STATS
COUNTING TECHNIQUES REVIEW

1. Make a tree diagram to show the possible necklaces from these choices: 28 in., 30 in., or 32 in. long; gold or silver finish; with all blue stones, all red stones, or all green stones.

One format for making license plates is to use two letters followed by four digits. For Questions 2 and 3, how many different license plates are possible for each situation?

2. Zero cannot be the first digit and repeats are allowed.
3. Zero cannot be the first digit and repeats are not allowed.
4. There are spaces for 10 bicycles in the rack next to the library. One afternoon 15 people who rode bicycles were there at the same time. Write a mathematical expression for determining the number of ways the bicycles could be arranged in the rack.

6-1

5. The math club has 7 members: 3 boys and 4 girls. One boy and one girl must be chosen to represent the school at a statewide math contest. In how many ways can the choice be made?
6. In how many ways can you form a numeral between 400 and 999 using only the digits 2, 3, 5, 6, 7, and 8 under each condition?
   a. Any digit may appear more than once.
   b. No digit may be repeated.
7. A ship has 4 different signal flags. How many different signals can be formed using from 1 to 4 of these flags placed vertically along the mast?

6-2

8. A store manager has chosen 7 items to put on sale: one item each week for seven weeks. In how many different ways can the manager choose the order in which the items go on sale?
9. How many four-letter sequences of letters can be formed using the letters of each word, without repeating any letters?
   a. HOUSE **b.** FOLDER

Find the value of each expression. 6-5

10. ${}_5P_3$ **11.** ${}_7C_4$ **12.** ${}_6C_3$ **13.** ${}_8P_2$

Rita wants to choose 4 of her 10 insect specimens to display at the science fair. 6-5

14. In how many ways can the choice of 4 be made?
15. In how many ways can she choose 4 specimens and display them in a row in a glass-topped case?

Find each value using Pascal's triangle. 6-6

16. ${}_8C_1$ **17.** ${}_7C_2$ **18.** ${}_5C_4$ **19.** ${}_6C_6$

Use the binomial theorem to write each power of a binomial in expanded form. 6-9

20. $(x + y)^5$ **21.** $(a - 3)^4$