

Jellybeans in a Bag

Jane has a bag of red, blue and green jellybeans. First she reached in the bag and pulled out a red jellybean. The 2nd jellybean she pulled out was blue. The 3rd jellybean she pulled out was green. The 4th jellybean she pulled out was red. If this continues, what do you think the 11th jellybean will be? Show all your math thinking.

Jellybeans in a Bag

Suggested Grade Span

Pre K–2

Grade(s) in Which Task was Piloted

Grade 2

Task

Jane has a bag of red, blue and green jellybeans. First she reached in the bag and pulled out a red jellybean. The 2nd jellybean she pulled out was blue. The 3rd jellybean she pulled out was green. The 4th jellybean she pulled out was red. If this continues, what do you think the 11th jellybean will be? Show all your math thinking.

Alternative Versions of Task

More Accessible Version:

Jane has a bag of red and blue jellybeans. First she reached in the bag and pulled out a red jellybean. The 2nd jellybean she pulled out was blue. The 3rd jellybean she pulled out was red. If this continues, what color do you think the 11th jellybean will be? Show all your math thinking.

More Challenging Version:

Jane has a bag of red, blue and green jellybeans. First she reached in the bag and pulled out a red jellybean. The 2nd jellybean she pulled out was blue. The 3rd jellybean she pulled out was green. The 4th jellybean she pulled out was also green. The 5th jellybean she pulled out was red. If this continues, what color do you think the 16th jellybean will be? How many of each color did Jane pull out of the bag after the 16th time? Show all your math thinking.

NCTM Content Standards and Evidence

Algebra Standard for Grades Pre K–2

Instructional programs from pre-kindergarten through grade 12 should enable students to —

- Understand patterns, relations and functions
 - *NCTM Evidence:* Recognize, describe and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another
 - *Exemplars Task Specific Evidence:* This task requires students to recognize and extend an A, B, C pattern.

Time/Context/Qualifiers/Tip(s) From Piloting Teacher

This task is considered a medium length task in that it took my students one class period in which to complete the task.

Links

This task may complement activities during Easter.

Common Strategies Used to Solve This Task

Most students drew representations of jellybeans labeling them with a color. They would go back periodically and count the jellybeans till they reached 11.

Possible Solutions

Original Version:

The pattern is an A,B,C pattern. Red, Blue, Green, Red, Blue, Green, Red, Blue, Green, Red, Blue. The 11th jellybean is blue.

More Accessible Version:

The pattern is an A,B pattern. Red, Blue, Red, Blue, Red, Blue, Red, Blue, Red, Blue, Red. The 11th jellybean is red.

More Challenging Version:

The pattern is an A,B,C,C pattern. Red, Blue Green, Green. Red, Blue Green, Green. Red, Blue Green, Green. Red, Blue Green, Green. The 16th jellybean is green. There are 4 red jellybeans, 4 blue jellybeans and 8 green jellybeans

Task Specific Assessment Notes

General Notes

You may want to have red, blue and green blocks within sight if any students need more tangible representations. Encourage these students to somehow transfer their representation to paper.

Novice

The Novice will not recognize that a pattern needs to be followed. No math language will be used and diagrams created will not lead toward a solution.

Apprentice

The Apprentice will have a partially correct solution. The student may start out with the correct pattern, but will fail to continue the pattern successfully or not be able to stop the pattern correctly.

Practitioner

The Practitioner will be able to continue the correct pattern to the 11th jellybean. The student will have an appropriate and accurate mathematical representation. A sense of audience and purpose is communicated.

Expert

The Expert will have everything the Practitioner has but will be able to identify the pattern as an A, B, C pattern or may extend the problem to determine the total number of red, blue and green jellybeans that were used.

No strategy is chosen that will lead to a solution.

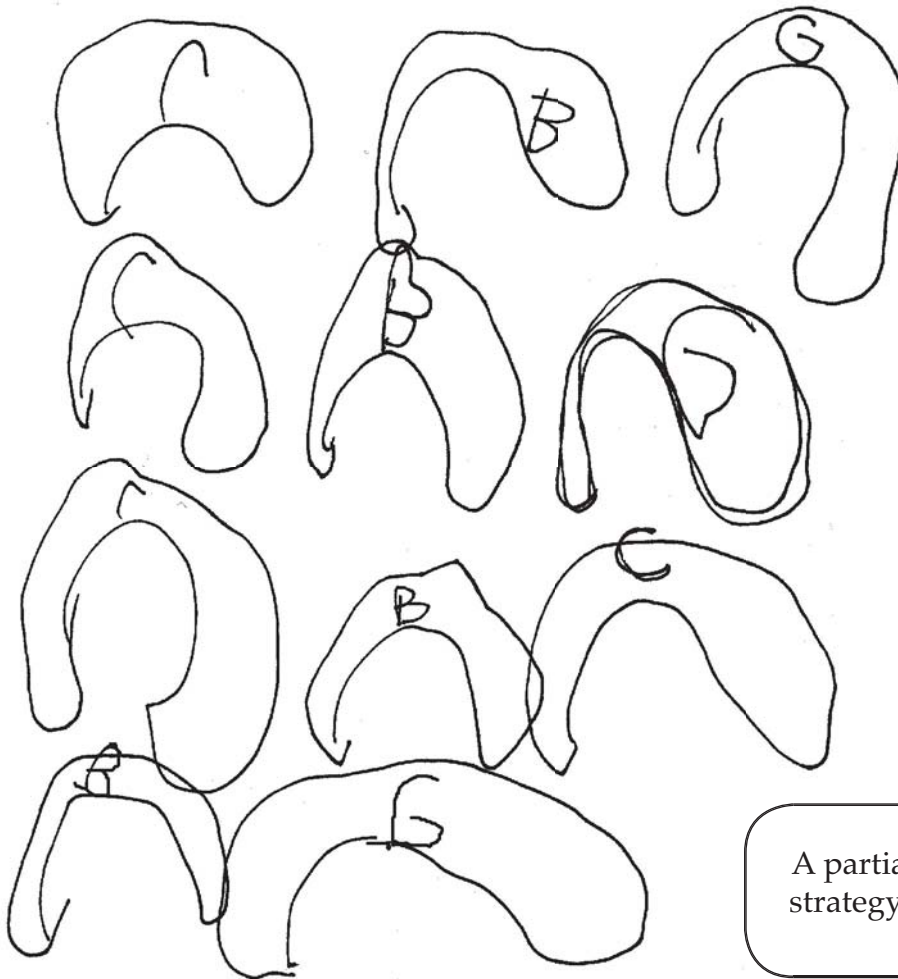


No correct reasoning or justification for mathematical reasoning is present.

Apprentice

Although a correct answer is given, the justification for the reasoning is flawed.

The student starts with the correct pattern, but loses that pattern in the second row.



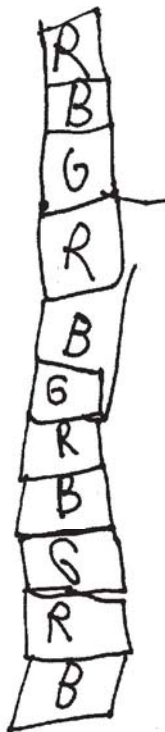
A partially correct strategy is chosen.

Practitioner

A systematic approach and correct reasoning is present.

key
R-Red
B-Blue
G-green

A correct strategy is chosen.



Appropriate and accurate mathematical representation is constructed and labeled.

11th cube
is blue

next is
Green-12th

The student extends the solution to the next jellybean.

Evidence of analyzing the situation in mathematical terms and connecting to prior knowledge is present when the A, B, C pattern is recognized.

I will do a Diagram first
da net's jelly beans



KEY

r = red

b = blue

g = green

The 11th bean
was blue. The
12th bean will
be green. That
ends the pattern

A mathematical representation is constructed to analyze relationships, and extend thinking to the 12th jellybean.

9 Yaddfg

Expert cont.

Jelly bean	1	2	3	4	5	6	7	8	9	10	11
color	r	b	g	r	b	g	r	b	g	r	b

Pattern
r, b, g, r, b, g

11th is b on my table to
It is a abc pattern