

SAMPLE TEMPLATE FOR DISCUSSIONS WITH FAMILIES

Schools are encouraged to share student work with families on Common Core-aligned performance tasks. There are many different ways to have these conversations with families. Here is an example of a template attached to a student response on the Cycle Shop assignment from the High School Algebra Task Bundle. For additional resources, visit <http://schools.nyc.gov/Academics/CommonCoreLibrary/Toolkit/Support/default.htm>.

Teacher: _____

Grade/Class: _____

Date: _____

PERFORMANCE TASK: THE CYCLE SHOP

You work for a small business that sells bicycles, tricycles, and tandem bikes. Bicycles have one seat, two pedals and two wheels. Tricycles have one seat, two pedals, and three wheels. Tandem bikes have two seats, four pedals and two wheels.

1. On Monday you counted 48 tricycle wheels.
How many tricycles were in the shop? _____.

Write an algebraic equation that shows the relationship between the number of wheels (w) and the number of tricycles (t).

2. On Wednesday there were no tandem bikes in the shop. There were only bicycles and tricycles. There are a total of 24 seats and 61 wheels in the shop. How many bicycles and how many triangles are in the shop? _____

Show how you figured it out using algebra.

3. A month later, there are a different number of bicycles, tricycles tandem bikes in the shop. There are a total of 144 front steering handlebars, 378 pedals, and 320 wheels. How many bicycles, tricycles and tandem bikes are in the shop? _____

Explain your solution.

KEY CRITERIA

I use a scoring guide to evaluate each student's assignment. The core elements of performance required by this task are:

- ✓ Modeling a situation using systems of equations
- ✓ Determining unknowns using multiple constraints
- ✓ Solving equations

ATTACHED EXEMPLARY STUDENT RESPONSE (LEVEL 4)

Level 4: Achieves Standards at a High Level (Score Range 7 – 8)

The student's response nearly meets the demands of the entire task, with few errors. With more time for checking and revisions, excellent solutions would seem likely. The student response shows understanding and use of stated assumptions, definitions and previously established results in constructing arguments. The student is able to make conjectures and build a logical progression of statements to explore the truth of their conjecture. The student response routinely interprets their mathematical results in the context of the situation and reflects on whether the results make sense. The communication is precise, using definitions clearly. The students look closely to discern a pattern or structure. The body of work looks at the overall situation of the problem and process, while attending to the details.

STUDENT A – Level 4

Student A achieved standards at a high level (4) with a score of 8. The student demonstrates understanding of all parts of the task and provides written work that illustrates and justifies solutions.

You work for a small business that sells bicycles, tricycles, and tandem bikes. Bicycles have one seat, two pedals and two wheels. Tricycles have one seat, two pedals, and three wheels. Tandem bikes have two seats, four pedals and two wheels.



The student was able to find the answer to the number of tricycles and was able to create an equation to represent the situation. A-REI.3 & MP4

1. On Monday you counted 48 tricycle wheels.

How many tricycles were in the shop? 16

Write an algebraic equation that shows the relationship between the number of wheels (w) and the number of tricycles (t).

$$w = 3t$$

In part two, the student models the situation using two equations. The student labels the variables, show a solution path for solving the system and then checks the solutions. A-REI.1, A-REI.6 MP1, MP3 & MP4

2. On Wednesday there were ~~no~~ tandem bikes in the shop. There were only bicycles and tricycles. There are a total of 24 seats and 61 wheels in the shop. How many bicycles and how many triangles are in the shop?

11 bikes and 13 tricycles
Show how you figured it out.

T: Tricycles

B: Bicycles

$$2B + 3T = 61$$

$$B + T = 24$$

check: $11 + 13 = 24$

$$22 + 39 = 61$$

$$2B + 3T = 61$$

$$2B + 2T = 48$$

$$T = 13$$

$$B = 11$$

STUDENT A – Level 4 continued

3. A month later, there are a different number of bicycles, tricycles tandem bikes in the shop. There are a total of 144 front steering handlebars, 378 pedals, and 320 wheels.

How many bicycles, tricycles and tandem bikes are in the shop?

67 Bicycles, 32 tricycles, 45 tandem bicycles

Explain your solution.

B = Bicycles

T = Tricycles

N = Tandem Bikes

$$\text{EQ1: } B + T + N = 144$$

$$\text{EQ2: } 2B + 2T + 4N = 378$$

$$\text{EQ3: } 2B + 3T + 2N = 320$$

Compare EQ1 + EQ3

$$2B + 3T + 2N = 320$$

$$- \quad 2B + 2T + 2N = 288$$

$$\hline T = 32$$

Compare EQ1 + EQ2

$$2B + 64 + 4N = 378$$

$$2B + 64 + 2N = 288$$

$$\hline 2N = 90$$

$$N = 45$$

$$\text{so } B + 32 + 45 = 144$$

$$B = 67$$

The student presents a clear solution to part 3. The variables and values are labeled. The student modeled the situation using a system of three equations. The work showed how the equations were used to find solutions. The values were then checked to verify the solution. The student demonstrated skills in the following standards: A-REI.1, A-REI.6, MP1, MP3, MP4 & MP7.

ATTACHED STUDENT RESPONSE (LEVEL 2)

Level 2: Performance below Standard (Score Range 3 - 4)

The student's response shows some of the elements of performance that the tasks demand and some signs of a coherent attack on the core of some of the problems. However, the shortcomings are substantial, and the evidence suggests that the student would not be able to produce high-quality solutions without significant further instruction. The student might ignore or fail to address some of the constraints. The student may occasionally make sense of quantities in relationships to the problem, but their use of quantity is limited or not fully developed. The student response may not state assumptions, definitions, and previously established results. While the student makes an attack on the problem it is incomplete. The student may recognize some patterns or structures, but has trouble generalizing or using them to solve the problem.

STUDENT C – Level 2

Performance Task
The Cycle Shop

Student C performed at Level 2 with a score of 4. The student was able to model the situations with equations, but was unable to use the equations to find solutions.

You work for a small business that sells bicycles, tricycles, and tandem bikes. Bicycles have one seat, two pedals and two wheels. Tricycles have one seat, two pedals, and three wheels. Tandem bikes have two seats, four pedals and two wheels.



Bicycle



Tricycle



Tandem Bike

1. On Monday you counted 48 tricycle wheels.

How many tricycles were in the shop? 16 tricycles

Write an algebraic equation that shows the relationship between the number of wheels (w) and the number of tricycles (t).

$$w \div 3 = t$$

In part 1, the student correctly found the number of tricycles and formed an equation to represent the relationship in two variables. A-REI.3, A-REI.6, MP4

2. On Wednesday there were no tandem bikes in the shop. There were only bicycles and tricycles. There are a total of 24 seats and 61 wheels in the shop. How many bicycles and how many triangles are in the shop?

7 tricycles, 21 bicycles
Show how you figured it out.

The student modeled the situation with two correct equations and two unknowns. MP4

The student was unsuccessful solving the system. The student failed to use the distributive property accurately.

$$2b + 3t = 61$$

$$b + \frac{1}{2}t = 24$$

$$1b = 24 + \frac{1}{2}t$$

$$2(24 + \frac{1}{2}t) + 3t = 61$$

$$48 + 2t = 61$$

$$\begin{array}{r} 48 + 2t = 61 \\ -48 \quad \quad 48 \\ \hline 2t = 13 \end{array}$$

$$t = 13 \div 2$$

$$t = 6\frac{1}{2} \text{ or } 7$$

STUDENT C – Level 2 continued

3. A month later, there are a different number of bicycles, tricycles tandem bikes in the shop. There are a total of 144 front steering handlebars, 378 pedals, and 320 wheels.

How many bicycles, tricycles and tandem bikes are in the shop?

48, 48, 48

The student was able to represent the situation using three equations and three variables. A-CED.3 MP4

The student was unable to use the equations to determine a solution. A-REI.6 MP7, MP1

Explain your solution.

$$x + b + d = 144 \quad 2x + 2b + 4d = 378$$

$$3x + 2b + 2d = 320$$

$$\begin{array}{r} 106 \\ 3 \overline{) 320} \end{array}$$

$$\begin{array}{r} 49 \\ 3 \overline{) 144} \end{array}$$

$$\begin{array}{r} 47 \\ 8 \overline{) 378} \end{array}$$

$$\begin{array}{r} 32 \\ \hline 58 \end{array}$$