

MATH ACTIVITIES

Grades: 3-5

Overview: This series of three math activities, *How Much do Panthers Need to Eat?*, *How Many Raccoons?* and *Where are the Deer and Hogs?*, is designed to meet many of the Sunshine State Standards in math and science by using real-life data. Activities cover basic mathematical operations (addition, subtraction, division, multiplication), and decimals, fractions, and percentages. Students are required to analyze and display graphical data and to interpret maps. They are required to use data to make predictions about the health of the panther and the suitability of different environments. They are also asked to justify their reasoning. The activities can be completed as a series or completed separately.

Data on panther's diet and on the abundance of deer and hogs provided by the Florida Game and Fresh Water Fish Commission.

Math Activity 1. How Much Do Panthers Need to Eat?

Sunshine State Standards

Mathematics

Sense, Concepts, and Operations

Standard 1.3 understands concrete and symbolic representations of whole numbers, fractions, decimals, and percents in real-world situations.

Measurement

Standard 1.1 uses concrete and graphic models to develop procedures for solving problems related to measurement including length, weight, time, temperature, perimeter, volume, and angles.

Standard 1.2 solves real-world problems involving length, weight, perimeter, area, capacity, volume, time, temperature, and angles.

Data Analysis and Probability

Standard 2.2 predicts the likelihood of simple events occurring.

Standard 3.2 uses statistical data about life situations to make predictions and justifies reasoning.

Science

How Living things Interact with their Environment

Standard 1.5 knows that animals eat plants or other animals to acquire the energy they need for survival.

The Nature of Science

Standard 1.2 knows that a successful method to explore the natural world is to observe and record, and then to analyze and communicate the results.

Standard 1.4 knows that to compare and contrast observations and results is an essential skill in science.

Math Activity 2. How Many Raccoons?

Sunshine State Standards

Mathematics

Number Sense, Concepts, and Operations

Standard 1.2 understands the relative size of whole numbers, commonly used fractions, decimals and percents.

Standard 1.3 understands concrete and symbolic representations of whole numbers, fractions, decimals, and percents in real-world situations.

Standard 3.2 selects the appropriate operation to solve problems involving addition, subtraction, and multiplication of whole numbers, decimals, and fractions, and division of whole numbers.

Standard 3.3 adds, subtracts, and multiplies whole numbers, decimals, and fractions, including mixed numbers, and divides whole numbers to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

Measurement

Standard 1.2 solves real-world problems involving length, weight, perimeter, area, capacity, volume, time, temperature, and angles.

Data Analysis and Probability

Standard 3.2 uses statistical data about life situations to make predictions and justifies reasoning.

Science

How Living things Interact with their Environment

Standard 1.5 knows that animals eat plants or other animals to acquire the energy they need for survival.

The Nature of Science

Standard 1.2 knows that a successful method to explore the natural world is to observe and record, and then to analyze and communicate the results.

Standard 1.4 knows that to compare and contrast observations and results is an essential skill in science.

Math Activity 3. Where are the Deer and Hogs?

Mathematics

Number Sense, Concepts, and Operations

Standard 3.2 selects the appropriate operation to solve problems involving addition, subtraction, and multiplication of whole numbers, decimals, and fractions, and division of whole numbers.

Standard 3.3 adds, subtracts, and multiplies whole numbers, decimals, and fractions, including mixed numbers, and divides whole numbers to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

Measurement

Standard 1.1 uses concrete and graphic models to develop procedures for solving problems related to measurement including length, weight, time, temperature, perimeter, volume, and angles.

Standard 1.2 solves real-world problems involving length, weight, perimeter, area, capacity, volume, time, temperature, and angles.

Data Analysis and Probability

Standard 3.2 uses statistical data about life situations to make predictions and justifies reasoning.

Science

How Living things Interact with their Environment

Standard 1.5 knows that animals eat plants or other animals to acquire the energy they need for survival.

The Nature of Science






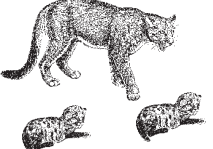
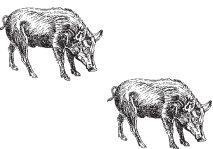
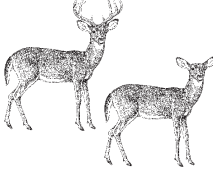
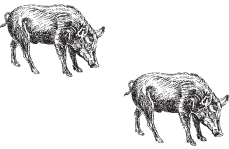

Standard 1.2 knows that a successful method to explore the natural world is to observe and record, and then to analyze and communicate the results.

Social Studies



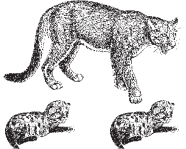









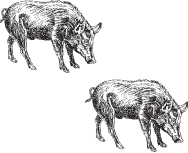


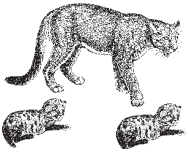
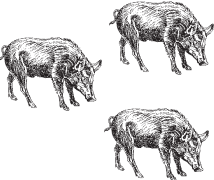
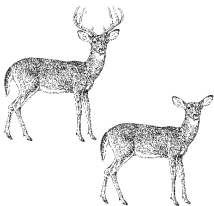
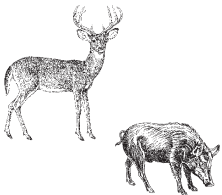
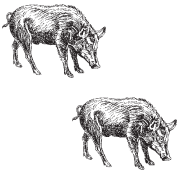
Standard 1.1 uses maps, globes, charts, graphs, and other geographic tools including map keys and symbols to gather and interpret data and to draw conclusions about physical patterns.

How Much Do Panthers Need to Eat?

The sample chart below shows two panthers that are eating enough to be healthy.

	Week 1	Week 2	Week 3	Week 4
 Adult panther	 1 deer	 1 hog	 1 deer	 1 hog
 Adult Female panther with kittens	 2 hogs	 2 deer	 2 hogs	 1 deer, 1 hog

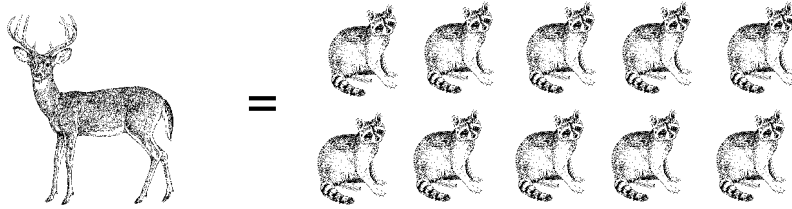
Compare the following chart to the sample chart and try to figure out whether these panthers are likely to be healthy.

	Week 1	Week 2	Week 3	Week 4	Healthy?
 1. Adult male		None	None	None	
 2. Adult female with kittens					
 3. Adult male			No data	No data	
 4. Adult female, no kittens					
 5. Adult female with kittens					

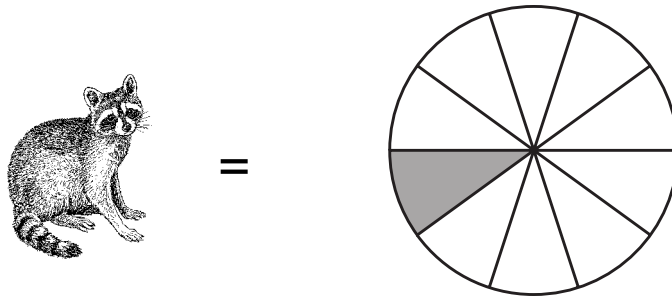
6. Were there any panthers you thought may be healthy, but you weren't sure? If so, which one(s) and why?

How Many Raccoons?

Panthers have to eat 10 raccoons to equal the food value of 1 deer. To be healthy adult panthers need to eat 1 deer each week. Females with kittens need to eat twice this amount.



1 deer = 10 raccoons



1 raccoon = 1/10 deer

I. How many raccoons would a panther have to eat to equal:

1. 2 deer = _____ raccoons

2. 6 deer = _____ raccoons

3. 3 deer = _____ raccoons

4. 5 deer = _____ raccoons

5. 4 deer = _____ raccoons

II. How many deer would a panther have to eat to equal:

1. 20 raccoons = _____ deer

2. 10 raccoons = _____ deer

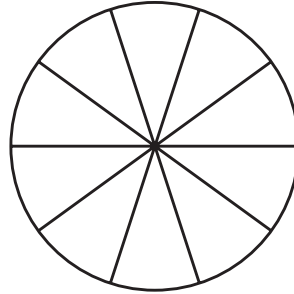
3. 70 raccoons = _____ deer

4. 60 raccoons = _____ deer

5. 40 raccoons = _____ deer

III. What portion of a deer equals: (shade in the circle)

1. 1 raccoon

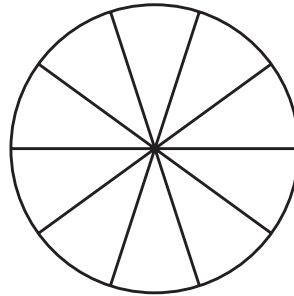


Fraction _____

Percent _____

Decimal _____

2. 3 raccoons

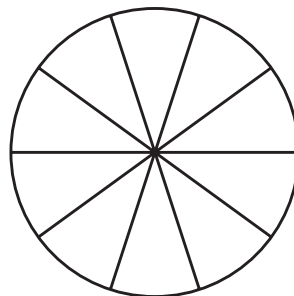
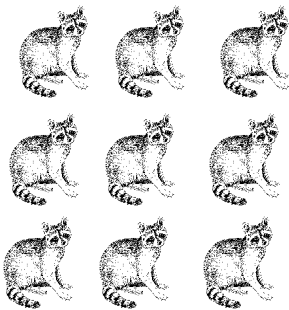


Fraction _____

Percent _____

Decimal _____

3. 9 raccoons



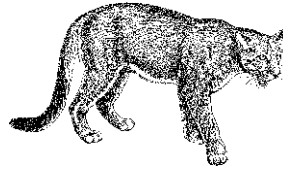
Fraction _____

Percent _____

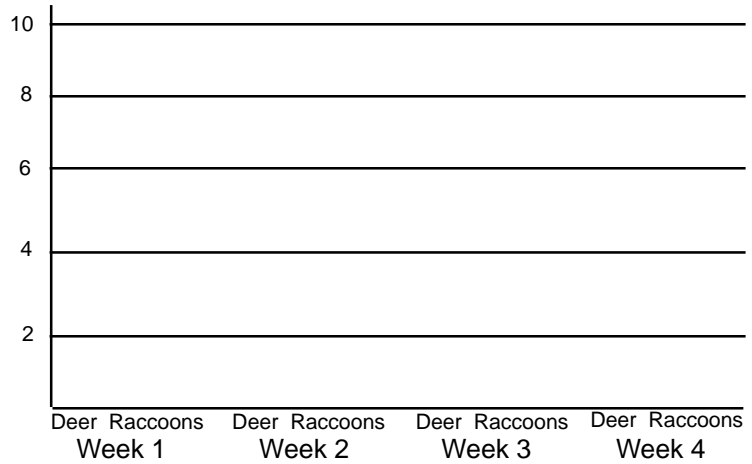
Decimal _____

IV. Challenge

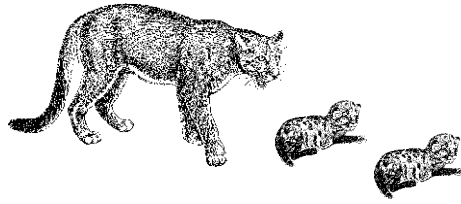
Graph the number of raccoons and deer eaten over a four-week period.



1. Panther 1, adult male
- Week 1 - 1 deer, 5 raccoons
- Week 2 - 10 raccoons
- Week 3 - 1 deer
- Week 4 - 2 deer



Is this panther eating enough to be healthy? _____



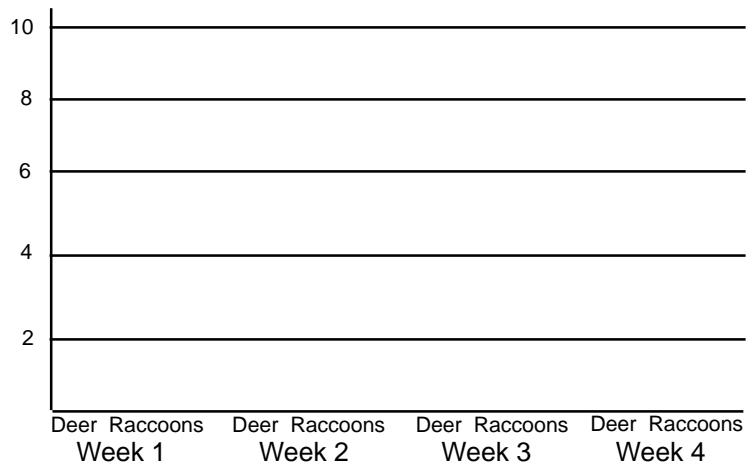
2. Panther 2, adult female
with 2 kittens

Week 1 - 1 deer, 2 raccoons

Week 2 - 2 deer

Week 3 - 5 raccoons

Week 4 - 1 deer, 7 raccoons



Is this panther eating enough to be healthy? _____

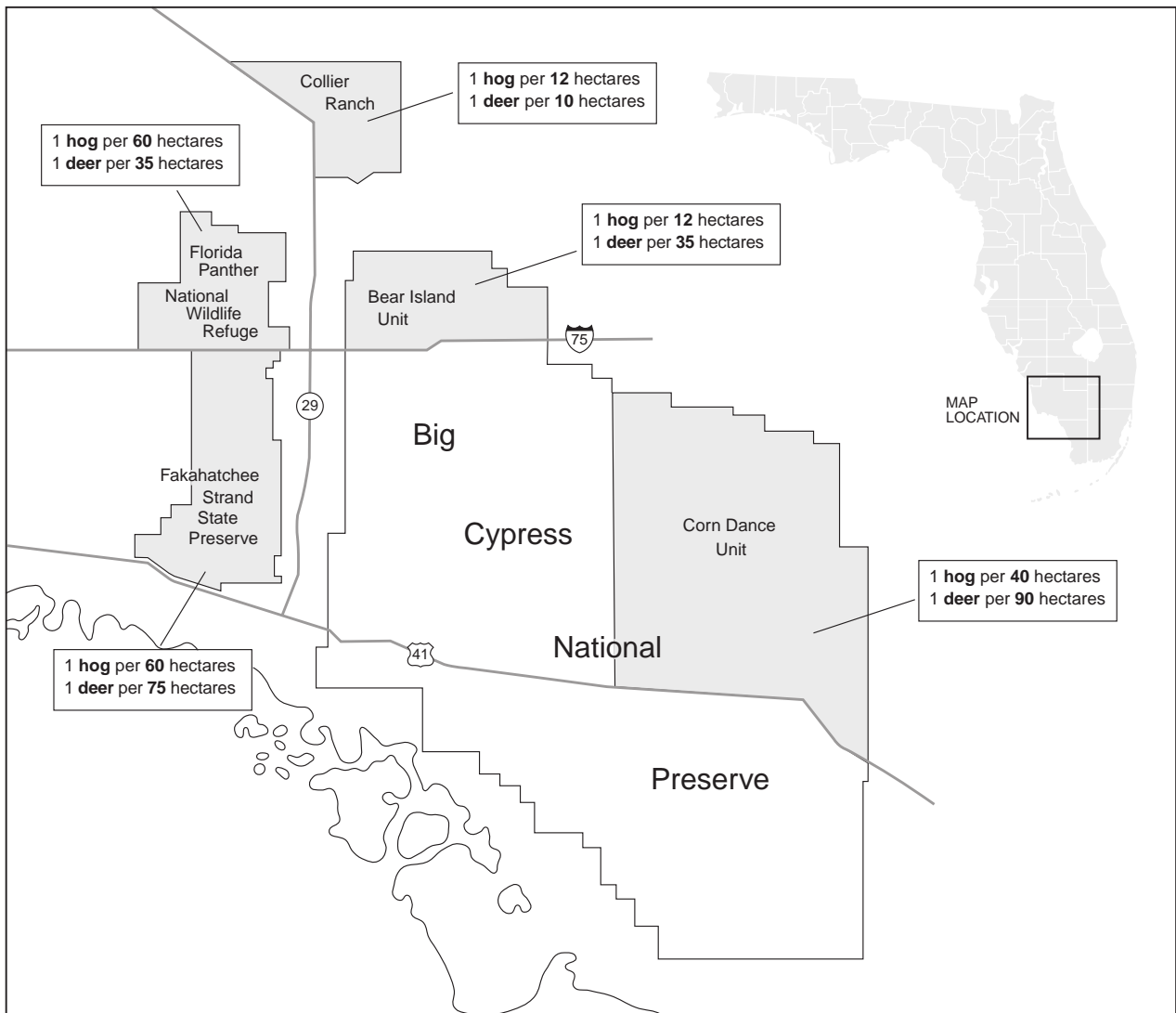
V. Thought/Discussion question.

Do you think there are any advantages of eating deer over raccoons? Or of eating raccoons over deer? Why? _____

Where are the Deer and the Hogs?

Panthers usually thrive if they live where every 40 hectares of land has at least one deer and one hog. Below these densities, panthers may have to expend more energy travelling longer distances to find food and to catch smaller prey. Females may not be able to find enough food to support their kittens. They may have fewer kittens or they may not reproduce at all.

Below is a map of the Florida panther's range showing the estimated density of deer and hogs for different areas. Study the map and answer the questions on the following page.



In which areas are panthers most likely to thrive? _____

In which areas might panthers have difficulty finding enough large prey? _____

Challenge Questions:

Prey density alone doesn't totally explain the location of panthers. What other factors determine where you are most likely to find panthers? _____

What might be done to increase the numbers of deer and hogs so panthers would have more to eat? Do you think increasing the numbers of deer and hog would have other, negative consequences? _____

Answers Math Activities

Activity 1. How Much Do Panthers Need to Eat?

1. no
2. no
3. not enough information
4. no
5. yes

Activity 2. How Many Raccoons?

I

1. 20
2. 60
3. 30
4. 50
5. 40

II

1. 2
2. 1
3. 7
4. 6
5. 4

III

1. $\frac{1}{10}$; 10 percent; .1
2. $\frac{3}{10}$; 30 percent; .3
3. $\frac{9}{10}$; 90 percent; .9

IV

1. yes
2. no

Activity 3. Where are the Deer and Hogs?

In what areas are panthers most likely to thrive? Collier Ranch and Bear Island Unit

In what areas might panthers have difficulty finding enough large prey? Corn Dance Unit, Fakahatchee Strand State Preserve, Florida Panther National Wildlife Refuge