

Problem Solving Workshop: Mixed Problem Solving

For use with the lessons "Find Probabilities and Odds", "Find Probabilities Using Permutations", "Find Probabilities Using Combinations", and "Find Probabilities of Compound Events"

- 1. Multi-Step Problem** You are ordering a steak dinner with two side dishes. You can choose from the following list: baked potato, mixed vegetables, salad, coleslaw, and applesauce.

- Make an organized list of all the possible side dishes that you can order.
- Use a permutation or combination formula to find the number of possible steak dinners.

- 2. Multi-Step Problem** In NCAA men's basketball tournaments from 1985 to 2004, teams seeded, or ranked, number one have won 266 games and lost 69 games in the tournament. Suppose a team is chosen at random from all those that have been seeded number one.

- What is the probability that the team won a game in the tournament?
- What are the odds in favor of the team's having won a game in the tournament?

- 3. Short Response** The table shows the number of males of voting age and the number of these males that are registered to vote according to two age groups.

Age	Population	Number registered
18 to 24	13,960,000	6,731,000
25 to 34	19,401,000	10,184,000

- What is the probability of randomly choosing a registered voter that is between 18 and 24 years old?
 - What is the probability of randomly choosing a registered voter or a person between 18 and 24 years old? *Explain* how this probability is related to the probability you found in part (a).
- 4. Open-Ended** Describe a real-world situation in which the number of possible arrangements is given by ${}_{15}P_3$.

- 5. Gridded Answer** A bowl contains 27 lemon jelly beans and 13 orange jelly beans. You randomly choose a jelly bean, eat it, and randomly choose another jelly bean. What is the probability, in decimal form, that both jellybeans are orange?

- 6. Short Response** You sign up to be in the school's talent show. There will be 4 students in a group in an order chosen at random with the winner moving on to the next round. You are in the first group.

- What is the probability that you are chosen to be the first or second performer on the first day? *Explain* how you found your answer.
- What is the probability that you are chosen to be the third or fourth performer on the first day? *Compare* your answer with that in part (a).

- 7. Extended Response** A survey asked a total of 400 students, 100 male 10-year olds, 100 male 12-year olds, 100 female 10-year olds, and 100 female 12-year olds, about drinking milk. The table shows the number of students who said that they drink milk every day.

	10 years old	12 years old
Male	74	62
Female	78	71

- Find the probability that a male student, chosen at random from the students surveyed, drinks milk every day.
- Find the probability that a 10-year-old student, chosen at random from the students surveyed, drinks milk every day.
- You select a student at random from the students surveyed. Find the odds against the student's drinking milk every day. *Explain* your reasoning.