



The Case of the Missing Star Crystal

Grade 4 math · Multiplication, Rounding, Addition, Subtraction, Division · Reading level grades 3-4

Detective: _____ Date: _____

Someone snuck into the potion vault at Whispering Pines Witch Academy and snatched the rare Star Crystal! Headmistress Potionkeeper needs your detective skills to figure out which witch brewed up this trouble.

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 wicked witch is _____

Possible suspects

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

NAME	SPELL TYPE	FAMILIAR	STIRRING HAND	HAT COLOR	MAGIC COUNTER
Beatrix Spellman	Flame Spark Spell	Raven Companion	Right Handed Stir	Deep Purple Hat	Silver Bell
Nancy Downs	Echo Voice Spell	Raven Companion	Left Handed Stir	Midnight Black Hat	Silver Bell
Sarah Sanderson	Echo Voice Spell	Black Cat	Left Handed Stir	Deep Purple Hat	Salt Crystal
Circe Moon	Levitation Spell	Black Cat	Right Handed Stir	Emerald Green Hat	Silver Bell
Phoebe Halliwell	Shape Change Spell	Spotted Toad	Left Handed Stir	Deep Purple Hat	Silver Bell
Hilda Spellcraft	Frost Beam Spell	Black Cat	Right Handed Stir	Emerald Green Hat	Silver Bell
Glinda Finch	Echo Voice Spell	Spotted Toad	Left Handed Stir	Deep Purple Hat	Salt Crystal
Elphaba Drake	Flame Spark Spell	Raven Companion	Right Handed Stir	Emerald Green Hat	Silver Bell
Morgana Vane	Frost Beam Spell	Wise Owl	Left Handed Stir	Emerald Green Hat	Dried Sage
Winifred Sanderson	Echo Voice Spell	Fruit Bat	Left Handed Stir	Deep Purple Hat	Silver Bell
Rowan Nightshade	Levitation Spell	Fruit Bat	Right Handed Stir	Emerald Green Hat	Silver Bell
Agnes Broomfield	Frost Beam Spell	Wise Owl	Left Handed Stir	Emerald Green Hat	Silver Bell
Paige Halliwell	Echo Voice Spell	Spotted Toad	Left Handed Stir	Emerald Green Hat	Salt Crystal
Tabitha Moss	Levitation Spell	Raven Companion	Left Handed Stir	Deep Purple Hat	Silver Bell
Hazel Starling	Echo Voice Spell	Fruit Bat	Right Handed Stir	Midnight Black Hat	Silver Bell
Zelda Darkwood	Flame Spark Spell	Fruit Bat	Left Handed Stir	Deep Purple Hat	Silver Bell
Piper Halliwell	Levitation Spell	Raven Companion	Left Handed Stir	Midnight Black Hat	Salt Crystal
Mary Sanderson	Frost Beam Spell	Fruit Bat	Right Handed Stir	Emerald Green Hat	Salt Crystal
Bonnie Bennett	Flame Spark Spell	Spotted Toad	Left Handed Stir	Deep Purple Hat	Silver Bell
Sabrina Thorne	Flame Spark Spell	Spotted Toad	Right Handed Stir	Midnight Black Hat	Silver Bell
Ursula Blackwood	Echo Voice Spell	Spotted Toad	Right Handed Stir	Emerald Green Hat	Silver Bell

CLUE 1
Multiplication facts (1-12)

You inspect the potion classroom where cauldrons are arranged in neat rows along the stone walls.

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

T																T
20	56	24	108	9	40	40	28	9	25	2	12	24	144	25	12	20
								T	T			T				
56	28	108	24	28	144	3	12	20	20	24	2	20	12	28	2	

$10 \times 2 = \square \rightarrow \boxed{\text{T}}$

$3 \times 3 = \square \rightarrow \boxed{\text{I}}$

$2 \times 1 = \square \rightarrow \boxed{\text{D}}$

$6 \times 4 = \square \rightarrow \boxed{\text{E}}$

$7 \times 8 = \square \rightarrow \boxed{\text{H}}$

$12 \times 9 = \square \rightarrow \boxed{\text{V}}$

$12 \times 12 = \square \rightarrow \boxed{\text{S}}$

$8 \times 5 = \square \rightarrow \boxed{\text{L}}$

$3 \times 1 = \square \rightarrow \boxed{\text{P}}$

$5 \times 5 = \square \rightarrow \boxed{\text{N}}$

$3 \times 4 = \square \rightarrow \boxed{\text{O}}$

$4 \times 7 = \square \rightarrow \boxed{\text{A}}$

Scratch space:

CLUE 2 Rounding

You check the magic crystal display which rounds cauldron temperatures to the nearest hundred.

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

T									T							
300	110	1100	30	900	30	7000	1100	4300	300	200	90	30	30	1100	1100	1300

	T									T					T	
30	300	2300	20	20	2300	1300	130	200	2300	300	110	20	2300	130	110	300

110	90	1300	5000

Round 258 to the nearest hundred → **T**

Round 31 to the nearest ten → **S**

Round 865 to the nearest hundred → **U**

Round 6,697 to the nearest thousand → **P**

Round 221 to the nearest hundred → **W**

Round 87 to the nearest ten → **A**

Round 19 to the nearest ten → **R**

Round 2,307 to the nearest hundred → **I**

Round 1,072 to the nearest hundred → **E**

Round 1,303 to the nearest hundred → **N**

Round 4,279 to the nearest hundred → **C**

Round 4,775 to the nearest thousand → **D**

Round 131 to the nearest ten → **G**

Round 108 to the nearest ten → **H**

Scratch space:

CLUE 3 Addition

You gather up and tally all the potion vials left behind near the suspect footprints.

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

A											A						
2867	3201	7114	8400	2069	5483	8688	2212	5483	8400	8400	8688	2867	7131	7864	7587	4430	9366

										A					
9366	7587	3201	9366	7587	4172	9366	7857	5483	2069	7114	8400	8400	2867	7114	7131

889 + 1978 = → A	2590 + 4541 = → N	2768 + 2715 = → E
2983 + 5417 = → L	4643 + 3214 = → H	3180 + 3934 = → I
1964 + 2466 = → U	1703 + 1498 = → S	4840 + 2747 = → O
2623 + 1549 = → P	1029 + 1040 = → V	2871 + 5817 = → R
693 + 1519 = → B	3717 + 4147 = → G	5477 + 3889 = → T

Scratch space:

CLUE 4

Subtraction

You calculate missing spellbook pages by subtracting what remains on the classroom shelf.

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

A				A												A	
6651	1295	4322	1017	6651	4251	8641	1523	5347	1657	1017	8998	8998	4251	8362	6651	4322	

							A						
1017	7869	1298	1298	1523	4251	7324	6651	1295	5347	1523	3018	4251	8641

$7344 - 693 = \boxed{} \rightarrow \boxed{\text{A}}$

$9681 - 4334 = \boxed{} \rightarrow \boxed{\text{F}}$

$5584 - 4286 = \boxed{} \rightarrow \boxed{\text{B}}$

$6211 - 4688 = \boxed{} \rightarrow \boxed{\text{O}}$

$5371 - 3714 = \boxed{} \rightarrow \boxed{\text{G}}$

$9025 - 4703 = \boxed{} \rightarrow \boxed{\text{T}}$

$11944 - 3582 = \boxed{} \rightarrow \boxed{\text{H}}$

$12143 - 4819 = \boxed{} \rightarrow \boxed{\text{W}}$

$9647 - 649 = \boxed{} \rightarrow \boxed{\text{E}}$

$8249 - 380 = \boxed{} \rightarrow \boxed{\text{I}}$

$1210 - 193 = \boxed{} \rightarrow \boxed{\text{R}}$

$7243 - 2992 = \boxed{} \rightarrow \boxed{\text{N}}$

$6840 - 3822 = \boxed{} \rightarrow \boxed{\text{U}}$

$3366 - 2071 = \boxed{} \rightarrow \boxed{\text{S}}$

$12087 - 3446 = \boxed{} \rightarrow \boxed{\text{D}}$

Scratch space:

CLUE 5**Division facts (1-12) - the last clue**

You divide the total bundle of flying broomsticks equally among the coven towers to find a secret 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:

$35 \div 7 = \boxed{}$

$40 \div 5 = \boxed{}$

$4 \div 1 = \boxed{}$

$54 \div 9 = \boxed{}$

$100 \div 10 = \boxed{}$

$88 \div 8 = \boxed{}$

$108 \div 12 = \boxed{}$

$96 \div 8 = \boxed{}$

$11 \div 11 = \boxed{}$

$14 \div 2 = \boxed{}$

$24 \div 8 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain transformed the golden trophy into a toad, then escaped into the night with a wise owl.
2. The villain froze the academy courtyard in ice, then flew away on a broom with a black cat.
3. The villain lit the witch tower with blue fire, then leapt into the shadows with a spotted toad.
4. The villain cast a floating spell on the library, then flew away on a broom with a black cat.
5. The villain lit the witch tower with blue fire, then vanished upward with a raven companion.
6. The villain cast a floating spell on the library, then leapt into the shadows with a spotted toad.
7. The villain froze the academy courtyard in ice, then leapt into the shadows with a spotted toad.
8. The villain cast a floating spell on the library, then fluttered into the rafters with a fruit bat.
9. The villain transformed the golden trophy into a toad, then leapt into the shadows with a spotted toad.
10. The villain transformed the golden trophy into a toad, then fluttered into the rafters with a fruit bat.
11. The villain echoed spooky whispers through the hall, then flew away on a broom with a black cat.
12. The villain lit the witch tower with blue fire, then flew away on a broom with a black cat.

Answer Key

The Case of the Missing Star Crystal

Culprit: Hilda Spellcraft

Frost Beam Spell · Black Cat · Right Handed Stir · Emerald Green Hat · Silver Bell

Trail: Start 21 → Clue 1 15 → Clue 2 7 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Multiplication facts (1-12)): "THE VILLAIN DOES NOT HAVE A SPOTTED TOAD"

$10 \times 2 = 20$ (T) · $3 \times 3 = 9$ (I) · $2 \times 1 = 2$ (D) · $6 \times 4 = 24$ (E) · $7 \times 8 = 56$ (H) · $12 \times 9 = 108$ (V) · $12 \times 12 = 144$ (S) · $8 \times 5 = 40$ (L) · $3 \times 1 = 3$ (P) · $5 \times 5 = 25$ (N) · $3 \times 4 = 12$ (O) · $4 \times 7 = 28$ (A)

Clue 2 (Rounding): "THE SUSPECT WAS SEEN STIRRING WITH RIGHT HAND"

Round 258 to the nearest hundred = 300 (T) · Round 31 to the nearest ten = 30 (S) · Round 865 to the nearest hundred = 900 (U) · Round 6,697 to the nearest thousand = 7000 (P) · Round 221 to the nearest hundred = 200 (W) · Round 87 to the nearest ten = 90 (A) · Round 19 to the nearest ten = 20 (R) · Round 2,307 to the nearest hundred = 2300 (I) · Round 1,072 to the nearest hundred = 1100 (E) · Round 1,303 to the nearest hundred = 1300 (N) · Round 4,279 to the nearest hundred = 4300 (C) · Round 4,775 to the nearest thousand = 5000 (D) · Round 131 to the nearest ten = 130 (G) · Round 108 to the nearest ten = 110 (H)

Clue 3 (Addition): "A SILVER BELL RANG OUT TO STOP THE VILLAIN"

$889 + 1978 = 2867$ (A) · $2590 + 4541 = 7131$ (N) · $2768 + 2715 = 5483$ (E) · $2983 + 5417 = 8400$ (L) · $4643 + 3214 = 7857$ (H) · $3180 + 3934 = 7114$ (I) · $1964 + 2466 = 4430$ (U) · $1703 + 1498 = 3201$ (S) · $4840 + 2747 = 7587$ (O) · $2623 + 1549 = 4172$ (P) · $1029 + 1040 = 2069$ (V) · $2871 + 5817 = 8688$ (R) · $693 + 1519 = 2212$ (B) · $3717 + 4147 = 7864$ (G) · $5477 + 3889 = 9366$ (T)

Clue 4 (Subtraction): "A STRAND OF GREEN HAT RIBBON WAS FOUND"

$7344 - 693 = 6651$ (A) · $9681 - 4334 = 5347$ (F) · $5584 - 4286 = 1298$ (B) · $6211 - 4688 = 1523$ (O) · $5371 - 3714 = 1657$ (G) · $9025 - 4703 = 4322$ (T) · $11944 - 3582 = 8362$ (H) · $12143 - 4819 = 7324$ (W) · $9647 - 649 = 8998$ (E) · $8249 - 380 = 7869$ (I) · $1210 - 193 = 1017$ (R) · $7243 - 2992 = 4251$ (N) · $6840 - 3822 = 3018$ (U) · $3366 - 2071 = 1295$ (S) · $12087 - 3446 = 8641$ (D)

Clue 5 (Division facts (1-12)): surviving statement is box 2 → Hilda Spellcraft

$35 \div 7 = 5$ · $40 \div 5 = 8$ · $4 \div 1 = 4$ · $54 \div 9 = 6$ · $100 \div 10 = 10$ · $88 \div 8 = 11$ · $108 \div 12 = 9$ · $96 \div 8 = 12$ · $11 \div 11 = 1$ · $14 \div 2 = 7$ · $24 \div 8 = 3$