**Lesson Guide: Gazelle vs. Cheetah**

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| **Lesson: Gazelle vs. Cheetah**  **Comparing Rates Graphically – Animal Speeds** | | | |
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| **Time:** 1 day | |  | **Mathematical Practices**  ***Circle or highlight all practices included in lesson***   1. Make sense of problems, and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments, and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for, and make use of, structure. 8. Look for, and express regularity in, repeated reasoning. |
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| **CCS Standards:**  7.RP.2b  7.RP.2c  7.RP.2d | |
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| **Materials:**   * Comparing Rates Graphically Worksheets | | | |
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| **Instructional Procedure:**   * This activity is an informal introduction to slope. The idea is to get students to understand that that a steeper line translates to a greater speed. A formal lesson with the definition of slope should follow this activity. * Discuss the concept of a constant speed. Talk about a car on cruise control or items traveling on an assembly line in a factory. Over short periods of time it is possible for animals to run at a constant speed. * ?? “If a cheetah is running at a constant speed and has traveled a distance of 102.6 feet in 1 second, how far will it run in 2 seconds?” (205.2 feet) * Have students complete the table. * Discuss the numbers in the table. “After 3 seconds, how far has each animal run? Is there a time when the gazelle has run farther than the cheetah? * Discuss the relationship between the time and the distance. (the distance is the speed multiplied by the time) Use this idea to write the equation for each animals distance. (d = 102.6t and d = 73.3t) * “What does a line graph show?” (the trend in data over time) * Have students construct the graph. It may be helpful to use a different color for each animal. * “If the cheetah was not running at a constant speed, would your graph look different?” (yes, the points would not be a straight line) * Discuss the relationship between the speed of the animals and the steepness of the graphs. | | | |
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| **Assessment:**  Question 2 can be done as homework. | | | |

**Gazelle vs. Cheetah: Comparing Rates Graphically**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- | --- |
| **Animal** | **Speed**  **(feet per second)** |  | **Animal** | **Speed**  **(feet per second)** |
| Antelope | 89.5 |  | Giant Tortoise | 0.3 |
| Chicken | 13.2 |  | Grizzly Bear | 44.0 |
| Cheetah | 102.6 |  | Human | 41.0 |
| Coyote | 63.1 |  | Lion | 73.3 |
| Domestic Pig | 16.0 |  | Spider | 1.76 |
| Elephant | 36.6 |  | Squirrel | 17.6 |
| Elk | 66.0 |  | Sloth | 0.2 |
| Gazelle | 73.3 |  | Tuna | 68.9 |

1. A cheetah and a gazelle are running at constant speeds.

1. Find the missing distances to fill in the charts.

|  |  |  |
| --- | --- | --- |
|  | **Cheetah** | **Gazelle** |
| Time (seconds) | **Distance (feet)** | **Distance (feet)** |
| 0 | 0 | 0 |
| 1 | 102.6 |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |

1. Write an equation to show the relationship between each animal’s time and distance.
2. Use the table to complete the line graph for each animal.



1. Which graph is steeper?

The speed of which animal is greater?

1. Choose 3 other animals from the chart.
2. Make a table for each animal similar to the table on the front.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Time (seconds) | **Distance (feet)** | **Distance (feet)** | **Distance (feet)** |
| 0 |  |  |  |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |
| 6 |  |  |  |
| 7 |  |  |  |

1. Write an equation (1 for each animal) to show the relationship between the time and distance.

Animal 3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Animal 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Animal 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Sketch a graph of the distances for each animal.
2. Compare the steepness of the graphs. What can you conclude?