Name _____ Date _____
AP Biology Mr. Collea

M&M's Statistics

Bozeman Science: Pre-Lab Chi-Square Video Sheet

www.bozemanscience.com/chi-squared-test

1. Label what each element represents in the Chi-square formula: $X^2 = \sum \frac{(o - e)^2}{e}$

2. Why do you use the Chi-Square Test?

_____

_____

3. Define the Null Hypothesis.

_____

_____

4. What is the whole point or cool thing about Chi-Square?

_____

_____

_____

5. What is the whole point of a Chi-Square test?

_____

_____

6. What is the definition of and how do you calculate the "**Degrees of Freedom**"?

_____

_____

7. What is the ***probability*** (**p value**) we will always us in this class (*AP Biology at NSU*)?
_____

8. What does a ***probability*** (**p value**) of **.05** actually mean?

_____

_____

_____

_____

9. What happens if you get a Chi-Square **HIGHER** than your critical value?

_____

10. What happens if you get a Chi-Square **LOWER** than your critical value?

_____

11. Complete the Chi-square question Paul Andersen uses as an example involving coin flipping.
(a) State your **null hypothesis** (H_o) for this problem:

_____

_____

(b) Fill in the data table to the right with the sample data Mr. Andersen gives you and then solve.

Please <u>SHOW ALL WORK</u> in the space below.
(***<u>E</u>****quation –* ***<u>S</u>****ubstitute –* ***<u>A</u>****nswer = ESA*)

	Heads	**Tails**
Expected		
Observed		

(c) What is the ***probability*** (**p value**) we will use in this problem and **<u>MOST</u>** problems at NSU?

_____

(d) What is your ***critical value*** for this problem? _____

(e) What is your ***degrees of freedom*** for this problem? _____

(f) What is the Chi-square value you calculated? _____

(g) Is your Chi-square **HIGHER** or **LOWER** than the critical value from the table? _____

(h) Do you ***ACCEPT*** or ***REJECT*** your null hypothesis? _____

What **EXACTLY** does this mean: _____

_____

_____

_____

_____

12. Complete the 2nd Chi-square question Paul Andersen uses as an example involving dice.

(a) State your **null hypothesis** (*Ho*) for this problem:

_____

_____

(b) Fill in the data table below with the sample data Mr. Andersen give you and then solve.

Please <u>SHOW ALL WORK</u> in the space below.
(***<u>E</u>****quation –* ***<u>S</u>****ubstitute –* ***<u>A</u>****nswer = ESA*)

	1	**2**	**3**	**4**	**5**	**6**
Expected						
Observed						

(c) What is your ***critical value*** for this problem? _____

(d) What is your ***degrees of freedom*** for this problem? _____

(e) What is the **Chi-square value** you calculated? _____

(f) Is your Chi-square **HIGHER** or **LOWER** than the critical value from the table? _____

(g) Do you ***ACCEPT*** or ***REJECT*** your null hypothesis? _____

What **EXACTLY** does this mean: _____

_____

_____

_____

_____

13. Complete the 3rd Chi-square question Paul Andersen uses as an example involving pill bugs.

(a) State your **null hypothesis (*Ho*)** for this problem:

_____

_____

(b) Fill in the data table to the right with the sample data Mr. Andersen give you and then solve.

Please <u>SHOW ALL WORK</u> in the space below.
(***<u>E</u>****quation –* ***<u>S</u>****ubstitute –* ***<u>A</u>****nswer = ESA*)

	Wet	**Dry**
Expected		
Observed		

(c) What is your ***critical value*** for this problem? _____

(d) What is your ***degrees of freedom*** for this problem? _____

(e) What is the ***Chi-square*** value you calculated? _____

(f) Is your Chi-square **HIGHER** or **LOWER** than the critical value from the table? _____

(g) Do you ***ACCEPT*** or ***REJECT*** your null hypothesis? _____

What **EXACTLY** does this mean: _____

_____

_____

_____

_____