



**GRADE 12 APPLIED  
UNIT A (&E) PROBABILITY  
PERMS AND COMBS ACTIVITY**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Aim of Activity.** The aim of this activity is to explore permutations and combinations and probability (theoretical and experimental) and expected value.

**Mission.** Your Mission is to collect random data on license plates and do some calculations.

**Activity Instructions.** Provided there are at least 30 cars (ideally) in the parking lot, go to the parking lot and complete the table provided at Appendix 1. (If there are fewer than 30 cars then this activity will be only partially effective). When done complete the calculations below.

**Calculations:**

Calculate the theoretical probability (to nearest whole percent) of having:

- a. all three digits the same [ Prob(3 same) ]
- b. two, and only two, digits the same [ Prob(two same) ]
- c. none of the three digits the same [ Prob(none same) ]
- d. *some* digits the same [ Prob (two or more same) ].

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

[Show work ↓]



**Calculate the Expected Value(s).** Given the Theoretical Probability you calculated, how many licence plates should you **expect** (on average) to have. **Example:** if there is a 25% ( $1/4$ ) chance of an event happening and you try it 80 times, you can *expect* it to happen 20 times. The EV is 20.

- a. number of plates with all three digits the same [  $n(3 \text{ same})$  ]
- b. number of plates with two, and only two, digits the same [  $n(\text{two same})$  ]
- c. number of plates with none of the three digits the same [  $n(\text{none same})$  ]
- d. number of plates with some digits the same [  $n(\text{two or more same})$  ].

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

[Show work ↓]

## ACTIVITY TABLE FOR THE SURVEY

Survey only cars that have the standard format:



**Letter Letter Letter Digit Digit Digit**

→

**Do not** survey (sample) vanity plates, Jets plates, etc.



<b>Category (Event)</b>	<b>Tally (tick marks)</b>	<b>Totals (at end of survey, count the tick marks)</b>	<b>Experimental Probability from your survey [rounded to whole %]</b>
Plates with <b>all three digits</b> the same			
Plates with <b>two and only two</b> digits the same			
Plates with <b>no digits</b> the same.			
	Total Licence Plates Surveyed:		