Sample Spaces for Compound Events

Spot mistakes, reason, and work backward

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A table, tree, or systematic list can show outcomes. Keep the stage order unless the task says otherwise. If branches differ in size, add their counts: three branches with 2, 4, and 5 leaves give 11 outcomes.

Worked example

Choose an online O or in-person P class, then a day D or evening E time. List the ordered outcomes.

1. Format O gives 2 outcomes: (O, D) and (O, E).
2. Format P gives 2 outcomes: (P, D) and (P, E).
3. The format is first in each pair; $2 + 2 = 4$ outcomes.
Answer: $(O, D), (O, E), (P, D), (P, E)$.

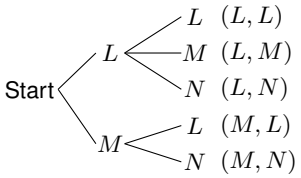
Practice Problems

Show your thinking.

1. A photo booth chooses backdrop L or D, then frame A or B. The proposed table repeats a pair. Identify the missing pair, correct the table, and give the count.

1st / 2nd	A	B
L	(L, A)	(L, B)
D	(D, A)	(D, A)

2. Choose L or M first, then choose L, M, or N, but never repeat the first letter. Cross out the invalid tip on the proposed tree. Give the corrected space and count.



3. Choose jacket size S or L, color W or K, and badge Y or N. A student adds $2 + 2 + 2$ for the number of designs. List the ordered triples and repair the count.

4. Choose two different tiles from J, K, L with no order or roles. A student lists JK and KJ separately. Give all distinct selections and explain the count.

5. A spinner has equal sectors A, A, B; independently choose card U or V with equal chance. A student says all distinct label pairs are equally likely. List the pairs and compare the paths to (A, U) and (B, U).

6. Two ordered spins each give 0 or 2. A student says there are four different sums. List the distinct sums and show which ordered results give the same sum.

Answer Key

1. Replace the repeated (D, A) with (D, B) in row D, column B; 4 outcomes.
2. Remove (L, L); 4 valid outcomes.
3. 8 designs, listed below.
4. JK, JL, KL: 3 selections.
5. $(A, U), (A, V), (B, U), (B, V)$. AU has 2 paths; BU has 1.
6. Sums $0, 2, 4$; $(0, 2)$ and $(2, 0)$ both give 2.

Step-by-Step Solutions

Follow each calculation, then check your own work.

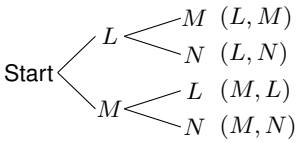
Problem 1

1. Each of the 2 backdrops must pair once with each frame.
2. Row D has (D, A) twice instead of its 2 distinct outcomes. The D, B cell must be (D, B).
3. The corrected total is $2(2) = 4$.

1st / 2nd	A	B
L	(L, A)	(L, B)
D	(D, A)	(D, B)

Problem 2

1. The L branch lists 3 outcomes, but (L, L) repeats the letter and must go.
2. Keep $(L, M), (L, N)$ and $(M, L), (M, N)$: each branch now has 2 outcomes.
3. Count $2 + 2 = 4$ valid outcomes.



Problem 3

1. Size S: (S, W, Y), (S, W, N), (S, K, Y), (S, K, N). Count 4.
2. Size L: (L, W, Y), (L, W, N), (L, K, Y), (L, K, N). Count 4.
3. Each choice combines with each choice at the next stage: $2(2)(2) = 8$, not 6.

Problem 4

1. There would be $3(2) = 6$ ordered draws.
2. Each two-tile selection appears in 2 orders: JK/KJ, JL/LJ, KL/LK.
3. Keep one from each pair of orders: $6/2 = 3$ selections.

Problem 5

1. There are $2(2) = 4$ distinct label pairs, but $3(2) = 6$ sector-card paths.
2. With card U, either of the 2 A sectors gives (A, U).
3. Only 1 B sector gives (B, U) with U; the two label outcomes are not equally likely.

Problem 6

1. $(0, 0)$ gives $0 + 0 = 0$ and $(2, 2)$ gives $2 + 2 = 4$.
2. $(0, 2)$ and $(2, 0)$ give $0 + 2 = 2 + 0 = 2$.
3. So 4 ordered pairs give only 3 distinct sums.

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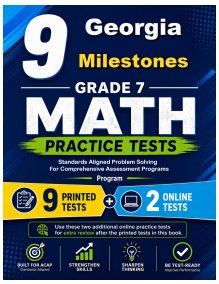

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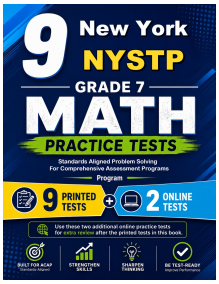

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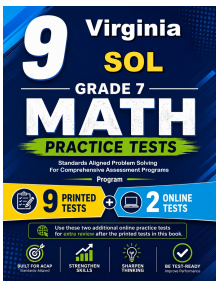

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