



The Case of the Missing Juice Box

Grade 7 math · Integers, Percentages, Order of operations, Exponents, Two-step equations · Reading level grades 1-2

Detective: _____ **Date:** _____

Oh no! The Golden Juice Box is gone from the Secret Treehouse! The playground bandit left a trail of crumbs. We need to use our math clues to find out who did it before recess ends!

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 playground bandit is _____

Possible suspects

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

NAME	FAVORITE TOY	SUPER SKILL	SHOE STRAP	HAT COLOR	SILLY FEAR
Rex	Pocket Chalk	Fast Dash	Right Shoe Loose	Blue Cap	Squeaky Toys
Sam	Laser Pointer	Loud Whistle	Left Shoe Loose	Green Cap	Spiders
Meg	Pocket Chalk	Fast Dash	Left Shoe Loose	Blue Cap	Squeaky Toys
Mia	Laser Pointer	Silent Crawl	Right Shoe Loose	Red Cap	Spiders
Fay	Laser Pointer	Silent Crawl	Right Shoe Loose	Green Cap	Squeaky Toys
Kai	Pocket Chalk	Fast Dash	Left Shoe Loose	Green Cap	Squeaky Toys
Jon	Grappling Rope	Loud Whistle	Right Shoe Loose	Blue Cap	Squeaky Toys
Joy	Laser Pointer	Loud Whistle	Left Shoe Loose	Blue Cap	Squeaky Toys
Hal	Pocket Chalk	Quick Climb	Right Shoe Loose	Green Cap	Broccoli
Zoe	Water Blaster	Loud Whistle	Left Shoe Loose	Green Cap	Squeaky Toys
Ben	Water Blaster	Quick Climb	Left Shoe Loose	Red Cap	Spiders
Roy	Pocket Chalk	Quick Climb	Right Shoe Loose	Blue Cap	Squeaky Toys
Amy	Pocket Chalk	Super Jump	Left Shoe Loose	Green Cap	Broccoli
Max	Laser Pointer	Quick Climb	Right Shoe Loose	Red Cap	Broccoli
Ned	Spy Camera	Super Jump	Left Shoe Loose	Red Cap	Broccoli
Leo	Laser Pointer	Fast Dash	Right Shoe Loose	Blue Cap	Squeaky Toys
Eli	Pocket Chalk	Loud Whistle	Right Shoe Loose	Green Cap	Squeaky Toys
Eva	Laser Pointer	Silent Crawl	Right Shoe Loose	Blue Cap	Squeaky Toys
Gus	Grappling Rope	Super Jump	Right Shoe Loose	Green Cap	Broccoli
Ted	Water Blaster	Quick Climb	Right Shoe Loose	Red Cap	Spiders
Ivy	Laser Pointer	Fast Dash	Right Shoe Loose	Blue Cap	Broccoli

CLUE 1

We look at the treehouse thermometer. The temperature went up and down. Let us count the change to find our first clue.

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

Diagram illustrating a sequence of boxes and numbers, with some boxes containing the letter 'T'.

Row 1: [T] [] [] [] [] [] [T] [] [] [] [] [] [T] [] [] []

Row 2: 5 17 26 9 27 18 21 11 5 21 23 26 19 18 23 5 29 19 26

Row 3: [] [] [] [] [] [T] [] [] [] [] []

Row 4: 19 11 2 26 18 5 30 3 27 12 2

$$(-14) + 19 = \boxed{} \rightarrow \boxed{\mathbf{T}}$$

$$(-13) + 34 = \boxed{} \rightarrow \boxed{\mathbf{D}}$$

$12 - (-15) = \boxed{} \rightarrow \boxed{\mathbf{A}}$

$$(-5) + 22 = \boxed{} \rightarrow \boxed{\text{H}}$$

$17 - (-13) = \boxed{} \rightarrow \boxed{\text{C}}$

$$(-12) + 21 = \boxed{} \rightarrow \boxed{\mathbf{B}}$$

$$(-8) + 31 = \boxed{} \rightarrow \boxed{0}$$

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

$$(-1) + 4 = \boxed{} \rightarrow \boxed{\mathbf{R}}$$

$3 - (-9) = \boxed{} \rightarrow \boxed{W}$

$$8 - (-10) = \boxed{} \rightarrow \boxed{\mathbf{N}}$$

$$2 - (-9) = \boxed{} \rightarrow \boxed{11}$$

$$(-1) + 30 = \boxed{} \rightarrow \boxed{\mathbf{U}}$$

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

$$(-9) + 28 = \boxed{} \rightarrow \boxed{\text{S}}$$

Scratch space:

CLUE 2 Percentages

We check our spy walkie-talkie. The battery screen shows how much power is left. Solve the math to read the signal.

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

T																			
21	28	9	7	23	30	42	45	21	28	23	35	23	13	17	17	35	9		
				T															
46	45	22	28	21	35	28	17	9											

$20\% \text{ of } 105 = \boxed{} \rightarrow \boxed{\text{T}}$

$60\% \text{ of } 15 = \boxed{} \rightarrow \boxed{\text{E}}$

$5\% \text{ of } 140 = \boxed{} \rightarrow \boxed{\text{B}}$

$50\% \text{ of } 92 = \boxed{} \rightarrow \boxed{\text{R}}$

$40\% \text{ of } 70 = \boxed{} \rightarrow \boxed{\text{H}}$

$75\% \text{ of } 40 = \boxed{} \rightarrow \boxed{\text{N}}$

$50\% \text{ of } 46 = \boxed{} \rightarrow \boxed{\text{A}}$

$50\% \text{ of } 84 = \boxed{} \rightarrow \boxed{\text{D}}$

$50\% \text{ of } 90 = \boxed{} \rightarrow \boxed{\text{I}}$

$5\% \text{ of } 340 = \boxed{} \rightarrow \boxed{\text{O}}$

$20\% \text{ of } 110 = \boxed{} \rightarrow \boxed{\text{G}}$

$10\% \text{ of } 130 = \boxed{} \rightarrow \boxed{\text{L}}$

$50\% \text{ of } 70 = \boxed{} \rightarrow \boxed{\text{S}}$

Scratch space:

CLUE 3
Order of operations

We find a secret box with a code. We must follow the rules in the right order to pop the lock.

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

T									T										
96	59	20	87	44	42	30	105	96	105	79	44	57	71	44	105	30	83	57	
								T											
79	55	74	20	44	100	90	96	83	90	79									

$42 + 6 \times 9 = \boxed{} \rightarrow \boxed{\text{T}}$

$3 \times 11 - 3 = \boxed{} \rightarrow \boxed{\text{D}}$

$11 \times 11 - 21 = \boxed{} \rightarrow \boxed{\text{K}}$

$10 \times 6 - 3 = \boxed{} \rightarrow \boxed{\text{F}}$

$9 \times 9 - 26 = \boxed{} \rightarrow \boxed{\text{Q}}$

$9 \times 12 - 3 = \boxed{} \rightarrow \boxed{\text{I}}$

$9 \times 11 - 9 = \boxed{} \rightarrow \boxed{\text{Y}}$

$25 + 9 \times 6 = \boxed{} \rightarrow \boxed{\text{S}}$

$9 \times 10 - 16 = \boxed{} \rightarrow \boxed{\text{U}}$

$30 + 7 \times 2 = \boxed{} \rightarrow \boxed{\text{A}}$

$77 + 2 \times 3 = \boxed{} \rightarrow \boxed{\text{O}}$

$43 + 4 \times 7 = \boxed{} \rightarrow \boxed{\text{R}}$

$11 \times 9 - 12 = \boxed{} \rightarrow \boxed{\text{B}}$

$4 \times 10 - 20 = \boxed{} \rightarrow \boxed{\text{E}}$

$22 + 4 \times 5 = \boxed{} \rightarrow \boxed{\text{N}}$

$50 + 3 \times 3 = \boxed{} \rightarrow \boxed{\text{H}}$

Scratch space:

CLUE 4 Exponents

We look at the dusty ground. The bandit left footprints that double at each step. Let us count the power of the steps.

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

T																			
225	125	343	169	128	49	64	216	225	196	343	128	32	121	128	169	8	27	343	

243	128	144

$15^2 = \square \rightarrow \text{T}$	$8^2 = \square \rightarrow \text{D}$	$6^3 = \square \rightarrow \text{I}$	$3^3 = \square \rightarrow \text{U}$
$5^3 = \square \rightarrow \text{H}$	$3^5 = \square \rightarrow \text{C}$	$12^2 = \square \rightarrow \text{P}$	$2^7 = \square \rightarrow \text{A}$
$7^3 = \square \rightarrow \text{E}$	$2^3 = \square \rightarrow \text{L}$	$13^2 = \square \rightarrow \text{B}$	$11^2 = \square \rightarrow \text{S}$
$2^5 = \square \rightarrow \text{R}$	$14^2 = \square \rightarrow \text{W}$	$7^2 = \square \rightarrow \text{N}$	

Scratch space:

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

We find a bag of gold stars. Some are missing from the total. Solve the puzzle to find the last 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:

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

$3x + 1 = 37, x = \boxed{}$

$4x + 6 = 22, x = \boxed{}$

$3x + 4 = 31, x = \boxed{}$

$2x + 12 = 32, x = \boxed{}$

$6x + 9 = 57, x = \boxed{}$

$5x + 8 = 13, x = \boxed{}$

$6x + 6 = 72, x = \boxed{}$

$3x + 7 = 16, x = \boxed{}$

$2x + 4 = 14, x = \boxed{}$

$4x + 9 = 17, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain snapped photos of the map with a Spy Camera, then escaped by doing a Super Jump.
2. The villain snapped photos of the map with a Spy Camera, then zipped away with a Fast Dash.
3. The villain drew arrows on the path with Pocket Chalk, then startled the birds with a Loud Whistle.
4. The villain drew arrows on the path with Pocket Chalk, then zipped away with a Fast Dash.
5. The villain drew arrows on the path with Pocket Chalk, then sneaked past the swings with a Silent Crawl.
6. The villain drew arrows on the path with Pocket Chalk, then escaped up the ladder with a Quick Climb.
7. The villain shined a red beam with a Laser Pointer, then zipped away with a Fast Dash.
8. The villain swung across the swings with a Grappling Rope, then sneaked past the swings with a Silent Crawl.
9. The villain sprayed the slides with a Water Blaster, then escaped by doing a Super Jump.
10. The villain sprayed the slides with a Water Blaster, then zipped away with a Fast Dash.
11. The villain snapped photos of the map with a Spy Camera, then escaped up the ladder with a Quick Climb.
12. The villain swung across the swings with a Grappling Rope, then startled the birds with a Loud Whistle.

Answer Key

The Case of the Missing Juice Box

Culprit: Leo

Laser Pointer · Fast Dash · Right Shoe Loose · Blue Cap · Squeaky Toys

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

Clue 1 (Integers): "THE BANDIT DOES NOT USE SILENT CRAWL"

$(-14) + 19 = 5$ (T) · $(-13) + 34 = 21$ (D) · $12 - (-15) = 27$ (A) · $(-5) + 22 = 17$ (H) · $17 - (-13) = 30$ (C) · $(-12) + 21 = 9$ (B) · $(-8) + 31 = 23$ (O) · $(-12) + 14 = 2$ (L) · $(-1) + 4 = 3$ (R) · $3 - (-9) = 12$ (W) · $8 - (-10) = 18$ (N) · $2 - (-9) = 11$ (I) · $(-1) + 30 = 29$ (U) · $23 - (-3) = 26$ (E) · $(-9) + 28 = 19$ (S)

Clue 2 (Percentages): "THE BANDIT HAS A LOOSE RIGHT SHOE"

20% of 105 = 21 (T) · 60% of 15 = 9 (E) · 5% of 140 = 7 (B) · 50% of 92 = 46 (R) · 40% of 70 = 28 (H) · 75% of 40 = 30 (N) · 50% of 46 = 23 (A) · 50% of 84 = 42 (D) · 50% of 90 = 45 (I) · 5% of 340 = 17 (O) · 20% of 110 = 22 (G) · 10% of 130 = 13 (L) · 50% of 70 = 35 (S)

Clue 3 (Order of operations): "THE BANDIT IS AFRAID OF SQUEAKY TOYS"

$42 + 6 \times 9 = 96$ (T) · $3 \times 11 - 3 = 30$ (D) · $11 \times 11 - 21 = 100$ (K) · $10 \times 6 - 3 = 57$ (F) · $9 \times 9 - 26 = 55$ (Q) · $9 \times 12 - 3 = 105$ (I) · $9 \times 11 - 9 = 90$ (Y) · $25 + 9 \times 6 = 79$ (S) · $9 \times 10 - 16 = 74$ (U) · $30 + 7 \times 2 = 44$ (A) · $77 + 2 \times 3 = 83$ (O) · $43 + 4 \times 7 = 71$ (R) · $11 \times 9 - 12 = 87$ (B) · $4 \times 10 - 20 = 20$ (E) · $22 + 4 \times 5 = 42$ (N) · $50 + 3 \times 3 = 59$ (H)

Clue 4 (Exponents): "THE BANDIT WEARS A BLUE CAP"

$15^2 = 225$ (T) · $8^2 = 64$ (D) · $6^3 = 216$ (I) · $3^3 = 27$ (U) · $5^3 = 125$ (H) · $3^5 = 243$ (C) · $12^2 = 144$ (P) · $2^7 = 128$ (A) · $7^3 = 343$ (E) · $2^3 = 8$ (L) · $13^2 = 169$ (B) · $11^2 = 121$ (S) · $2^5 = 32$ (R) · $14^2 = 196$ (W) · $7^2 = 49$ (N)

Clue 5 (Two-step equations): surviving statement is box 7 → Leo

$2x + 7 = 19, x = 6$ · $3x + 1 = 37, x = 12$ · $4x + 6 = 22, x = 4$ · $3x + 4 = 31, x = 9$ · $2x + 12 = 32, x = 10$ · $6x + 9 = 57, x = 8$ · $5x + 8 = 13, x = 1$ · $6x + 6 = 72, x = 11$ · $3x + 7 = 16, x = 3$ · $2x + 4 = 14, x = 5$ · $4x + 9 = 17, x = 2$