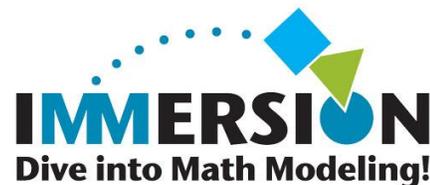


Design A Zoo

Learning Goals



Grade Band	6 – 8
Possible Math Tools	<ul style="list-style-type: none">• Data Analysis• Linear Functions• Data Extrapolation
Real-World Context	Students divide into groups, and each group designs a zoo: it must have more than one exhibit, and students must consider multiple sources of cost. Students may brainstorm one of many different modeling problems: <ul style="list-style-type: none">• How much should we charge for admittance?• How could we reduce an outstanding cost?• How can we design a profitable zoo with limited space?• If we went on a field trip to the zoo, could we learn which exhibits are popular?• Which one is the best investment?
Cross-Curricular Connections	This lesson goes well with a field trip to the zoo, encouraging students to think quantitatively during the trip

Relevant Common Core Standards:

CCSS.MATH.CONTENT.6.RP.A.3

Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

Task: Construct a formula for the cost of a zoo, starting with cost per animal, then cost per exhibit.

CCSS.MATH.CONTENT.6.EE.A.2

Write, read, and evaluate expressions in which letters stand for numbers.

Task: Find the cost and profit of a zoo in which some quantities are unknown. Test different quantities and find the best option.

CCSS.MATH.CONTENT.6.EE.C.9

Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.

Task: Develop a function of cost and revenue against time.

CCSS.MATH.CONTENT.6.SP.B.4

Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

Task: Collect data on the popularity of different exhibits, and use the data to plan which exhibits should get the most focus.

This lesson was developed by Jody Britten, Marka Carson, Misael Jimenez, and Erika Villegas-Jimenez based on Fairfax County Public Schools' Garden Design

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CCSS.MATH.CONTENT.7.RP.A.2

Recognize and represent proportional relationships between quantities.

Task: Construct a generalized cost formula, and test it with specific values.

CCSS.MATH.CONTENT.8.EE.B.5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Task: Graph the cost of a zoo over time. Compare the results of different groups, to find when the cost of one overtakes another.

CCSS.MATH.CONTENT.8.EE.C.8

Analyze and solve pairs of simultaneous linear equations.

Task: Graph the cost of a zoo over time. Compare the results of different groups, to find when the cost of one overtakes another.