

## Open-Ended Template

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**Grade Level:** 3 - 5

**Content Area:** Area and Perimeter

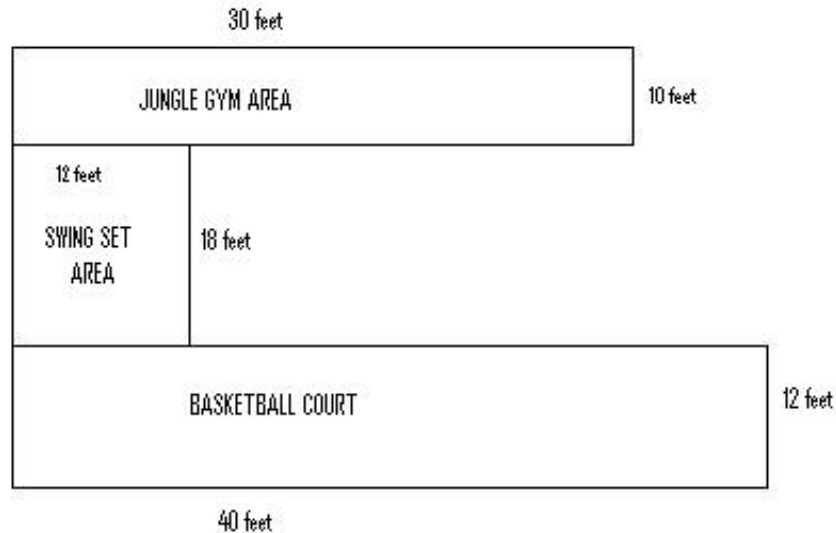
**PA Standard(s) addressed:** 2.3.3 h  
2.3.5 e

**NCTM Standard(s) addressed:** Measurement: Apply appropriate techniques, tools, and formulas to determine measurements.

**Problem Name:** The New Playground:

**Problem:**

**A.** The PTA is planning a new playground for the school. Below is a diagram of the Basketball Court, Jungle Gym and the Swing Set Area.



**Before you can play on the playground, these areas must be blacktopped. Do we need more than 1000 square feet of blacktop to complete this project?**

**B. How many feet of fence are needed to close in the entire blacktopped area?**

**Directions: Show and explain all work.  
Label your answers.**

**Problem Solution(s):**

**Part A**

**1. Area of the Basketball Court**  
 $12 \times 40 = 480$  square feet

**2. Area of the Swing Set Location**  
 $18 \times 12 = 216$  square feet

**3. Area of the Jungle Gym Location**  
 $10 \times 30 = 300$  square feet

**4. Total Area of the 3 Locations**  
 $480 + 216 + 300 = 996$

**5. Difference between total area and 1000 square feet**  
 $1000 - 996 = 4$

**Part A Explanation:**

- 1. I looked at the diagram to find the length and width of the basketball court. Then I found the area of the basketball court by multiplying the length (40 feet) by the width (12 feet). The Area was 480 square feet.**
- 2. I looked at the diagram to find the length and width of the swing set location. I found the Area of the swing set location by multiplying the length (18 feet) by the width (12 feet). The Area was 216 square feet.**
- 3. I looked at the diagram to find the length and width of the jungle gym location. I found the Area of the jungle gym location by multiplying the length (30 feet) by the width (10 feet). The Area was 300 square feet.**
- 4. I added all three Areas to get a total of 996 square feet.**
- 5. I know that 996 square feet is 4 less than 1000 square feet so I do not need more than 1000 square feet of blacktop to complete the project.**

**Part B**

$30 \text{ feet} + 10 \text{ feet} + 18 \text{ feet} + 18 \text{ feet} + 28 \text{ feet} + 12 \text{ feet} + 40 \text{ feet} + 12 \text{ feet} + 18 \text{ feet} + 10 \text{ feet} = 196 \text{ feet}$

**Part B Explanation**

**I looked on the diagram and found the measurement of each of the exposed sides of the blacktopped area. I found the perimeter by adding all the sides.**

## **Specific Rubric:**

### **5. Advanced Understanding:**

- All work is shown and correct. All steps are explained.

#### **PART A:**

The student completed three multiplication problems and one addition problem for section A and answered no.

#### **PART B:**

The student found the Perimeter of the blacktopped area. The student labeled the answer and gave an explanation.

### **4. Satisfactory Understanding:**

Complete understanding of the problem with:

- one computation error  
or
- some work is not explained  
or
- answer to Part B is not labeled.

### **3. Almost Satisfactory Understanding:**

- Correct answers; most or all work is shown but not explained.  
or
- Correct answers; some of the work is shown and some steps are explained.  
or
- Incorrect answer; all work is shown but two calculation errors are made and only some steps are explained.

### **2. Partial Understanding:**

- Incorrect answer; half of work is shown and only some steps are explained.  
or
- At least one of the two answers is correct and only some steps are explained.

### **1. Minimal Understanding:**

- Incorrect answers but the student shows some understanding of Area and/or Perimeter

### **0. No Understanding:**

- The student shows no evidence of any understanding of Area and Perimeter