(4) Example 1-B: Mars Incorporated the maker of skittles claims that there should be an equal distribution of flavors. Since there are 5 flavors in each package, each flavor should represent ___ % of the total bag. Does your bag support their claim? (Show all steps below)

H_0: The distribution of candy colors is as the manufacturer claimed; uniform (all occur with frequency 1/5).
H_A: The distribution is not what the manufacturer claims it to be.

A0 Data are counts.
C0 (Are they?) We have categorical data (counts).
A1 Individuals/data independent.
C1 SRS and *n* < 10% population. We have a random sample of Skittles (we think) and 59 < 10% of all candies.
A2 Sample large enough
C2 All expected counts ≥ 5. We expect 11.8 ≥ 5 of each color to be in the bag.

Because the conditions are satisfied I'll use a χ^2 model with 5 – 1 = 4 degrees of freedom and do a chi-square goodness-of-fit test.

Flavor/Color	Observed Counts	Expected Values (#obs.*hyp.prop.)	Residuals (Obs - Exp)	(Residuals)^2 (Obs - Exp)^2	Component (Obs - Exp)^2/Exp	
Lime/Green	11	11.8	-0.8	0.64	0.054	
Grape/Purple	16	11.8	4.2	17.64	1.495	
Lemon/Yellow	11	11.8	-0.8	0.64	0.054	
Orange/Orange	11	11.8	-0.8	0.64	0.054	
Strawberry/Red	10	11.8	-1.8	3.24	0.275	
Sum	**59**				**1.932**	**= χ^2**
degrees freedom (*# of cells* - 1)	4					