

### AP Biology Chi-square Practice Problems

1. The age distribution of the Canadian population and the age distribution of a random sample of 455 residents in the Red Lake Village of the Northwest Territories are shown below. Use the chi square test to determine if the age distribution in Red Lake is significantly different ( $p = 0.05$ ) from the general Canadian population.

Age (years)	% of Canadian population	Observed number in Red Lake
Under 5	7.2%	47
5 to 14	13.6%	75
15 to 64	67.1%	288
65 and older	12.1%	45

Outcomes	O	E	O - E	$(O - E)^2$	$(O - E)^2/E$
					$\Sigma =$

Conclusion =

2. Using binoculars, volunteers observed feeding habits of a random sample of 320 deer, as shown below. Use chi square to test the hypothesis that the natural distribution of plants fits the deer feeding pattern.

Observed Feeding Area	Plant Composition in Area	Observed # of Deer Feeding in Area
Area A	32%	102
Area B	38.7%	125
Area C	12%	43
Area D	9.3%	27
Area E	8%	23

Outcomes	O	E	O - E	$(O - E)^2$	$(O - E)^2/E$
					$\Sigma =$

Conclusion =

3. The Fish and Game Department stocked Lake Lulu with fish in the following proportions: 30% catfish, 15% bass, 40% bluegill, and 15% pike. Five years later, they sampled 500 fish in the lake to see if the distribution of fish had changed, as shown below. Use the chi square test to determine if the distribution of fish changed significantly ( $p = 0.05$ ) in the 5-year interval.

Catfish = 120, Bass = 85, Bluegill = 220, Pike = 75

Outcomes	O	E	O - E	$(O - E)^2$	$(O - E)^2/E$
					$\Sigma =$

Conclusion =