



The Lost Golden Compass

Grade 7 math · Integers, Percentages, Order of operations, Exponents, Two-step equations · Reading level grades 7-9

Detective: _____ **Date:** _____

The Golden Compass, the crown jewel of the Whispering Canopy Expedition, has vanished from the Grand Basecamp! The culprit has fled deep into the ancient jungle. Grab your canteen and map, team—we need to analyze the clues left on the trail to track down the thief!

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 The Renegade Explorer is _____

Possible suspects

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

NAME	PRIMARY GEAR	SECONDARY GEAR	DOMINANT HAND	HAIRSTYLE	VULNERABILITY
Percy Fawcett	Decoder Ring	Camp Stove	Right-handed	Dusty Ponytail	Loud Noises
Mary Kingsley	Smoke Bomb	Camp Stove	Left-handed	Sleek Buzzcut	Shiny Gold
Roald Amundsen	Climbing Spikes	Pocket Knife	Right-handed	Windswept Curls	Shiny Gold
Ibn Battuta	Smoke Bomb	Flare Gun	Right-handed	Dusty Ponytail	Shiny Gold
Gertrude Bell	Climbing Spikes	Binoculars	Left-handed	Sleek Buzzcut	Shiny Gold
Marco Polo	Glider Wing	Pocket Knife	Left-handed	Dusty Ponytail	Swarms of Bugs
Alexandrine Tinne	Climbing Spikes	Mini Compass	Right-handed	Windswept Curls	Loud Noises
Bessie Coleman	Smoke Bomb	Mini Compass	Left-handed	Windswept Curls	Swarms of Bugs
Thor Heyerdahl	Decoder Ring	Flare Gun	Right-handed	Windswept Curls	Shiny Gold
Amelia Earhart	Decoder Ring	Camp Stove	Right-handed	Sleek Buzzcut	Loud Noises
Sacagawea	Smoke Bomb	Mini Compass	Right-handed	Dusty Ponytail	Loud Noises
Matthew Henson	Smoke Bomb	Binoculars	Right-handed	Windswept Curls	Loud Noises
Freya Stark	Smoke Bomb	Mini Compass	Right-handed	Windswept Curls	Shiny Gold
Charles Darwin	Smoke Bomb	Flare Gun	Right-handed	Sleek Buzzcut	Shiny Gold
Nellie Bly	Decoder Ring	Camp Stove	Left-handed	Windswept Curls	Loud Noises
George Mallory	Grappling Hook	Camp Stove	Left-handed	Dusty Ponytail	Swarms of Bugs
Junko Tabei	Smoke Bomb	Camp Stove	Right-handed	Windswept Curls	Loud Noises
Ernest Shackleton	Decoder Ring	Pocket Knife	Right-handed	Windswept Curls	Loud Noises
Hiram Bingham	Grappling Hook	Binoculars	Right-handed	Windswept Curls	Loud Noises
Jacques Cousteau	Climbing Spikes	Binoculars	Right-handed	Dusty Ponytail	Loud Noises
Isabella Bird	Glider Wing	Binoculars	Right-handed	Windswept Curls	Shiny Gold

CLUE 1 Integers

To track the suspect, the team measures changes in altitude. We compare steps climbed and cave descents using positive and negative values.

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

T																T
22	25	29	2	19	24	24	9	19	20	10	27	29	12	20	27	22
15	9	23	23	30	9	16	19	20	19	15	27	16	13	9	12	12

$$(-4) + 26 = \boxed{} \rightarrow \boxed{\text{T}}$$

$$10 - (-14) = \boxed{} \rightarrow \boxed{\text{L}}$$

$$(-10) + 33 = \boxed{} \rightarrow \boxed{\text{R}}$$

$$(-2) + 31 = \boxed{} \rightarrow \boxed{\text{E}}$$

$$(-11) + 23 = \boxed{} \rightarrow \boxed{\text{S}}$$

$$13 - (-2) = \boxed{} \rightarrow \boxed{\text{C}}$$

$$(-9) + 19 = \boxed{} \rightarrow \boxed{\text{D}}$$

$$(-7) + 34 = \boxed{} \rightarrow \boxed{\text{O}}$$

$$(-3) + 23 = \boxed{} \rightarrow \boxed{\text{N}}$$

$$(-2) + 15 = \boxed{} \rightarrow \boxed{\text{P}}$$

$$3 - (-6) = \boxed{} \rightarrow \boxed{\text{A}}$$

$$22 - (-8) = \boxed{} \rightarrow \boxed{\text{Y}}$$

$$(-12) + 31 = \boxed{} \rightarrow \boxed{\text{I}}$$

$$(-15) + 31 = \boxed{} \rightarrow \boxed{\text{M}}$$

$$(-8) + 33 = \boxed{} \rightarrow \boxed{\text{H}}$$

$$(-12) + 14 = \boxed{} \rightarrow \boxed{\text{V}}$$

Scratch space:

CLUE 2

Percentages

Our GPS map scanner only displays the percentage of the temple grid that has been cleared of traps. Let's calculate the remaining safety zone.

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

T			T						T										T
14	46	19	14	40	12	2	19	14	2	12	40	6	6	19	3	49	14		
		T		T									T						
53	49	14	46	14	46	19	49	12	12	49	2	46	14	46	40	34	3		

$5\% \text{ of } 280 = \square \rightarrow \text{ T }$

$40\% \text{ of } 5 = \square \rightarrow \text{ G }$

$20\% \text{ of } 265 = \square \rightarrow \text{ W }$

$50\% \text{ of } 38 = \square \rightarrow \text{ E }$

$40\% \text{ of } 100 = \square \rightarrow \text{ A }$

$50\% \text{ of } 92 = \square \rightarrow \text{ H }$

$50\% \text{ of } 24 = \square \rightarrow \text{ R }$

$20\% \text{ of } 15 = \square \rightarrow \text{ D }$

$25\% \text{ of } 136 = \square \rightarrow \text{ N }$

$75\% \text{ of } 8 = \square \rightarrow \text{ B }$

$10\% \text{ of } 490 = \square \rightarrow \text{ I }$

Scratch space:

CLUE 3
Order of operations

A heavy stone gate blocks the jungle path. We must follow the strict order of mathematical steps carved into the lock to swing it open.

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

T										T							
102	32	23	33	66	33	99	23	95	102	95	13	86	23	28	23	8	

T											T	T						
102	32	23	57	28	23	96	28	33	96	102	102	32	23	41	96	46	61	

$77 + 5 \times 5 = \square \rightarrow \text{[T]}$

$9 \times 12 - 22 = \square \rightarrow \text{[V]}$

$2 + 2 \times 3 = \square \rightarrow \text{[D]}$

$5 + 4 \times 2 = \square \rightarrow \text{[O]}$

$11 \times 10 - 15 = \square \rightarrow \text{[C]}$

$49 + 4 \times 2 = \square \rightarrow \text{[I]}$

$69 + 9 \times 3 = \square \rightarrow \text{[A]}$

$56 + 2 \times 5 = \square \rightarrow \text{[U]}$

$21 + 5 \times 8 = \square \rightarrow \text{[G]}$

$18 + 9 \times 9 = \square \rightarrow \text{[P]}$

$11 + 4 \times 3 = \square \rightarrow \text{[E]}$

$4 \times 10 - 8 = \square \rightarrow \text{[H]}$

$11 \times 5 - 27 = \square \rightarrow \text{[R]}$

$12 \times 6 - 26 = \square \rightarrow \text{[N]}$

$29 + 3 \times 4 = \square \rightarrow \text{[B]}$

$8 \times 5 - 7 = \square \rightarrow \text{[S]}$

Scratch space:

CLUE 4 Exponents

Glowing jungle ferns are multiplying fast! To estimate how many spores are blocking our vision, we must calculate their exponential growth rate.

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

W						W													
100	49	243	343	289	100	8	16	121	196	144	32	400	36	27	256	49	32		
W																			
100	256	289	25	243	121	27	8	169	49	243	8	289							

$10^2 = \square \rightarrow$ W	$20^2 = \square \rightarrow$ L	$17^2 = \square \rightarrow$ S	$2^8 = \square \rightarrow$ A
$2^5 = \square \rightarrow$ R	$3^5 = \square \rightarrow$ N	$4^2 = \square \rightarrow$ P	$6^2 = \square \rightarrow$ Y
$7^2 = \square \rightarrow$ I	$3^3 = \square \rightarrow$ H	$14^2 = \square \rightarrow$ C	$5^2 = \square \rightarrow$ O
$13^2 = \square \rightarrow$ V	$7^3 = \square \rightarrow$ D	$12^2 = \square \rightarrow$ U	$2^3 = \square \rightarrow$ E
$11^2 = \square \rightarrow$ T			

Scratch space:

CLUE 5**Two-step equations - the last clue**

An ancient scale holds two carved stone weights. We need to find the weight of a single golden idol to balance the scale and reveal the 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:

$6x + 1 = 67, x = \boxed{}$

$2x + 10 = 22, x = \boxed{}$

$3x + 2 = 38, x = \boxed{}$

$3x + 8 = 23, x = \boxed{}$

$6x + 7 = 25, x = \boxed{}$

$2x + 9 = 23, x = \boxed{}$

$6x + 8 = 62, x = \boxed{}$

$5x + 11 = 21, x = \boxed{}$

$4x + 2 = 18, x = \boxed{}$

$4x + 12 = 16, x = \boxed{}$

$5x + 9 = 49, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain soared off the canopy cliff, then brewed hot cocoa on a camp stove.
2. The villain scaled the crumbling temple steps, then scanned the valley with binoculars.
3. The villain decoded the glyphs on the stone wall, then checked the direction on a mini compass.
4. The villain swung across the ancient chasm, then brewed hot cocoa on a camp stove.
5. The villain threw a smoke bomb into the chamber, then checked the direction on a mini compass.
6. The villain threw a smoke bomb into the chamber, then scanned the valley with binoculars.
7. The villain scaled the crumbling temple steps, then fired a warning flare.
8. The villain soared off the canopy cliff, then checked the direction on a mini compass.
9. The villain swung across the ancient chasm, then cut through the thick vines.
10. The villain swung across the ancient chasm, then scanned the valley with binoculars.
11. The villain decoded the glyphs on the stone wall, then cut through the thick vines.
12. The villain threw a smoke bomb into the chamber, then brewed hot cocoa on a camp stove.

Answer Key

The Lost Golden Compass

Culprit: Hiram Bingham

Grappling Hook · Binoculars · Right-handed · Windswept Curls · Loud Noises

Trail: Start 21 → Clue 1 17 → Clue 2 12 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Integers): "THE VILLAIN DOES NOT CARRY A MINI COMPASS"

$(-4) + 26 = 22$ (T) · $10 - (-14) = 24$ (L) · $(-10) + 33 = 23$ (R) · $(-2) + 31 = 29$ (E) · $(-11) + 23 = 12$ (S) · $13 - (-2) = 15$ (C) · $(-9) + 19 = 10$ (D) · $(-7) + 34 = 27$ (O) · $(-3) + 23 = 20$ (N) · $(-2) + 15 = 13$ (P) · $3 - (-6) = 9$ (A) · $22 - (-8) = 30$ (Y) · $(-12) + 31 = 19$ (I) · $(-15) + 31 = 16$ (M) · $(-8) + 33 = 25$ (H) · $(-12) + 14 = 2$ (V)

Clue 2 (Percentages): "THE TARGET GRABBED IT WITH THEIR RIGHT HAND"

5% of 280 = 14 (T) · 40% of 5 = 2 (G) · 20% of 265 = 53 (W) · 50% of 38 = 19 (E) · 40% of 100 = 40 (A) · 50% of 92 = 46 (H) · 50% of 24 = 12 (R) · 20% of 15 = 3 (D) · 25% of 136 = 34 (N) · 75% of 8 = 6 (B) · 10% of 490 = 49 (I)

Clue 3 (Order of operations): "THE SUSPECT COVERED THEIR EARS AT THE BANG"

$77 + 5 \times 5 = 102$ (T) · $9 \times 12 - 22 = 86$ (V) · $2 + 2 \times 3 = 8$ (D) · $5 + 4 \times 2 = 13$ (O) · $11 \times 10 - 15 = 95$ (C) · $49 + 4 \times 2 = 57$ (I) · $69 + 9 \times 3 = 96$ (A) · $56 + 2 \times 5 = 66$ (U) · $21 + 5 \times 8 = 61$ (G) · $18 + 9 \times 9 = 99$ (P) · $11 + 4 \times 3 = 23$ (E) · $4 \times 10 - 8 = 32$ (H) · $11 \times 5 - 27 = 28$ (R) · $12 \times 6 - 26 = 46$ (N) · $29 + 3 \times 4 = 41$ (B) · $8 \times 5 - 7 = 33$ (S)

Clue 4 (Exponents): "WIND SWEPT CURLY HAIR WAS ON THE VINES"

$10^2 = 100$ (W) · $20^2 = 400$ (L) · $17^2 = 289$ (S) · $2^8 = 256$ (A) · $2^5 = 32$ (R) · $3^5 = 243$ (N) · $4^2 = 16$ (P) · $6^2 = 36$ (Y) · $7^2 = 49$ (I) · $3^3 = 27$ (H) · $14^2 = 196$ (C) · $5^2 = 25$ (O) · $13^2 = 169$ (V) · $7^3 = 343$ (D) · $12^2 = 144$ (U) · $2^3 = 8$ (E) · $11^2 = 121$ (T)

Clue 5 (Two-step equations): surviving statement is box 10 → Hiram Bingham

$6x + 1 = 67, x = 11$ · $2x + 10 = 22, x = 6$ · $3x + 2 = 38, x = 12$ · $3x + 8 = 23, x = 5$ · $6x + 7 = 25, x = 3$ · $2x + 9 = 23, x = 7$ · $6x + 8 = 62, x = 9$ · $5x + 11 = 21, x = 2$ · $4x + 2 = 18, x = 4$ · $4x + 12 = 16, x = 1$ · $5x + 9 = 49, x = 8$