



Try these problems before watching the lesson.

1. I have five different colors of paint. In how many different ways can I choose one color for my walls and a different color for the trim?
2. I have five marbles, each with a different color. In how many different ways can I choose two of these marbles to give to my sister as a birthday present?
3. What is the difference between the first two problems?
4. In how many ways can six different gifts be given to six different children with each child receiving at least one gift and each gift being given to exactly one child?
5. In one roll of three standard, six-sided dice, what is the probability of rolling three different numbers? Express your answer as a common fraction in simplest form.




First Problem: In how many ways can six different gifts be given to five different children with each child receiving at least one gift and each gift being given to exactly one child?

Second Problem: In one roll of four standard, six-sided dice, what is the probability of rolling exactly three different numbers?

 Follow-up Problems

6. How many four-digit numbers have exactly three identical digits?
7. How many five-digit numbers have exactly one zero?
8. My class has seven girls and two boys. In how many different ways can the nine students sit in a row of ten chairs if the two boys insist on sitting in adjacent chairs?
9. A *palindrome* is a number that reads the same forwards as backwards, such as 345676543. How many 7-digit palindromes are there?
10. What was Richard talking about when he said that this month's problems are essentially the same problem but with the numbers changed? How can you rewrite the second problem to be the same problem as the first problem, but with the numbers changed?

 Share Your Thoughts

Have some thoughts about the video? Want to discuss the problems on the Activity Sheet? Visit the MATHCOUNTS Facebook page or the Art of Problem Solving Online Community (www.artofproblemsolving.com).