

Nov. 7 worksheet

$$\text{prob} \Rightarrow \frac{\text{fav. outcome}}{\text{total possible}}$$

1. fav.  $\frac{2 \cdot 10 \cdot 10 \cdot 1}{\substack{\text{greater} \\ \text{than 7}}} = 200$   
3 at end

total possible:  $\frac{9 \cdot 10 \cdot 10 \cdot 10}{\substack{\text{can't be} \\ \text{zero}}} = 9000$

prob:  $\frac{200}{9000} = 0.022 = 2.2\%$

2. fav. (only children)  $\frac{6 \cdot 5 \cdot 4 \cdot 3}{\text{children}} = 360$

total possible (anyone can win)  $\frac{21 \cdot 20 \cdot 19 \cdot 18}{\text{anyone can win}} = 143640$

or  $\frac{{}_6P_4}{{}_{21}P_4} = \frac{360}{143640} = 0.0025 = 0.25\%$

3. Total = 9 people

Stand together  $\frac{3! \cdot 7!}{7!} = 3! \cdot 7! = 30240$

Total 9 people  $\Rightarrow 9! = 362880$

prob of standing together  $\frac{30240}{362880} = 8.3\%$

# ways not together  $9! - 3! \cdot 7! = 332640$

$\frac{332640}{362880} = 91.7\%$

$100\% - 8.3\% = 91.7\%$   
 NOT together

4. \* choosing (no order) = combination

$$\text{fav. (3 green marbles)} \Rightarrow 7C_3 = 35$$

$$\text{total possible (any color)} \Rightarrow 11C_3 = 165$$

$$\text{prob} = \frac{35}{165} = 21.2\%$$

5. At least 2 yellow  $\Rightarrow$  cases!

fav 2 yellow 1 blue or 3 yellow

$$5C_2 \cdot 3C_1 + 5C_3 = 40$$

$$\text{Total possible (any color)} \quad 8C_3 = 56$$

$$\text{prob.} = \frac{40}{56} = 71.4\%$$

\* If you are chosen, there's 8 people left & 3 positions (random)

$$\text{fav.} \quad \frac{8C_3}{9C_4} = \frac{56}{126} = 44.4\%$$

total possible

$$7a) 1:5$$

$$b) \frac{1}{6} = 16.7\%$$

$$8. \frac{14 P_2}{15 P_3} = \frac{182}{2730} = 6.7\%$$

$$9. \boxed{MR} \text{ --- } \Rightarrow 2!4! = 48 \text{ fav}$$

$$\text{total possible} \Rightarrow 5! = 120$$

$$\text{prob.} \Rightarrow \frac{48}{120} = 40\%$$

10. 2 vowels, 1 consonant  
from 3, from 4

$$\text{fav. } \frac{3 C_2 \cdot 4 C_1}{7 C_3} = \frac{12}{35} = 34.3\%$$

total.  
(3 from 7)