Inspect

CCR Performance Task

Math Grade 6: Extended Performance Task
Bracelet Sales

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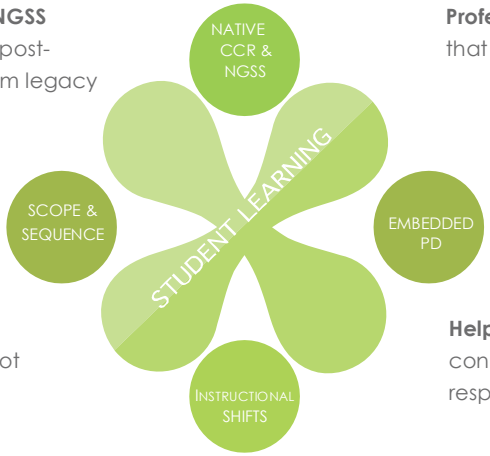

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CCR Performance Tasks

Math Grade 6: Extended Performance Task
Bracelet Sales

Student Test Booklet

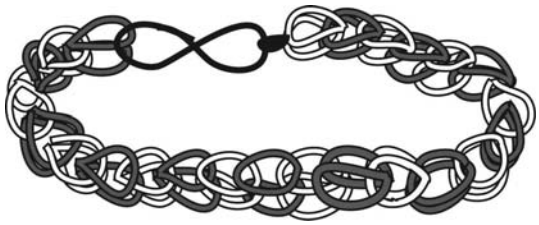
Name:

Math Grade 6: Extended Performance Task: Bracelet Sales

Complete all the tasks in the test booklet.

Lakeland Middle School needs to raise money to send 6th-grade students on a field trip to science camp for a weekend. The field trip will cost $100 per student.

Jenny, one of the 6th graders who signed up to go on the field trip, has an idea to help raise money by selling rubber band bracelets. Jenny shows a picture of a bracelet, like the one shown below, to her teacher.



Example of a Single-Strand Bracelet

The bracelets are made using a plastic loom to loop 25 rubber bands. Then a plastic clasp is used to fasten the two ends together. After talking to other students, Jenny knows that there are 20 looms available to make the bracelets. These looms can be shared after a student finishes making all of their bracelets. The science club has agreed to buy the materials the students need in order to make the bracelets as long as the students pay back this money before they leave on the field trip. Each student is expected to pay the science club back the total amount of money they spent on the materials for their bracelets. The students will be responsible for ordering all of the materials.

Part A: Design a Bracelet

1. You will need to design a bracelet with at least two different colors of rubber bands. There are many different types and colors of rubber bands that are available. Research the different types of rubber bands online. Determine which types and colors you would like to use for your bracelet and write down the costs involved. Make sure you include everything you will need in order to make a bracelet.

Take notes on the graphic organizer given on the next page. You will use your notes to answer questions in this section.

Research Organizer for Part A question 1

a. Which internet websites did you use to find your information?

b. What types and colors of rubber bands are available (neon, opaque, glitter, jelly, primary colors, etc.)? How many rubber bands are in the package (i.e., bag of 25, box of 600)? How much does each of the different types cost? Fill in the table below with the information for at least 15 different types or colors.

Type	Color	Number in Package	Cost per Package	Unit Price per Rubber Band

Explain how you calculated the unit price per rubber band in the table above.

2. Now that you have the information, you are ready to design your bracelet. You must use at least two different colors of rubber bands. Describe the design you will use for all of your bracelets. You may use letters, colors, numbers, tables, pictures or words to clearly describe your design.

3. How much will it cost to make one bracelet? Explain or show how you found your answer using pictures, numbers, and/or words.

Optional Support Worksheet for question 3

How much will it cost to make one bracelet? Explain or show how you found your answer using pictures, numbers, and/or words.

Number of Bags of rubber bands	Cost of bags of rubber bands	Other costs	Number of bracelets that can be made	Unit cost per bracelet
1				
2				
3				
4				
5				
6				

Part A (optional): Group Work

Use the information in Questions 2 and 3 and compare your bracelet design with other students in your group. Here are some questions for you to think about:

- Are their designs the same as yours?
- Is the representation they used clear?
- Was the cost for your design more or less than the other people in your group? Why?
- Is there a way that you can lower the cost of your bracelet without changing the design?
- Is everything needed to make the bracelet included in the cost?

Take notes on what you learn from this discussion.

Show a bracelet design that is more expensive than your bracelet. Use pictures, words, or another type of representation to show the design.

Show a bracelet design that is less expensive than your bracelet. Use pictures, words, or another type of representation to show the design.

What makes a bracelet design more expensive?

What makes a design less expensive?

Part B: Plan the Fundraising

Now that you have decided on the design of your bracelet and you know the costs involved in making one bracelet, you are ready for the next step.

4. Outline a plan that details how many bracelets you will need to make and sell so that you can raise enough money to go on the field trip. The questions below should help you to write a final plan in Part C.

Plan Title: _____

By: _____

Explain the design of your bracelet.

Why did you decide on this design for your bracelet?

What is the unit cost to make 1 bracelet? Using this unit cost, how much will it cost to make 10 bracelets? 50 bracelets? Show your work.

How much will you charge for each bracelet? Why do you think this is a reasonable price?

Are there any additional costs to consider?

How many bracelets do you need to sell to make $100 for the field trip? Show your work.

What will you do with any leftover materials that you purchased?

Part C (optional): Verify the Plan

In this section, you will need to partner with another student. Exchange your answers to the questions in Part B with your partner.

Review your partner's outline for their plan to make sure it is correct and complete. Prepare detailed notes for your partner. Clearly show the parts of the outline that you think are good, creative, or well communicated. Also clearly show which parts are not clear enough, not detailed enough, or contain mistakes. Below are some questions to ask.

a. Does the outline specify all of the costs involved in making and selling the bracelets?
b. Is the price of the bracelet reasonable?
c. Will the plan result in raising the $100 required for the field trip?
d. Do you have any questions about the plan?

Part C (optional): Adjust Your Plan

In this section, you will need to continue to work with your partner from the first section in Part C. Give back your partner's plan and your review of their plan. Work with each other to make any adjustments that need to be made in order for you both to raise enough money to pay for the field trip.

Make any new adjustments that are needed to the outline of your plan so that you reach your goal of raising $100. Use the response box below to rewrite and adjust any changes that need to be made to your original outline from Part B. Feel free to work with your partner to make sure your plan includes all of the details needed to show that your plan will work.

Part C: Write Your Plan

In this section, you will need to use all of the information that you gathered in the previous sections to write up a plan. Your plan should contain detailed information about 1) the design of the bracelet, 2) the unit cost of a bracelet, 3) the items that you will buy and how much you will spend altogether, 4) the selling price of the bracelet, 5) the number of bracelets you will make, 6) the total profit. The plan should be written clearly and contain correct calculations.

5. Write a plan that details how you will reach your goal of raising $100 with the sales of your bracelet. Along with the information listed above, include at least one interesting fact, idea, or conclusion that will make your plan successful.

Optional Support Worksheet for thinking about price and profit in Part C

You may want to try out different prices for the bracelet. You may use the table below to help organize your thinking.

Price for each bracelet	Unit cost per bracelet	Profit per bracelet	Number of bracelets to sell	Approximate total profit	Other costs	Total profit

Table Representation for Bracelet Design

Rubber Band Number	Color and Type of Rubber Band
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

Pattern Representation for Bracelet Design

Here is another example of how you could show your design.

R=red
O=orange
Y=yellow

RRRORRYRRORRYRRORRYRRORRYclasp

CCR Performance Tasks

Math Grade 6: Extended Performance Task
Bracelet Sales

Teacher Guide

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Task Specifications

Content Area	Mathematics
Title	Bracelet Sales
Grade Level	Grade 6
Problem Type	Extended Performance Task
Standards for Mathematical Practices	**Mathematical Practice 1 (MP.1):** Make sense of problems and persevere in solving them. Mathematically proficient students: • Explain to themselves the meaning of a problem and look for entry points to its solution. • Analyze givens, constraints, relationships, and goals. • Make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. • Consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. • Monitor and evaluate their progress and change course if necessary. • Explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. • Check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” • Understand the approaches of others to solving complex problems and identify correspondences between different approaches. **Mathematical Practice 3 (MP.3):** Construct viable arguments and critique the reasoning of others. Mathematically proficient students: • Understand and use stated assumptions, definitions, and previously established results in constructing arguments. • Make conjectures and build a logical progression of statements to explore the truth of their conjectures. • Analyze situations by breaking them into cases, and can recognize and use counterexamples. • Justify their conclusions, communicate them to others, and respond to the arguments of others. • Reason inductively about data, making plausible arguments that take into account the context from which the data arose. • Compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. **Mathematical Practice 6 (MP.6):** Attend to precision. Mathematically proficient students: • Communicate precisely to others. • Use clear definitions in discussion with others and in their own reasoning. • State the meaning of symbols they choose, including using the equal sign consistently and appropriately. • Are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem.

	• Calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other.
Common Core State Standards	**5.NBT.4** Use place value understanding to round decimals to any place. **6.NS.2** Fluently divide multi-digit numbers using the standard algorithm. **6.NS.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. **6.RP.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
CCSS Literacy in Writing-Grade 6-8	**WHST.6-8.5** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. **WHST.6-8.2** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
SBAC Assessment Claims	**Claim 4: Modeling and Data Analysis**—Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.
PARCC Assessment Claims	**Sub-Claim D: Highlighted Practice MP.4 with Connections to Content (modeling/application)** —The student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice.
Depth of Knowledge	**Level 4: Extended Strategic Thinking**—Curricular elements assigned to the level demand extended use of higher order thinking processes such as synthesis, reflection, assessment and adjustment of plans over time. Students are engaged in conducting investigations to solve real-world problems with unpredictable outcomes. Employing and sustaining strategic thinking processes over a longer period of time to solve the problem is a key feature of curricular objectives that are assigned to this level. Key strategic thinking processes that denote this particular level include: synthesize, reflect, conduct, and manage.
Task Overview	In this task you will be asked to research a product and analyze the information found. Then take the information and design a plan that involves cost and profit in order to make a certain amount of money. Once you have an understanding of the problem and the resources that are available you can make a detailed plan to achieve the goal. You may find that your original plan has errors so you will be given a chance to reflect on your work and then edit your plan so that the goal is met.

Student Task

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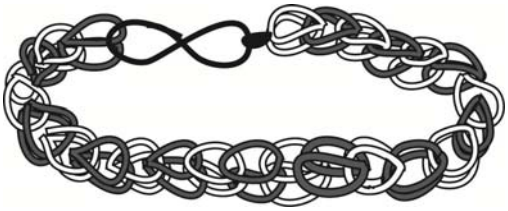

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Teacher Instructions

This performance task is designed to assess student understanding of a variety of content and mathematical practice standards. Students are challenged to solve a real-world problem involving mathematical operations and rates. They obtain information about a product and develop a written plan based on their research to solve a problem. The plan should clearly and correctly lay out the steps that the student will need to organize to ensure its success. The task was designed with the understanding that all classrooms and students are different. Some students may need an extension activity, some may need to reduce the number of days planned for this task, and some may need to omit or simplify certain parts depending on what time during the school year this task is given.

Test Definition File

Item	Correct Answer	Practice Standard	Common Core Standards
1	See Scoring Rubric	Mathematical Practice 1, 3, and 6	5.NBT.4, 6.NS.2, 6.NS.3, 6.RP3
			CCSS ELA-Literacy Standards
			WHST.6-8.2, WHST.6-8.5

SBAC Claims	PARCC Sub-Claims
4	D

Before the task,

- The students should have been taught about unit rates.
- The concept of “profit” should be introduced. Profit can be defined as follows: Profit = Revenue – Expenses. Some real-life examples should be given and explained. For example, if Emily spends $200 to plant a garden, and sells the vegetables she grows for $800, she makes a profit of $600.

Vocabulary:

Costs/Expenses
Revenue
Profit
Discount (percent)
Tax (in percent)
Shipping costs
Unit costs/Unit Rate

Setting the Context:

Teacher: “Has anyone ever had a lemonade stand?” [or you can ask “Has anyone ever sold raffle tickets for an organization?”] “What was the reason you sold lemonade?”

[Let students respond after each question. If no one has ever done either of these then continue to the next question, but pose the questions as “What do you think you would do…?” Students may answer that they sold lemonade to make money to buy a toy or a gift for someone, OR, they sold raffle tickets to raise money for equipment, dues, etc.]

Teacher: [for the lemonade stand] “What did you need before you began selling the lemonade?”

[Students should respond with the ingredients needed to make lemonade: packets/container of lemonade powder, water, sugar, lemons, ice.
Teacher: “Did you have to buy these ingredients? How much do you think all of these ingredients cost?”

[Students may respond that they had everything at home already. It is important to ask about the cost of the ingredients so that expenses can be talked about. Answers should be somewhere between $2-$5.]

Teacher: “How much did you sell each cup of lemonade for? Why did you think that was a good price? How much money did you want to make?”

[Some students may be able to answer these questions, but make sure to keep the numbers realistic.]

Teacher: “The amount of money you made is called *revenue*. Though you may have made a certain amount of money by selling the lemonade, you should think about the amount of money you first had to put into the lemonade (or the ingredients). This is called your *expenses*. The total *profit* is your revenue minus your expenses. [Pick an example that one of the students gave or if you did not get a student example make a scenario up.]
So…[student’s name], if you made $20 on lemonade but you (or your parents) paid $4 for the ingredients to make the lemonade, then what would be your profit?"

[Student(s) should give the difference between the revenue and the expenses used in the example you gave.]

[If you feel that a lemonade stand is not an appropriate example at this age then use the raffle ticket scenario. The revenue is the amount made after everyone bought a ticket (if 20 people bought a $5 raffle ticket then the revenue is $100). The expense would be the prize money paid out to the winning ticket number. For example, if the winning ticket is worth $25 then what is the profit for selling raffle tickets?]

Give an introduction to the task. A suggested introduction is below. Some of the information may need to be repeated each day.

Teacher: “You will be given a situation that involves putting a plan together to sell an item in order to raise money for a school field trip. The item that you will be selling is a rubber band bracelet. Who knows what a rubber band bracelet looks like? Has anyone ever made one?” [Show examples of a rubber band bracelet and the loom that is used to make one; you could have a student bring in a loom and they can show how one is made; you could print pictures from the internet and show examples.]

Timeline:

There are two different options to choose.

Option 1: This option should take two days (or 2 hours with the assumption that math lessons/ activities take up an hour during a school day).

> **Day 1:** The students should complete Part A, Questions 1 – 3 (research). In Part A the optional group work is omitted.*
> **Day 2:** The students should complete Parts B and C. In Part C the optional partner work and plan adjusting is omitted.**

*Some students may need extra time to complete part A. This time could either be given as outside work (homework) or an extra day could be added to the timeline.
**Some students may need extra time in writing the plan for part C. This time could either be given as outside work (homework) or an extra 15-20 minutes could be given on the following day.

Option 2: This option should take three days (or 3 hours with the assumption that math lessons/activities take up an hour during a school day).

> **Day 1:** The students should complete Part A, Questions 1 – 3 (research).*
> **Day 2:** The students should complete Part A with the group activity and Part B.
> **Day 3:** The students should complete Part C**.

*Some students may need extra time to complete part A. This time could either be given as outside work (homework) or an extra 15-20 minutes could be given on Day 2 before the group work is started.
**Some students may need extra time in writing the plan for part C. This time could either be given as outside work (homework) or an extra 15-20 minutes could be given on the following day.

Task Information:

A calculator is optional and up to the discretion of the classroom teacher. Decimals will be in the hundred-thousandths place before rounding to hundredths to give money totals. This task can be done without calculators.

Part A Question 1:

Links that will provide the rubber band information:
http://www.rainbowloom.com/products

http://www.partycity.com/product/loom+rubber+bands.do?sortby=ourPicks&size=all&navSet=275376

http://tiny.cc/gfoi8x

For the students to understand all that is involved in out-of-pocket costs and profits, it would be best to allow them to go through the ordering process online (stopping just before the payment screen is shown). Then they can see that there are other costs involved in buying products (shipping charge and tax). There is also a teaching opportunity to add in a discount to the total if the student orders more than $10 worth (for example; an extra 10% off the price for any orders of $10 or more).

If you are uncomfortable about having the students go to live links and begin the order process, then there is an option given on the last two pages of this teacher document to create a printed order form with a list of rubber bands and their prices from each of the websites given. This can also be used if the Internet is not readily available to students.

Part A Question 2:

The students may use any representation they feel mathematically shows their design. Mathematic representations could be a graph, chart, table, equations with defined variables, or a combination of these. An optional table (Table Representation for Bracelet Design) and an example of how to represent the design using variables are given in this task. These can also be used to assist any students that may be struggling with figuring out a mathematical way to represent their design.

Part A Question 3:

The students may or may not have used all of the costs involved in buying the rubber bands online. The students may realize during the next question that the shipping cost or tax for the product was not included in the unit cost for one bracelet. They should realize this before the end of the task, but points should not be taken off here if they have not included these other costs into the unit cost of a bracelet.

There is an optional worksheet for students to use that may help to organize their thoughts and help to find the unit cost.

Part A Group Work:

This section is optional and should not be scored. It has the students breaking off into groups. It is suggested that the groups be no more than 4-5 students. The students should fill out the worksheet during this group activity, but there are no right or wrong answers.

Part B Question 4:

Students should answer the questions given on the worksheet as thoroughly as possible. Please stress to the students that detailed answers are needed. These answers will help to outline their final plan which will be written in Part C.

Part C Partner Work:

This section is optional and should not be scored. The students should be partnered with another student so that they both can review and reflect on the outline of their plan. They will read each other's outlined plan to determine if anything is missing or incorrect. They should discuss ideas and solutions to fix problems during this time. Please suggest to students to take notes with another color of pen and remind them that they will need to go back and make edits to their original plan. Consider having the students type up their final plan, to be written in the last section of Part C, on the computer.

There is an optional worksheet for students to use that may help to organize their thoughts and help them in thinking about price and profit.

This section also contains an optional adjustment activity. The students have the opportunity to continue to work with their partner and adjust their outline so that the plan will be successful. This aspect of the task encourages two students to work together as a team to ensure that the plan's outline is clear and correct before sitting down to write the final version on their own.

Part C Question 5:

Students should give a detailed plan that states the cost of each bracelet along with the design they chose (and even why they decided on that design). It should state the amount each bracelet will be sold for and why they decided on that amount. The plan should end with the final profit total and how they figured this total out. Other points that could be addressed: sharing the costs with other students who may be using the same color rubber bands, buying

supplies in a store instead of online so that there is no shipping charge, selling their leftover rubber bands to other students, or determining if they have enough clasps or selling/buying clasps to/from other students.

Extension Activity:

Keep in mind that you will be selling your bracelet to other students. Knowing what the students in your school like will be important in selling your bracelets. Conduct a survey of the students in your classroom. Some questions to include in the survey:

What is your favorite color?
What is your favorite sports team's colors?
Do you think boys will want to buy and wear this type of bracelet?
Would you buy a bracelet as a gift for someone?
How much would you be willing to pay for one of these bracelets?
Would you pay extra to have more rubber bands added to your bracelet?

Have students gather the data and display the data using tables, graphs, or charts. Once they have reviewed their data, have them determine if the bracelet they designed would be appropriate given the data collected. If not, they should re-design their bracelet.

Purchase Order Form:

SHIP FROM:
SHIP TO:

ITEM	QUANTITY	DESCRIPTION	COUNT PER UNIT	UNIT PRICE	TOTAL
				TOTAL:	
				TAX:	
				SHIPPING:	
				FINAL TOTAL:	

NOTES:

Store Information:

Store #1 Shipping Charge: 5.99 for any number of items			
Type	**Color**	**Contents of One Package**	**Cost of One Package**
Opaque	White, Purple, Pink, Navy Blue, Turquoise, Purple	bag of 600 with 30 c-clasps	2.79
Opaque	Red, Ocean Blue, Bright Green, Dark Green	bag of 600 with 30 c-clasps	2.79
Opaque	Orange, Yellow, Black	bag of 600 with 30 c-clasps	2.79
Opaque	Fuchsia, Neon Green, Teal, Neon Orange, Grey	bag of 600 with 30 c-clasps	2.79
Opaque	Mixed (yellow, pink, neon green, turquoise, purple, red, white, and black)	bag of 600 with 30 c-clasps (at least 50 of each color)	2.79
Glow in the Dark	White (glows green)	bag of 600 with 30 c-clasps	3.59
Jelly (Semi-Transparent)	Orange, Lime Green, Clear, Navy Blue, Turquoise	bag of 600 with 30 c-clasps	2.79
Jelly (Semi-Transparent)	Ocean Blue, Yellow, Rose, Purple	bag of 600 with 30 c-clasps	2.79
Jelly (Semi-Transparent)	Mixed (yellow, pink, neon green, turquoise, purple, red, white, and black)	bag of 600 with 30 c-clasps (at least 50 of each color)	2.79
Clasps	clear	bag of 96	4.79

Store #2 Shipping Charge: 3.99 for up to 4 items; 5.99 for up to 10 items; 6.99 for 11 items or more			
Type	**Color(s)**	**Contents of One Package**	**Cost of One Package**
Opaque	White, Purple, Bright Pink, Dark Blue, Turquoise	bag of 300	1.99
Opaque	Red, Light Blue, Bright Green, Dark Green	bag of 300	1.99
Opaque	Orange, Yellow, Black	bag of 300	1.99
Earth Tone	Orange	bag of 300	2.99
Glitter	Multi Colors	bag of 200 with 6 c-clasps	2.99
Tie Dye	Multi Colors	bag of 200 with 6 c-clasps	2.99
Clasps	clear	bag of 100	4.99

Store #3 Shipping Charge: 2.50 for 1-3 items; 3.50 for 4-6 items; Free for 7 or more items			
Type	**Color**	**Contents of One Package**	**Cost of One Package**
Opaque	White, Purple, Pink, Navy Blue, Turquoise, Purple	bag of 300 with 12 clasps	1.99
Opaque	Red, Royal Blue, Green, Orange, Yellow, Black	bag of 300 with 12 clasps	1.99
Opaque	Mixed (yellow, light pink, green, turquoise, royal blue, lilac, purple, fuchsia, white, and black)	bag of 300 with 12 clasps (30 of each color listed)	1.99
Glow in the Dark	Mixed (pink and green)	bag of 300 with 12 clasps (150 of each color listed)	1.99
Glitter	Mixed (pink, green, blue and yellow)	bag of 300 with 12 clasps (75 of each color listed)	1.99

Scoring Rubric

Part A

4 Point Response:
The response demonstrates a high level of understanding. The response demonstrates:

- A strong ability to make sense of a real-world problem and develop a solution that meets given requirements;
- A strong ability to check work and communicate reasoning in a clear and precise way;
- A strong ability to calculate accurately with an appropriate degree of precision;
- A strong understanding of how to find rates and use number sense and operations concepts to solve real-world problems.

A level 4 response should include:

- In problem 1, the complete information required for 1a, and a complete table in 1b;
- The correct unit price per rubber band or all of the types listed in the table;
- A clear and correct explanation of how the unit price per rubber band is calculated;
- In problem 2, a clear and complete description of the design for a bracelet that uses at least 2 different colors of rubber bands;
- In problem 3, the correct cost for one bracelet, with a clear and correct explanation or work shown to find the cost for one bracelet. If the optional support worksheet is used by the student it should not be scored unless it was used by the student as the only method of showing their work.

Sample Response for Part A

Problem 1a:
I went to the links provided in the teacher instructions (or used the provided information for rubber bands and their prices). [If students use other websites, the exact links should be listed.]

Problem 1b:

Type	Color	Number in Package	Cost per Package	Unit Price per Rubber Band
Opaque	Turquoise	Bag of 600	2.79	0.00465
Opaque	Red	Bag of 600	2.79	0.00465
Opaque	White	Bag of 600	2.79	0.00465
Opaque	Navy Blue	Bag of 600	2.79	0.00465
Opaque	Teal	Bag of 600	2.79	0.00465
Glow in the Dark	White (glows green)	Bag of 600	3.59	0.005983
Jelly	Red	Bag of 600	2.79	0.00465
Jelly	Navy Blue	Bag of 600	2.79	0.00465
Jelly	Ocean Blue	Bag of 600	2.79	0.00465
Opaque	Mixed	Bag of 600	2.79	0.00465
Opaque	Red	Bag of 300	1.99	0.00663
Glitter	Multi Colors	Bag of 200	2.99	0.01495
Tie Dye	Multi Colors	Bag of 200	2.99	0.01495
Opaque	White	Bag of 300	1.99	0.00663
Opaque	Red	Bag of 300	1.99	0.00663
Opaque	Mixed	Bag of 300	1.99	0.00663
Glow in the Dark	Mixed	Bag of 300	1.99	0.00663

I found the unit price per rubber band by dividing the cost of a bag of rubber bands by the number of bands in the bag. For example, in the first row a bag of 600 rubber bands cost 2.79: 2.79/600 = 0.00465. So, the price for one rubber band is less than a penny.

Problem 2:
My bracelet design is:
R=red; B= turquoise blue; W=white
WRBRBWRBRBWRBRBWRBRBWRBRBclasp

Question 3:
I figured that I would need to make around 130 bracelets if I sell them for $1.00 each. This way I should make enough money to pay the science club back for the materials and still have $100 to go on the field trip. I plan to buy 1 package of white opaque bands that come in a bag of 600 for $2.79, 2 packages of red opaque bands and 2 packages of turquoise blue bands for $2.79 each for the bag of 600, and 2 packages of mixed opaque colors for $2.79 each for the bag of 600. This should give me enough bands and clasps to make 130 bracelets using my design. The total for all of the bands is $19.53. I will purchase these bands from rainbowloom.com. The tax is 8% and the shipping for all of the bands is $5.99. My total is 19.53 x 0.08 = 1.56, so 19.53 + 1.56 = 21.09, then add shipping and my final cost is $27.08. If I divide this amount by the number of bracelets that I plan to make, I will have the unit cost for one bracelet. 27.08/130 = 0.2083 or about 20 cents per bracelet.

3 Point Response:
The response demonstrates a strong understanding, but the work is incomplete or contains minor errors.

A level 3 response is characterized by:

- In problem 1, the information required for 1a and a complete table in 1b;
- The unit price per rubber band for all of the types listed in the table, but there may be a few incorrect unit price values given because of a minor error made in the calculations;
- A strong understanding of how to find unit rates, demonstrated by a clear and correct explanation of how the unit price per rubber band is calculated, but a minor calculation error is made or the explanation is incomplete;
- In problem 2, a clear and complete description of the design for a bracelet that uses at least 2 different colors of rubber bands;
- A strategy for solving problem 3 that shows a strong understanding of how to find the unit rate per bracelet using basic operations and number sense, but a minor calculation error is made or the work shown is incomplete.

2 Point Response:
The response demonstrates a basic but incomplete understanding.

A level 2 response is characterized by:

- In problem 1, the information required for 1a and a partially-completed table in 1b;
- The unit price per rubber band for all of the types listed in the table, but half of the unit prices are incorrect because of minor errors made in the calculations;
- A basic understanding of how to find unit rates, demonstrated by an explanation of how the unit price per rubber band is found, but two or more minor calculation errors or one major calculation or concept error is made;
- In problem 2, an incomplete description of the design for a bracelet that uses at least 2 different color rubber bands;
- An incorrect or incomplete strategy for solving problem 3, resulting in an incorrect answer but which demonstrates a basic understanding of how to find the unit cost per bracelet using basic operations and number sense; the work or explanation contains 2 or more minor errors or one major error.

1 Point Response:
The response demonstrates minimal understanding.

A level 1 response is characterized by:

- In problem 1, the information required for 1a or a partially-completed table in 1b;
- The unit price per rubber band for all of the types listed in the table, but all of the unit prices are incorrect because of major errors made in the calculations;
- A weak understanding of how to find unit rates, demonstrated by an explanation of how the unit price per rubber band is found, but two or more major calculation errors are made or the explanation is missing;
- In problem 2, an incomplete description of the design for a bracelet that uses at least 2 different color rubber bands;
- An incorrect or incomplete strategy for solving problem 3 resulting in an incorrect answer, demonstrating a weak understanding of how to find the unit cost per bracelet using basic operations and number sense; the work or explanation contains 2 or more major errors or no work is shown.

0 Point Response:
There is no response, or the response is off topic.

NOTE: The group activity in Part A is not scored.

Part B

4 Point Response:
The response demonstrates a high level of understanding. The response demonstrates:

- A strong ability to make sense of a real-world problem and develop a solution that meets given requirements;
- A strong ability to check work and communicate reasoning in a clear and precise way;
- A strong ability to justify the solution and communicate this to others;
- A strong ability to calculate accurately with an appropriate degree of precision;
- A strong understanding of how to find rates and use number sense and operations concepts to solve real-world problems.

A level 4 response should include:

- Answers to all of the questions show a strong understanding of why the student made the choices involved in the bracelet design and cost which is demonstrated by the complete and clear explanations given;
- Answers which show a strong ability to demonstrate the use of number sense and operations in order to solve the problems involving cost, and the calculations given are correct;
- Answers which show a strong understanding of how to develop a plan that will raise enough money to go on the field trip and pay for the materials used.

Sample Response for Part B

Question 4:
My bracelet will use three opaque colors: white, red, and turquoise blue. I will have a pattern that starts with 1 white band, then 1 red, 1 turquoise, 1 red, and 1 turquoise. My pattern will continue until I have used 25 bands which means my pattern will repeat five times: WRBRBWRBRBWRBRBWRBRBWRBRBclasp.

I chose this design because it is our school colors and thought that boys and girls would want to buy the bracelet.

It will cost 20 cents to make 1 bracelet (work shown in #3). Ten bracelets will cost $2 (0.20 x 10 = 2) and 50 bracelets will cost $10 (0.2 x 50 = 10).

I plan to charge $1 for each bracelet. I think $1 is reasonable to charge because it is easier to carry a $1 bill than to carry around change or have to make change if someone gives you dollars.

I already added the shipping cost and tax to my total amount that I will spend. My unit cost has the shipping and tax in it. Since all of my rubber band bags have 30 clasps in the bag, I did not have to buy any more. I bought 7 bags of rubber bands and each had 30**,** so I will have 210 (7 x 30) clasps, which is more than I need for my 130 bracelets.

Since I am charging $1 a bracelet, I knew I would need to sell more than 100 to make the $100. I will need to make enough to pay the science club back the money I spent on the materials, which was $27.08. So, I will need to sell at least 128 bracelets to have $128. Then I can pay the science club back and still have enough to pay for the field trip; 128 – 27.08 = 100.92.

Since I will buy 2 mixed bags with at least 50 bands of each color (yellow, pink, neon green, turquoise, purple, red, white, and black) then I will have some of the colors that I didn't use left over. I used 10 red, 10 turquoise, and 5 white bands for each bracelet. I made 130 bracelets so I used 1,300 red (130 x 10), 1,300 blue (130 x 10), and 650 white bands (130 x 5). I know I will have at least 1,300 red and blue bands from my packages; 2 x 600 = 1200 + 50 + 50 = 1300

and 700 white bands; 600 + 50 + 50 = 700. There is a good chance that I will not have any red and turquoise bands left over, but I should have about 50 white bands left over. I will also have 80 clasps left over (30 x 7 = 210, 210 – 130 = 80). I plan on sharing any of my leftover bands with some of my friends that are making bracelets to sell so that we can all go on the field trip.

3 Point Response:
The response demonstrates a strong understanding, but the work is incomplete or contains minor errors.

A level 3 response is characterized by:

- An example of a bracelet design that correctly shows the required number of bands;
- Answers to all of the questions that show a strong understanding of why the student made the choices involved in the bracelet design and cost, which is demonstrated by the complete and clear explanations given, but a minor calculation error is made or one answer is incomplete;
- Answers which show a strong ability to demonstrate the use of number sense and operations in order to solve the problems involving cost, but a minor error is made in one of the calculations.

2 Point Response:
The response demonstrates a basic but incomplete understanding.

A level 2 response is characterized by:

- An example of a bracelet design that correctly shows the required number of bands;
- Answers to the questions that show a basic understanding of why the student made the choices involved in the bracelet design and cost, which is demonstrated by the explanations given, but two or more minor calculation errors or one major calculation error is made or 2-3 answers are incomplete;
- Answers which show a basic ability to demonstrate the use of number sense and operations in order to solve the problems involving cost, with two or more minor calculation errors or one major calculation error being made.

1 Point Response:
The response demonstrates minimal understanding.

A level 1 response is characterized by:

- An example of a bracelet design, but the design is incorrect due to a counting error or the requirement of using at least two colors is not met;
- Answers to the questions that show a minimal understanding as to why the student made the choices involved in the bracelet design and cost, which is demonstrated by the explanations given; there may be two or more major calculation errors made or 4 answers are incomplete or 1-2 answers are missing;
- Answers which show a weak ability to demonstrate the use of number sense and operations in order to solve the problems involving cost, with two or more major calculation errors being made.

0 Point Response:
There is no response, or the response is off topic.

Part C

4 Point Response:
The response demonstrates a high level of understanding. The response demonstrates:

- A strong ability to make sense of a real-world problem and develop a solution that meets given requirements;
- A strong ability to check work and communicate reasoning in a clear and precise way;
- A strong ability to justify the solution and communicate this to others;
- A strong ability to calculate accurately with an appropriate degree of precision;
- A strong understanding of how to find rates and use number sense and operations concepts to solve real-world problems.

A level 4 response should include:

- A plan that clearly explains the design of the bracelet and includes the correct calculations for everything involved in the making and selling of the bracelet; specifics that should be detailed in the plan: the unit cost of the bracelet, the expense of the materials bought to make the bracelets, the selling price of the bracelet, the number of bracelets that will need to be made in order to reach $100, and the total profit;
- A plan that contains the reasoning behind the choices made by the student; the choices are strongly supported with at least 6 sentences that clearly demonstrate a strong understanding of the thought process involved in making these decisions.

3 Point Response:
The response demonstrates a strong understanding, but the work is incomplete or contains minor errors.

A level 3 response is characterized by:

- A plan that demonstrates a strong understanding of the design of the bracelet and includes the calculations for everything involved in the making and selling of the bracelet; specifics that should be detailed in the plan: the unit cost of the bracelet, the expense of the materials bought to make the bracelets, the selling price of the bracelet, the number of bracelets that will need to be made in order to reach $100, and the total profit; the plan may contain 1-2 minor errors or may have 1-2 incomplete specifics;
- A plan that contains the reasoning behind the choices made by the student; the choices are supported with at least 6 sentences that demonstrate a strong understanding of the thought process involved in making these decisions, but 1-2 ideas are incomplete or incorrect due to minor errors made in the calculations.

2 Point Response:
The response demonstrates a basic but incomplete understanding.

A level 2 response is characterized by:

- A plan that demonstrates a basic understanding of the design of the bracelet and includes some of the calculations involved in the making and selling of the bracelet; the plan may contain more than 2 minor errors or 1 major error or may have 3 incomplete specifics or 1-2 missing specifics;
- A plan that contains the reasoning behind the choices made by the student; the choices are supported with 4-5 sentences that demonstrate a basic understanding of the thought process involved in making these decisions with 3 or more ideas being incomplete or incorrect due to errors made in the calculations.

1 Point Response:
The response demonstrates minimal understanding.

A level 1 response is characterized by:

- A plan that demonstrates minimal understanding of the design of the bracelet and includes some of the calculations involved in the making and selling of the bracelet; the plan may contain more than 2 major errors or may have 4 or more incomplete specifics or 3-4 missing specifics;
- A plan that contains the reasoning behind the choices made by the student; the choices are supported with 2-3 sentences that demonstrate a minimal understanding of the thought process involved in making these decisions with 3 or more ideas being incorrect due to errors made in the calculations or completely missing.

0 Point Response:
There is no response, or the response is off topic.

NOTE: The partner activities in Part C are not scored.