

Math Domain

- Number/Quantity
- Chance/Data
- Shape/Space
- Arrangement
- Function/Pattern

Math Actions (possible weights: 0 through 4)

- 2 Modeling/Formulating
- 2 Inferring/Drawing Conclusions
- 1 Manipulating/Transforming
- 2 Communicating

Math Big Ideas

- Scale
- Continuity
- Equivalence
- Use of Limits
- Reference Frame
- Boundedness
- General/Particular
- Approximation
- Representation
- Invariance/Symmetry
- Contradiction
- Other

The intent of this task is to have student demonstrate their ability to reason logically in a simple situation modeled by discrete mathematics.

Pre-activity: Certainly taking two socks out of the drawer is not enough to guarantee a pair, since you might get one brown and one white sock; but the third sock drawn, whether brown or white, is guaranteed to create a match.

1. The situation is exactly the same as the pre-activity and is independent of the number of socks of each color; so three socks will guarantee a match.
2. If seeking a red pair, the worst case scenario is that all eight blue socks are drawn before you get two reds. Thus, it is necessary to draw ten socks to be sure of getting a red pair.
3. If you begin by drawing three socks out of the drawer, there is guaranteed to be a pair (see question 1) plus one extra sock. Again by the results in 1, taking the leftover sock and drawing two more socks guarantees another pair; so by drawing five socks you are guaranteed to have two matched pairs.
4. This question calls for a generalization of the results of 1. With the addition of the third color, drawing three socks isn't enough, as you might get one red, one blue, and one green. By taking a fourth sock you are sure to have a match.

	partial level	full level
Modeling/ Formulating (weight: 2)	Devise an appropriate counting scheme for any two of questions 1-3.	Devise an appropriate counting scheme for questions 1-3 and correctly generalize to the three-color situation in 4.
Transforming/ Manipulating (weight: 1)	Arrive at correct numerical answers for some of the questions.	Correctly carry out the counting schemes to arrive at correct numerical answers for all questions.
Inferring/ Drawing Conclusions (weight: 2)	Use the results from 1 to solve the more general problem in 4.	Successfully apply the results from 1 and 2 to the more complex situations in 3 and 4.
Communicating (weight: 2)	Communicate the numerical answers clearly and give a limited explanation in 3 and 4.	Communicate numerical answers clearly and display evidence that supports the answers to 3 and 4.