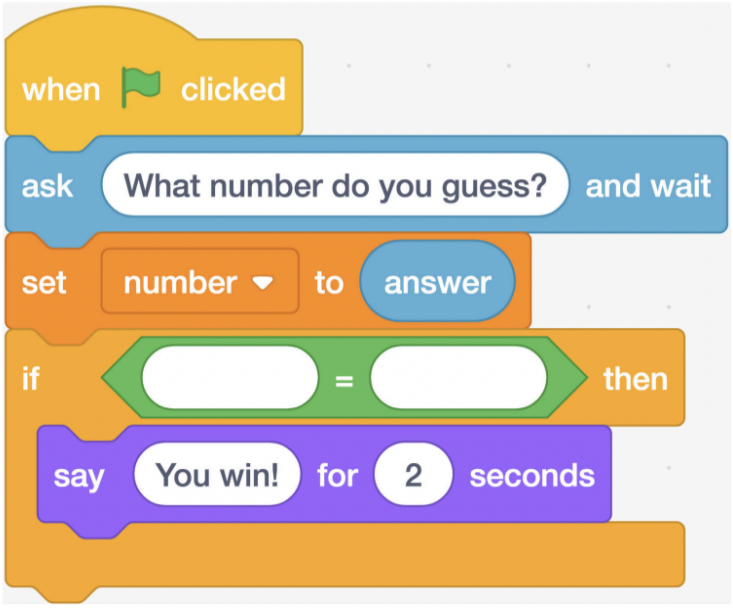
Meta-data

- Item code: V.12.a
- Trajectory: Variable

Item

7) Kristi is playing a game where she has to guess a number 0-9. She doesn’t know it, but she has to guess “4”.

Fill in the if condition in this Scratch script so the program will say "You win!" if Kristi guesses correctly.



Alt Text Description: [A script displays blocks in the following order:

1. Event block: when the green flag is clicked
2. Sensing block: asks user to input a value (asks “What number do you guess”?)
3. Variable block: sets a variable named number to the user input value
4. Control block:
    a. This if-then control block contains a condition and an action
    b. Condition: An operator block that tests whether two values and/or variables are equivalent
    c. Action: A looks block that says “You win!” for 2 seconds]

Exemplar response(s)

If [answer] = [4] then

Scoring Guidance

- "answer", "4" or "4", "answer" = 1; anything else=0
- "answer" and "4" are interchangable

Rubric(s)

None

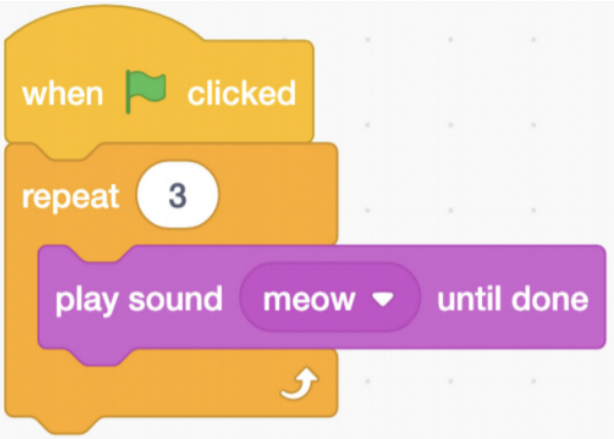
#08

Meta-data

- Item code: R.03.c
- Trajectory: Repetition

Item

8) Describe what will happen when the green flag is clicked.



Alt Text Description: [A script displays blocks in the following order:

1. Event block: when the green flag is clicked
2. Control block:
    a. This repetition loop control block, which repeats 3 times, contains one block
        i. Sound block: plays sound “meow” until done]

Exemplar response(s)

The meow sound will play three times.

Scoring Guidance

- Indicates that meow will play 3 times = 1; anything else = 0.
- Student might not clearly indicate the the *sound* is being repeated 3 times. If they are not clear it doesn't get credit (e.g., "it will repeat 3 times and play sound meow" = 0).

Rubric(s)

None

#09

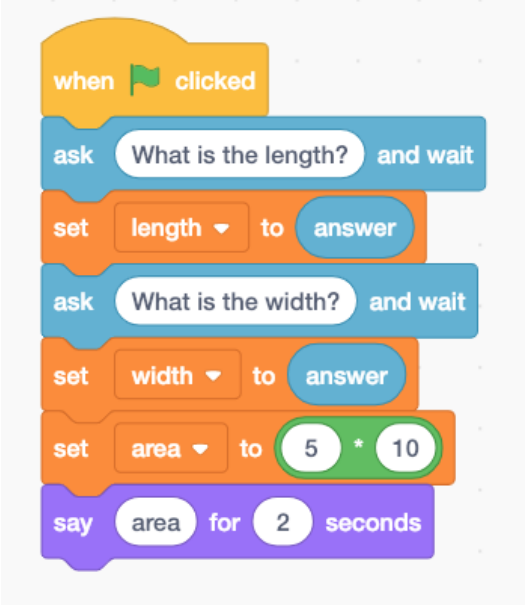
Meta-data

- Item code: V.07.c

- Trajectory: Variable

Item

9) Helena wrote this code.
How would you change the code so that it would use the user input for length and width of a rectangle to calculate the area of that rectangle?



Alt Text Description: [A script displays blocks in the following order:

1. Event block: when the green flag is clicked
2. Sensing block: asks user to input a value (asks “What is the length”?)
3. Variable block: sets a variable named length to the user input value
4. Sensing block: asks user to input a value (asks “What is the width”?)
5. Variable block: sets a variable named width to the user input value
6. Variable block: sets a variable named area equal to the product of two variables (which contain the values 5 and 10)
7. Looks block: say the value of the area variable for 2 seconds]

Exemplar response(s)

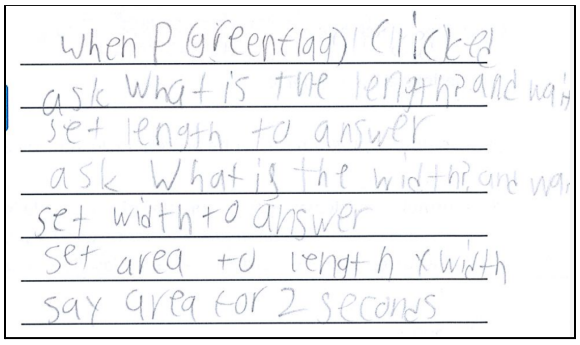
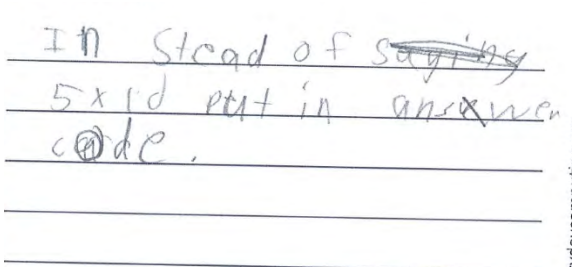
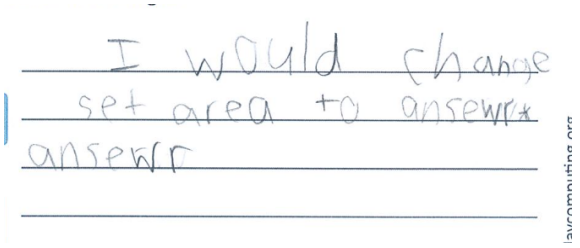
In the block “set area to 5 x 10” I would replace the 5 with the length variable and the 10 with the width variable.

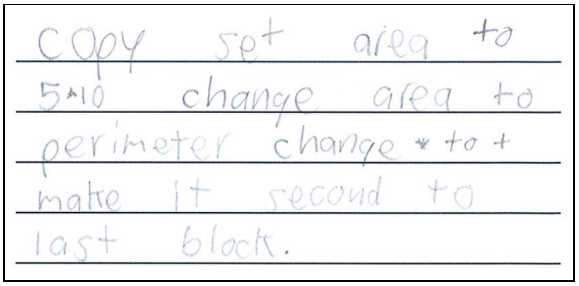
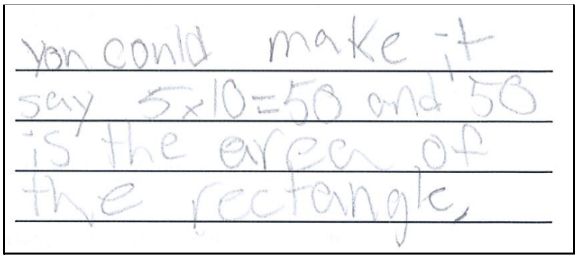
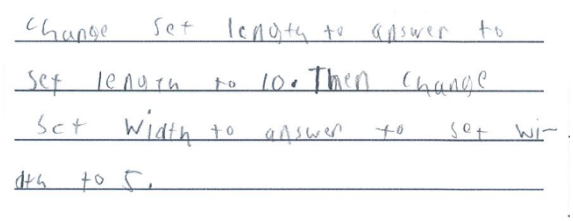
Scoring Guidance

See Rubric

Rubric(s)

This rubric allows partial credit to allow for student responses that seem to demonstrate some understanding and ability to modify existing code to replace constants with variables, even if they did not replace all constants correctly.

	Description	Example
2	Replaces each value (5 & 10) with a different variable (width and length)	 Alt Text Description:[The student writes: when green flag clicked, ask what is the length and wait, set length to answer, ask what is the width and wait, set width to answer, set area to length*width, say area for 2 seconds.]
1	Replaces one value (5 or 10) with a variable (width, length), or replaces one or both values (5 and/or 10) with the answer variable	 Alt Text Description:[The student writes: instead of 5*10 put in answer code.]  Alt Text Description:[The student writes: I would change set area to answer*answer.]

0	Anything else	 Alt Text Description:[The student writes: copy set area to 5*10, change area to perimeter, change * to +, make it second to last block.]  Alt Text Description:[The student writes: you could make it say 5*10=50 and 50 is the area of the rectangle.]  Alt Text Description:[The student writes: change set length to answer to set length to 10. Then change set width to answer to set width to 5.]

#10

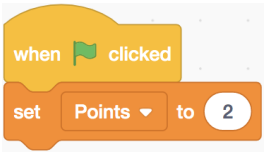
Meta-data

- Item code: V.13.a
- Trajectory: Variable

Item

10)

A. You run this code:



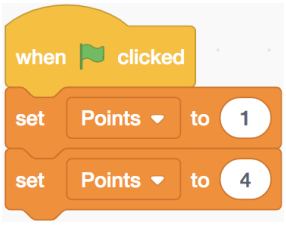
Alt Text Description: [A script displays blocks in the following order:
1. Event block: when the green flag is clicked
2. Variable block: sets a variable named points to 2]

- What is the value in 

Alt Text Description: [a variable reporter block named points]?
- What value is 

Alt Text Description: [an operator block displaying points + 5]?

B. You run this code:

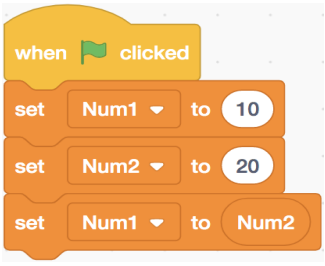


Alt Text Description: [A script displays blocks in the following order:
1. Event block: when the green flag is clicked
2. Variable block: sets a variable named points to 1
3. Variable block: sets a variable named points to 4]

- What is the value in 

Alt Text Description: [a variable reporter block named points]?

C. You run this code:



Alt Text Description: [A script displays blocks in the following order:
1. Event block: when the green flag is clicked
2. Variable block: sets a variable named num1 to 10
3. Variable block: sets a variable named num2 to 20
4. Variable block: sets a variable named num1 to num2

- What is the value in 

Alt Text Description: [a variable reporter block named num1]?
- What is the value in 

Alt Text Description: [a variable reporter block named num2]?

Exemplar response(s)

A.
- 2
- 7

B.
- 4

C.
- 20
- 20

Scoring Guidance

Correct answers = 2,7,4,20,20.
While we provide the correct answers, the decision about how to calculate a score(s) for this item is left up to the end user. The entire item could be scored overall (i.e., 1 score on the item), each part (a, b, c) could be scored separately (i.e., 3 scores on the item), or each response could be scored separately (i.e., 5 scores on the item).

Rubric(s)

None