



The Great Volume Heist

Grade 5 math · Fractions of a number, Order of operations, Multiplication, Rounding, Division · Reading level grades 5-6

Detective: _____ **Date:** _____

The lab is in a total splash! Someone snuck into the high-security vault and drained the primary reservoir of its glowing blue serum. The security alarms failed, but the culprit left behind a trail of spilled drops, empty graduated cylinders, and cubic unit blocks. As lead detective, you must use your volume math skills to measure the clues and find the thief before the serum evaporates!

1. Solve each math problem. The answer is a number, and the letter beside it is what that number stands for.
2. In the clue boxes, write that letter in every box showing the same number, then read the secret clue.
3. Use each clue to cross suspects off the list. The one suspect left at the end is the culprit!

My answer: the Density Disrupter is _____

Possible suspects

Cross off a row as each clue rules it out. The one left at the end is the culprit.

NAME	MEASUREMENT METHOD	LIQUID ABILITY	HANDEDNESS	SAFETY HEADGEAR	LAB TOOL VULNERABILITY
Archimedes	Unit Converting	Condensing	Uses right handed pipette	Clear swim cap	Mega drain
Daniel Bernoulli	Beaker Balancing	Freezing	Uses left handed pipette	Clear swim cap	Mega drain
Thomas Edison	Displacement Calculation	Evaporating	Uses left handed pipette	Clear swim cap	Empty beaker
Michael Faraday	Displacement Calculation	Condensing	Uses left handed pipette	Yellow splash visor	Empty beaker
John Dalton	Cubic Stacking	Gellifying	Uses left handed pipette	Clear swim cap	Mega drain
Louis Pasteur	Displacement Calculation	Siphoning	Uses left handed pipette	Blue safety goggles	Empty beaker
Albert Einstein	Unit Converting	Evaporating	Uses left handed pipette	Blue safety goggles	Spilled sponge
Charles Boyle	Beaker Balancing	Gellifying	Uses left handed pipette	Clear swim cap	Mega drain
Antoine Lavoisier	Beaker Balancing	Condensing	Uses left handed pipette	Clear swim cap	Spilled sponge
Jacques Charles	Unit Converting	Condensing	Uses left handed pipette	Blue safety goggles	Mega drain
Marie Curie	Beaker Balancing	Evaporating	Uses left handed pipette	Yellow splash visor	Mega drain
Gregor Mendel	Cylinder Calibrating	Evaporating	Uses right handed pipette	Clear swim cap	Mega drain
Isaac Newton	Cubic Stacking	Condensing	Uses right handed pipette	Blue safety goggles	Empty beaker
Robert Boyle	Cubic Stacking	Evaporating	Uses left handed pipette	Clear swim cap	Spilled sponge
Alan Turing	Unit Converting	Condensing	Uses left handed pipette	Clear swim cap	Mega drain
Nikola Tesla	Cubic Stacking	Gellifying	Uses right handed pipette	Yellow splash visor	Spilled sponge
Jane Goodall	Displacement Calculation	Siphoning	Uses right handed pipette	Clear swim cap	Empty beaker
Galileo Galilei	Beaker Balancing	Evaporating	Uses right handed pipette	Clear swim cap	Mega drain
Lord Kelvin	Cubic Stacking	Gellifying	Uses left handed pipette	Yellow splash visor	Spilled sponge
Joseph Gay-Lussac	Beaker Balancing	Condensing	Uses left handed pipette	Clear swim cap	Empty beaker
Evangelista Torricelli	Cubic Stacking	Siphoning	Uses left handed pipette	Clear swim cap	Mega drain

CLUE 1
Fractions of a number

The lab team had forty graduated cylinders on the rack, but the thief knocked over a fraction of them. We counted the broken ones to narrow down the suspect list.

Solve each problem, then write its letter in every clue box that shows the same number.

T																	T
5	16	8	34	19	12	12	31	19	13	26	35	8	6	13	35	5	
7	6	8	6	19	40	16	35	13	19	13	17						

$2/6 \text{ of } 15 = \square \rightarrow \text{ **T** }$

$2/4 \text{ of } 52 = \square \rightarrow \text{ **D** }$

$1/6 \text{ of } 96 = \square \rightarrow \text{ **H** }$

$1/4 \text{ of } 124 = \square \rightarrow \text{ **A** }$

$1/4 \text{ of } 68 = \square \rightarrow \text{ **G** }$

$4/6 \text{ of } 51 = \square \rightarrow \text{ **V** }$

$2/4 \text{ of } 12 = \square \rightarrow \text{ **S** }$

$5/10 \text{ of } 26 = \square \rightarrow \text{ **N** }$

$1/5 \text{ of } 200 = \square \rightarrow \text{ **P** }$

$1/6 \text{ of } 72 = \square \rightarrow \text{ **L** }$

$1/3 \text{ of } 21 = \square \rightarrow \text{ **U** }$

$4/6 \text{ of } 12 = \square \rightarrow \text{ **E** }$

$3/6 \text{ of } 70 = \square \rightarrow \text{ **O** }$

$1/8 \text{ of } 152 = \square \rightarrow \text{ **I** }$

Scratch space:

CLUE 2
Order of operations

To find the mystery volume of the storage tank, we must solve a formula with parentheses, multiplication, and addition. Calculating this correctly reveals a key clue about the thief.

Solve each problem, then write its letter in every clue box that shows the same number.

L																
51	8	80	70	24	10	56	65	8	65	34	45	34	8	70	70	8
34	25	45	56	70	19	16	8	25	8	80	68	60	56	65	10	70
70	24	8														

$24 + 3 \times 9 = \square \rightarrow \text{L}$	$10 \times 5 - 25 = \square \rightarrow \text{R}$	$17 + 9 \times 7 = \square \rightarrow \text{F}$
$2 + 4 \times 2 = \square \rightarrow \text{A}$	$2 + 2 \times 3 = \square \rightarrow \text{E}$	$3 \times 6 - 1 = \square \rightarrow \text{B}$
$12 + 2 \times 6 = \square \rightarrow \text{H}$	$8 \times 10 - 24 = \square \rightarrow \text{N}$	$40 + 5 \times 4 = \square \rightarrow \text{U}$
$62 + 4 \times 2 = \square \rightarrow \text{T}$	$4 + 3 \times 4 = \square \rightarrow \text{W}$	$10 \times 7 - 2 = \square \rightarrow \text{O}$
$10 \times 3 - 11 = \square \rightarrow \text{S}$	$10 \times 5 - 16 = \square \rightarrow \text{P}$	$7 \times 12 - 19 = \square \rightarrow \text{D}$
$24 + 7 \times 3 = \square \rightarrow \text{I}$		

Scratch space:

CLUE 3
Multiplication facts (1-12)

The thief escaped by climbing a wall of cubic storage boxes. By multiplying the rows, columns, and height of the boxes, we figured out how high they climbed.

Solve each problem, then write its letter in every clue box that shows the same number.

T																		
45	33	108	21	110	7	7	99	110	88	100	99	81	81	10	24	84	108	11
11	144	100	88	99	50	108	48	99	11	12	99	110	88					

$9 \times 5 = \square \rightarrow$ T	$11 \times 3 = \square \rightarrow$ H	$10 \times 10 = \square \rightarrow$ W
$9 \times 9 = \square \rightarrow$ S	$12 \times 12 = \square \rightarrow$ O	$8 \times 3 = \square \rightarrow$ C
$10 \times 5 = \square \rightarrow$ M	$7 \times 1 = \square \rightarrow$ L	$12 \times 1 = \square \rightarrow$ R
$9 \times 12 = \square \rightarrow$ E	$11 \times 10 = \square \rightarrow$ I	$11 \times 9 = \square \rightarrow$ A
$11 \times 1 = \square \rightarrow$ D	$10 \times 1 = \square \rightarrow$ U	$7 \times 3 = \square \rightarrow$ V
$7 \times 12 = \square \rightarrow$ K	$8 \times 6 = \square \rightarrow$ G	$11 \times 8 = \square \rightarrow$ N

Scratch space:

CLUE 4 Rounding

An eye-witness saw the thief spill a beaker, but the exact volume measurement on the scale was blurry. We had to round it to the nearest liter to understand the clue.

Solve each problem, then write its letter in every clue box that shows the same number.

A				A							A			A			
4300	1700	3000	2300	4300	170	700	20	500	90	1700	4300	290	20	4300	700		
30	200	370	9000	900	500	9000	50	130	2300	700	290	2300	1700	500	90	2300	9000

Round 4,333 to the nearest hundred →

A

Round 526 to the nearest hundred →

I

Round 8,511 to the nearest thousand →

N

Round 287 to the nearest ten →

P

Round 2,310 to the nearest hundred →

E

Round 129 to the nearest ten →

H

Round 889 to the nearest hundred →

D

Round 33 to the nearest ten →

F

Round 368 to the nearest ten →

U

Round 2,510 to the nearest thousand →

L

Round 168 to the nearest ten →

R

Round 17 to the nearest ten →

W

Round 212 to the nearest hundred →

O

Round 94 to the nearest ten →

M

Round 664 to the nearest hundred →

S

Round 49 to the nearest ten →

T

Round 1,728 to the nearest hundred →

C

Scratch space:

CLUE 5**Division facts (1-12) - the last clue**

We recovered a stolen container of formula and had to divide it equally among our five small test tubes. The shared volume amount told us the final identity clue.

First solve each problem. Then find each answer in the numbered list below and cross that sentence out. One sentence will be left - that is exactly what the villain did!

Step 1 - solve these:

$27 \div 3 = \boxed{}$

$24 \div 3 = \boxed{}$

$4 \div 2 = \boxed{}$

$32 \div 8 = \boxed{}$

$36 \div 6 = \boxed{}$

$15 \div 5 = \boxed{}$

$84 \div 12 = \boxed{}$

$40 \div 8 = \boxed{}$

$5 \div 5 = \boxed{}$

$144 \div 12 = \boxed{}$

$88 \div 8 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain filled the graduated cylinder, then siphoned the water supply.
2. The villain stacked the cubic unit blocks, then gellified the lab specimen.
3. The villain converted liters to milliliters, then siphoned the water supply.
4. The villain measured the liquid level, then evaporated the swimming pool.
5. The villain converted liters to milliliters, then gellified the lab specimen.
6. The villain filled the graduated cylinder, then condensed the steam cloud.
7. The villain measured the liquid level, then froze the measuring flask.
8. The villain filled the graduated cylinder, then gellified the lab specimen.
9. The villain converted liters to milliliters, then condensed the steam cloud.
10. The villain filled the graduated cylinder, then froze the measuring flask.
11. The villain stacked the cubic unit blocks, then froze the measuring flask.
12. The villain converted liters to milliliters, then froze the measuring flask.

Answer Key

The Great Volume Heist

Culprit: Daniel Bernoulli

Beaker Balancing · Freezing · Uses left handed pipette · Clear swim cap · Mega drain

Trail: Start 21 → Clue 1 18 → Clue 2 13 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Fractions of a number): "THE VILLAIN DOES NOT USE SIPHONING"

$\frac{2}{6}$ of 15 = 5 (T) · $\frac{2}{4}$ of 52 = 26 (D) · $\frac{1}{6}$ of 96 = 16 (H) · $\frac{1}{4}$ of 124 = 31 (A) · $\frac{1}{4}$ of 68 = 17 (G) · $\frac{4}{6}$ of 51 = 34 (V) · $\frac{2}{4}$ of 12 = 6 (S) · $\frac{5}{10}$ of 26 = 13 (N) · $\frac{1}{5}$ of 200 = 40 (P) · $\frac{1}{6}$ of 72 = 12 (L) · $\frac{1}{3}$ of 21 = 7 (U) · $\frac{4}{6}$ of 12 = 8 (E) · $\frac{3}{6}$ of 70 = 35 (O) · $\frac{1}{8}$ of 152 = 19 (I)

Clue 2 (Order of operations): "LEFT HANDED PIPETTE PRINTS WERE FOUND AT THE LAB"

$24 + 3 \times 9 = 51$ (L) · $10 \times 5 - 25 = 25$ (R) · $17 + 9 \times 7 = 80$ (F) · $2 + 4 \times 2 = 10$ (A) · $2 + 2 \times 3 = 8$ (E) · $3 \times 6 - 1 = 17$ (B) · $12 + 2 \times 6 = 24$ (H) · $8 \times 10 - 24 = 56$ (N) · $40 + 5 \times 4 = 60$ (U) · $62 + 4 \times 2 = 70$ (T) · $4 + 3 \times 4 = 16$ (W) · $10 \times 7 - 2 = 68$ (O) · $10 \times 3 - 11 = 19$ (S) · $10 \times 5 - 16 = 34$ (P) · $7 \times 12 - 19 = 65$ (D) · $24 + 7 \times 3 = 45$ (I)

Clue 3 (Multiplication facts (1-12)): "THE VILLAIN WAS SUCKED DOWN A MEGA DRAIN"

$9 \times 5 = 45$ (T) · $11 \times 3 = 33$ (H) · $10 \times 10 = 100$ (W) · $9 \times 9 = 81$ (S) · $12 \times 12 = 144$ (O) · $8 \times 3 = 24$ (C) · $10 \times 5 = 50$ (M) · $7 \times 1 = 7$ (L) · $12 \times 1 = 12$ (R) · $9 \times 12 = 108$ (E) · $11 \times 10 = 110$ (I) · $11 \times 9 = 99$ (A) · $11 \times 1 = 11$ (D) · $10 \times 1 = 10$ (U) · $7 \times 3 = 21$ (V) · $7 \times 12 = 84$ (K) · $8 \times 6 = 48$ (G) · $11 \times 8 = 88$ (N)

Clue 4 (Rounding): "A CLEAR SWIM CAP WAS FOUND IN THE SPECIMEN"

Round 4,333 to the nearest hundred = 4300 (A) · Round 526 to the nearest hundred = 500 (I) · Round 8,511 to the nearest thousand = 9000 (N) · Round 287 to the nearest ten = 290 (P) · Round 2,310 to the nearest hundred = 2300 (E) · Round 129 to the nearest ten = 130 (H) · Round 889 to the nearest hundred = 900 (D) · Round 33 to the nearest ten = 30 (F) · Round 368 to the nearest ten = 370 (U) · Round 2,510 to the nearest thousand = 3000 (L) · Round 168 to the nearest ten = 170 (R) · Round 17 to the nearest ten = 20 (W) · Round 212 to the nearest hundred = 200 (O) · Round 94 to the nearest ten = 90 (M) · Round 664 to the nearest hundred = 700 (S) · Round 49 to the nearest ten = 50 (T) · Round 1,728 to the nearest hundred = 1700 (C)

Clue 5 (Division facts (1-12)): surviving statement is box 10 → Daniel Bernoulli

$27 \div 3 = 9$ · $24 \div 3 = 8$ · $4 \div 2 = 2$ · $32 \div 8 = 4$ · $36 \div 6 = 6$ · $15 \div 5 = 3$ · $84 \div 12 = 7$ · $40 \div 8 = 5$ · $5 \div 5 = 1$ · $144 \div 12 = 12$ · $88 \div 8 = 11$