



MATHITAT

Overview

Book: *The One and Only Ivan* by Katherine Applegate

Grades 4-6

Ivan knew that the zoo would be a much better home for Ruby and himself because the habitat would be larger and more comfortable. Students will use math to find the area, perimeter, and volume (Gr. 5-6) of spaces. They will then analyze which spaces would be best for a variety of animals. Students will write opinion pieces to defend their choices.

Standards

4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
4.NBT.5	Multiply a whole number of up to four digits by a one digit number. Multiply two two-digit numbers.
5.MD.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
W3-6.1	Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
W3-5.1d	Provide a concluding statement or section related to the opinion stated.
RI.4.1	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

Objectives

Students will find area, perimeter, and volume for a variety of rectangles.

Students will use knowledge of animals to analyze which sized habitat would be best for two characters in the book.

Students will create lists of measurements of rectangles and determine the perimeter and area of these rectangles.

Students will use knowledge of animals to analyze which size of habitat would be best for each animal.

Students will provide facts about a list of animals.

Students will write opinion pieces that provide a concluding statement that defends their choice of habitat for a specific animal.

Materials Required

Paper and pencil

List of measurements for rectangular habitats. Suggestions:

1. 12 ft. x 11 ft.
2. 60 ft. x 80 ft.
3. 20 ft. x 15 ft.
4. 310 ft. 3 ft.
5. 14 ft. x 16 ft.
6. 35 ft. x 25 ft.
7. 212 ft. x 2 ft.
8. 13 ft. x 12 ft.
9. 75 ft. x 40 ft.
10. 395 ft. x 3 ft.

For 5th and 6th graders, add a third measurement for finding the volume.

Procedure

1. Review the formula for finding perimeter and area. Have students solve the eight problems and list both the perimeter and area for each one. For 5th and 6th graders, add another length to represent height and have students find the volume as well.
2. When students have completed the problems, ask them to tell which sized habitat would be best for Ruby. Have them explain why.
3. Which one would be best for Ivan? Why?
4. Give students a list of the following animals: zebra, giraffe, lemur, tarantula, and meerkat or let students create a list of 5 animals on their own. Have students read about the animals and list at least 5 facts for each one.
5. Students should then make up a list of measurements for habitats that would be appropriate for each of the animals on the list. Have students provide the length of the sides, the perimeter, the area, and (volume).
6. Tell students to select either Ivan or Ruby and remember the habitat that they chose for that character. Have them write a paragraph explaining why they chose a particular sized habitat for the gorilla or the baby elephant. Remind students that the paragraph must include a concluding statement.

Extensions

1. Have students draw a plan of the habitat they selected for Ivan or Ruby on to graph paper with a scale of 1 square = 1 foot.
2. Have students create a collage that represents the habitat they selected for Ivan or Ruby. Suggested materials: magazine photos, newspapers, sandpaper, fabric, and tissue paper.
3. Calculate area and perimeter of the various “habitats” in the school. Calculate these measurements for the gym, classroom, library, lunch room, play area, soccer field, office, etc.

Rubric

RUBRIC	Exceeds (3)	Meets (2)	Partially Meets (1)	Does Not Meet (0)
MATH PROBLEMS	All math problems were solved correctly.	Seven to nine math problems were solved correctly.	Four to six math problems were solved correctly.	Less than four math problems were solved correctly.
HABITAT SELECTION	All animals were matched to habitats with appropriate areas and the stated reasons were logical and concise.	Most of the animals were matched to habitats with appropriate areas and most of the stated reasons were logical and concise.	Some of the animals were matched to habitats with appropriate areas and some of the stated reasons were logical.	No animals were matched to habitats with appropriate areas and no reasons were stated or did not make sense.
WRITING	Paragraph was logical and included a concluding statement.	Paragraph was mostly logical and included a concluding statement.	Paragraph contained very little logic and did not include a concluding statement.	Paragraph was not logical and did not include a concluding statement.
REQUIREMENTS	Meets all of the requirements for the project.	Meets most of the requirements for the project.	Meets some of the requirements for the project.	Does not meet the requirements for the project.
DEMONSTRATION OF KNOWLEDGE OF CONTENT IN DISCUSSIONS AND ACTIVITIES	Does a great job showing an understanding of the content covered in class.	Does an okay job with showing an understanding of the content covered in class.	Tries but has a difficult time showing an understanding of the content covered in class.	Does not show an understanding of the content covered in class.
Total	N/15			

STEM Read and SmartSpace@NIU are part of Northern Illinois University's STEAM Works Initiative.

