



The Case of Mr. Nappi's Missing Pencils

Grade 9 math · Fractions of a number, Word problems, Bar models, Multi-step word problems · Reading level grades 7-9

Detective: _____ Date: _____

Disaster has struck Room 204! Mr. Nappi's prized vault of premium yellow Ticonderoga pencils has been completely cleaned out. Only a math detective can solve the trail of graphite clues and find the culprit.

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 pencil bandit is _____

Possible suspects

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

NAME	HALLWAY EXCUSE	LOOTING STYLE	WRITING HAND	BACKPACK COLOR	DISTRACTION TRICK
Ian	guidance meeting	backpack sweep	right handed	crimson red	dropped hallway binder
Valerie	locker runs	backpack sweep	left handed	crimson red	dropped hallway binder
Zoe	guidance meeting	locker dumping	right handed	crimson red	crinkly chip bag
Gavin	locker runs	hoodie pocketing	left handed	navy blue	dropped hallway binder
Marcus	bathroom pass	pencil case raid	left handed	crimson red	crinkly chip bag
Danielle	guidance meeting	backpack sweep	right handed	neon green	crinkly chip bag
Lana	guidance meeting	locker dumping	right handed	crimson red	squeaky desk chair
Fiona	bathroom pass	pencil case raid	right handed	crimson red	dropped hallway binder
Ethan	water fountain	backpack sweep	left handed	crimson red	dropped hallway binder
Haley	water fountain	backpack sweep	right handed	crimson red	dropped hallway binder
Wyatt	locker runs	backpack sweep	right handed	navy blue	squeaky desk chair
Nadia	guidance meeting	backpack sweep	right handed	navy blue	dropped hallway binder
Kyle	bathroom pass	backpack sweep	right handed	crimson red	dropped hallway binder
Julia	bathroom pass	locker dumping	left handed	neon green	crinkly chip bag
Owen	bathroom pass	hoodie pocketing	left handed	neon green	crinkly chip bag
Paige	bathroom pass	binder stuffing	left handed	neon green	squeaky desk chair
Ulysses	nurse visit	binder stuffing	right handed	neon green	squeaky desk chair
Riley	guidance meeting	pencil case raid	left handed	navy blue	dropped hallway binder
Sam	nurse visit	backpack sweep	right handed	crimson red	crinkly chip bag
Quinn	guidance meeting	hoodie pocketing	right handed	navy blue	dropped hallway binder
Tara	nurse visit	backpack sweep	right handed	crimson red	dropped hallway binder

CLUE 1

Fractions of a number

To track the bandit's path, we analyze the classroom supply log. The bandit took several boxes of pencils, handed some out to accomplices, and hid the rest, requiring a multi-step calculation to find the true starting count.

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

T							T						T					
5	57	17	43	2	13	44	59	5	44	59	44	13	47	5	34	60	17	2

27	17	13	23	59	54	23	2	60	17	32	2	59	44

$1/4 \text{ of } 20 = \square \rightarrow \text{T}$

$2/6 \text{ of } 162 = \square \rightarrow \text{L}$

$2/6 \text{ of } 129 = \square \rightarrow \text{B}$

$2/4 \text{ of } 120 = \square \rightarrow \text{S}$

$1/8 \text{ of } 136 = \square \rightarrow \text{E}$

$2/10 \text{ of } 160 = \square \rightarrow \text{R}$

$1/4 \text{ of } 52 = \square \rightarrow \text{N}$

$1/5 \text{ of } 115 = \square \rightarrow \text{C}$

$5/10 \text{ of } 118 = \square \rightarrow \text{I}$

$3/6 \text{ of } 114 = \square \rightarrow \text{H}$

$1/3 \text{ of } 132 = \square \rightarrow \text{D}$

$2/4 \text{ of } 4 = \square \rightarrow \text{A}$

$1/3 \text{ of } 141 = \square \rightarrow \text{O}$

$2/8 \text{ of } 108 = \square \rightarrow \text{P}$

$2/4 \text{ of } 68 = \square \rightarrow \text{U}$

Scratch space:

CLUE 2

Word problems

A witness in the hall remembers seeing someone rushing past the lockers with bundles of writing utensils. We can figure out the exact number of stolen pencils by solving this word problem.

Solve each problem, then write its letter in the boxes to fill in the missing word.

A witness saw the villain was R D E D .

80 68 52 85 97 85 62 88

There were 108 protractors. 28 were used up. How many protractors are left?

Answer: → R

Mr. Nappi found 12 calculators yesterday and 56 more today. How many calculators in all?

Answer: → I

There were 121 rulers. 24 were used up. How many rulers are left?

Answer: → T

Mr. Nappi found 11 protractors yesterday and 41 more today. How many protractors in all?

Answer: → G

Mr. Nappi found 49 erasers yesterday and 36 more today. How many erasers in all?

Answer: → H

Mr. Nappi found 58 calculators yesterday and 30 more today. How many calculators in all?

Answer: → N

Mr. Nappi found 43 protractors yesterday and 19 more today. How many protractors in all?

Answer: → A

Scratch space:

CLUE 3

Bar model word problems

Mr. Nappi draws a bar model on the board to compare his morning pencil stash with the empty boxes left behind. Visualizing these ratios reveals the culprit's getaway timing.

Draw a bar model to solve each word problem, then write its letter in the boxes to fill in the missing word.

Someone scared the villain off with

D **D** **L** **L** **W** **Y** **B** **I** **N** **D** .

35 62 75 40 40 138 35 27 63 63 35 138 62

Mr. Nappi has 5 times as many pencils as a teammate. The teammate has 7 pencils. How many pencils does Mr. Nappi have?

draw a bar model

Answer: → **D**

Mr. Nappi shares 189 erasers equally among 3 teams. How many erasers does each team get?

draw a bar model

Answer: → **A**

Mr. Nappi used $\frac{1}{2}$ of the calculators on the first day. The other 69 calculators were used the next day. How many calculators were there in all?

draw a bar model

Answer: → **E**

One group collected 45 rulers and another group collected 17 rulers. How many rulers in all?

draw a bar model

Answer: → **R**

Mr. Nappi has 3 times as many pencils as a teammate. The teammate has 9 pencils. How many pencils does Mr. Nappi have?

draw a bar model

Answer: → **H**

Mr. Nappi used $\frac{1}{2}$ of the calculators on the first day. The other 20 calculators were used the next day. How many calculators were there in all?

draw a bar model

Answer: → **P**

The red team has 108 protractors and the blue team has 33 protractors. How many more protractors does the red team have?

draw a bar model

Answer: →

CLUE 5**Fractions of a number - the last clue**

A final clue comes from the lost and found box, where another fraction of the missing collection was hidden. Finding this precise fraction narrows down our suspect list.

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:

$3/8 \text{ of } 8 = \boxed{}$

$2/4 \text{ of } 16 = \boxed{}$

$4/8 \text{ of } 14 = \boxed{}$

$3/8 \text{ of } 24 = \boxed{}$

$5/10 \text{ of } 22 = \boxed{}$

$4/8 \text{ of } 8 = \boxed{}$

$1/8 \text{ of } 8 = \boxed{}$

$2/10 \text{ of } 25 = \boxed{}$

$2/4 \text{ of } 4 = \boxed{}$

$2/5 \text{ of } 25 = \boxed{}$

$1/4 \text{ of } 48 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain nabbed the dry erase markers, then dropped a broken lead piece.
2. The villain nabbed the dry erase markers, then ran down the main corridor.
3. The villain emptied the pencil drawer, then left a trail of shavings.
4. The villain stole the golden sharpener, then ran down the main corridor.
5. The villain swiped the mechanical pencils, then ran down the main corridor.
6. The villain plundered the spare erasers, then left a trail of shavings.
7. The villain nabbed the dry erase markers, then left a trail of shavings.
8. The villain stole the golden sharpener, then left a trail of shavings.
9. The villain nabbed the dry erase markers, then hid the evidence in a locker.
10. The villain emptied the pencil drawer, then ran down the main corridor.
11. The villain emptied the pencil drawer, then smudged the whiteboard clean.
12. The villain stole the golden sharpener, then hid the evidence in a locker.

Answer Key

The Case of Mr. Nappi's Missing Pencils

Culprit: Ian

guidance meeting · backpack sweep · right handed · crimson red · dropped hallway binder

Trail: Start 21 → Clue 1 18 → Clue 2 12 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Fractions of a number): "THE BANDIT DID NOT USE A PENCIL CASE RAID"

$\frac{1}{4}$ of 20 = 5 (T) · $\frac{2}{6}$ of 162 = 54 (L) · $\frac{2}{6}$ of 129 = 43 (B) · $\frac{2}{4}$ of 120 = 60 (S) · $\frac{1}{8}$ of 136 = 17 (E) · $\frac{2}{10}$ of 160 = 32 (R) · $\frac{1}{4}$ of 52 = 13 (N) · $\frac{1}{5}$ of 115 = 23 (C) · $\frac{5}{10}$ of 118 = 59 (I) · $\frac{3}{6}$ of 114 = 57 (H) · $\frac{1}{3}$ of 132 = 44 (D) · $\frac{2}{4}$ of 4 = 2 (A) · $\frac{1}{3}$ of 141 = 47 (O) · $\frac{2}{8}$ of 108 = 27 (P) · $\frac{2}{4}$ of 68 = 34 (U)

Clue 2 (Word problems): "RIGHT HANDED"

There were 108 protractors. 28 were used up. How many protractors are left? = 80 (R) · Mr. Nappi found 12 calculators yesterday and 56 more today. How many calculators in all? = 68 (I) · There were 121 rulers. 24 were used up. How many rulers are left? = 97 (T) · Mr. Nappi found 11 protractors yesterday and 41 more today. How many protractors in all? = 52 (G) · Mr. Nappi found 49 erasers yesterday and 36 more today. How many erasers in all? = 85 (H) · Mr. Nappi found 58 calculators yesterday and 30 more today. How many calculators in all? = 88 (N) · Mr. Nappi found 43 protractors yesterday and 19 more today. How many protractors in all? = 62 (A)

Clue 3 (Bar model word problems): "DROPPED HALLWAY BINDER"

Mr. Nappi has 5 times as many pencils as a teammate. The teammate has 7 pencils. How many pencils does Mr. Nappi have? = 35 (D) · Mr. Nappi shares 189 erasers equally among 3 teams. How many erasers does each team get? = 63 (A) · Mr. Nappi used $\frac{1}{2}$ of the calculators on the first day. The other 69 calculators were used the next day. How many calculators were there in all? = 138 (E) · One group collected 45 rulers and another group collected 17 rulers. How many rulers in all? = 62 (R) · Mr. Nappi has 3 times as many pencils as a teammate. The teammate has 9 pencils. How many pencils does Mr. Nappi have? = 27 (H) · Mr. Nappi used $\frac{1}{2}$ of the calculators on the first day. The other 20 calculators were used the next day. How many calculators were there in all? = 40 (P) · The red team has 108 protractors and the blue team has 33 protractors. How many more protractors does the red team have? = 75 (O)

Clue 4 (Multi-step word problems): "CRIMSON RED"

There were 84 calculators in all. 2 The Math Club used 20 calculators each. The other 2 The Math Club shared the rest equally. How many calculators did each of the other The Math Club get? = 22 (C) · There were 378 protractors in all. 35 protractors were set aside. The rest were shared equally among 7 The Math Club. How many protractors did each get? = 49 (S) · Mr. Nappi earned 2 protractors in each of 4 rounds, plus 66 bonus protractors. Then 15 protractors were lost. How many protractors are left? = 59 (M) · Mr. Nappi earned 4 protractors in each of 2 rounds, plus 13 bonus protractors. Then 8 protractors were lost. How many protractors are left? = 13 (R) · Mr. Nappi earned 2 calculators in each of 5 rounds, plus 17 bonus calculators. Then 2 calculators were lost. How many calculators are left? = 25 (I) · Mr. Nappi earned 3 rulers in each of 2 rounds, plus 28 bonus rulers. Then 15 rulers were lost. How many rulers are left? = 19 (O) · Mr. Nappi collected 16 protractors in the morning and 28 protractors in the afternoon, then split them equally among 4 The Math Club. How many protractors did each get? = 11 (N)

Clue 5 (Fractions of a number): surviving statement is box 6 → Ian

$\frac{3}{8}$ of 8 = 3 · $\frac{2}{4}$ of 16 = 8 · $\frac{4}{8}$ of 14 = 7 · $\frac{3}{8}$ of 24 = 9 · $\frac{5}{10}$ of 22 = 11 · $\frac{4}{8}$ of 8 = 4 · $\frac{1}{8}$ of 8 = 1 · $\frac{2}{10}$ of 25 = 5 · $\frac{2}{4}$ of 4 = 2 · $\frac{2}{5}$ of 25 = 10 · $\frac{1}{4}$ of 48 = 12