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How to Weigh an Alligator

Teacher Notes

NCTM Standards:

- Understanding numbers and representing numbers

- Understanding patterns, relations, and functions

- Using mathematical models to represent and understand quantitative relationships

- Develop and evaluate inferences and predictions that are based on data

Mathematical Concepts:

- Creating a scatter plot

- Creating the curve of best fit

- Using the curve of best fit to predict different data

- Interpreting the r^2 value

Sample Responses

1. Create a linear model, a quadratic model, an exponential model, and a power model of the data. Record below the equation and the r^2 value of each model.

Model	Equation	r^2 value
Linear	$y = 5.9x - 394.27$	0.84
Quadratic	$y = 0.09x^2 - 11.35x + 411.1$	0.99
Exponential	$y = 3.72(1.04)^x$	0.96
Power Model	$y = 3.6 \times 10^{-5} x^{3.3}$	0.94

Answer the following questions on a separate piece of paper.

2. Based on your results above which model do you believe is the most accurate way to model this data? Provide justification for your choice.

   Various Answers, most will choose Quadratic Model.

3. Using your model find the y – intercept. Explain using words like length and height, what does the y – intercept mean in real life. Does your answer make sense? Explain.

   Y – intercept is 3.73, This does not make sense because a length of 0 inches should result in 0 pounds.

4. Use your model to find the weight of an alligator 100 inches long. Find the weight of an alligator 20 inches long.

   100 inches results in 130.48 pounds, 20 inches results in 7.59 pounds

5. The longest alligator recorded in Florida's Everglade National Park was 17 feet 5 inches (http://www.nps.gov/archive/ever/eco/gator.htm). According to your model how much did the alligator weigh?

6288.43 pounds

6. What limitations does your model have in predicting data?

Various Answers