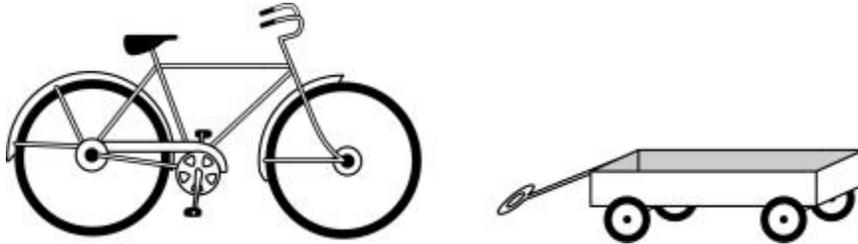


The following question refers to the situation described below.



A school yard contains only bicycles and wagons like those in the figure above.

On Monday there were 3 bicycles and 2 wagons in the school yard. How many wheels were in the school yard?

Answer:

Scoring Guide

Solution:

3 bicycles and 2 wagons have $6 + 8 = 14$ wheels

Possible acceptable responses include: 14, 14 wheels, 14 wheels in yard

Score & Description
Correct Correct response
Partial At least one correct conclusion, such as 3 bicycles implies 6 wheels, but answer not correct
Incorrect Incorrect response

In this question the student needed to determine the total number of wheels on 3 bicycles and 2 wagons. The student needed to know or observe from the picture that each bicycle has 2 wheels and each wagon has 4 wheels, and then determine and carry out an appropriate method for determining the total number of wheels. Students were permitted to use a calculator.

Correct - Student Response

On Monday there were 3 bicycles and 2 wagons in the school yard. How many wheels were in the school yard?

$$6 + 8 = 14$$

Partial - Student Response

On Monday there were 3 bicycles and 2 wagons in the school yard. How many wheels were in the school yard?

$$3 \times 2 = 6 \text{ wheels}$$

Incorrect - Student Response

On Monday there were 3 bicycles and 2 wagons in the school yard. How many wheels were in the school yard?

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2003 National Performance Results

Score	Percentage of Students
Correct	69%
Partial	1%
Incorrect	29%
Omitted Item	1%
Off Task	0%



Note:

- These results are for public and nonpublic school students.
- Percentage may not add to 100 due to rounding.

Mathematical Content Area

Algebra and functions

This question was classified in the algebra and functions content area. This content area extends from work with simple patterns at grade 4, to basic algebra concepts at grade 8, to sophisticated analysis at grade 12. Students are expected to use grade-level appropriate algebraic notation and thinking in meaningful contexts to solve mathematical and real-world problems, addressing an increasing understanding of the use of functions in grades 8 and 12. Other topics assessed include using open sentences and equations as representational tools and using the notion of equivalent representations to transform and solve number sentences and equations of increasing complexity.

Mathematical Ability

Procedural knowledge

This question measures students' procedural knowledge. Students demonstrate procedural knowledge in mathematics when they select and apply appropriate procedures correctly; verify or justify the correctness of a procedure using concrete models or symbolic methods; or extend or modify procedures to deal with factors inherent in problem settings. Procedural knowledge encompasses the abilities to read and produce graphs and tables, execute geometric constructions, and perform noncomputational skills such as rounding and ordering. Procedural knowledge is often reflected in a student's ability to connect an algorithmic process with a given problem situation, to employ that algorithm correctly, and to communicate the results of the algorithm in the context of the problem setting.