Math 10 pts		classroc	om Activ	vity 6			Name	e:_	<del> </del>				
Matei	rials N Scale	eeded:	:										
	i <b>ction</b> s Do all		in the m	etric sys	tem								
1.	Memb	ember's Mark claims that there are grams of candy in each bag.											
2. For your bag of candy, measure the following and record.													
	Mass of package (g)			(g)	Mass of wrapper (g)					Mass of candy (g)			
3.	Recor	d the n	umber o	of each a	nima	l in y	our ba	ıg.					
Ape	F	Bear Chimp Elephan		Elephant	t Giraffe Hi		Hippo	po Koala		a	Lion	Penguin	Seal
4.	Gathe	r the m	ass of th	ne candy	fron	n all o	of the	stu	dents	and	record	them in the	ne table.

We will be working with the claimed mass of the candy at this point. Save the animal data for later in the course.

The original claim is that there is a certain amount of candy in each bag. Since a sample of size one is statistically useless, we'll instead test the claim that the mean of our bags is that amount.

5. Summarize the sample

Sample Size, n	Mean, $\overline{x}$	St. Dev, s	SE Mean		

- 6. Write the original claim symbolically.
- 7. The original claim is the (null / alternative) hypothesis.
- 8. Write the null and alternative hypotheses.

 $H_0$ :

 $H_1$ :

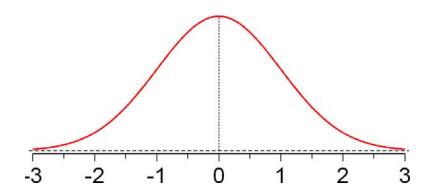
- 9. This is a (left tail / right tail / two tail) test.
- 10. The level of significance is  $\alpha = \underline{\hspace{1cm}}$ .
- 11. The Student's t distribution needs degrees of freedom, which are \_\_\_\_\_.
- 12. The critical value(s) is/are \_\_\_\_\_.
- 13. The test statistic is  $t = \frac{\overline{x} \mu}{SE(\overline{x})}$ , its value is \_\_\_\_\_\_.
- 14. The probability value is \_\_\_\_\_\_.
- 15. The \_\_\_\_\_ % confidence interval is \_\_\_\_\_ <  $\mu$  < \_\_\_\_\_.

16. Complete the following table to demonstrate an understanding of the relationship between the answers questions 9-14. Correctly label four of the values in the table as CV, TS,  $\alpha$ , and p-value.

t-score	area to left*	area to right*	twice smaller area		

<sup>\*</sup>If you have a two tail test, then put the same area for the left and right when finding the critical value.

- 17. Illustrate the diagram as follows
  - a. Draw and label vertical line(s) at the critical value(s)
  - b. Shade and label the critical region
  - c. Label the non-critical region
  - d. Draw arrows and label the area in the critical region and non-critical region. Use  $\alpha$  notation like  $\alpha = 0.05$  or  $1 \alpha = 0.05$ .
  - e. Label the appropriate regions with "Reject  $H_0$ " and "Retain  $H_0$ ".
  - f. Draw and label a vertical line at the test statistic.
  - g. Draw an arrow and label the area beyond the test statistic with the p-value.



- 18. The test statistic ( does / does not ) fall in the critical region, so we ( reject / retain ) the null hypothesis.
- 19. The p-value is ( less / greater ) than the significance level, so we ( reject / retain ) the null hypothesis.
- 20. The confidence interval ( does / does not ) contain the claimed value of the mean, so we ( reject / retain ) the null hypothesis.

21.	The decision is to (reject / retain) the null hypothesis.							
22.	There ( is / is not ) enough evidence to ( reject / support ) the claim that the mean amount of candy in each bag is grams.							
23.	If you change the alternative hypothesis to be a greater than, the p-value will become							
24.	There ( is / is not ) enough evidence to ( reject / support ) the claim that the mean amount of candy in each bag is more than grams.							
25.	Complete the following table regarding p-values and decisions. Assume the one tail area is the area of the smaller of the two tails.							
	one tail area	two tail area	one tail decision	two tail decision				
	0.063		Reject / Retain	Reject / Retain				
		0.078	Reject / Retain	Reject / Retain				
		0.036	Reject / Retain	Reject / Retain				
	0.003		Reject / Retain	Reject / Retain				
26.	Assuming the correct tail is used, a one-tail p-value is always (half/twice) a two-tail p-value.							
	a. If you reject a two-tail test, you will ( never / sometimes / always ) reject a one-tail test.							
	b. If you reject a one-tail test, you will ( never / sometimes / always ) reject a two-tail test.							
27.	Record the combined number of each animal for the entire class. This part will be blank when you turn in the activity.							

Giraffe

Elephant

Bear

Ape

Chimp

Hippo

Koala

Lion

Penguin

Seal