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| **Synopsis of high-quality task:**  Students will create a landscape map for a zoo. The zoo has to meet certain parameters for the animals it is housing. Students will need to calculate the amount of land used (area) and the length of barriers needed (perimeter).  **Anticipated student time spent on task:** One 52-minute period  **Student task structure(s):** Partner work |
| [**Math Content Standards and Practices:**](http://www.doe.mass.edu/frameworks/math/2017-06.pdf)  **5.G.B** Classify two-dimensional figures into categories based on their properties.  **5.G.B.3** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.  **5.G.B.4** Classify two-dimensional figures in a hierarchy based on properties.  **SMP 1** Make sense of problems and persevere in solving them.  **SMP 2** Reason abstractly and quantitatively.  **SMP 6** Attend to precision. |
| **Prior Knowledge:**  **4.G.A** Draw and identify lines and angles, and classify shapes by properties of their lines and angles.  **4.G.A.1** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.  **4.G.A.2** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. |
| **Connections to the real-world:**  Floor Designs and the amount of space that is taken up in a 2-dimensional model. Mapping skills are being utilized as well as visual representation in a model form. |
| **Mastery Goals:**  **Learning Objective:**  Students will be able to apply the concepts of area and perimeter to creating a zoo, while meeting certain criteria.  **Language Objective:**  Students will verbally share their completed zoo design with a peer or teacher. |
| **Teacher instructions**  **Instructional Tips/Strategies/Suggestions:**  Introduction:   * Make sure to go over all the rules explicitly. * Have students utilize Math Reference sheet when applicable.   Strategies and Suggestions:   * Limit time to choose animal enclosures. * Some extra time may be needed if students want to decorate their layout. Possible limited class time or homework extension option. * Can make more difficult for advanced students by introducing the area of other shapes. * Landscaping Extension: Find the area of the entire park and subtract all other areas to identify the area that the landscapers could use. * Fencing Extensions/Ape Escape!: Find the perimeter of the entire park to make sure no more animals leave the zoo. |
| **Instructional Materials/Resources/Tools:**  Include:   * Task Introduction with recording sheet * Graphic organizer for organizing and showing work * Grid for floor layout with key * TASK Completion Checklist |
| **Accessibility and Supports:**  **Potential sentence starters:**  I can \_\_\_\_\_\_\_ to find the area.  The perimeter goes….  **Key academic vocabulary:** area, perimeter |

**TASK Introduction**

Your task is to design a floor plan/layout for a zoo. You have to follow the rules below in order to keep the animals happy and healthy as well as keep the zoo up and running.

1. The elephant enclosure cannot be next to the lion’s den. The elephants must have the largest area.
2. The flamingo lagoon must be in the shape of a rectangle.
3. The monkey jungle has to have an area of 60 meters squared.
4. The zebra enclosure needs to have a perimeter of 24 meters.
5. All walkways and sidewalks need to reach all enclosures.
6. All walkways and sidewalks are 1 meter in width.
7. There must be at least 7 animal enclosures.

**Registry of Animal Enclosures**

Please list the animals in the enclosure, identify the shape of the enclosure, the enclosure perimeter and the enclosure area. The color will be important in identifying the enclosures on the floor design and will be shown on the key. It is important to note that each box on your floor design plan represents a 1 meter by 1 meter.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Color | Animals | Shape? | Perimeter in meters | Area in meters squared |
|  | Elephants |  |  |  |
|  | Lions |  |  |  |
|  | Flamingos |  |  |  |
|  | Monkeys |  |  |  |
|  | Zebras |  |  |  |
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**Sidewalks and Walkways**

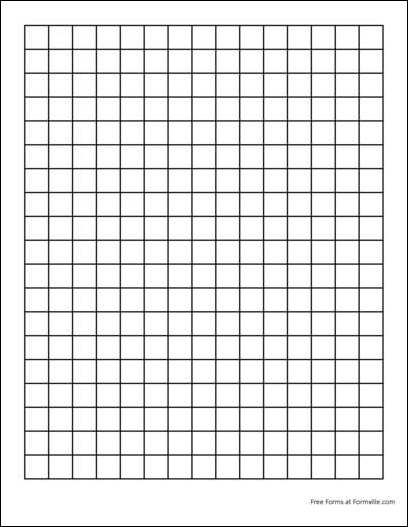
|  |  |
| --- | --- |
| Perimeter in meters | Area in meters |
|  |  |

**Work Space**

|  |  |  |  |
| --- | --- | --- | --- |
| Animal | Enclosure Shape  (Draw) | Perimeter | Area |
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Title of Zoo



KEY : (Show color and animal name)

TASK Checklist Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_ Period\_\_

Double check it. Did you meet all of the zoo’s requirements?

|  |  |
| --- | --- |
| ✓ | Requirement |
|  | The elephant enclosure cannot be next to the lion’s den. |
|  | The elephants must have the largest area. |
|  | The flamingo lagoon must be in the shape of a rectangle. |
|  | The monkey jungle has to have an area of 60 meters squared. |
|  | The zebra enclosure needs to have a perimeter of 24 meters. |
|  | All walkways and sidewalks need to reach all enclosures. |
|  | All walkways and sidewalks are 1 meter in width. |
|  | There must be at least 7 animal enclosures. |
|  | All area measurements are labeled with meters squared. |
|  | All perimeter measurements are labeled with meters. |
|  | Each animal enclosure in color coded and matched the key. |

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| **Sample Student Work:**  **Student Work, registry of animal enclosures. Elephants: blue, square, 34 m perimeter, 66 m squared area. Lions: yellow, rectangle, 18 m perimeter, 20 m squared area. Flamingoes: pink, square, 12 m perimeters, 9 m squared area.  Monkeys: brown, rectangle, 32 m perimeter, 60 m squared area. Zebras: orange, square, 24 m perimeter, 36 m squared area. Kodiak bear: purple, rectangle, 10 m perimeter, 6 m squared area. Lockness monster: green, rectangle, 16 m perimeter, 7 m squared area. Unicorn: rainbow, 10 m perimeter, 6 m squared area. Lunch area: red, rectangle, 6 m perimeter, 2 m squared area.  Sidewalks and walkways =  grey 80 cm perimeter 70 cm squared areaStudent work- map of zoo plan with key. elephant and monkey on the left. kodiak bear, lockness monster, lunch are, unicorn in the middle. flamingo, monkey, lion on the right.** |