

Activity 4: Measuring Mass

Name _____

Date _____

Class _____

Key Questions

1. _____
2. _____
3. _____

Part A: Developing Ideas about Mass**We Think**

1. The standard-unit cubes are examples of objects that all have the same volume and the same mass. Do you think that objects with the same volume always have the same mass? Write your reasoning.

Explore Your Ideas

Table 1: Measured Masses of Solid Objects			
	Mass of _____ Cube (g)	Mass of _____ Cube (g)	Mass of _____ Cube (g)
Team Member 1			
Team Member 2			
Team Member 3			
Team Member 4			
Best Value (average)			
Uncertainty			
Class Average Uncertainty:			

Make Sense of Your Ideas

1. What are some mistakes that are avoidable when you measure mass?

2. If you make no mistakes, what are some unavoidable sources of uncertainty in measuring the mass of an object?

3. The three objects you measured had approximately the same *volume*. Why do you think they differ so much in mass?

4. Can you think of two objects that have the same mass but different volumes?

5. Which has more mass—a kilogram of sand or a kilogram of styrene foam? Why?

Part B: Developing Ideas about Gases

We Think

What do you think will happen to the mass of the ball? Why?

Explore Your Ideas

Table 2: Pumping Air Into a Soccer Ball		
Before Air Pumped into Soccer Ball (g)	After Air Pumped into Soccer Ball (g)	Change in Mass (g) (After — Before)

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1. Did the mass of the soccer ball *increase*, *decrease*, or *stay the same* after your teacher put air into the soccer ball (taking into account possible uncertainty)? Include your evidence.

Make Sense of Your Ideas

1. The third key question for this activity is: Do gases (like air) have mass? Does your conclusion provide supporting evidence that gases have mass or provide evidence that gases do not have mass? Explain.

Our Consensus Ideas

The first key question of this activity is:



1. How is mass measured?

1. Write your best answer for this key question.

2. Write the class consensus ideas about the first key question: *How is mass measured?*

The second key question is:



2. How is mass different from volume?

3. Write your best answer for this key question. In answering this question, look back over the definitions of mass and volume. Think about how these two definitions are different from each other.

4. With the guidance of your teacher, write the class consensus ideas about the second key question: *How is mass different from volume?*

The third key question is:



3. Do gases have mass?

5. Write your answer for this key question.

6. Write the class consensus ideas about the third key question: *Do gases have mass?*
