



The Joshua Oil Caper

Grade 5 math · Subtraction, Addition, Place value, Fractions of a number · Reading level grades 5-6

Detective: _____ Date: _____

A sneaky saboteur has tampered with the main valves at the Joshua Oil Company desert headquarters, leaking harmless blue dye into the test pipes! We must find the culprit before the grand inspection.

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 pipeline saboteur is _____

Possible suspects

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

NAME	SABOTAGE TOOL	ESCAPE VEHICLE	SAFETY GOGGLES TYPE	HARD HAT COLOR	FAVORITE SNACK
Olga Oil	electronic bypass device	electric quad bike	clear goggles	neon orange hat	licorice ropes
Rusty Pipe	pneumatic pressure drill	stealth dirt bike	clear goggles	neon orange hat	salted peanuts
Gemma Stone	magnetic valve wrench	electric quad bike	tinted goggles	bright yellow hat	licorice ropes
Geologist George	pneumatic pressure drill	armored pickup truck	tinted goggles	neon orange hat	cinnamon mints
Slick Sammy	heavy bolt cutters	desert dune buggy	tinted goggles	classic white hat	cinnamon mints
Crude Carl	laser pipe cutter	armored pickup truck	clear goggles	classic white hat	cinnamon mints
Gus Gushington	magnetic valve wrench	electric quad bike	clear goggles	bright yellow hat	cinnamon mints
Valerie Valve	heavy bolt cutters	desert dune buggy	tinted goggles	classic white hat	salted peanuts
Pressure Paul	electronic bypass device	hover drone flyer	clear goggles	neon orange hat	cinnamon mints
Joshua Miller	heavy bolt cutters	electric quad bike	clear goggles	neon orange hat	cinnamon mints
Sandy Dunes	magnetic valve wrench	hover drone flyer	tinted goggles	neon orange hat	salted peanuts
Sally Shale	laser pipe cutter	armored pickup truck	clear goggles	neon orange hat	cinnamon mints
Drill Specialist Dan	heavy bolt cutters	electric quad bike	clear goggles	classic white hat	salted peanuts
Tanker Tom	magnetic valve wrench	armored pickup truck	clear goggles	classic white hat	licorice ropes
Derrick Diggs	pneumatic pressure drill	armored pickup truck	tinted goggles	classic white hat	salted peanuts
Chief Petro	heavy bolt cutters	stealth dirt bike	tinted goggles	classic white hat	salted peanuts
Rig Operator Ron	heavy bolt cutters	stealth dirt bike	clear goggles	neon orange hat	cinnamon mints
Hap Hazard	pneumatic pressure drill	stealth dirt bike	clear goggles	classic white hat	cinnamon mints
Piper Line	heavy bolt cutters	armored pickup truck	clear goggles	neon orange hat	licorice ropes
Gage Watson	heavy bolt cutters	hover drone flyer	clear goggles	classic white hat	cinnamon mints
Elena Petrova	laser pipe cutter	desert dune buggy	clear goggles	neon orange hat	cinnamon mints

CLUE 1
Subtraction

A security guard counted the barrels of drilling fluid before and after the alarm went off. Let us subtract the missing barrels to reveal our first clue.

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

T			T											T
7028	8223	6237	7028	8223	6260	6237	7089	5056	6260	5056	7189	6741	7028	
6237	8923	4741	2448	2490	6237	6741	7189	2448	8223	6741	8918	6237	7821	5056

$7248 - 220 = \square \rightarrow \text{[T]}$

$5427 - 2937 = \square \rightarrow \text{[P]}$

$10422 - 1504 = \square \rightarrow \text{[V]}$

$11312 - 4223 = \square \rightarrow \text{[F]}$

$9729 - 1908 = \square \rightarrow \text{[R]}$

$9780 - 3543 = \square \rightarrow \text{[E]}$

$6715 - 1974 = \square \rightarrow \text{[C]}$

$5246 - 190 = \square \rightarrow \text{[D]}$

$8087 - 898 = \square \rightarrow \text{[N]}$

$6074 - 3626 = \square \rightarrow \text{[A]}$

$11095 - 2172 = \square \rightarrow \text{[S]}$

$7766 - 1025 = \square \rightarrow \text{[O]}$

$10707 - 2484 = \square \rightarrow \text{[H]}$

$11007 - 4747 = \square \rightarrow \text{[I]}$

Scratch space:

CLUE 2 Addition

To find where the suspect fled, we need to add up the lengths of the newly installed steel pipeline segments.

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

T																			
9867	6228	5397	2731	9701	2731	6724	5397	3833	9867	9487	4639	7201	5397	3833	9742	5397	5763	7201	

2731	5763	5243	5397	9867	8218	6107	4639	6107	6107	9742	5397	2731			

$4094 + 5773 = \square \rightarrow \text{T}$	$2478 + 2765 = \square \rightarrow \text{F}$	$3733 + 2991 = \square \rightarrow \text{P}$
$2944 + 4257 = \square \rightarrow \text{R}$	$4607 + 5094 = \square \rightarrow \text{U}$	$1225 + 1506 = \square \rightarrow \text{S}$
$2877 + 2520 = \square \rightarrow \text{E}$	$2206 + 1627 = \square \rightarrow \text{C}$	$3001 + 2762 = \square \rightarrow \text{A}$
$4337 + 1891 = \square \rightarrow \text{H}$	$4841 + 4646 = \square \rightarrow \text{W}$	$5406 + 4336 = \square \rightarrow \text{L}$
$1607 + 3032 = \square \rightarrow \text{O}$	$3104 + 5114 = \square \rightarrow \text{Y}$	$2604 + 3503 = \square \rightarrow \text{G}$

Scratch space:

CLUE 3 Place value

A digital lock on the valve control panel has a blinking screen. We must read the digit in the tens place of the code to unlock the third clue.

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

T																			
900	7000	4000	8000	500	4000	400	4000	8000	40	4000	5000	5000	4000	60	5000	2000	300	4000	

											T	
500	2000	400	400	600	40	200	400	40	2000	400	900	8000

What is the value of the 9 in 40,943? → **T**

What is the value of the 3 in 92,314? → **K**

What is the value of the 7 in 47,019? → **H**

What is the value of the 5 in 15,163? → **L**

What is the value of the 5 in 207,506? → **C**

What is the value of the 4 in 24,907? → **E**

What is the value of the 6 in 18,699? → **A**

What is the value of the 8 in 48,900? → **S**

What is the value of the 4 in 833,541? → **M**

What is the value of the 6 in 48,962? → **D**

What is the value of the 4 in 923,418? → **N**

What is the value of the 2 in 92,198? → **I**

What is the value of the 2 in 63,276? → **O**

Scratch space:

CLUE 4
Fractions of a number

The geology lab is testing a batch of soil samples. Find the fraction of samples containing quartz to pinpoint the fourth clue.

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

T												T	T			
22	14	32	35	6	28	32	31	6	39	25	29	22	22	32	10	6
																T
26	32	29	26	29	31	6	26	15	32	14	6	31	10	14	6	22

$1/4 \text{ of } 88 = \square \rightarrow \text{ **T** }$

$2/3 \text{ of } 48 = \square \rightarrow \text{ **E** }$

$1/6 \text{ of } 150 = \square \rightarrow \text{ **P** }$

$1/3 \text{ of } 42 = \square \rightarrow \text{ **H** }$

$2/10 \text{ of } 50 = \square \rightarrow \text{ **D** }$

$2/6 \text{ of } 18 = \square \rightarrow \text{ **A** }$

$2/4 \text{ of } 62 = \square \rightarrow \text{ **R** }$

$1/5 \text{ of } 145 = \square \rightarrow \text{ **O** }$

$6/10 \text{ of } 25 = \square \rightarrow \text{ **G** }$

$1/5 \text{ of } 130 = \square \rightarrow \text{ **N** }$

$3/10 \text{ of } 130 = \square \rightarrow \text{ **S** }$

$2/4 \text{ of } 56 = \square \rightarrow \text{ **M** }$

$2/8 \text{ of } 140 = \square \rightarrow \text{ **C** }$

Scratch space:

CLUE 5**Fractions of a number - the last clue**

The inspection team has a large pack of safety lights. Calculating a fraction of the total lights reveals our final 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:

$4/5 \text{ of } 10 = \boxed{}$

$1/4 \text{ of } 44 = \boxed{}$

$1/6 \text{ of } 24 = \boxed{}$

$7/10 \text{ of } 10 = \boxed{}$

$1/6 \text{ of } 30 = \boxed{}$

$2/10 \text{ of } 10 = \boxed{}$

$2/3 \text{ of } 15 = \boxed{}$

$2/8 \text{ of } 24 = \boxed{}$

$2/10 \text{ of } 15 = \boxed{}$

$6/10 \text{ of } 15 = \boxed{}$

$6/10 \text{ of } 20 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain loosened the safety valves on rig nine, then sped away across the dusty sand dunes.
2. The villain loosened the safety valves on rig nine, then slipped past the night guard post.
3. The villain redirected the pressure gauges, then sped away across the dusty sand dunes.
4. The villain loosened the safety valves on rig nine, then left a trail of blue dye behind.
5. The villain redirected the pressure gauges, then hid the stolen schematics in a pipe.
6. The villain redirected the pressure gauges, then slipped past the night guard post.
7. The villain unlocked the secure storage shed, then left a trail of blue dye behind.
8. The villain disabled the main pipeline alarm, then hid the stolen schematics in a pipe.
9. The villain scrambled the geological data files, then hid the stolen schematics in a pipe.
10. The villain scrambled the geological data files, then erased the security footage.
11. The villain disabled the main pipeline alarm, then slipped past the night guard post.
12. The villain redirected the pressure gauges, then left a trail of blue dye behind.

Answer Key

The Joshua Oil Caper

Culprit: Elena Petrova

laser pipe cutter · desert dune buggy · clear goggles · neon orange hat · cinnamon mints

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

Clue 1 (Subtraction): "THE THIEF DID NOT ESCAPE ON A HOVER DRONE"

$7248 - 220 = 7028$ (T) · $5427 - 2937 = 2490$ (P) · $10422 - 1504 = 8918$ (V) · $11312 - 4223 = 7089$ (F) · $9729 - 1908 = 7821$ (R) · $9780 - 3543 = 6237$ (E) · $6715 - 1974 = 4741$ (C) · $5246 - 190 = 5056$ (D) · $8087 - 898 = 7189$ (N) · $6074 - 3626 = 2448$ (A) · $11095 - 2172 = 8923$ (S) · $7766 - 1025 = 6741$ (O) · $10707 - 2484 = 8223$ (H) · $11007 - 4747 = 6260$ (I)

Clue 2 (Addition): "THE SUSPECT WORE CLEAR SAFETY GOGGLES"

$4094 + 5773 = 9867$ (T) · $2478 + 2765 = 5243$ (F) · $3733 + 2991 = 6724$ (P) · $2944 + 4257 = 7201$ (R) · $4607 + 5094 = 9701$ (U) · $1225 + 1506 = 2731$ (S) · $2877 + 2520 = 5397$ (E) · $2206 + 1627 = 3833$ (C) · $3001 + 2762 = 5763$ (A) · $4337 + 1891 = 6228$ (H) · $4841 + 4646 = 9487$ (W) · $5406 + 4336 = 9742$ (L) · $1607 + 3032 = 4639$ (O) · $3104 + 5114 = 8218$ (Y) · $2604 + 3503 = 6107$ (G)

Clue 3 (Place value): "THE SCENE SMELLED LIKE CINNAMON MINTS"

What is the value of the 9 in 40,943? = 900 (T) · What is the value of the 3 in 92,314? = 300 (K) · What is the value of the 7 in 47,019? = 7000 (H) · What is the value of the 5 in 15,163? = 5000 (L) · What is the value of the 5 in 207,506? = 500 (C) · What is the value of the 4 in 24,907? = 4000 (E) · What is the value of the 6 in 18,699? = 600 (A) · What is the value of the 8 in 48,900? = 8000 (S) · What is the value of the 4 in 833,541? = 40 (M) · What is the value of the 6 in 48,962? = 60 (D) · What is the value of the 4 in 923,418? = 400 (N) · What is the value of the 2 in 92,198? = 2000 (I) · What is the value of the 2 in 63,276? = 200 (O)

Clue 4 (Fractions of a number): "THE CAMERA SPOTTED A NEON ORANGE HARD HAT"

$\frac{1}{4}$ of 88 = 22 (T) · $\frac{2}{3}$ of 48 = 32 (E) · $\frac{1}{6}$ of 150 = 25 (P) · $\frac{1}{3}$ of 42 = 14 (H) · $\frac{2}{10}$ of 50 = 10 (D) · $\frac{2}{6}$ of 18 = 6 (A) · $\frac{2}{4}$ of 62 = 31 (R) · $\frac{1}{5}$ of 145 = 29 (O) · $\frac{6}{10}$ of 25 = 15 (G) · $\frac{1}{5}$ of 130 = 26 (N) · $\frac{3}{10}$ of 130 = 39 (S) · $\frac{2}{4}$ of 56 = 28 (M) · $\frac{2}{8}$ of 140 = 35 (C)

Clue 5 (Fractions of a number): surviving statement is box 1 → Elena Petrova

$\frac{4}{5}$ of 10 = 8 · $\frac{1}{4}$ of 44 = 11 · $\frac{1}{6}$ of 24 = 4 · $\frac{7}{10}$ of 10 = 7 · $\frac{1}{6}$ of 30 = 5 · $\frac{2}{10}$ of 10 = 2 · $\frac{2}{3}$ of 15 = 10 · $\frac{2}{8}$ of 24 = 6 · $\frac{2}{10}$ of 15 = 3 · $\frac{6}{10}$ of 15 = 9 · $\frac{6}{10}$ of 20 = 12