

HurkleQuest in Quadrant 1 Game 01

The Hurkle Hiders [Bob & George] • MathBackpacks@aol.com

This is the story of **HurkleQuest in Quadrant 1 Game 01**, played by email from 2005-03-14 through 2005-04-12. We invited fourth and fifth grade teachers and their students to play by sending email to the Oregon Council of Teachers of Mathematics (OCTM) listserv.

Invitation to Play HurkleQuest in Quadrant 1

Subject: Play HurkleQuest in Quadrant 1 by Email

Date: 2005-03-01

We invite up to six teams of fourth and fifth grade students, from six different schools, to play **HurkleQuest in Quadrant 1** by email.

If you want to play, send an email request to **The Hurkle Hiders** at **MathBackpacks@aol.com**.

Three decades or so ago, we invented a simple game called **Hurkle** and published the first primitive version of Hurkle as a computer game in *People's Computer Company*, April 1973. You can find Hurkle in its original version in the book *Family Math* and on the Internet. Do a Google search using **hurkle** as the search key. Also try the search key: **hurkle game**.

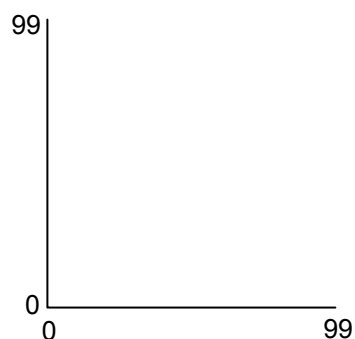
We have invented new versions of Hurkle that use colors of the rainbow as "fuzzy feedback" clues. We have played HurkleQuest in classrooms, by USPS mail, and by email. We have played HurkleQuest on the number line, in 2-dimensional space using Cartesian coordinates, on maps of elementary school neighborhoods, on maps of the USA, on globes of the Earth, and in other spaces.

The Hurkle is a happy beast that lives in another galaxy on a planet named Lirht that has three moons. Hurkles are favorite pets of the Gwik, the most intelligent denizens of Lirht.

Paraphrased from "The Hurkle Is a Happy Beast," a story by Theodore Sturgeon.

HurkleQuest is a search-and-find game with "fuzzy feedback clues." The clues are colors of the rainbow.

- Hurkle is hiding at a point (x_H, y_H) in Quadrant 1 of a two-dimensional Cartesian space.
- x_H and y_H are whole numbers, also known as nonnegative integers.
- x_H is an integer from 0 to 99 ($0 \leq x_H \leq 99$). There are 100 possible values of x_H .
- y_H is an integer from 0 to 99 ($0 \leq y_H \leq 99$). There are 100 possible values of y_H .
- Hurkle can hide at any one of 10,000 points.



Each turn you send three guesses by email to the Hurkle Hiders at **MathBackpacks@aol.com**. If your first three guesses are (20, 30), (40, 50), and (60, 70), please send them as shown below:

- Guess #1: (20, 30)
- Guess #2: (40, 50)
- Guess #3: (60, 70)

When we receive your 3 guesses, we will use the **distance formula** to calculate the **distance** of each of your guesses from Hurkle's hiding place.

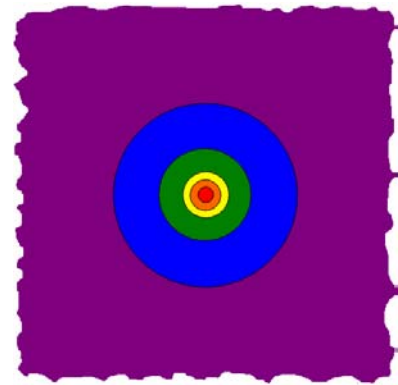
- Let (x_H, y_H) be the ordered pair of coordinates of Hurkle's hiding place.
- Let (x_G, y_G) be the ordered pair of coordinates of your guess.

The distance D of your guess from Hurkle's hiding place is

- $D = \text{square root}[(x_H - x_G)^2 + (y_H - y_G)^2]$

We will send a clue for each of your guesses. Here are the possible clues:

- RED means your guess is VERY HOT, very close to Hurkle's hiding place.
- ORANGE means your guess is HOT, close to Hurkle's hiding place, but not as close as RED.
- YELLOW means your guess is WARM, not as close as RED or ORANGE, but closer than GREEN, BLUE, or VIOLET.
- GREEN means your guess is COOL, not as close as YELLOW, ORANGE, or RED, but closer than BLUE or VIOLET.
- BLUE means your guess is COLD, far from Hurkle's hiding place. That's OK. Expect to get a bunch of BLUES as you begin your quest.
- VIOLET means that your guess is VERY COLD, very far from Hurkle's hiding place. Despair not. Avoid these regions in future guesses!



We will also send you the email addresses of the other players and encourage you to share information with them. It is good strategy to form an alliance with another team in order to find Hurkle more quickly.

Hurkle is hiding, wanting to be found!

The Hurkle Hiders [Bob & George] MathBackpacks@aol.com

HurkleQuest in Quadrant 1 Game 01 Begins

Four teams respond. The game begins. Two teams drop out. The other two teams continue the quest.

- Hoisington's Hurklefinders, a fourth-grade team coached by Rob Hoisington
- The Tom McCall Hurkle Hunters, a fifth-grade team coached by Amy Sanders.

This is the story of how they played HurkleQuest in Quadrant 1 Game 01.

Hoisington's Hurklefinders

Turn 01, 2005-03-14. Hoisington's Hurklefinders send their first set of three guesses.

Our first guesses (after making a horrendously large 100 x 100 grid – I'd better laminate!) are:

(67, 77)
(45, 56)
(19, 15)

Here's to happy Hurkle finders! Rob

Turn 01, 2005-03-18. The Hurkle Hiders respond.

Ahoy Hoisington's Hurklefinders,

Welcome to HurkleQuest in Quadrant 1 Game 01. It is our great pleasure to play with you again. Here are your guesses and clues.

Guess #1: (67, 77) Clue: VIOLET
Guess #2: (45, 56) Clue: VIOLET
Guess #3: (19, 15) Clue: VIOLET

Your three VIOLET guesses are typical of guesses at the beginning of the game. Hurkle is hiding at one point in a 2-dimensional space of 10,000 points! Now you know regions of Hurkle space to avoid.

Turn 02, 2005-03-31. Spring break is history. Hoisington's Hurklefinders return to the quest.

Ok, we're back again! Here's our next set of guesses:

9, 80
77, 6
38, 31

Thanks, Hoisington's Hurklefinders

Turn 02, 2005-04-01. The Hurkle Hiders, refreshed from an Oregon adventure, resume play.

Ahoy Hoisington's Hurklefinders,

We're back from our trip through Oregon. We traveled 2,200 kilometers from Santa Rosa, CA through Oregon looking for the best place for the Hurkle Hiders to live in Oregon. Success! We'll move to xxxxxx early June 2005. Here are your Turn 02 guesses and clues:

Guess #4: (9, 80) Clue: VIOLET
Guess #5: (77, 6) Clue: VIOLET
Guess #6: (38, 31) Clue: VIOLET

Post these guesses and colors on your humongous Quadrant 1 coordinate system that adorns a wall of your classroom. The pattern will guide you to your next set of three guesses. We'd love to see a picture of the HurkleQuest coordinate system on your wall!

Turn 03, 2005-04-04. Hoisington's Hurklefinders make a giant leap.

Ah! The beauty of spring in Oregon! Our guesses this week are:

71, 35
72, 55
68, 47

Thanks, Hois' Hurklefinders

Turn 03, 2005-04-06. The Hurkle Hiders have recently returned from exploring spring in Oregon.

Ahoy Hoisington's Hurklefinders,

Bodacious! Awesome set of guesses. Here are your guesses and clues.

Guess #7: (71, 35) Clue: ORANGE
Guess #8: (72, 55) Clue: BLUE
Guess #9: (68, 47) Clue: GREEN

Guess #7 is in the HOT part of Hurkle space. You are surrounded by orange spring flowers. Your big wall chart will have lots of colors. Soon you will enter the red zone.

Playful Hurkle is quivering in anticipation of your arrival.

Turn 04, 2005-04-06. Much excitement in the Hurklefinders' classroom!

Oh, did those guesses excite the kids! Our next guesses are:

71, 32
74, 33
68, 29

Thanks, Rob Hoisington and the Hurklers

Turn 04, 2005-04-07. Hurkle and the Hurkle Hiders are excited too!

Ahoy Hoisington's Hurklefinders,

Two yellows and a green. Now you have explored all the colors of Hurkle space except red. Graph your orange guess (#7) and your two yellow guesses (#10 and #11) on that humongous wall chart and let the pattern guide you in your next three guesses. Get ready, Hurkle, here come Hoisington's Hurklefinders!

Guess #10: (71, 32) Clue: YELLOW
Guess #11: (74, 33) Clue: YELLOW
Guess #12: (68, 29) Clue: GREEN

Coming soon: Hoisington's Hurklefinders enter the red region of Hurkle space!

Turn 05, 2005-04-07. The Hurklefinders ponder strategy and the coordinate universe.

Ok, that was a bit sad, but we bucked up and started thinking about strategy and the coordinate universe. Our new picks are:

73, 36
69, 35
71, 37

Thanks, H.'s Hs.

Turn 05, 2005-04-08. Happiness abounds in Hurkle space as the Hurklefinders approach.

Ahoy Hoisington's Hurklefinders,

Your good thinking about strategy and the coordinate universe worked well! Nice assortment of warm and hot colors. Here are your guesses and clues.

Guess #13: (73, 36) Clue: RED
Guess #14: (69, 35) Clue: YELLOW
Guess #15: (71, 37) Clue: ORANGE

The happy sound you hear is Hurkle anticipating your arrival at Hurkle's hiding place at the center of the red circle in Hurkle space.

Turn 06, 2005-04-08. Do Hoisington's Hurklefinders find Hurkle?

Hello! The kids are very strategy oriented now...they still want to know what a Hurkle looks like!! Our next guesses:

74, 36
74, 37
73, 37

Thanks, Hois' Hurklers

Turn 06, 2005-04-09. Did Hoisington's Hurklefinders find Hurkle? Decide, then read on.

Ahoy Hoisington's Hurklefinders,

The pipers are piping! The drummers are drumming! Let the parade begin! Hoisington's Hurklefinders are the first team to find Hurkle in **HurkleQuest in Quadrant 1 Game 01**.

Guess #16: (74, 36) Clue: RED
Guess #17: (74, 37) Clue: RED
Guess #18: (73, 37) Clue: **HURKLE!**

Great game! You played well.

Hoisington says, "The kids are very strategy oriented now." Music to our ears. Designing strategies is one of our favorite uses of mathematics. Hoisington, please tell us more.

The Hurkle Hiders [Bob & George]

The Tom McCall Hurkle Hunters

Turn 01, 2005-03-14. The Tom McCall Hurkle Hunters send their first set of guesses.

Our first round of guesses is as follows:

Guess #1: (34,39)
Guess #2: (91,91)
Guess #3: (20,90)

We are excitedly waiting for your response!

Amy Sanford, ring-leader for the Tom McCall Hurkle Hunters

Turn 01, 2005-03-17. The Hurkle Hiders respond.

Ahoy and Good Cheer Tom McCall Hurkle Hunters,

Welcome to HurkleQuest in Quadrant 1! Hurkle and the Hurkle Hiders love to play with students and the teachers who are their mentors and coaches. Your guesses and clues are:

Guess #1: (34, 39) Clue: VIOLET
Guess #2: (91, 91) Clue: VIOLET
Guess #3: (20, 90) Clue: VIOLET

Your three VIOLET guesses are typical of guesses at the beginning of the game. Hurkle is hiding at one point in a 2-dimension space of 10,000 points! Now you know regions of Hurkle space to avoid!

Ponder your guesses for turn #2. Will you do it alone, or might you trade guesses with another team? At the beginning of the game, is it better to be competitive and secretive, or better to be cooperative? Imagine trading your three VIOLET guesses for three other VIOLET guesses. Would that help you make better guesses?

Imagine trading two VIOLET guesses or even three VIOLET guesses for one BLUE guess. Is that a good trade? One other team is playing:

Hoisington's Hurklefinders: hoisingr@wlwv.k12.or.us

In the real world, people, corporations, governments, et cetera, et cetera, form alliances in order to get things done. In the real world, people work in teams to do wonderful things in synergistic ways.

In the imaginary world of HurkleQuest, you can compete or cooperate or

Turn 02, 2005-03-28. Refreshed by Spring Break, Tom McCall Hurkle Hunters return to the quest.

My class decided that they wanted to finish round #2 independently. After that they want to work with other groups. Here are our guesses:

(68,54)
(80,45)
(97,9)

We are eagerly waiting for the results! We hope you liked your visit to Oregon – it's a wonderful place to live, but rather damp!

Ms. Sanford and the Tom McCall Hurkle Hunters

Turn 02, 2005-04-01. The Hurkle Hiders are happy to resume play.

Ahoy Tom McCall Hurkle Hunters,

We're back from our trip through Oregon. We traveled 2,200 kilometers from Santa Rosa, Ca through Oregon looking for the best place for the Hurkle Hiders to live. Success! We'll move to xxxxxx early June 2005. Here are your Turn 02 guesses and clues:

Guess #4: (68, 54) Clue: BLUE
 Guess #5: (80, 45) Clue: GREEN
 Guess #6: (97, 9) Clue: VIOLET

Good show! You bagged a BLUE and grabbed a GREEN. Make a big Quadrant 1 graph, put it on the wall of your classroom, and plot all of your guesses and their colors. You will soon meander into the warmer regions of Hurkle Space.

Turn 03, 2005-04-07. The Tom McCall Hurkle Hunters are exploring cool Hurkle space.

We're wondering if you got our 3rd round of guesses. They were:

(81, 29)
 (68, 43)
 (94, 44)

We're very excited to hear back! Every time my email reminder beeps, my students ask me to check my email!

Amy Sanford

Turn 03, 2005-04-07. The Hurkle Hiders respond quickly.

Ahoy Tom McCall Hurkle Hunters,

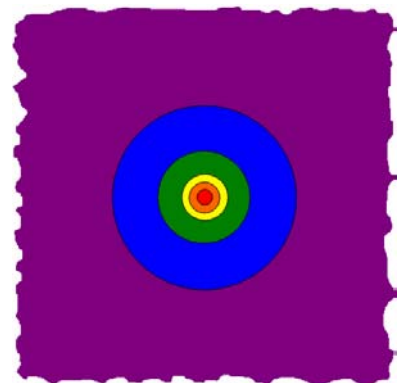
You grabbed two greens and a blue. Here are your guesses and clues:

Guess #7: (81, 29) Clue: GREEN
 Guess #8: (68, 43) Clue: GREEN
 Guess #9: (94, 44) Clue: BLUE

Now you have three green guesses and two blue guesses. Graph them in Quadrant 1 and let the pattern point you in the right direction for your next three guesses.

Look at the graph of Hurkle space that we sent. If you connect two green points with a line segment, what colors might the segment pass through? Experiment using two points in different parts of green space.

Hurkle beckons!



Turn 04, 2005-04-09. Coach Sanford's April Fool's joke gets cheers, then groans.

Cool! We finally feel like we're zeroing in on Hurkle! We have a new set of guesses:

(69,30)
 (75,37)
 (73,25)

I played an April Fool's joke on my students. I told them that they wouldn't believe it, but one of them guessed Hurkle's position EXACTLY! They all fell for it and were getting really full of themselves, until I told them that you had one more message for them – "April Fools!". They groaned, but then we all had a good laugh. I had to watch out for retribution for the rest of the day! Just thought you'd like to know.

Amy Sanford and the Tom McCall Hurkle Hunters

Turn 04, 2005-04-09. The Hurkle Hiders like that April Fool's joke.

Ahoy Tom McCall Hurkle Hunters,

We like that April Fool's joke! Now you are homing in on Hurkle (no fooling). Nice assortment of colors this time, including an orange guess.

Guess #10: (69, 30) Clue: GREEN
 Guess #11: (75, 37) Clue: ORANGE
 Guess #12: (73, 25) Clue: BLUE

Graph your four green guesses and one orange guess and let the pattern guide you in cleverly selecting your next three guesses. May dragons of good fortune dance on your HurkleQuest graph!

Turn 05, 2005-04-11. Do the Tom McCall Hurkle Finders find Hurkle?

We were very excited to hear the latest results! Orange is a very good color. Here are our next guesses:

(71, 33)
 (73, 37)
 (69, 38)

We're on the edge of our seats!

Tom McCall Hurkle Hunters

Turn 05, 2005-04-12. Did the Tom McCall Hurkle Hunters find Hurkle? Decide, then read on.

Ahoy Tom McCall Hurkle Hunters,

The pipers are piping! The drummers are drumming! Let the parade begin! The Tom McCall Hurkle Hunters have found Hurkle in **HurkleQuest in Quadrant 1 Game 01**.

Guess #13: (71, 33) Clue: YELLOW
 Guess #14: (73, 37) Clue: **HURKLE!**
 Guess #15: (69, 38) Clue: YELLOW

You went from orange in your guess #11 all the way to Hurkle's hiding place. Great game. You played well. We'd love to hear the story of how the Tom McCall Hurkle Hunters played the game.

The Hurkle Hiders [Bob & George]

Aftermath, 2005-04-12. The Tom McCall Hurkle Hunters want to play again.

WooHoo! Now that the game is over, my students want to do it again! Will you be starting a new game? Do you ever do a game with all 4 quadrants? Thanks for setting this up for us!

Amy Sanford & the Tom McCall Hurkle Hunters

Aftermath, 2005-04-12. Yes, there will be more HurkleQuest games.

You say that your students want another HurkleQuest game. We'll run many games during the 2005-2006 school year, including games in all four quadrants, and invite you to **Play Together, Learn Together**.

The Hurkle Hiders [Bob & George]

What Do the Colors Mean?

Hurkle is hiding at a point (x_H, y_H) in Quadrant 1 of a two-dimensional Cartesian space.

- x_H is an integer from 0 to 99 ($0 \leq x_H \leq 99$).
- y_H is an integer from 0 to 99 ($0 \leq y_H \leq 99$).

A guess is a point (x_G, y_G) in Quadrant 1 of the Cartesian space.

- x_G is an integer from 0 to 99 ($0 \leq x_G \leq 99$).
- y_G is an integer from 0 to 99 ($0 \leq y_G \leq 99$).

The **distance** D of the guess from Hurkle's hiding place is the length of the **line segment** from the hiding place to the guess. We use the **distance formula** to calculate the distance.

- Distance formula: $D = \sqrt{(x_H - x_G)^2 + (y_H - y_G)^2}$

In Game 01, we assigned colors to values of the distance D like so below. Hurkle is hiding at the center of the red circle. The violet space ($24 \leq D$) goes on forever in all directions.

D	Color	Hurkle Space
$D = 0$	Hurkle!	
$1 \leq D < 2$	red	
$2 \leq D < 4$	orange	
$4 \leq D < 6$	yellow	
$6 \leq D < 12$	green	
$12 \leq D < 24$	blue	
$24 \leq D$	violet	

How Did We Run the Game? We Used Microsoft Excel.

We used an **Excel workbook** to run HurkleQuest in Quadrant 1 Game Number 01. Down yonder there be **Excel worksheets** for Hoisington's Hurklefinders and the Tom McCall Hurkle Finders. If you are Excel literate, you can create workbooks to help you run games. Or you may have ours.

Want to run a HurkleQuest game?
Ask us and we'll send you Excel workbooks that you can use to run HurkleQuest games.

HurkleQuest in Quadrant 1 Game 01			Begin: 2005-03-14		0 ≤ x ≤ 99, 0 ≤ y ≤ 99			
Hoisington's Hurklefinders			hoisingr@wlwv.k12.or.us					
	x_H	y_H						
Hurkle:	73	37	Red	Orange	Yellow	Green	Blue	Violet
			1≤D<2	2≤D<4	4≤D<6	6≤D<12	12≤D<24	24≤D
	Received	x_G	y_G	D	Clue	Sent		
Guess 1	3/14/2005	67	77	40.4	violet	3/18/2005		
Guess 2		45	56	33.8	violet			
Guess 3		19	15	58.3	violet			
Guess 4	3/31/2005	9	80	77.1	violet	4/1/2005		
Guess 5		77	6	31.3	volet			
Guess 6		38	31	35.5	violet			
Guess 7	4/4/2005	71	35	2.8	orange	4/6/2005		
Guess 8		72	55	18.0	blue			
Guess 9		68	47	11.2	green			
Guess 10	4/6/2005	71	32	5.4	yellow	4/7/2005		
Guess 11		74	33	4.1	yellow			
Guess 12		68	29	9.4	green			
Guess 13	4/7/2005	73	36	1.0	red	4/8/2005		
Guess 14		69	35	4.5	yellow			
Guess 15		71	37	2.0	orange			
Guess 16	4/8/2005	74	36	1.4	red	4/9/2005		
Guess 17		74	37	1.0	red			
Guess 18		73	37	0.0	Hurkle!			

HurkleQuest in Quadrant 1 Game 01			Begin: 2005-03-14		0 ≤ x ≤ 99, 0 ≤ y ≤ 99			
Tom McCall Hurkle Hunters			Asanford@fgsd.k12.or.us					
	x_H	y_H						
Hurkle:	73	37	Red	Orange	Yellow	Green	Blue	Violet
			1 ≤ D < 2	2 ≤ D < 4	4 ≤ D < 6	6 ≤ D < 12	12 ≤ D < 24	24 ≤ D
	Received	x_G	y_G	D	Clue	Sent		
Guess 1	3/14/2005	34	39	39.1	violet	3/17/2005		
Guess 2		91	91	56.9	violet			
Guess 3		20	90	75.0	volet			
Guess 4	3/28/2005	68	54	17.7	blue	4/1/2005		
Guess 5		80	45	10.6	green			
Guess 6		97	9	36.9	violet			
Guess 7	4/7/2005	81	29	11.3	green	4/7/2005		
Guess 8		68	43	7.8	green			
Guess 9		94	44	22.1	blue			
Guess 10	4/9/2005	69	30	8.1	green	4/9/2005		
Guess 11		75	37	2.0	orange			
Guess 12		73	25	12.0	blue			
Guess 13	4/11/2005	71	33	4.5	yellow	4/12/2005		
Guess 14		73	37	0.0	Hurkle!			
Guess 15		69	38	4.1	yellow			

The end – of the beginnig.

**The Hurkle Hiders [Bob & George]
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