



The Lost Compass of the Sun Jaguar

Grade 8 math · Exponents, Square roots, Pythagorean theorem, Order of operations, Two-step equations · Reading level grades 7-9

Detective: _____ Date: _____

A priceless artifact, the Obsidian Compass, has been stolen from the Sun Jaguar Temple. The Chief Archaeologist was locked inside a sealed stone vault. We must decode the ancient clues left behind, bypass the temple traps, and identify which rogue explorer in our expedition team is the thief before they escape the jungle.

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 Rogue 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 SKILL	SPECIAL GEAR	DISTINCT HABIT	HAIR CONDITION	EXPLOITABLE FEAR
Florence Baker	poison dart evasion	laser scanning goggles	wears a leather wristband	dusty blonde hair	allergic to jungle pollen
Richard Burton	grappling hook mastery	smoke bomb canisters	uses a left handed notepad	dusty blonde hair	allergic to jungle pollen
Jeanne Baret	poison dart evasion	compact climbing spikes	uses a left handed notepad	cobwebbed black hair	afraid of cave spiders
Marco Polo	ancient glyph decoding	laser scanning goggles	wears a leather wristband	muddy brown hair	allergic to jungle pollen
Robert Peary	poison dart evasion	smoke bomb canisters	wears a leather wristband	muddy brown hair	allergic to jungle pollen
Jacques Cousteau	ruins map navigation	compact climbing spikes	wears a leather wristband	dusty blonde hair	allergic to jungle pollen
Gertrude Bell	grappling hook mastery	ultraviolet flashlights	wears a leather wristband	dusty blonde hair	startled by loud bats
Roald Amundsen	grappling hook mastery	miniature radio drones	wears a leather wristband	dusty blonde hair	allergic to jungle pollen
Harriet Chalmers	ancient glyph decoding	smoke bomb canisters	uses a left handed notepad	dusty blonde hair	allergic to jungle pollen
Ada Blackjack	poison dart evasion	miniature radio drones	uses a left handed notepad	cobwebbed black hair	allergic to jungle pollen
Freya Stark	machete path clearing	miniature radio drones	uses a left handed notepad	dusty blonde hair	allergic to jungle pollen
Nellie Bly	machete path clearing	ultraviolet flashlights	uses a left handed notepad	dusty blonde hair	startled by loud bats
Ernest Shackleton	grappling hook mastery	ultraviolet flashlights	wears a leather wristband	dusty blonde hair	allergic to jungle pollen
Isabella Bird	poison dart evasion	smoke bomb canisters	uses a left handed notepad	cobwebbed black hair	startled by loud bats
Amelia Earhart	poison dart evasion	compact climbing spikes	uses a left handed notepad	dusty blonde hair	allergic to jungle pollen
Alexandrine Tinne	ancient glyph decoding	miniature radio drones	uses a left handed notepad	cobwebbed black hair	startled by loud bats
Roy Andrews	ancient glyph decoding	miniature radio drones	wears a leather wristband	dusty blonde hair	afraid of cave spiders
Ibn Battuta	grappling hook mastery	miniature radio drones	wears a leather wristband	muddy brown hair	afraid of cave spiders
Percy Fawcett	machete path clearing	compact climbing spikes	wears a leather wristband	dusty blonde hair	allergic to jungle pollen
Charles Darwin	ancient glyph decoding	ultraviolet flashlights	uses a left handed notepad	muddy brown hair	afraid of cave spiders
Hiram Bingham	poison dart evasion	laser scanning goggles	uses a left handed notepad	muddy brown hair	startled by loud bats

CLUE 1 Exponents

To unlock the temple outer gate, we must calculate how quickly the toxic jungle spore population doubles over several hours because the growth is exponential.

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

T			T															
9	36	625	9	36	441	625	484	8	4	625	324	400	4	9	16	324	625	
81	32	324	625	729	196	4	196	196	81	625	324							

$3^2 = \square \rightarrow \text{T}$	$9^2 = \square \rightarrow \text{L}$	$14^2 = \square \rightarrow \text{G}$	$6^2 = \square \rightarrow \text{H}$
$9^3 = \square \rightarrow \text{R}$	$18^2 = \square \rightarrow \text{S}$	$2^4 = \square \rightarrow \text{U}$	$21^2 = \square \rightarrow \text{I}$
$5^4 = \square \rightarrow \text{E}$	$2^2 = \square \rightarrow \text{O}$	$2^3 = \square \rightarrow \text{D}$	$2^5 = \square \rightarrow \text{A}$
$22^2 = \square \rightarrow \text{F}$	$20^2 = \square \rightarrow \text{N}$		

Scratch space:

CLUE 2 Square roots

We find a mosaic tile floor blocking our path. To step only on the safe stones, we must find the side length of a square chamber using its total area.

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

A				A						A							A	
16	24	15	25	16	13	10	22	2	23	16	15	4	23	25	18	16	24	
								A										
6	25	10	13	13	23	6	19	23	16	25	15	4	23	6	10	10	25	

$\sqrt{256} = \square \rightarrow \boxed{A}$

$\sqrt{100} = \square \rightarrow \boxed{O}$

$\sqrt{169} = \square \rightarrow \boxed{P}$

$\sqrt{484} = \square \rightarrow \boxed{F}$

$\sqrt{4} = \square \rightarrow \boxed{L}$

$\sqrt{324} = \square \rightarrow \boxed{W}$

$\sqrt{529} = \square \rightarrow \boxed{E}$

$\sqrt{225} = \square \rightarrow \boxed{T}$

$\sqrt{16} = \square \rightarrow \boxed{H}$

$\sqrt{625} = \square \rightarrow \boxed{R}$

$\sqrt{576} = \square \rightarrow \boxed{S}$

$\sqrt{361} = \square \rightarrow \boxed{N}$

$\sqrt{36} = \square \rightarrow \boxed{D}$

Scratch space:

CLUE 3

Pythagorean theorem

A deep chasm cuts through the ruins. We need to find the exact length of the diagonal rope bridge we must throw from the top ledge to the bottom landing.

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

T										T							
65	17	30	82	52	82	34	30	25	65	82	13	30	30	68	30	37	
										T							
39	17	30	13	13	30	26	40	65	17	30	74	40	25	17	50	37	82

legs 25 and 60, hypotenuse = → **T**

legs 8 and 15, hypotenuse = → **H**

legs 20 and 48, hypotenuse = → **U**

legs 32 and 60, hypotenuse = → **Z**

legs 16 and 30, hypotenuse = → **P**

legs 12 and 35, hypotenuse = → **D**

legs 14 and 48, hypotenuse = → **I**

legs 18 and 80, hypotenuse = → **S**

legs 24 and 70, hypotenuse = → **O**

legs 7 and 24, hypotenuse = → **C**

legs 15 and 36, hypotenuse = → **W**

legs 5 and 12, hypotenuse = → **N**

legs 10 and 24, hypotenuse = → **A**

legs 24 and 32, hypotenuse = → **R**

legs 18 and 24, hypotenuse = → **E**

Scratch space:

CLUE 4

Order of operations

An ancient stone dial requires us to turn the gears in a very specific sequence. We must solve the complex multi-step equation on the wall to get the combination.

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

W																
62	86	76	11	107	85	44	76	80	46	81	22	11	37	44	86	85
												W				
61	41	81	80	85	44	61	11	85	41	26	86	62	80	37	37	

$7 \times 9 - 1 = \square \rightarrow \boxed{W}$

$8 \times 2 - 5 = \square \rightarrow \boxed{O}$

$46 + 5 \times 6 = \square \rightarrow \boxed{F}$

$8 \times 6 - 7 = \square \rightarrow \boxed{T}$

$29 + 4 \times 2 = \square \rightarrow \boxed{L}$

$16 + 5 \times 9 = \square \rightarrow \boxed{S}$

$56 + 6 \times 5 = \square \rightarrow \boxed{E}$

$9 \times 12 - 23 = \square \rightarrow \boxed{N}$

$53 + 3 \times 9 = \square \rightarrow \boxed{A}$

$10 + 2 \times 6 = \square \rightarrow \boxed{G}$

$8 + 6 \times 3 = \square \rightarrow \boxed{H}$

$9 + 5 \times 7 = \square \rightarrow \boxed{D}$

$99 + 2 \times 4 = \square \rightarrow \boxed{U}$

$11 \times 10 - 29 = \square \rightarrow \boxed{R}$

$5 \times 11 - 9 = \square \rightarrow \boxed{I}$

Scratch space:

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

To balance the boulder trap scale, we need to find the weight of a single golden idol when we know the combined weight of several jars and a heavy stone tablet.

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:

$3x + 4 = 37, x = \boxed{}$

$6x + 3 = 57, x = \boxed{}$

$5x + 5 = 20, x = \boxed{}$

$6x + 4 = 10, x = \boxed{}$

$5x + 2 = 12, x = \boxed{}$

$6x + 5 = 35, x = \boxed{}$

$6x + 8 = 80, x = \boxed{}$

$5x + 10 = 50, x = \boxed{}$

$4x + 1 = 29, x = \boxed{}$

$6x + 4 = 28, x = \boxed{}$

$2x + 7 = 19, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain consulted a faded parchment map, then navigated the dark with a bright light.
2. The villain hacked through thick jungle vines, then sent a tiny flying machine ahead.
3. The villain swung across the pit using a rope, then navigated the dark with a bright light.
4. The villain decoded the ancient locking glyphs, then escaped behind a cloud of grey smoke.
5. The villain hacked through thick jungle vines, then navigated the dark with a bright light.
6. The villain swung across the pit using a rope, then scanned the room for hidden tripwires.
7. The villain decoded the ancient locking glyphs, then scanned the room for hidden tripwires.
8. The villain dodged a trap of flying darts, then escaped behind a cloud of grey smoke.
9. The villain swung across the pit using a rope, then sent a tiny flying machine ahead.
10. The villain hacked through thick jungle vines, then scaled the stone walls with spikes.
11. The villain consulted a faded parchment map, then scaled the stone walls with spikes.
12. The villain decoded the ancient locking glyphs, then navigated the dark with a bright light.

Answer Key

The Lost Compass of the Sun Jaguar

Culprit: Percy Fawcett

machete path clearing · compact climbing spikes · wears a leather wristband · dusty blonde hair · allergic to jungle pollen

Trail: Start 21 → Clue 1 18 → Clue 2 8 → Clue 3 5 → Clue 4 4 → Clue 5 1

Clue 1 (Exponents): "THE THIEF DOES NOT USE LASER GOGGLES"

$3^2 = 9$ (T) · $9^2 = 81$ (L) · $14^2 = 196$ (G) · $6^2 = 36$ (H) · $9^3 = 729$ (R) · $18^2 = 324$ (S) · $2^4 = 16$ (U) · $21^2 = 441$ (I) · $5^4 = 625$ (E) · $2^2 = 4$ (O) · $2^3 = 8$ (D) · $2^5 = 32$ (A) · $22^2 = 484$ (F) · $20^2 = 400$ (N)

Clue 2 (Square roots): "A STRAP OF LEATHER WAS DROPPED NEAR THE DOOR"

$\sqrt{256} = 16$ (A) · $\sqrt{100} = 10$ (O) · $\sqrt{169} = 13$ (P) · $\sqrt{484} = 22$ (F) · $\sqrt{4} = 2$ (L) · $\sqrt{324} = 18$ (W) · $\sqrt{529} = 23$ (E) · $\sqrt{225} = 15$ (T) · $\sqrt{16} = 4$ (H) · $\sqrt{625} = 25$ (R) · $\sqrt{576} = 24$ (S) · $\sqrt{361} = 19$ (N) · $\sqrt{36} = 6$ (D)

Clue 3 (Pythagorean theorem): "THE SUSPECT SNEEZED WHEN NEAR THE ORCHIDS"

legs 25 and 60, hypotenuse = 65 (T) · legs 8 and 15, hypotenuse = 17 (H) · legs 20 and 48, hypotenuse = 52 (U) · legs 32 and 60, hypotenuse = 68 (Z) · legs 16 and 30, hypotenuse = 34 (P) · legs 12 and 35, hypotenuse = 37 (D) · legs 14 and 48, hypotenuse = 50 (I) · legs 18 and 80, hypotenuse = 82 (S) · legs 24 and 70, hypotenuse = 74 (O) · legs 7 and 24, hypotenuse = 25 (C) · legs 15 and 36, hypotenuse = 39 (W) · legs 5 and 12, hypotenuse = 13 (N) · legs 10 and 24, hypotenuse = 26 (A) · legs 24 and 32, hypotenuse = 40 (R) · legs 18 and 24, hypotenuse = 30 (E)

Clue 4 (Order of operations): "WE FOUND FAIR GOLDEN STRANDS ON THE WALL"

$7 \times 9 - 1 = 62$ (W) · $8 \times 2 - 5 = 11$ (O) · $46 + 5 \times 6 = 76$ (F) · $8 \times 6 - 7 = 41$ (T) · $29 + 4 \times 2 = 37$ (L) · $16 + 5 \times 9 = 61$ (S) · $56 + 6 \times 5 = 86$ (E) · $9 \times 12 - 23 = 85$ (N) · $53 + 3 \times 9 = 80$ (A) · $10 + 2 \times 6 = 22$ (G) · $8 + 6 \times 3 = 26$ (H) · $9 + 5 \times 7 = 44$ (D) · $99 + 2 \times 4 = 107$ (U) · $11 \times 10 - 29 = 81$ (R) · $5 \times 11 - 9 = 46$ (I)

Clue 5 (Two-step equations): surviving statement is box 10 → Percy Fawcett

$3x + 4 = 37, x = 11$ · $6x + 3 = 57, x = 9$ · $5x + 5 = 20, x = 3$ · $6x + 4 = 10, x = 1$ · $5x + 2 = 12, x = 2$ · $6x + 5 = 35, x = 5$ · $6x + 8 = 80, x = 12$ · $5x + 10 = 50, x = 8$ · $4x + 1 = 29, x = 7$ · $6x + 4 = 28, x = 4$ · $2x + 7 = 19, x = 6$