Name:_____ Date:_____
Geometry Band:_____

# Unit 2: Reasoning and Proof

*Instructions*: Choose one performance task. Write all your work on a separate clean piece of paper and attach it to this page.

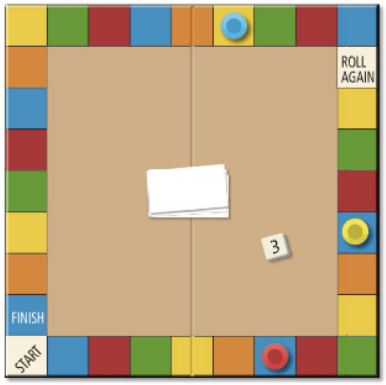
**Big Idea**: Reasoning and Proof
You can observe patterns to make a conjecture; you can prove a conjecture is true by using given information, definitions, properties, postulates, and theorems.

## Performance Task 1

You have the yellow game piece, your friend has the red game piece, and your brother has the blue game piece. Read the rules of the board game and then answer the questions.

Rules:

- You play counterclockwise.
- If you land on red, then you go back 1.
- If you land on green, then you advance 1.
- If you land on yellow, then you pick a card.




a. You roll 3. What must you do next? How do you know?
b. Your brother picks a card at the end of his turn. On what colors might he have landed? Explain.
c. Your friend rolls 2. What else must your friend do? How do you know?
d. Based on the colors already shown on the board, what color should the roll-again box be? Justify your answer.

## Performance Task 2

Consider the pattern at the right.

The sum of the numbers 1–10 is 55.
The sum of the numbers 11–20 is 155.
The sum of the numbers 21–30 is 255.

a. What is the sum of the numbers 31-40?
b. What is the sum of the numbers 101-110?
c. What kind of reasoning did you use in parts (a) and
d. Following is the development of a formula for the sum of $n$ consecutive integers. Use the formula to find the sum of the numbers 101-110.

$$S = x + (x + 1) + (x + 2) + \ldots + (y - 2) + (y - 1) + y$$ The sum of $n$ integers from $x$ to $y$

$$+\quad S = y + (y - 1) + (y - 2) + \ldots + (x + 2) + (x + 1) + x$$ The same sum in reverse order

$$2S = (x + y) + (x + y) + (x + y) + \ldots + (x + y) + (x + y) + (x + y)$$ Add the equations.

$$2S = n(x + y)$$ There are $n$ terms of $(x + y)$.

$$S = \frac{n(x + y)}{2}$$ Divide each side by 2.

Use the formula to find the sum of the numbers 101-110.

e. What kind of reasoning did you use in part (d)?

# Performance Task Assessment: Analytic Holistic Scoring

### Developing Autonomy—The student

| | |
|---|---|
| 3 | Persevered to complete the problem without help |
| 2 | Completed most of the problem without help |
| 1 | Needed key hints to complete the problem |
| 0 | Needed extensive guidance to work the problem |

### The Solution Process—The student's work showed

| | |
|---|---|
| 3 | A complete and appropriate solution process |
| 2 | An appropriate solution process that is almost complete |
| 1 | An appropriate process that is partially complete |
| 0 | An inappropriate process or no evidence of a process |

### The Conclusion/Answer—The student's answer is an

| | |
|---|---|
| 3 | Accurate conclusion, supported by valid evidence and reasons, appropriate to this problem and context |
| 2 | Inaccurate but logical conclusion, supported by evidence and reasoning but incorrect due to a minor factual error (in details of problem, in computation, recall a formula, etc.) or minor mistake in reasoning |
| 1 | Inaccurate but logical conclusion that overlooks, or gets wrong significant facts (about the problem, the rule, computation, etc.) |
| 0 | Inappropriate conclusion: not supported by facts and logic, or there is no conclusion |

**Teacher Comments:**