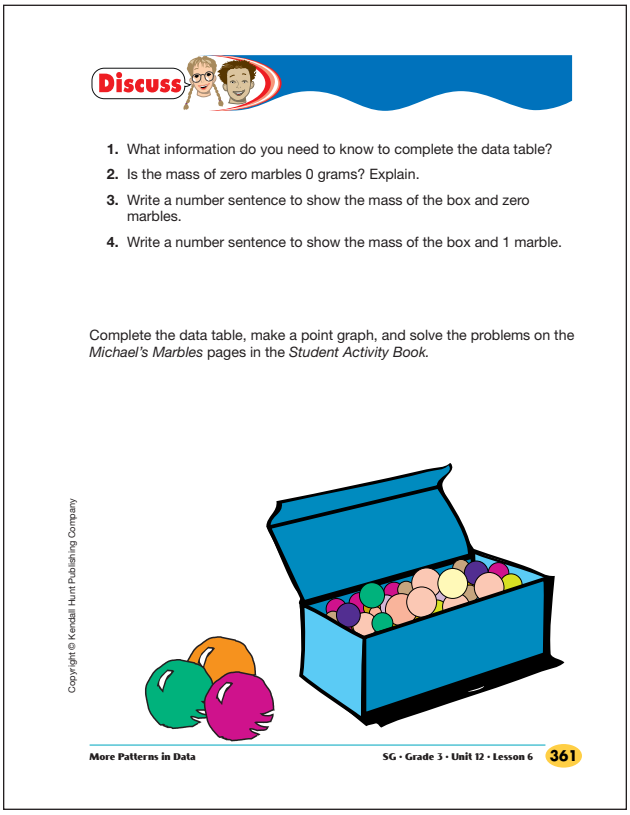
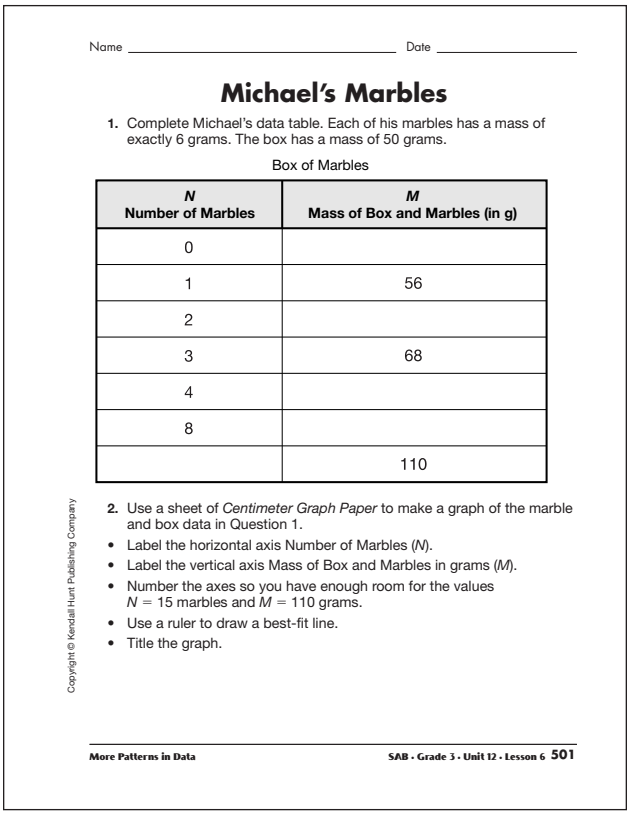


Discuss

1. What information do you need to know to complete the data table?
2. Is the mass of zero marbles 0 grams? Explain.
3. Write a number sentence to show the mass of the box and zero marbles.
4. Write a number sentence to show the mass of the box and 1 marble.

Complete the data table, make a point graph, and solve the problems on the *Michael's Marbles* pages in the *Student Activity Book*.

***Student Guide* - Page 361**



Name _____ Date _____

Michael's Marbles

1. Complete Michael's data table. Each of his marbles has a mass of exactly 6 grams. The box has a mass of 50 grams.

Box of Marbles

N Number of Marbles	*M* Mass of Box and Marbles (in g)
0	
1	56
2	
3	68
4	
8	
	110

2. Use a sheet of *Centimeter Graph Paper* to make a graph of the marble and box data in Question 1.
- Label the horizontal axis Number of Marbles (*N*).
- Label the vertical axis Mass of Box and Marbles in grams (*M*).
- Number the axes so you have enough room for the values $N = 15$ marbles and $M = 110$ grams.
- Use a ruler to draw a best-fit line.
- Title the graph.

***Student Activity Book* - Page 501**

Student Guide

More Patterns in Data (SG p. 361)
Questions 1–4

*See the lesson for answers to Questions 1–4.

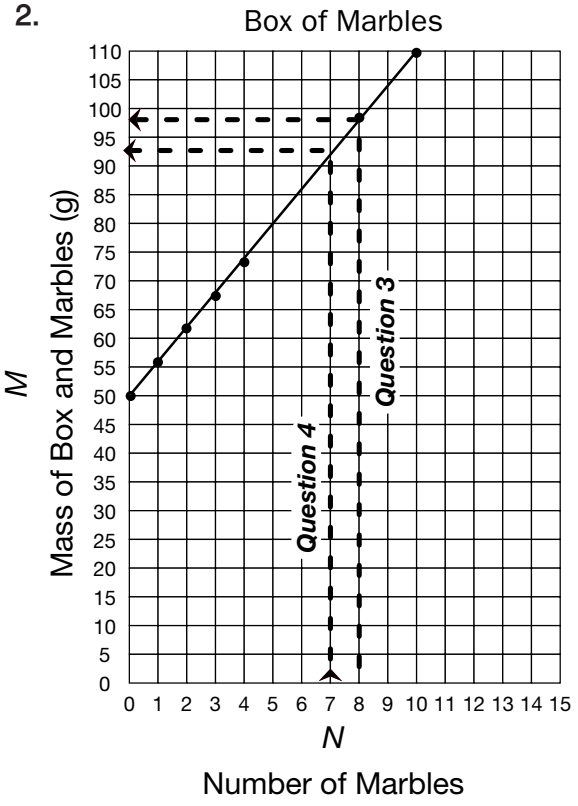
Student Activity Book

Michael's Marbles (SAB pp. 501–504)
Questions 1–11

1.

N Number of Marbles	*M* Mass of Box and Marbles
0	**50**
1	56
2	**62**
3	68
4	**74**
8	**98**
10	110

2.



*Answers and/or discussion are included in the lesson.

3. A. Josh is correct. 50 grams for the box plus $8 \times 6 = 48$ grams for the marbles is 98 grams. The graph shows that the box and 8 marbles has a mass of about 98 grams. Students should show their work on the graph with dotted lines as shown in the answer for Question 2.

4. A.* 92 grams. See graph in Question 2.

B.* $50 + 42 = 92$ grams

5. If you double the number of marbles, the mass of the marbles and box do not double. Possible explanation: The box with 1 marble is 56 grams. The mass with 2 marbles is 62 grams. 62 is not double 56.

6. If the number of marbles increases by one, the mass increases by 6 grams. Possible response: I looked at table. The mass of the box and one marble is 56. Add 1 marble and the mass of the box and 2 marbles is 6 grams more, 62 grams.

7.* A; Zero marbles have zero mass, but the box weighs 50 grams, so the first point must be at (0, 50) and the line must increase as marbles are added.

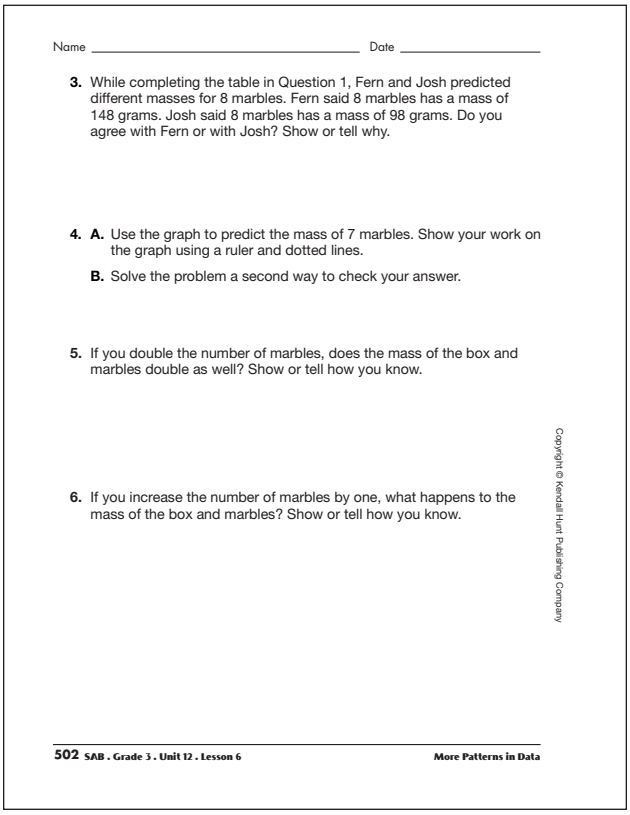
8.* The graph in Question 2 is different because the line does not go through the origin. It starts at 50 instead of 0.

9. A. 12-inch ruler: about 10g

B. calculator: about 100 g

C. 2 small paper clips: about 2 g

D. wooden meterstick: about 100g



Name _____ Date _____

3. While completing the table in Question 1, Fern and Josh predicted different masses for 8 marbles. Fern said 8 marbles has a mass of 148 grams. Josh said 8 marbles has a mass of 98 grams. Do you agree with Fern or with Josh? Show or tell why.

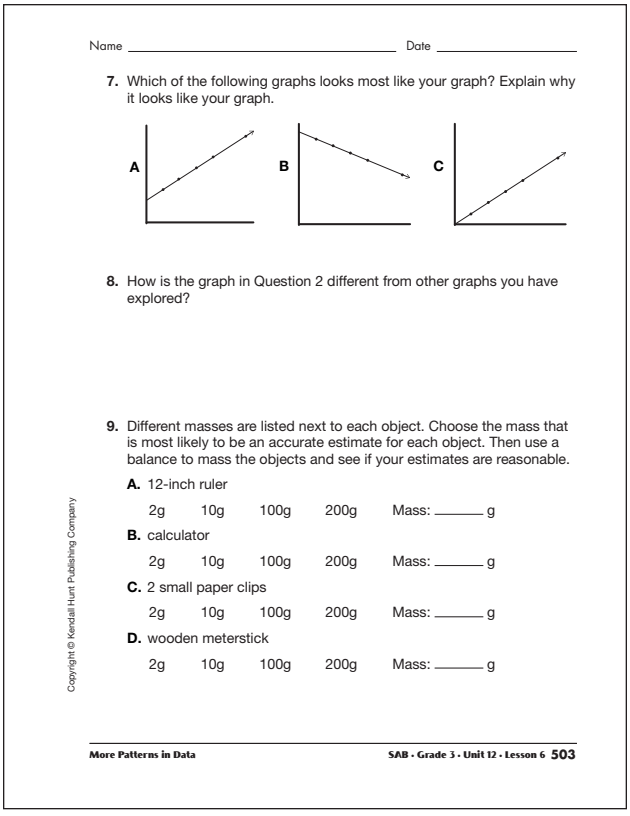
4. A. Use the graph to predict the mass of 7 marbles. Show your work on the graph using a ruler and dotted lines.

B. Solve the problem a second way to check your answer.

5. If you double the number of marbles, does the mass of the box and marbles double as well? Show or tell how you know.

6. If you increase the number of marbles by one, what happens to the mass of the box and marbles? Show or tell how you know.

***Student Activity Book* - Page 502**



Name _____ Date _____

7. Which of the following graphs looks most like your graph? Explain why it looks like your graph.

A B C

8. How is the graph in Question 2 different from other graphs you have explored?

9. Different masses are listed next to each object. Choose the mass that is most likely to be an accurate estimate for each object. Then use a balance to mass the objects and see if your estimates are reasonable.

A. 12-inch ruler

2g 10g 100g 200g Mass: _____ g

B. calculator

2g 10g 100g 200g Mass: _____ g

C. 2 small paper clips

2g 10g 100g 200g Mass: _____ g

D. wooden meterstick

2g 10g 100g 200g Mass: _____ g

***Student Activity Book* - Page 503**

***Answers and/or discussion are included in the lesson.**

Name _____ Date _____

10. Estimate the mass of a peanut butter and jelly sandwich. Explain how you decided that your estimate is reasonable.

Estimate: 2g 10g 100g 200g

11. Each jumbo marble in Yolanda's collection is about 8 grams. Decide whether the measurements she made below "could be" or are "crazy." Circle your choice.

Jumbo Marbles' Mass

	N Number of Jumbo Marbles	*M* Mass in grams		
A.	3	24	Could be	Crazy
B.	5	50	Could be	Crazy
C.	8	64	Could be	Crazy
D.	10	79	Could be	Crazy
E.	16	200	Could be	Crazy

F. If you chose crazy, explain why the measurement is crazy.

***Student Activity Book* - Page 504**

10.* About 100 grams. Explanations will vary. Students could mass an object in the classroom that represents a mass similar to a sandwich to help make the estimate.

11. A. could be

B. crazy; 5 marbles × 8 grams = 40 grams. 50 grams is too much.

C. could be

D. could be

E. crazy; 8 marbles × 8 grams = 64 grams. Double that is 16 marbles, so 64 grams + 64 grams = 128 grams. 200 grams is crazy.

***Answers and/or discussion are included in the lesson.**

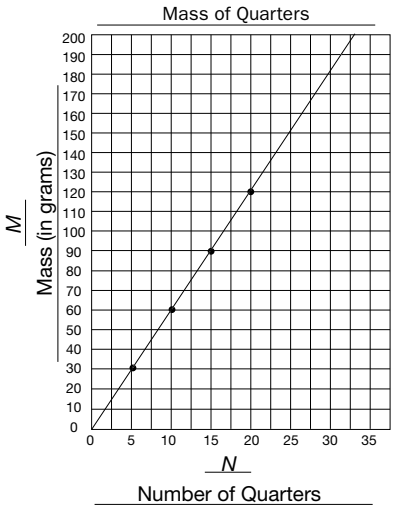
Professor Peabody's Quarters (SAB pp. 506–508)
Questions 1–7

1. 90 grams

   20 quarters

2. **A.** Responses will vary. Possible response: The numbers of quarters skip count by 5s. The mass skip counts by about 30.

   B. The mass is always about 6 times the number of quarters.

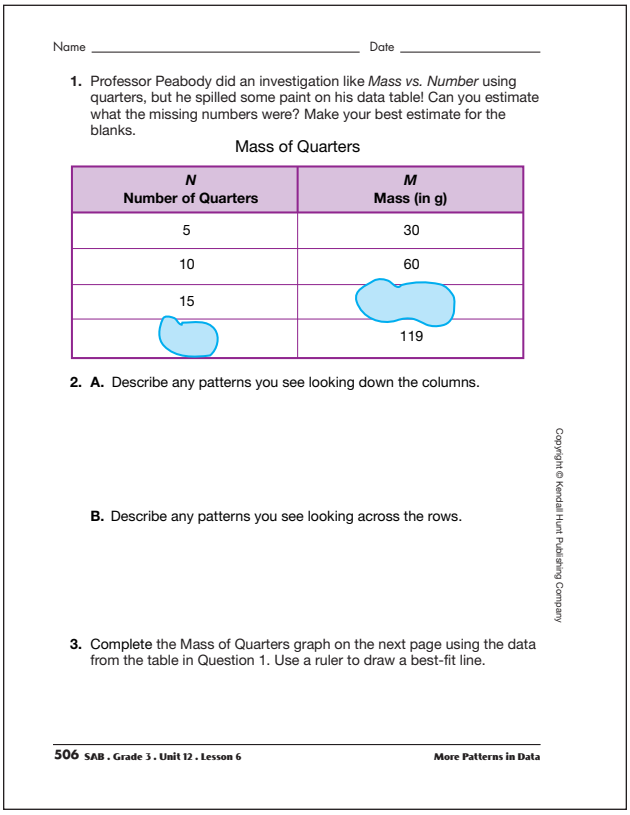
3. 

4. **A.** Possible response: When the number of quarters doubles from 5 to 10, the mass doubles from 30 to 60.

5. Mass = 150 grams. Strategies will vary. Possible strategy: I skip counted by 5s going down the first column: 5, 10, 15, 20, 25. Then I skip counted by 30s going down the second column: 30, 60, 90, 120, 150. So 25 quarters is 150 grams.

6. 72 grams; Possible explanation: I used the best-fit line on my graph. I found 12 quarters on the horizontal axis and followed the line straight up until it hit the best-fit line. I followed that line over to the vertical axis and found a mass of 72 grams.

7. 17 quarters is about 100 grams. Possible explanation: Using the patterns in the data table, I see that if I multiply the number in the quarters column by 6, I find the mass in the second column. So, each quarter is about 6 grams. I see that 15 quarters has a mass of 90 grams. Adding 2 more quarters to make 17 total adds 12 grams. 90 + 12 = 102 grams.



Name _____ Date _____

1. Professor Peabody did an investigation like *Mass vs. Number* using quarters, but he spilled some paint on his data table! Can you estimate what the missing numbers were? Make your best estimate for the blanks.

Mass of Quarters

N **Number of Quarters**	***M*** **Mass (in g)**
5	30
10	60
15	
	119

2. **A.** Describe any patterns you see looking down the columns.

B. Describe any patterns you see looking across the rows.

3. Complete the Mass of Quarters graph on the next page using the data from the table in Question 1. Use a ruler to draw a best-fit line.

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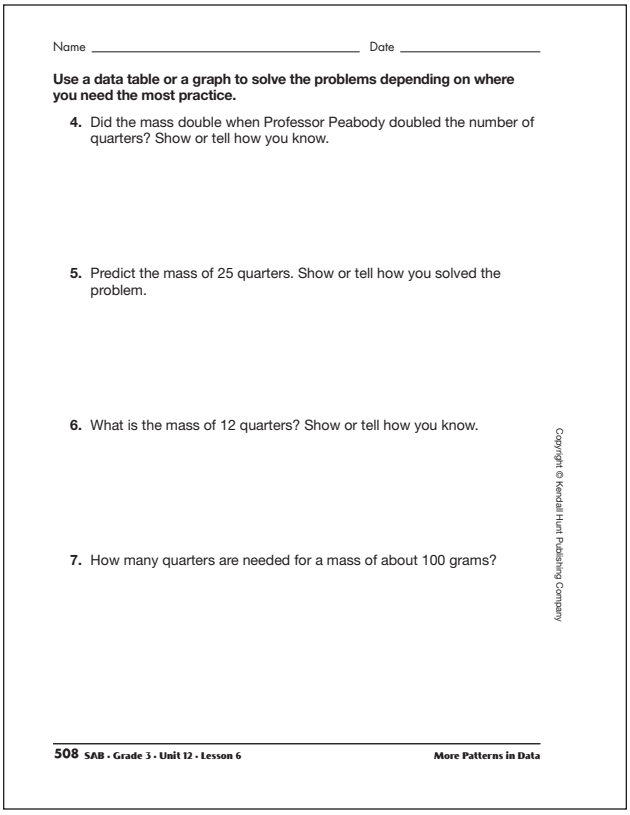
Student Activity Book **- Page 506**



Name _____ Date _____

Use a data table or a graph to solve the problems depending on where you need the most practice.

4. Did the mass double when Professor Peabody doubled the number of quarters? Show or tell how you know.

5. Predict the mass of 25 quarters. Show or tell how you solved the problem.

6. What is the mass of 12 quarters? Show or tell how you know.

7. How many quarters are needed for a mass of about 100 grams?

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Student Activity Book **- Page 508**

Name _____ Date _____

Tiffany's Investigation

1. A. Tiffany did an investigation like *Mass vs. Number* with pieces of chalk. Each piece of chalk had about the same mass. Here is her data table. Complete the missing data.

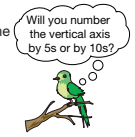
Mass of Chalk

N Number of Pieces of Chalk	*M* Mass (in grams)
1	4
2	8
3	12
4	16
5	
6	25
	28
8	33
9	
	40

2. Describe any patterns you see in the data table.

3. Use a sheet of *Centimeter Graph Paper* to make a graph of the chalk and mass data in Question 1.

- Label the horizontal axis Number of Pieces of Chalk (N).
- Label the vertical axis Mass in grams (M).
- Number the axes so you have enough room for the values N = 15 pieces of chalk and M = 100 grams.
- Use a ruler to draw a best-fit line.
- Title the graph.



***Teacher Guide* - Page 1**

Teacher Guide

Tiffany's Investigation (TG pp. 1–2) Questions 1–7

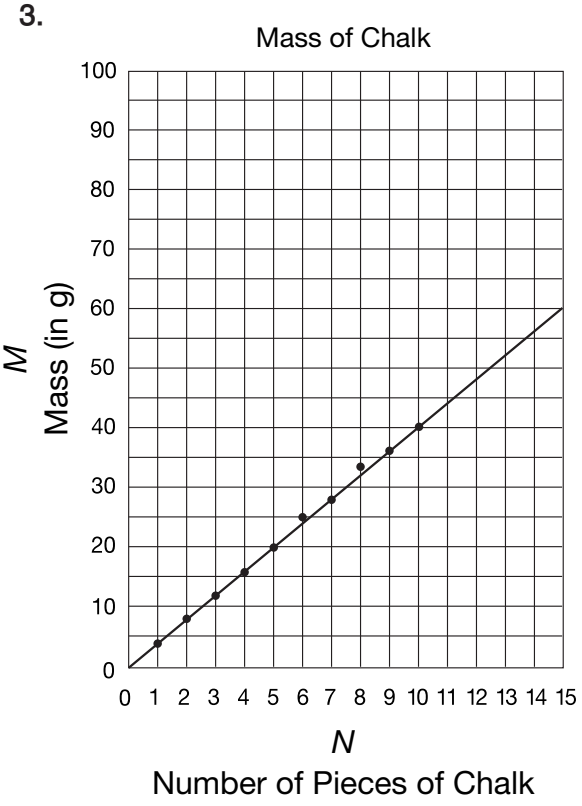
1. Possible responses given. Mass of each piece of chalk should be about 4 grams.

Mass of Chalk

N Number of Pieces of Chalk	*M* Mass (in grams)
1	4
2	8
3	12
4	16
5	**20**
6	25
7	28
8	33
9	**36**
10	40

2. Responses will vary. The mass is always about 4 times the number of pieces of chalk. When the number of pieces of chalk doubles, the mass doubles.

3.



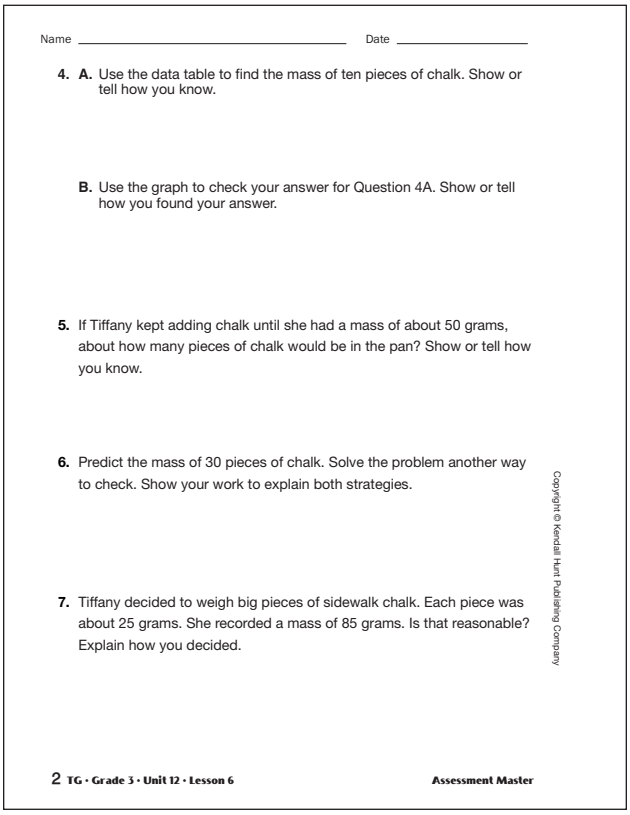
4. **A.** 40 grams; Possible response: Using the data table, I know 5 pieces of chalk has a mass of 20 grams, so 40 grams must be double the chalk with 10 pieces.

   B. Possible response: To check, I found 40 grams on the vertical axis of the graph. The lines intersect at 10 pieces of chalk.

5. 12 or 13 pieces of chalk; Possible explanation: I see a pattern in the data table. 1 piece of chalk is 4 grams, 2 is 8 grams, 3 is 12 grams, 4 is 16 grams. With each piece of chalk, I add about 4 grams to the total mass. 10 pieces of chalk is 40 grams, so 11 pieces of chalk would be 44 grams and 12 pieces of chalk would be 48 grams. 48 is close to 50 grams.

6. About 120 grams; Strategies will vary. Using the graph,15 pieces of chalk have a total mass of 60g so 30 pieces will have a mass of 120g. 30 pieces of chalk times 4 grams each equals 120 grams.

7.* 85 grams is not reasonable. Strategies will vary. Possible strategy: I made a graph with Number of Pieces of Sidewalk Chalk on the horizontal axis and Mass in Grams on the vertical axis. I plotted (1, 25), (2, 50), (3, 75), and (4, 100). The points were in a straight line and I connected them. I could not find a certain number of pieces of sidewalk chalk that would have a mass 85 grams.)



Name _____ Date _____

4. A. Use the data table to find the mass of ten pieces of chalk. Show or tell how you know.

B. Use the graph to check your answer for Question 4A. Show or tell how you found your answer.

5. If Tiffany kept adding chalk until she had a mass of about 50 grams, about how many pieces of chalk would be in the pan? Show or tell how you know.

6. Predict the mass of 30 pieces of chalk. Solve the problem another way to check. Show your work to explain both strategies.

7. Tiffany decided to weigh big pieces of sidewalk chalk. Each piece was about 25 grams. She recorded a mass of 85 grams. Is that reasonable? Explain how you decided.

***Teacher Guide* - Page 2**

***Answers and/or discussion are included in the lesson.**