6 letter sequences

w/ the letters

A, A, A, U, U, K. _ _ _ _ _ _

① 6 locations for K

② $C(5,2) = \frac{5!}{(5-2)!\,2!} = \frac{5!}{3!\,2!} = \frac{5 \cdot 4 \cdot \cancel{3!}}{\cancel{3!}\,2} = 10$

locations for the two U's once a K has been chosen.

③ This determines the 1 possible location for the three A's,

This sequence of choices satisfies the hypotheses of the multiplication principle, so there are

$$6 \cdot 10 \cdot 1 = 60$$

6 letter sequences.

$$C(5,3) = \frac{5!}{(5-3)!\,3!} = \frac{5!}{2!\,3!} = 10$$

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

K U U A A A

K U A U A A

K U A A U A

K U A A A U

K K U U A A

K A U A U A

K A U A A U

K A A U U A

K A A U A U

K A A A U U

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2 R

4 G

1 L

6 Y

6 O

4 marbles include all red.

R_1 R_2 — —

$$C(n,r) = \binom{n}{r} = \frac{n!}{(n-r)!\,r!}$$

{ u a k e s

3 letters, unordered

$$\binom{6}{3} = \frac{6!}{(6-3)!\,3!} = \frac{6!}{3!3!} = \frac{6\cdot5\cdot4\cdot3!}{3!\cdot3!}$$

$$= \frac{6\cdot5\cdot4}{3\cdot2\cdot1} = 20.$$

{ q, u, a, k, e, s }

How many possible 3-letter words can you make from these letters?

$$P(6,3) = \frac{6!}{(6-3)!} = \frac{6\cdot5\cdot4\cdot3!}{3!} = 120.$$

$$P(n,r) = \frac{n!}{(n-r)!}$$

How many 6-letter words possible?

$$P(6,6) = \frac{6!}{(6-6)!} = \frac{6!}{0!} = 6!$$