The Starlight Station Sabotage

Grade 5 math · Fractions of a number, Bar models, Multi-step word problems, Word problems · Reading level grades 5-6

Detective: _____ **Date:** _____

Deep in orbit aboard Starlight Orbital Station, someone tampered with the main energy vault and scrambled the station navigation grid! Station Commander Ray Vance needs your sharp detective skills to analyze logs, cross-reference suit gear, and catch the rogue crew member before the station drifts off course.

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 Space Saboteur is _____

Possible suspects

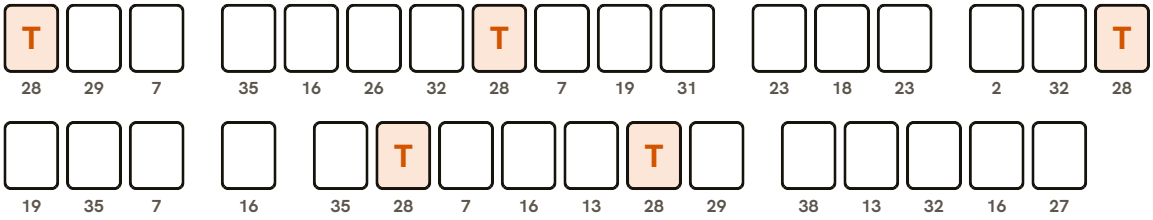
Cross off a row as each clue rules it out. The one left at the end is the culprit.

NAME	PRIMARY TOOL	SECONDARY TOOL	DOMINANT HAND	VISOR COLOR	COUNTERMEASURE
Commander Vance	Tractor Beam	Jetpack Module	Left handed	Cobalt visor	Magnetic Lock
Pilot Yuri	Laser Cutter	Cyber Scanner	Left handed	Silver visor	EMP Blast
Specialist Christina	Gravity Boots	Stealth Cloak	Left handed	Silver visor	Magnetic Lock
Cadet Astra	Plasma Torch	Stealth Cloak	Right handed	Gold visor	EMP Blast
Dr Peggy	Tractor Beam	Shield Emitter	Left handed	Gold visor	Laser Grid
Specialist Halley	Gravity Boots	Jetpack Module	Right handed	Cobalt visor	EMP Blast
Officer Sally	Plasma Torch	Cyber Scanner	Right handed	Gold visor	Magnetic Lock
Tech Sagan	Gravity Boots	Cyber Scanner	Left handed	Silver visor	Magnetic Lock
Pilot Nova	Laser Cutter	Hologram Chip	Right handed	Gold visor	EMP Blast
Engineer Scott	Tractor Beam	Hologram Chip	Left handed	Silver visor	Magnetic Lock
Specialist Michael	Laser Cutter	Stealth Cloak	Right handed	Silver visor	EMP Blast
Commander Chris	Tractor Beam	Hologram Chip	Right handed	Cobalt visor	EMP Blast
Pilot Sunita	Plasma Torch	Shield Emitter	Left handed	Silver visor	Laser Grid
Engineer Valentina	Tractor Beam	Jetpack Module	Left handed	Silver visor	Magnetic Lock
Cadet Victor	Gravity Boots	Cyber Scanner	Right handed	Gold visor	EMP Blast
Dr Neil	Sonic Screwdriver	Jetpack Module	Right handed	Silver visor	Magnetic Lock
Dr Ellen	Laser Cutter	Jetpack Module	Left handed	Silver visor	Magnetic Lock
Cadet Buzz	Tractor Beam	Stealth Cloak	Left handed	Silver visor	Laser Grid
Tech Guion	Laser Cutter	Jetpack Module	Right handed	Cobalt visor	Magnetic Lock
Astronaut Mae	Gravity Boots	Cyber Scanner	Left handed	Cobalt visor	Laser Grid
Captain Orion	Laser Cutter	Hologram Chip	Right handed	Silver visor	Magnetic Lock

CLUE 1 Fractions of a number

To decode the first encrypted transmission from the sabotage site, solve these supply log word problems.

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



4/5 of 35 = ☐ → T

3/5 of 45 = ☐ → K

1/5 of 160 = ☐ → O

1/5 of 130 = ☐ → B

1/4 of 72 = ☐ → I

1/2 of 46 = ☐ → D

2/4 of 76 = ☐ → C

7/10 of 50 = ☐ → S

2/10 of 155 = ☐ → R

2/10 of 145 = ☐ → H

1/6 of 42 = ☐ → E

2/4 of 38 = ☐ → U

4/6 of 24 = ☐ → A

1/10 of 130 = ☐ → L

2/3 of 3 = ☐ → N

Scratch space:

CLUE 2 Bar model word problems

Compare the energy readings across station sectors on the bar model to unlock the second scrap of evidence.

Draw a bar model to solve each word problem, then write its letter in the boxes to fill in the missing word.

A witness saw the villain was

L							D		D
60	142	85	123	104	48	25		142	

.

Cadet used 2/3 of the oxygen canisters on the first day. The other 20 oxygen canisters were used the next day. How many oxygen canisters were there in all?

draw a bar model

Answer: ☐ → L

Cadet has 5 times as many data drives as a teammate. The teammate has 5 data drives. How many data drives does cadet have?

draw a bar model

Answer: ☐ → N

Cadet used 1/3 of the solar batteries on the first day. The other 82 solar batteries were used the next day. How many solar batteries were there in all?

draw a bar model

Answer: ☐ → T

There were 112 oxygen canisters in all. 8 oxygen canisters were used. How many oxygen canisters are left?

draw a bar model

Answer: ☐ → H

Cadet has 144 meteorite samples, packed 3 to a bag. How many bags can be filled?

draw a bar model

Answer: ☐ → A

Cadet used 1/2 of the coolant cells on the first day. The other 71 coolant cells were used the next day. How many coolant cells were there in all?

draw a bar model

Answer: ☐ → E

The red team has 114 solar batteries and the blue team has 29 solar batteries. How many more solar batteries does the red team have?

draw a bar model

Answer: ☐ → F

CLUE 3 Multi-step word problems

Work through these multi-step flight calculations to clear up the orbital telemetry logs.

Solve each problem, then write its letter in the boxes to fill in the missing word.

Someone scared the villain off with

M							C	L	O	C	K
	22	62	14	47	66	51	58				

.

Cadet collected 115 oxygen canisters in the morning and 17 oxygen canisters in the afternoon, then split them equally among 6 Starlight Station crew. How many oxygen canisters did each get?

Answer: ☐ → M

There were 395 meteorite samples in all. 4 Starlight Station crew used 40 meteorite samples each. The other 5 Starlight Station crew shared the rest equally. How many meteorite samples did each of the other Starlight Station crew get?

Answer: ☐ → N

There were 153 meteorite samples in all. 1 Starlight Station crew used 21 meteorite samples each. The other 2 Starlight Station crew shared the rest equally. How many meteorite samples did each of the other Starlight Station crew get?

Answer: ☐ → E

There were 172 meteorite samples in all. 2 Starlight Station crew used 24 meteorite samples each. The other 2 Starlight Station crew shared the rest equally. How many meteorite samples did each of the other Starlight Station crew get?

Answer: ☐ → A

Cadet filled 3 boxes with 3 meteorite samples each, then found 49 more meteorite samples. How many meteorite samples are there in all?

Answer: ☐ → I

Cadet collected 195 data drives in the morning and 9 data drives in the afternoon, then split them equally among 4 Starlight Station crew. How many data drives did each get?

Answer: ☐ → T

Cadet collected 19 oxygen canisters in the morning and 23 oxygen canisters in the afternoon, then split them equally among 3 Starlight Station crew. How many oxygen canisters did each get?

Answer: ☐ → G

Scratch space:

CLUE 4 Word problems

Calculate the exact fractions of power restored to the main array to unmask the next clue.

Solve each problem, then write its letter in the boxes to fill in the missing word.

A strand of

S								S			hair turned up at the scene.
13	73	24	48	8	43	48	73	13	25	43	

Cadet found 6 coolant cells yesterday and 7 more today. How many coolant cells in all?

Answer: ☐ → **S**

Cadet found 8 coolant cells yesterday and 40 more today. How many coolant cells in all?

Answer: ☐ → **V**

Cadet found 7 oxygen canisters yesterday and 18 more today. How many oxygen canisters in all?

Answer: ☐ → **O**

Cadet found 14 solar batteries yesterday and 10 more today. How many solar batteries in all?

Answer: ☐ → **L**

Cadet found 2 coolant cells yesterday and 6 more today. How many coolant cells in all?

Answer: ☐ → **E**

There were 74 meteorite samples. 31 were used up. How many meteorite samples are left?

Answer: ☐ → **R**

There were 106 oxygen canisters. 33 were used up. How many oxygen canisters are left?

Answer: ☐ → **I**

Scratch space:

CLUE 5 Fractions of a number - the last clue

Determine the final fractions of life support reserves to decrypt the last piece of suit data.

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:

2/8 of 4 = ☐	1/2 of 24 = ☐	4/10 of 5 = ☐	1/6 of 66 = ☐
2/4 of 12 = ☐	1/10 of 70 = ☐	1/2 of 6 = ☐	3/10 of 30 = ☐
4/8 of 10 = ☐	1/8 of 32 = ☐	1/3 of 30 = ☐	

Step 2 - cross out the sentence with each answer:

1. The villain activated the heavy gravity boots, then downloaded station schematics with a cyber scanner.
2. The villain towed supply crates using a tractor beam, then projected a decoy with a hologram chip.
3. The villain overrode console locks with a sonic screwdriver, then blocked retaliatory blasts with a shield emitter.
4. The villain towed supply crates using a tractor beam, then slipped past sensors with a stealth cloak.
5. The villain overrode console locks with a sonic screwdriver, then downloaded station schematics with a cyber scanner.
6. The villain fired up the hot plasma torch, then downloaded station schematics with a cyber scanner.
7. The villain fired up the hot plasma torch, then slipped past sensors with a stealth cloak.
8. The villain sliced through conduits with a laser cutter, then zipped away using a jetpack module.
9. The villain towed supply crates using a tractor beam, then downloaded station schematics with a cyber scanner.
10. The villain sliced through conduits with a laser cutter, then blocked retaliatory blasts with a shield emitter.
11. The villain activated the heavy gravity boots, then projected a decoy with a hologram chip.
12. The villain towed supply crates using a tractor beam, then zipped away using a jetpack module.

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TEACHER / PARENT

Answer Key

The Starlight Station Sabotage

Culprit: Dr Ellen

Laser Cutter · Jetpack Module · Left handed · Silver visor · Magnetic Lock

Trail: Start 21 → Clue 1 17 → Clue 2 9 → Clue 3 5 → Clue 4 4 → Clue 5 1

Clue 1 (Fractions of a number): "THE SABOTEUR DID NOT USE A STEALTH CLOAK"

4/5 of 35 = 28 (T) · 3/5 of 45 = 27 (K) · 1/5 of 160 = 32 (O) · 1/5 of 130 = 26 (B) · 1/4 of 72 = 18 (I) · 1/2 of 46 = 23 (D) · 2/4 of 76 = 38 (C) · 7/10 of 50 = 35 (S) · 2/10 of 155 = 31 (R) · 2/10 of 145 = 29 (H) · 1/6 of 42 = 7 (E) · 2/4 of 38 = 19 (U) · 4/6 of 24 = 16 (A) · 1/10 of 130 = 13 (L) · 2/3 of 3 = 2 (N)

Clue 2 (Bar model word problems): "LEFT HANDED"

Cadet used 2/3 of the oxygen canisters on the first day. The other 20 oxygen canisters were used the next day. How many oxygen canisters were there in all? = 60 (L) · Cadet has 5 times as many data drives as a teammate. The teammate has 5 data drives. How many data drives does cadet have? = 25 (N) · Cadet used 1/3 of the solar batteries on the first day. The other 82 solar batteries were used the next day. How many solar batteries were there in all? = 123 (T) · There were 112 oxygen canisters in all. 8 oxygen canisters were used. How many oxygen canisters are left? = 104 (H) · Cadet has 144 meteorite samples, packed 3 to a bag. How many bags can be filled? = 48 (A) · Cadet used 1/2 of the coolant cells on the first day. The other 71 coolant cells were used the next day. How many coolant cells were there in all? = 142 (E) · The red team has 114 solar batteries and the blue team has 29 solar batteries. How many more solar batteries does the red team have? = 85 (F)

Clue 3 (Multi-step word problems): "MAGNETIC LOCK"

Cadet collected 115 oxygen canisters in the morning and 17 oxygen canisters in the afternoon, then split them equally among 6 Starlight Station crew. How many oxygen canisters did each get? = 22 (M) · There were 395 meteorite samples in all. 4 Starlight Station crew used 40 meteorite samples each. The other 5 Starlight Station crew shared the rest equally. How many meteorite samples did each of the other Starlight Station crew get? = 47 (N) · There were 153 meteorite samples in all. 1 Starlight Station crew used 21 meteorite samples each. The other 2 Starlight Station crew shared the rest equally. How many meteorite samples did each of the other Starlight Station crew get? = 66 (E) · There were 172 meteorite samples in all. 2 Starlight Station crew used 24 meteorite samples each. The other 2 Starlight Station crew shared the rest equally. How many meteorite samples did each of the other Starlight Station crew get? = 62 (A) · Cadet filled 3 boxes with 3 meteorite samples each, then found 49 more meteorite samples. How many meteorite samples are there in all? = 58 (I) · Cadet collected 195 data drives in the morning and 9 data drives in the afternoon, then split them equally among 4 Starlight Station crew. How many data drives did each get? = 51 (T) · Cadet collected 19 oxygen canisters in the morning and 23 oxygen canisters in the afternoon, then split them equally among 3 Starlight Station crew. How many oxygen canisters did each get? = 14 (G)

Clue 4 (Word problems): "SILVER VISOR"

Cadet found 6 coolant cells yesterday and 7 more today. How many coolant cells in all? = 13 (S) · Cadet found 8 coolant cells yesterday and 40 more today. How many coolant cells in all? = 48 (V) · Cadet found 7 oxygen canisters yesterday and 18 more today. How many oxygen canisters in all? = 25 (O) · Cadet found 14 solar batteries yesterday and 10 more today. How many solar batteries in all? = 24 (L) · Cadet found 2 coolant cells yesterday and 6 more today. How many coolant cells in all? = 8 (E) · There were 74 meteorite samples. 31 were used up. How many meteorite samples are left? = 43 (R) · There were 106 oxygen canisters. 33 were used up. How many oxygen canisters are left? = 73 (I)

Clue 5 (Fractions of a number): surviving statement is box 8 → Dr Ellen

2/8 of 4 = 1 · 1/2 of 24 = 12 · 4/10 of 5 = 2 · 1/6 of 66 = 11 · 2/4 of 12 = 6 · 1/10 of 70 = 7 · 1/2 of 6 = 3 · 3/10 of 30 = 9 · 4/8 of 10 = 5 · 1/8 of 32 = 4 · 1/3 of 30 = 10