

Grade Level: 3 – 5 **Content Area:** Probability and Predictions

PA Standard(s) addressed: 2.7.5.1

Find all possible combinations and arrangements involving a limited number of variables

Names:

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NCTM Standard(s) Addressed:

Data Analysis and Probability

Problem Name: Tom's Vacation

Problem:

Tom is planning a vacation. He will visit Hershey Park, Kennywood Park, or Dorney Park. He will travel by car or bus. He will stay at a hotel or a campground. He must choose a park to visit, a method of transportation, and a place to stay. How many possible combinations are there?

Directions:

Write your answer in the box.

Show all your work to justify your answer.

Answer: _____

Problem Solution(s):

There are 12 combinations.

<u>Vacation</u>	<u>Transportation</u>	<u>Accommodations</u>
1. Hershey Park	Car	Hotel
2. Hershey Park	Bus	Hotel
3. Hershey Park	Car	Camp
4. Hershey Park	Bus	Camp
5. Kennywood	Car	Hotel
6. Kennywood	Bus	Hotel
7. Kennywood	Car	Camp
8. Kennywood	Bus	Camp
9. Dorney Park	Car	Hotel
10. Dorney Park	Bus	Hotel
11. Dorney Park	Car	Camp
12. Dorney Park	Bus	Camp

The student provides written evidence to support his answer. Other strategies offered may be a tree diagram, the fundamental counting principle (for example $3 \times 2 \times 2$), guess and check, etc.

Specific Rubric:

5. Advanced Understanding:

- Correct answer of 12 combinations with all work shown and justified.

4. Satisfactory Understanding:

- Correct answer of 12 combinations with some work shown and justified.

3. Almost Satisfactory Understanding:

- Correct answer of 12 combinations with some steps missing. However, you can follow what is being done.
- Incorrect answer with all work shown and justified having a calculation/procedure error.

2. Partial Understanding:

- Correct answer with few calculations/procedures shown to justify the answer. Too many steps are missing to follow what is being done.
- Incorrect answer with half or more correct calculations/procedures shown. The student either did not proceed far enough or proceeded incorrectly.

1. Minimal Understanding:

- Correct answer of 12 combinations with no work shown.
- No answer or incorrect answer, but the student has provided some of the information critical to the solution. There is some indication that the student has read the item.

0. No Understanding:

- Incorrect answer with incorrect calculations/procedures.
- Incorrect answer with no justification.
- Blank response and/or off-task responses.