Student Activity Book

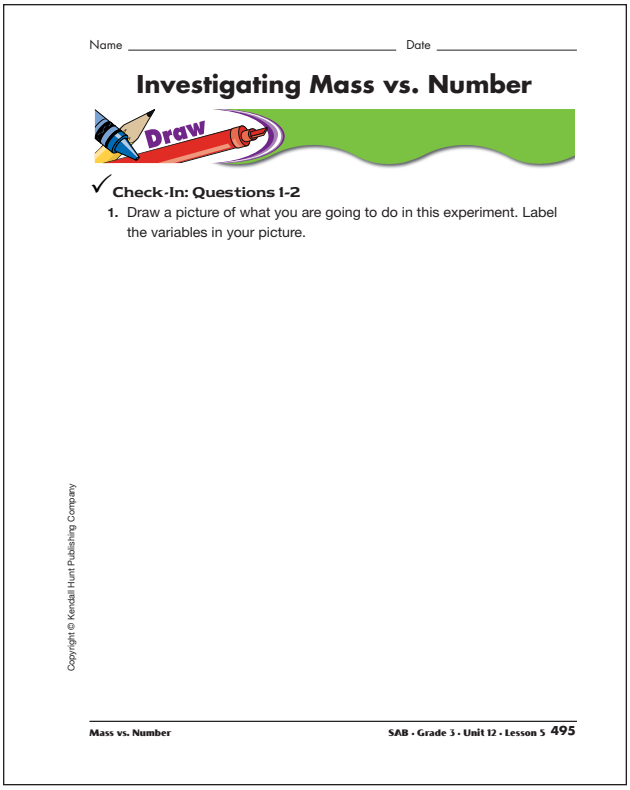
Investigating Mass vs. Number (SAB pp. 495–499) Questions 1–14

1.* See Figure 2 in the lesson for a sample drawing.

2.* See Figure 3 in the lesson for a sample data table.

3. **A.** Answers will vary based on the data.

   B. Answers will vary based on the data.



Name _____ Date _____

Investigating Mass vs. Number

Draw

✓ **Check-In: Questions 1-2**

1. Draw a picture of what you are going to do in this experiment. Label the variables in your picture.

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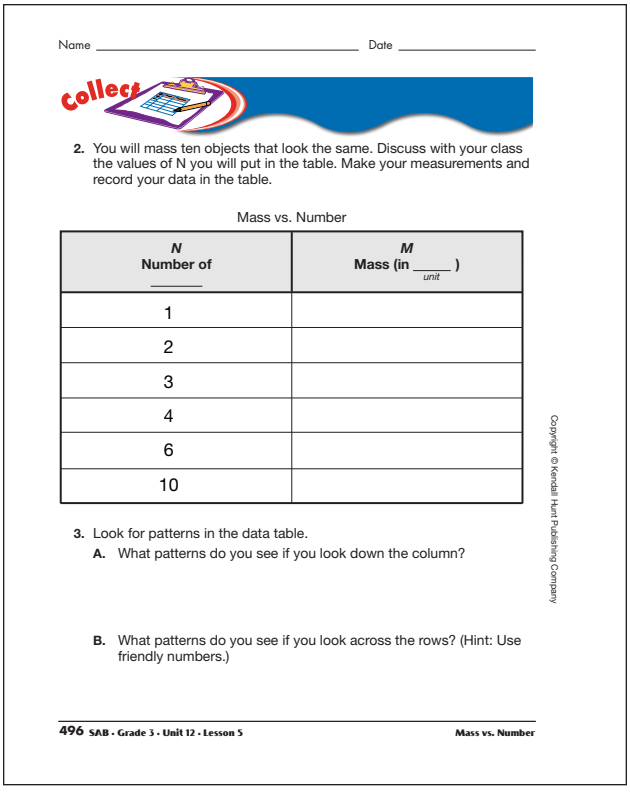

Name _____ Date _____

Collect

2. You will mass ten objects that look the same. Discuss with your class the values of N you will put in the table. Make your measurements and record your data in the table.

Mass vs. Number

N Number of _____	*M* Mass (in _____ unit)
1	
2	
3	
4	
6	
10	

3. Look for patterns in the data table.

   A. What patterns do you see if you look down the column?

   B. What patterns do you see if you look across the rows? (Hint: Use friendly numbers.)

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

Name _____ Date _____

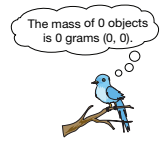
4. If you triple the number of objects, what happens to the mass? Show or tell how you found your answer.

5. If the number of objects goes up by 2, does the mass go up by two grams? Explain what happens.

Graph

✓ Check-In: Question 6

6. Use a piece of *Centimeter Graph Paper* to make a point graph.
   - Put Number of _____ (N) on the horizontal axis.
   - Put Mass in Grams (M) on the vertical axis.
   - Remember to title the graph, number the axes, and include units.
   - Be sure to start numbering with 0.



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Name _____ Date _____

Use your Mass vs. Number graph and data table to answer the following questions.

7. Think about the patterns you see in your data points. Which of the following looks most like your graph? Circle A, B, or C.

8. Use a ruler to draw a **best-fit line** for your data points. Since 0 objects have 0 mass, remember to start the line at 0, 0.

Explore

9. **A.** Predict the mass of five of your objects using the pattern in your graph.
   B. Check your prediction by measuring the mass of five of your objects. What is the actual mass?
   C. Was your prediction close? _____ Explain why you think this.

10. Find another way to predict the mass of five objects. (Do not use your graph.) Show your work. Is this new prediction better, worse, or about the same?

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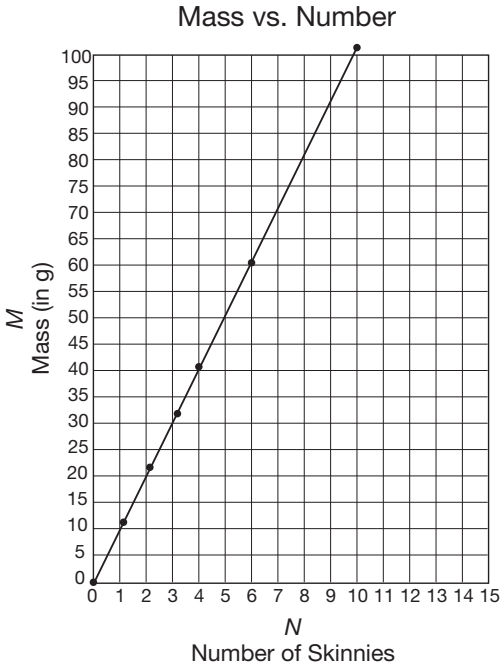
4. The mass triples; Using the table, 1 tripled is 3. 1 skinny is 11 grams and triple that is 3 × 11 grams or 33 grams. 3 skinnies are 30 grams on the table, and 30 is close to 33.

5. Using the sample data in Figure 3 in the Lesson Guide: If the number of objects goes up by 2, the mass goes up by more than 2 grams because according to the data table the mass of 2 skinnies is about 20 grams.

6.* Answer based on the data in Figure 3 in the lesson.



The answers to Questions 7–14 are based on the graph in Question 6. Answers will vary.

7. The points fall in a straight line like graph C.

8. See graph in Question 6.

9. **A.** About 50 grams
   B. Answers will vary.
   C. Answers will vary.

10. One skinny has a mass of about 10 grams. 10 grams × 5 = 50 grams. The graph usually gives a better prediction.

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

11. A. 70 grams using the graph or 7×10 grams $= 70$ grams

B. Answers will vary.

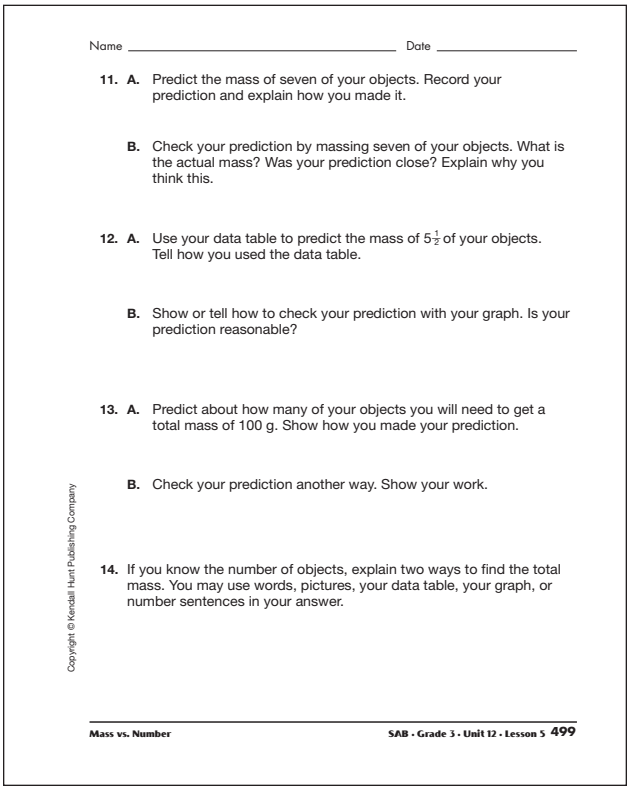
12. A. Possible response using patterns in the data table:10 skinnies are 104 grams. If I divide that in 2 to find the mass of 5, I get 52. 1 skinny is 11 grams. If I divide that in 2 to find the mass of $\frac{1}{2}$ of a skinny, I get about 5. $52 + 5 = 57$ grams for $5\frac{1}{2}$ skinnies.

B. About 58 grams; explanations and strategies used will vary. Find $5\frac{1}{2}$ on the horizontal axis and follow the grid line up to where it intersected with the line. Then, lay your ruler horizontally, touching the point of intersection and the vertical axis. The ruler should hit the vertical axis at about 58 grams. My prediction is reasonable.

13. A. Predictions will vary. One possible response: 100 grams ÷ 10 grams per skinny is 10 skinnies.

B. Answer will vary. Using the graph: Between 9 and 10 skinnies would have a mass of 100 grams. I found a mass of 100 grams on the vertical axis. I followed the line on the graph to the best-fit line and then followed the line down to find the number on the horizontal axis, Number of Skinnies. It fell between 9 and 10.

14.* Answers will vary. Possible responses: If you know the number of objects, you can find the mass by multiplying the number by about 10 grams. Or, you can use your graph to find the mass. Find the number of objects on the horizontal axis and find the number from the vertical axis that intersects with the best-fit line.



Name _____ Date _____

11. A. Predict the mass of seven of your objects. Record your prediction and explain how you made it.

B. Check your prediction by massing seven of your objects. What is the actual mass? Was your prediction close? Explain why you think this.

12. A. Use your data table to predict the mass of $5\frac{1}{2}$ of your objects. Tell how you used the data table.

B. Show or tell how to check your prediction with your graph. Is your prediction reasonable?

13. A. Predict about how many of your objects you will need to get a total mass of 100 g. Show how you made your prediction.

B. Check your prediction another way. Show your work.

14. If you know the number of objects, explain two ways to find the total mass. You may use words, pictures, your data table, your graph, or number sentences in your answer.

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