



The Case of the Missing Truth Ledger

Grade 5 math · Fractions of a number, Bar models, Multi-step word problems, Order of operations, Missing addends ·
Reading level grades 5-6

Detective: _____ Date: _____

The Grand Verity Academy is in chaos! Someone has stolen the Great Ledger of Truth, threatening to replace all real facts with wild rumors. Chief Archivist Penelope needs your help to decode the clues, track down the untruth agent, and restore honesty to the realm.

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 untruth agent is _____

Possible suspects

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

NAME	FACT FINDER GEAR	TRICKSTER TOOL	WRITING HAND	HAIR STYLE	REVEALING ELEMENT
Cluefinder Charles	Echo Bell	Shadow Cloak	right-handed writing	ink-black curls	lemon juice
Scribe Beatrice	Decoder Monocle	Wax Seal	right-handed writing	ink-black curls	lemon juice
Detective Martha	Fact Prism	Hologram Lens	right-handed writing	silver braids	bright sunlight
Scholar George	Echo Bell	Mirror Shield	left-handed writing	copper waves	lemon juice
Agent Boole	Scribe Quill	Wax Seal	right-handed writing	ink-black curls	bright sunlight
Sleuth Winston	Scribe Quill	Ink Mist	left-handed writing	copper waves	lemon juice
Scholar Bertrand	Echo Bell	Ink Mist	right-handed writing	copper waves	bright sunlight
Agent Constance	Fact Prism	Hologram Lens	left-handed writing	copper waves	lemon juice
Scribe Eleanor	Scribe Quill	Mirror Shield	left-handed writing	silver braids	lemon juice
Agent Florence	Echo Bell	Mirror Shield	right-handed writing	copper waves	lemon juice
Inspector Mary	Echo Bell	Ink Mist	left-handed writing	silver braids	lemon juice
Inspector Lewis	Scribe Quill	Wax Seal	left-handed writing	ink-black curls	bright sunlight
Inspector Francis	Scribe Quill	Wax Seal	left-handed writing	copper waves	bright sunlight
Scribe Venn	Fact Prism	Hologram Lens	right-handed writing	copper waves	bright sunlight
Detective Arthur	Fact Prism	Mirror Shield	right-handed writing	silver braids	bright sunlight
Investigator Ada	Fact Prism	Ink Mist	left-handed writing	copper waves	lemon juice
Detective Verity	Cipher Compass	Shadow Cloak	right-handed writing	silver braids	magnetic dust
Sleuth Sophia	Cipher Compass	Mirror Shield	left-handed writing	ink-black curls	magnetic dust
Agent Raymond	Scribe Quill	Mirror Shield	left-handed writing	ink-black curls	magnetic dust
Scribe Gabriel	Echo Bell	Shadow Cloak	right-handed writing	copper waves	bright sunlight
Scholar Blaise	Decoder Monocle	Shadow Cloak	left-handed writing	copper waves	lemon juice

CLUE 1

Fractions of a number

To map out the suspect's escape path, Verity must calculate the total energy used by the academy steam boilers across multiple shifts and rooms.

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

T			T					T											T			
29	39	4	29	9	2	30	4	29	14	38	4	15	11	38	29	6	15	4				
9	39	38	3	38	30	2	9	19	3	4	11	15										

$4/8 \text{ of } 58 = \square \rightarrow \boxed{\text{T}}$

$6/8 \text{ of } 8 = \square \rightarrow \boxed{\text{U}}$

$1/6 \text{ of } 66 = \square \rightarrow \boxed{\text{N}}$

$1/10 \text{ of } 90 = \square \rightarrow \boxed{\text{A}}$

$1/4 \text{ of } 76 = \square \rightarrow \boxed{\text{M}}$

$3/6 \text{ of } 76 = \square \rightarrow \boxed{\text{O}}$

$1/4 \text{ of } 8 = \square \rightarrow \boxed{\text{R}}$

$2/3 \text{ of } 45 = \square \rightarrow \boxed{\text{G}}$

$3/6 \text{ of } 6 = \square \rightarrow \boxed{\text{L}}$

$1/5 \text{ of } 75 = \square \rightarrow \boxed{\text{S}}$

$1/2 \text{ of } 8 = \square \rightarrow \boxed{\text{E}}$

$1/10 \text{ of } 140 = \square \rightarrow \boxed{\text{D}}$

$1/3 \text{ of } 117 = \square \rightarrow \boxed{\text{H}}$

Scratch space:

CLUE 2

Bar model word problems

The thief dropped a ripped diagram showing the academy library layout, which we can piece together using a grid of equal block models.

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

A witness saw the villain was

L

D

D
W
R
I

I

G

One group collected 13 quill nibs and another group collected 50 quill nibs. How many quill nibs in all?

draw a bar model

Answer: → L

The red team has 101 fact scrolls and the blue team has 8 fact scrolls. How many more fact scrolls does the red team have?

draw a bar model

Answer: → A

The red team has 49 quill nibs and the blue team has 32 quill nibs. How many more quill nibs does the red team have?

draw a bar model

Answer: → E

One group collected 20 decoder lenses and another group collected 2 decoder lenses. How many decoder lenses in all?

draw a bar model

Answer: → H

Verity has 12 times as many truth crystals as a teammate. The teammate has 10 truth crystals. How many truth crystals does Verity have?

draw a bar model

Answer: → N

The red team has 64 fact scrolls and the blue team has 25 fact scrolls. How many more fact scrolls does the red team have?

draw a bar model

Answer: → T

One group collected 39 cipher keys and another group collected 30 cipher keys. How many cipher keys in all?

draw a bar model

Answer: → F

CLUE 3

Multi-step word problems

A shattered ink jar left a dark spill, but we can measure exactly how much remains by calculating the fractional parts of the total volume.

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

Someone scared the villain off with L I C .

36 47 70 38 67 42 45 47

Verity collected 83 decoder lenses in the morning and 25 decoder lenses in the afternoon, then split them equally among 3 Verity League. How many decoder lenses did each get?

Answer: → L

Verity collected 79 fact scrolls in the morning and 173 fact scrolls in the afternoon, then split them equally among 6 Verity League. How many fact scrolls did each get?

Answer: → J

Verity filled 2 boxes with 6 cipher keys each, then found 26 more cipher keys. How many cipher keys are there in all?

Answer: → O

Verity collected 140 cipher keys in the morning and 210 cipher keys in the afternoon, then split them equally among 5 Verity League. How many cipher keys did each get?

Answer: → M

There were 137 cipher keys in all. 2 cipher keys were set aside. The rest were shared equally among 3 Verity League. How many cipher keys did each get?

Answer: → U

There were 237 fact scrolls in all. 1 Verity League used 36 fact scrolls each. The other 3 Verity League shared the rest equally. How many fact scrolls did each of the other Verity League get?

Answer: → N

There were 217 decoder lenses in all. 2 Verity League used 38 decoder lenses each. The other 3 Verity League shared the rest equally. How many decoder lenses did each of the other Verity League get?

Answer: → E

Scratch space:

CLUE 4 Order of operations

To crack the lock on the thief's abandoned tool kit, we must solve a series of equations in the exact, proper sequence.

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

T																		
57	49	23	65	12	23	17	23	49	71	35	38	61	23	12	22	65	70	38
12	70	31	31	23	27	49	71	37	27									

$10 \times 6 - 3 = \square \rightarrow \text{T}$	$10 \times 5 - 23 = \square \rightarrow \text{R}$	$5 \times 5 - 2 = \square \rightarrow \text{E}$
$1 + 3 \times 7 = \square \rightarrow \text{K}$	$28 + 6 \times 7 = \square \rightarrow \text{O}$	$26 + 7 \times 5 = \square \rightarrow \text{L}$
$3 + 3 \times 3 = \square \rightarrow \text{C}$	$51 + 2 \times 7 = \square \rightarrow \text{S}$	$1 + 8 \times 2 = \square \rightarrow \text{N}$
$8 \times 8 - 29 = \square \rightarrow \text{D}$	$31 + 2 \times 3 = \square \rightarrow \text{I}$	$34 + 5 \times 3 = \square \rightarrow \text{H}$
$5 \times 8 - 2 = \square \rightarrow \text{F}$	$12 \times 6 - 1 = \square \rightarrow \text{A}$	$25 + 2 \times 3 = \square \rightarrow \text{P}$

Scratch space:

CLUE 5**Missing addends - the last clue**

We found a weight balance scale used by the thief, where some counterweights are missing from the total sum needed to balance it.

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:

$12 + \underline{\quad} = 19$

$33 + \underline{\quad} = 42$

$14 + \underline{\quad} = 26$

$38 + \underline{\quad} = 49$

$9 + \underline{\quad} = 13$

$31 + \underline{\quad} = 33$

$11 + \underline{\quad} = 19$

$10 + \underline{\quad} = 15$

$36 + \underline{\quad} = 37$

$7 + \underline{\quad} = 17$

$1 + \underline{\quad} = 7$

Step 2 - cross out the sentence with each answer:

1. The villain grabbed the memory prism, then blended into the festival crowd.
2. The villain stole the truth ledger, then escaped through the skylight.
3. The villain lifted the fact cipher, then slipped into the rainy alley.
4. The villain stole the truth ledger, then vanished behind a secret bookcase.
5. The villain stole the truth ledger, then blended into the festival crowd.
6. The villain lifted the fact cipher, then fled in a steam-powered carriage.
7. The villain grabbed the memory prism, then escaped through the skylight.
8. The villain grabbed the memory prism, then slipped into the rainy alley.
9. The villain pocketed the whisper scroll, then escaped through the skylight.
10. The villain swiped the golden compass, then slipped into the rainy alley.
11. The villain swiped the golden compass, then blended into the festival crowd.
12. The villain swiped the golden compass, then vanished behind a secret bookcase.

Answer Key

The Case of the Missing Truth Ledger

Culprit: Scholar George

Echo Bell · Mirror Shield · left-handed writing · copper waves · lemon juice

Trail: Start 21 → Clue 1 18 → Clue 2 10 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Fractions of a number): "THE TARGET DOES NOT USE A HOLOGRAM LENS"

$4/8$ of 58 = 29 (T) · $6/8$ of 8 = 6 (U) · $1/6$ of 66 = 11 (N) · $1/10$ of 90 = 9 (A) · $1/4$ of 76 = 19 (M) · $3/6$ of 76 = 38 (O) · $1/4$ of 8 = 2 (R) · $2/3$ of 45 = 30 (G) · $3/6$ of 6 = 3 (L) · $1/5$ of 75 = 15 (S) · $1/2$ of 8 = 4 (E) · $1/10$ of 140 = 14 (D) · $1/3$ of 117 = 39 (H)

Clue 2 (Bar model word problems): "LEFT HANDED WRITING"

One group collected 13 quill nibs and another group collected 50 quill nibs. How many quill nibs in all? = 63 (L) · The red team has 101 fact scrolls and the blue team has 8 fact scrolls. How many more fact scrolls does the red team have? = 93 (A) · The red team has 49 quill nibs and the blue team has 32 quill nibs. How many more quill nibs does the red team have? = 17 (E) · One group collected 20 decoder lenses and another group collected 2 decoder lenses. How many decoder lenses in all? = 22 (H) · Verity has 12 times as many truth crystals as a teammate. The teammate has 10 truth crystals. How many truth crystals does Verity have? = 120 (N) · The red team has 64 fact scrolls and the blue team has 25 fact scrolls. How many more fact scrolls does the red team have? = 39 (T) · One group collected 39 cipher keys and another group collected 30 cipher keys. How many cipher keys in all? = 69 (F)

Clue 3 (Multi-step word problems): "LEMON JUICE"

Verity collected 83 decoder lenses in the morning and 25 decoder lenses in the afternoon, then split them equally among 3 Verity League. How many decoder lenses did each get? = 36 (L) · Verity collected 79 fact scrolls in the morning and 173 fact scrolls in the afternoon, then split them equally among 6 Verity League. How many fact scrolls did each get? = 42 (J) · Verity filled 2 boxes with 6 cipher keys each, then found 26 more cipher keys. How many cipher keys are there in all? = 38 (O) · Verity collected 140 cipher keys in the morning and 210 cipher keys in the afternoon, then split them equally among 5 Verity League. How many cipher keys did each get? = 70 (M) · There were 137 cipher keys in all. 2 cipher keys were set aside. The rest were shared equally among 3 Verity League. How many cipher keys did each get? = 45 (U) · There were 237 fact scrolls in all. 1 Verity League used 36 fact scrolls each. The other 3 Verity League shared the rest equally. How many fact scrolls did each of the other Verity League get? = 67 (N) · There were 217 decoder lenses in all. 2 Verity League used 38 decoder lenses each. The other 3 Verity League shared the rest equally. How many decoder lenses did each of the other Verity League get? = 47 (E)

Clue 4 (Order of operations): "THE SCENE HAD FLECKS OF COPPER HAIR"

$10 \times 6 - 3 = 57$ (T) · $10 \times 5 - 23 = 27$ (R) · $5 \times 5 - 2 = 23$ (E) · $1 + 3 \times 7 = 22$ (K) · $28 + 6 \times 7 = 70$ (O) · $26 + 7 \times 5 = 61$ (L) · $3 + 3 \times 3 = 12$ (C) · $51 + 2 \times 7 = 65$ (S) · $1 + 8 \times 2 = 17$ (N) · $8 \times 8 - 29 = 35$ (D) · $31 + 2 \times 3 = 37$ (I) · $34 + 5 \times 3 = 49$ (H) · $5 \times 8 - 2 = 38$ (F) · $12 \times 6 - 1 = 71$ (A) · $25 + 2 \times 3 = 31$ (P)

Clue 5 (Missing addends): surviving statement is box 3 → Scholar George

$12 + \underline{\quad} = 19 = 7$ · $33 + \underline{\quad} = 42 = 9$ · $14 + \underline{\quad} = 26 = 12$ · $38 + \underline{\quad} = 49 = 11$ · $9 + \underline{\quad} = 13 = 4$ · $31 + \underline{\quad} = 33 = 2$ · $11 + \underline{\quad} = 19 = 8$ · $10 + \underline{\quad} = 15 = 5$ · $36 + \underline{\quad} = 37 = 1$ · $7 + \underline{\quad} = 17 = 10$ · $1 + \underline{\quad} = 7 = 6$