



The Treehouse Island Mystery

Grade 8 math · Exponents, Square roots, Pythagorean theorem, Order of operations, Two-step equations · Reading level grades 1-2

Detective: _____ Date: _____

Oh no! Someone took the grand prize golden pineapple from the treehouse! The clues are scattered around the jungle. We need to solve the puzzles to find who did it!

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 Secret Snacker is _____

Possible suspects

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

NAME	MAIN GEAR	SPECIAL SKILL	PENCIL GRIP	HAT STYLE	FEAR
Chloe	pocket compass	rope climbing	right handed grip	baseball cap	afraid of spiders
Jack	super flashlight	rope climbing	right handed grip	baseball cap	scared of frogs
Mason	walkie talkie	rope climbing	left handed grip	safari hat	dislikes thick mud
Leo	grappling hook	tree swinging	right handed grip	sun visor	dislikes thick mud
Max	metal detector	animal mimicking	left handed grip	sun visor	scared of frogs
Mia	walkie talkie	map reading	right handed grip	sun visor	dislikes thick mud
Ben	grappling hook	tree swinging	right handed grip	sun visor	scared of frogs
Luke	pocket compass	bush hiding	left handed grip	baseball cap	afraid of spiders
Olivia	walkie talkie	rope climbing	right handed grip	safari hat	afraid of spiders
Abby	grappling hook	tree swinging	left handed grip	baseball cap	afraid of spiders
Sophie	metal detector	bush hiding	right handed grip	baseball cap	afraid of spiders
Sam	super flashlight	tree swinging	right handed grip	baseball cap	afraid of spiders
Zoe	pocket compass	rope climbing	right handed grip	sun visor	scared of frogs
Finn	walkie talkie	rope climbing	right handed grip	sun visor	afraid of spiders
Jake	super flashlight	rope climbing	left handed grip	sun visor	scared of frogs
Ella	walkie talkie	bush hiding	left handed grip	baseball cap	scared of frogs
Emma	grappling hook	animal mimicking	left handed grip	baseball cap	scared of frogs
Cooper	walkie talkie	tree swinging	left handed grip	safari hat	dislikes thick mud
Owen	super flashlight	animal mimicking	right handed grip	sun visor	afraid of spiders
Lily	walkie talkie	tree swinging	right handed grip	baseball cap	afraid of spiders
Ruby	walkie talkie	map reading	right handed grip	baseball cap	afraid of spiders

CLUE 1

We found a secret box. The lock has a number grid that grows bigger and bigger.

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

Diagram showing the distribution of 225 orange tiles and 196 white tiles into two rows of boxes. The top row has 18 boxes, and the bottom row has 12 boxes. The tiles are distributed as follows:

Row	Box 1	Box 2	Box 3	Box 4	Box 5	Box 6	Box 7	Box 8	Box 9	Box 10	Box 11	Box 12	Box 13	Box 14	Box 15	Box 16	Box 17	Box 18
Top Row	225 (Orange)	196 (White)	144 (White)	16 (White)	169 (White)	9 (White)	9 (White)	25 (White)	169 (White)	289 (White)	512 (White)	8 (White)	144 (White)	121 (White)	289 (White)	8 (White)	225 (Orange)	
Bottom Row	196 (White)	169 (White)	512 (White)	144 (White)	169 (White)	289 (White)	256 (White)	100 (White)	121 (White)	196 (White)	144 (White)	121 (White)						

$$15^2 = \boxed{} \rightarrow \boxed{\text{T}}$$

$$4^4 = \boxed{} \rightarrow \boxed{\mathbf{B}}$$

$$12^2 = \boxed{} \rightarrow \boxed{\mathbf{E}}$$

$$4^2 = \boxed{} \rightarrow \boxed{\mathbf{V}}$$

$$17^2 = \boxed{} \rightarrow \boxed{\text{N}}$$

$$3^2 = \boxed{} \rightarrow \boxed{\text{L}}$$

$$2^3 = \boxed{} \rightarrow \boxed{0}$$

$$5^2 = \boxed{} \rightarrow \boxed{\mathbf{A}}$$

$$14^2 = \boxed{} \rightarrow \boxed{\text{H}}$$

$$8^3 = \boxed{} \rightarrow \boxed{\text{D}}$$

$$13^2 = \boxed{} \rightarrow \boxed{1}$$

$$11^2 = \boxed{} \rightarrow \boxed{\text{S}}$$

$$10^2 = \boxed{} \rightarrow \boxed{\text{U}}$$

Scratch space:

CLUE 2 Square roots

We need to measure our camp square. We know the total space but need to find one side.

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

T													T					T	
17	9	22	12	18	24	24	3	18	5	10	25	18	17	22	14	10	18	17	9

T									T				
17	9	22	18	25	25	18	20	9	17	9	3	5	11

$\text{sqrt}(289) = \square \rightarrow \boxed{\text{T}}$	$\text{sqrt}(121) = \square \rightarrow \boxed{\text{D}}$	$\text{sqrt}(81) = \square \rightarrow \boxed{\text{H}}$
$\text{sqrt}(196) = \square \rightarrow \boxed{\text{S}}$	$\text{sqrt}(484) = \square \rightarrow \boxed{\text{E}}$	$\text{sqrt}(9) = \square \rightarrow \boxed{\text{A}}$
$\text{sqrt}(144) = \square \rightarrow \boxed{\text{V}}$	$\text{sqrt}(25) = \square \rightarrow \boxed{\text{N}}$	$\text{sqrt}(324) = \square \rightarrow \boxed{\text{I}}$
$\text{sqrt}(625) = \square \rightarrow \boxed{\text{R}}$	$\text{sqrt}(400) = \square \rightarrow \boxed{\text{G}}$	$\text{sqrt}(576) = \square \rightarrow \boxed{\text{L}}$
$\text{sqrt}(100) = \square \rightarrow \boxed{\text{W}}$		

Scratch space:

CLUE 3 Pythagorean theorem

We want to walk a shortcut across the map. We need to find the diagonal path.

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

A number line from 0 to 100 with boxes for numbers. The number 85 is highlighted in orange and labeled with a 'T'.

Number	Label
85	T
37	
58	
30	
75	
25	
34	
58	
25	
52	
52	
30	
74	
87	
58	
65	
85	T
37	
58	

Number	Label
29	
41	
40	
40	
74	
41	
5	
74	
34	
74	
68	

legs 40 and 75, hypotenuse = → **T**

legs 40 and 42, hypotenuse = → **E**

legs 60 and 63, hypotenuse = $\rightarrow$ **R**

legs 3 and 4, hypotenuse = $\rightarrow$ **N**

legs 24 and 32, hypotenuse = $\rightarrow$ **L**

legs 20 and 48, hypotenuse = $\rightarrow$ **S**

legs 12 and 35, hypotenuse = $\rightarrow$ **H**

legs 18 and 24, hypotenuse = → **C**

legs 9 and 40, hypotenuse = $\rightarrow$

legs 21 and 72, hypotenuse = $\rightarrow$

legs 24 and 70, hypotenuse = $\rightarrow$ **A**

legs 25 and 60, hypotenuse = $\rightarrow$ **D**

legs 20 and 21, hypotenuse = $\rightarrow$ **V**

legs 16 and 30, hypotenuse = $\rightarrow$ **W**

legs 7 and 24, hypotenuse = $\rightarrow$ **B**

legs 32 and 60, hypotenuse = $\rightarrow$ **Y**

Scratch space:

CLUE 4

Order of operations

The treasure chest has a code. We must do the math steps in the exact right order.

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

W													
84	106	77	72	74	61	30	8	36	111	72	105	93	49

39	8	36	106	39	8	21	21	89	8	111

$10 \times 11 - 26 = \square \rightarrow \text{W}$

$11 \times 10 - 5 = \square \rightarrow \text{R}$

$99 + 2 \times 6 = \square \rightarrow \text{P}$

$9 \times 11 - 22 = \square \rightarrow \text{F}$

$54 + 6 \times 3 = \square \rightarrow \text{O}$

$10 + 4 \times 5 = \square \rightarrow \text{D}$

$6 + 3 \times 5 = \square \rightarrow \text{L}$

$21 + 3 \times 6 = \square \rightarrow \text{B}$

$35 + 7 \times 2 = \square \rightarrow \text{Y}$

$75 + 7 \times 2 = \square \rightarrow \text{C}$

$8 \times 10 - 19 = \square \rightarrow \text{N}$

$2 + 2 \times 3 = \square \rightarrow \text{A}$

$8 \times 12 - 22 = \square \rightarrow \text{U}$

$65 + 7 \times 4 = \square \rightarrow \text{T}$

$5 \times 8 - 4 = \square \rightarrow \text{S}$

$11 \times 12 - 26 = \square \rightarrow \text{E}$

Scratch space:

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

Our spy team lost some coins. We must work backward to find how many we started with.

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:

$6x + 11 = 17, x = \boxed{}$

$4x + 9 = 25, x = \boxed{}$

$6x + 8 = 74, x = \boxed{}$

$4x + 4 = 24, x = \boxed{}$

$3x + 8 = 32, x = \boxed{}$

$6x + 4 = 40, x = \boxed{}$

$6x + 1 = 73, x = \boxed{}$

$2x + 3 = 7, x = \boxed{}$

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

$5x + 5 = 55, x = \boxed{}$

$4x + 7 = 35, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain whispers code words into a walkie talkie, then traces the old pirate map.
2. The villain whispers code words into a walkie talkie, then makes funny monkey sounds.
3. The villain checks the heading with a pocket compass, then climbs up the steep jungle rope.
4. The villain lights up the dark path with a flashlight, then leaps from branch to branch.
5. The villain swings up high with a grappling hook, then makes funny monkey sounds.
6. The villain swings up high with a grappling hook, then ducks behind a leafy green bush.
7. The villain swings up high with a grappling hook, then climbs up the steep jungle rope.
8. The villain sweeps the sandy floor with a metal detector, then climbs up the steep jungle rope.
9. The villain lights up the dark path with a flashlight, then ducks behind a leafy green bush.
10. The villain swings up high with a grappling hook, then leaps from branch to branch.
11. The villain whispers code words into a walkie talkie, then leaps from branch to branch.
12. The villain sweeps the sandy floor with a metal detector, then ducks behind a leafy green bush.

Answer Key

The Treehouse Island Mystery

Culprit: Chloe

pocket compass · rope climbing · right handed grip · baseball cap · afraid of spiders

Trail: Start 21 → Clue 1 18 → Clue 2 12 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Exponents): "THE VILLAIN DOES NOT HIDE IN BUSHES"

$15^2 = 225$ (T) · $4^4 = 256$ (B) · $12^2 = 144$ (E) · $4^2 = 16$ (V) · $17^2 = 289$ (N) · $3^2 = 9$ (L) · $2^3 = 8$ (O) · $5^2 = 25$ (A) · $14^2 = 196$ (H) · $8^3 = 512$ (D) · $13^2 = 169$ (I) · $11^2 = 121$ (S) · $10^2 = 100$ (U)

Clue 2 (Square roots): "THE VILLAIN WRITES WITH THEIR RIGHT HAND"

$\sqrt{289} = 17$ (T) · $\sqrt{121} = 11$ (D) · $\sqrt{81} = 9$ (H) · $\sqrt{196} = 14$ (S) · $\sqrt{484} = 22$ (E) · $\sqrt{9} = 3$ (A) · $\sqrt{144} = 12$ (V) · $\sqrt{25} = 5$ (N) · $\sqrt{324} = 18$ (I) · $\sqrt{625} = 25$ (R) · $\sqrt{400} = 20$ (G) · $\sqrt{576} = 24$ (L) · $\sqrt{100} = 10$ (W)

Clue 3 (Pythagorean theorem): "THE COBWEBS SCARED THE VILLAIN AWAY"

legs 40 and 75, hypotenuse = 85 (T) · legs 40 and 42, hypotenuse = 58 (E) · legs 60 and 63, hypotenuse = 87 (R) · legs 3 and 4, hypotenuse = 5 (N) · legs 24 and 32, hypotenuse = 40 (L) · legs 20 and 48, hypotenuse = 52 (S) · legs 12 and 35, hypotenuse = 37 (H) · legs 18 and 24, hypotenuse = 30 (C) · legs 9 and 40, hypotenuse = 41 (I) · legs 21 and 72, hypotenuse = 75 (O) · legs 24 and 70, hypotenuse = 74 (A) · legs 25 and 60, hypotenuse = 65 (D) · legs 20 and 21, hypotenuse = 29 (V) · legs 16 and 30, hypotenuse = 34 (W) · legs 7 and 24, hypotenuse = 25 (B) · legs 32 and 60, hypotenuse = 68 (Y)

Clue 4 (Order of operations): "WE FOUND A SPORTY BASEBALL CAP"

$10 \times 11 - 26 = 84$ (W) · $11 \times 10 - 5 = 105$ (R) · $99 + 2 \times 6 = 111$ (P) · $9 \times 11 - 22 = 77$ (F) · $54 + 6 \times 3 = 72$ (O) · $10 + 4 \times 5 = 30$ (D) · $6 + 3 \times 5 = 21$ (L) · $21 + 3 \times 6 = 39$ (B) · $35 + 7 \times 2 = 49$ (Y) · $75 + 7 \times 2 = 89$ (C) · $8 \times 10 - 19 = 61$ (N) · $2 + 2 \times 3 = 8$ (A) · $8 \times 12 - 22 = 74$ (U) · $65 + 7 \times 4 = 93$ (T) · $5 \times 8 - 4 = 36$ (S) · $11 \times 12 - 26 = 106$ (E)

Clue 5 (Two-step equations): surviving statement is box 3 → Chloe

$6x + 11 = 17, x = 1$ · $4x + 9 = 25, x = 4$ · $6x + 8 = 74, x = 11$ · $4x + 4 = 24, x = 5$ · $3x + 8 = 32, x = 8$ · $6x + 4 = 40, x = 6$ · $6x + 1 = 73, x = 12$ · $2x + 3 = 7, x = 2$ · $6x + 8 = 62, x = 9$ · $5x + 5 = 55, x = 10$ · $4x + 7 = 35, x = 7$