



# Introduction

Welcome, Class of 2027, to the eleventh **Aquarium Puzzle Hunt!** To get started:

- Form a team (with **3 to 6 people**).
- Go look for puzzles! There are **8 puzzles** hidden in the aquarium; you can do them in any order. Take only **one copy per puzzle** per team. Each puzzle has an answer that is a **word or short phrase**.
- The princesses at the **front desk** are available for help. General tips:
  - Look for patterns between the parts of the puzzle, and try to stay organized.
  - The title and the flavortext may have some subtle clues.
  - Look out for numbers ranging from 1-26, as there are 26 letters of the alphabet. Be wary, the numbers might be in another base!
  - If you need a hint, feel free to ask any of the princesses!
- To submit an answer, write the answer near the puzzle title and show it to the front desk. Try not to accidentally spoil any other teams!

The first 3 teams to finish the hunt will win **prizes**. Best of luck, and have fun!

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*Ariel is a new student entering MIT!*

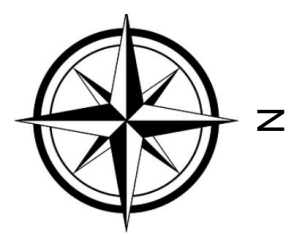
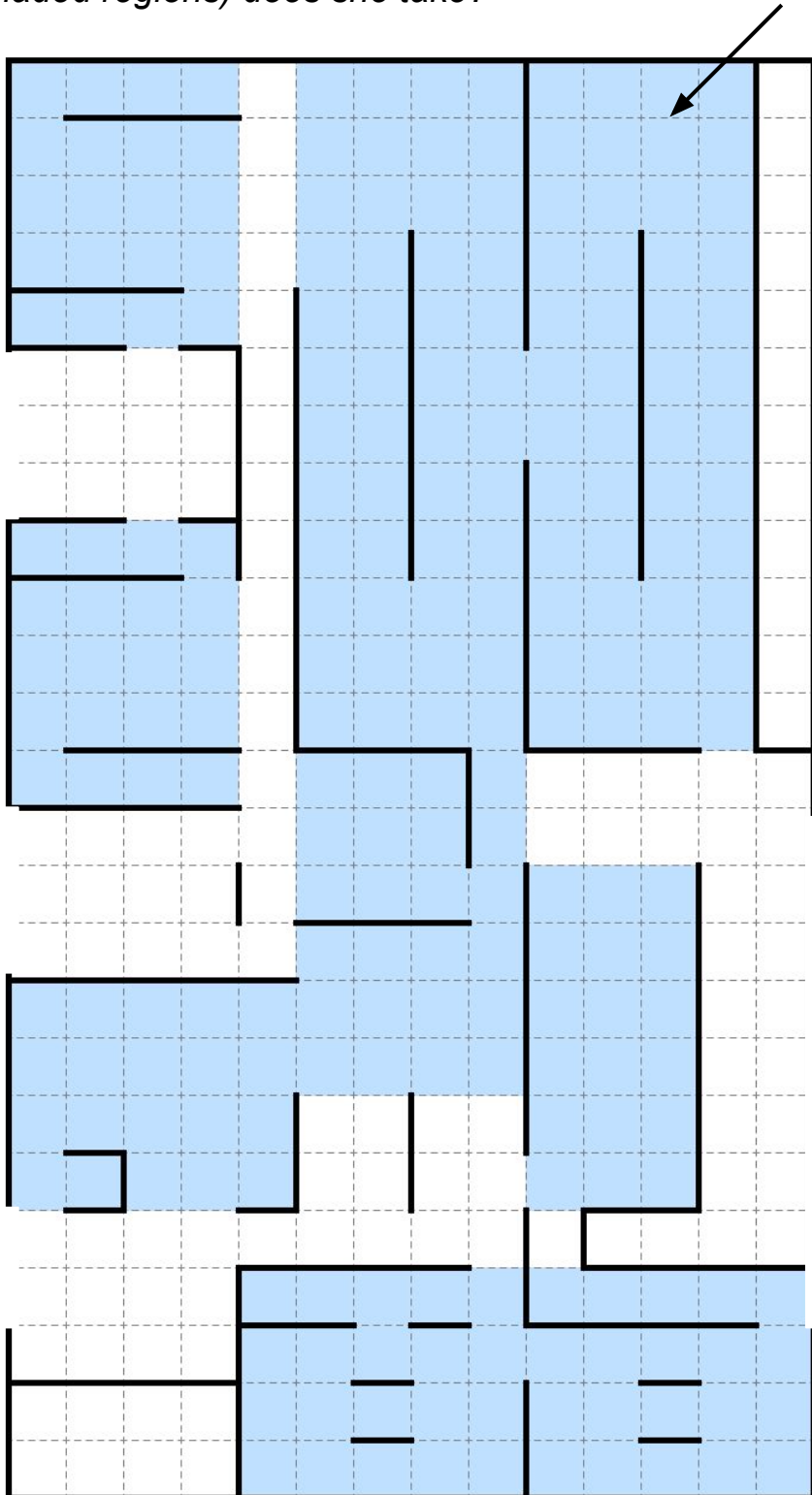
*Her friends, the other princesses, all know that Ariel collects relics of human things.*

*They all want to bring her a gift, but they are all having a hard time deciding on what to bring.*

*Maybe you can analyze their interests and situations, and figure out what they could gift Ariel?*

# Belle

*Belle likes to bounce off the walls of the Beast's castle while dancing. If she starts moving in the direction pointed at by the arrow, what path within the castle (the shaded regions) does she take?*



# Cinderella

*Cinderella's evil stepsisters make her do all their psets.*

1. Suppose that the DNA content of a cell is composed of 27% A. What percentage of the DNA content is G?
2. In two's complement notation, if a number begins with a 1, it is negative. What is the largest integer that can be expressed in two's complement notation using five bits?
3. In how many ways can you select two squares from a 3x3 grid of squares, such that the selected squares aren't in the same row or the same column?
4. A given good has demand curve  $0.1(\text{Income}) - 200P$  and supply curve  $300P$ . If  $\text{Income} = \$55000$ , what is the equilibrium price?
5. Pentane, an organic molecule with only single bonds, has the formula  $C_5H_x$ . What is  $x$ ?
6. A racecar, driving on a 120 meter straight track, starts at rest and accelerates at a constant rate. It takes the racecar 4 seconds to finish the 120 meter track. What is the racecar's acceleration?
7. Two charges of  $-4C$  and  $4C$  experience an attractive force of  $16k_c$  N. How far apart are the charges?
8. Suppose that  $dy/dx = 4/y^3$  and  $y(0) = 2$ . What is  $y(15)$ ?

# Elsa

*Elsa is lost in the woods. What should she dial in her phone to get help?*

6	9							
1	8							
2	7					1	5	
9	4					2	8	
2								
5								

Note: Normal sudoku rules apply; numbers strictly increase from the bulb to the tail of each thermometer.  
 Shaded squares and circles are for extraction.



# Moana

*Maui makes a lot of claims about things he's done. Moana thinks that someone else deserves the credit.*

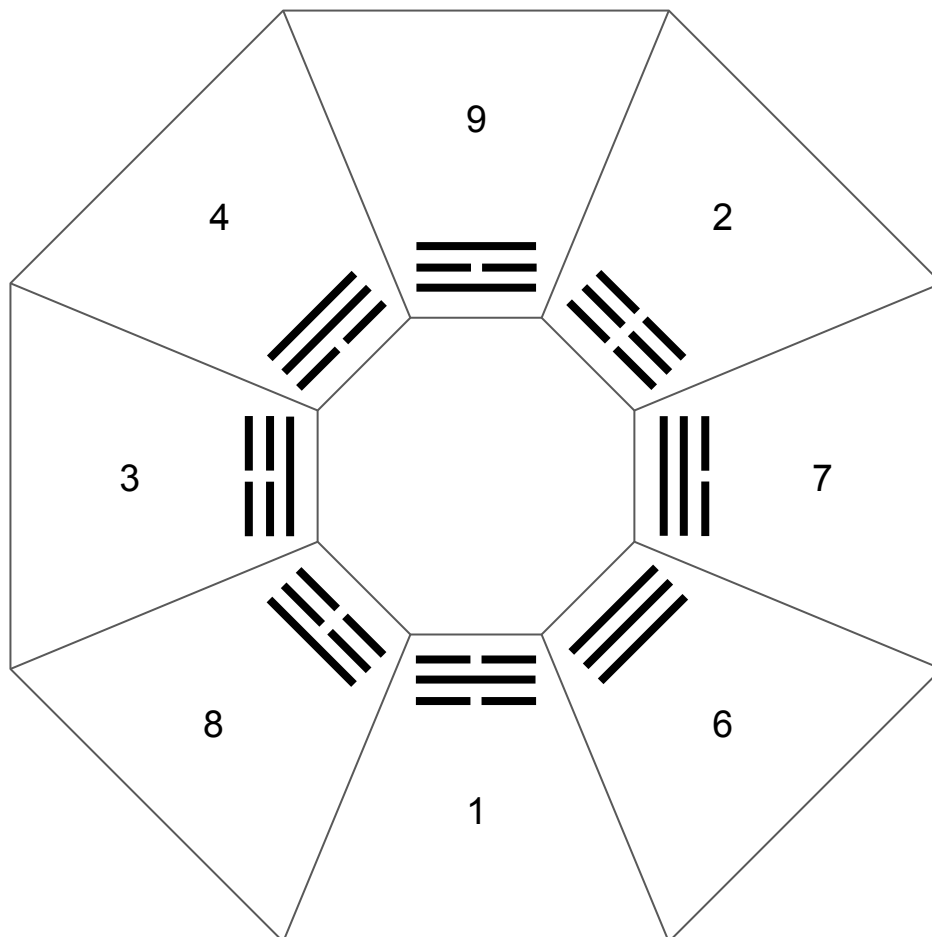
- I give the princess of Arendelle warm hugs!
- I can turn invisible and make forcefields!
- I sometimes get so sad about losing my tail that a personal cloud rains on me!
- I fell in love with Juliet!
- I deliver presents to children on Christmas Day!
- I use my hammer to summon lightning!
- I followed the White Rabbit into Wonderland!
- My pixie dust helps Peter Pan fly!
- I began a narration of a famous novel by asking the reader to call me by name.
- My dad had to find me after I was captured by a Sydney dentist.
- I'm a tree alien and one of the Guardians of the Galaxy!

# Mulan

*Mulan is trying to configure her living space according to the principles of feng shui.*

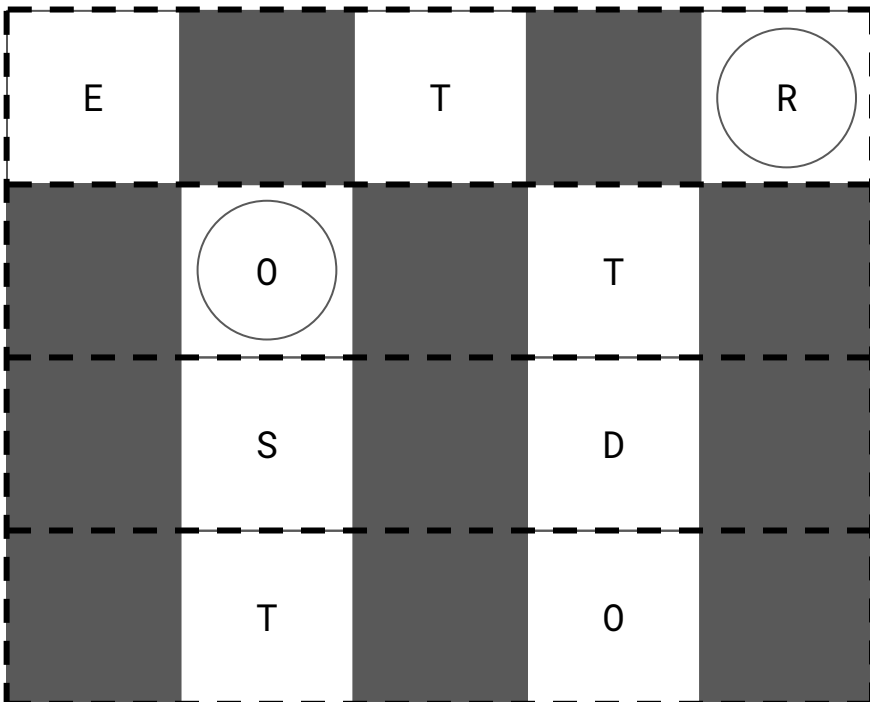
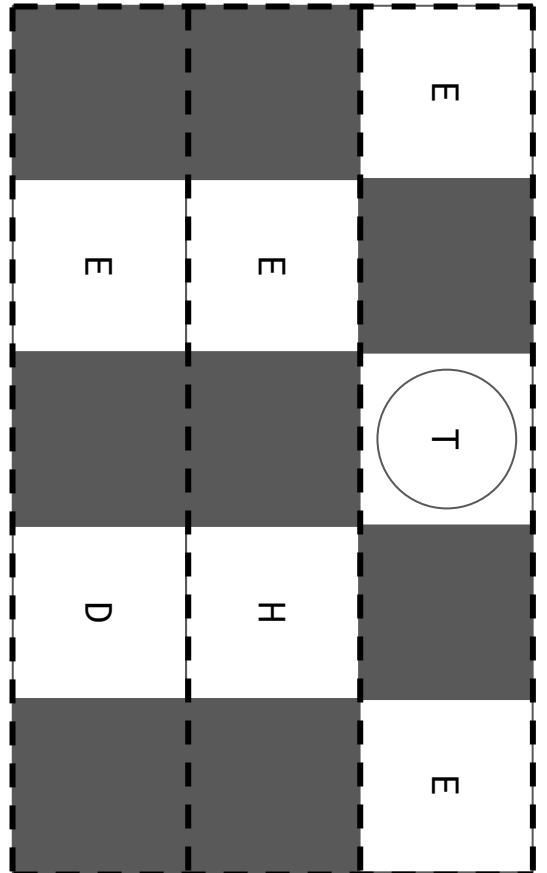
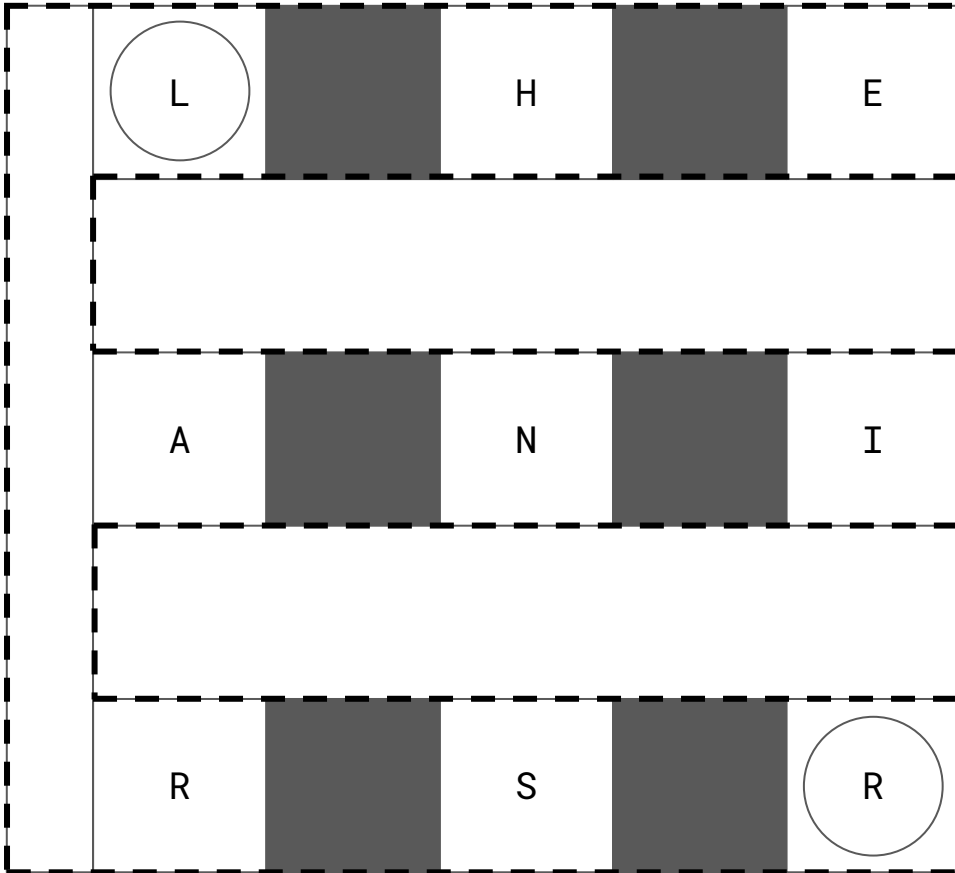
- The bookshelf is the counterclockwise neighbor of the divan.
- The closet is not adjacent to the wardrobe.
- The cradle is three steps clockwise from the wardrobe.
- The divan is not adjacent to the settee.
- The dresser is on the right.
- The settee is adjacent to the dresser.
- The storeroom is across from the divan.

Note: The Arabic numeral representations of the trigrams are provided for your convenience.



# Pocahontas

*Pocahontas is weaving a basket.*



*This is the reverse side.*

	C	Z
A		
	P	O
T		
	H	A

	S		F	
	R		O	
	W		D	

	R		N	
S		R		G
T		Y		E
M		I		R



# Snow White

*Snow White enjoys square dancing with her seven dwarves. They also enjoy thinking about what moves are possible from their formations. (moves can also be mirrored and/or rotated)*

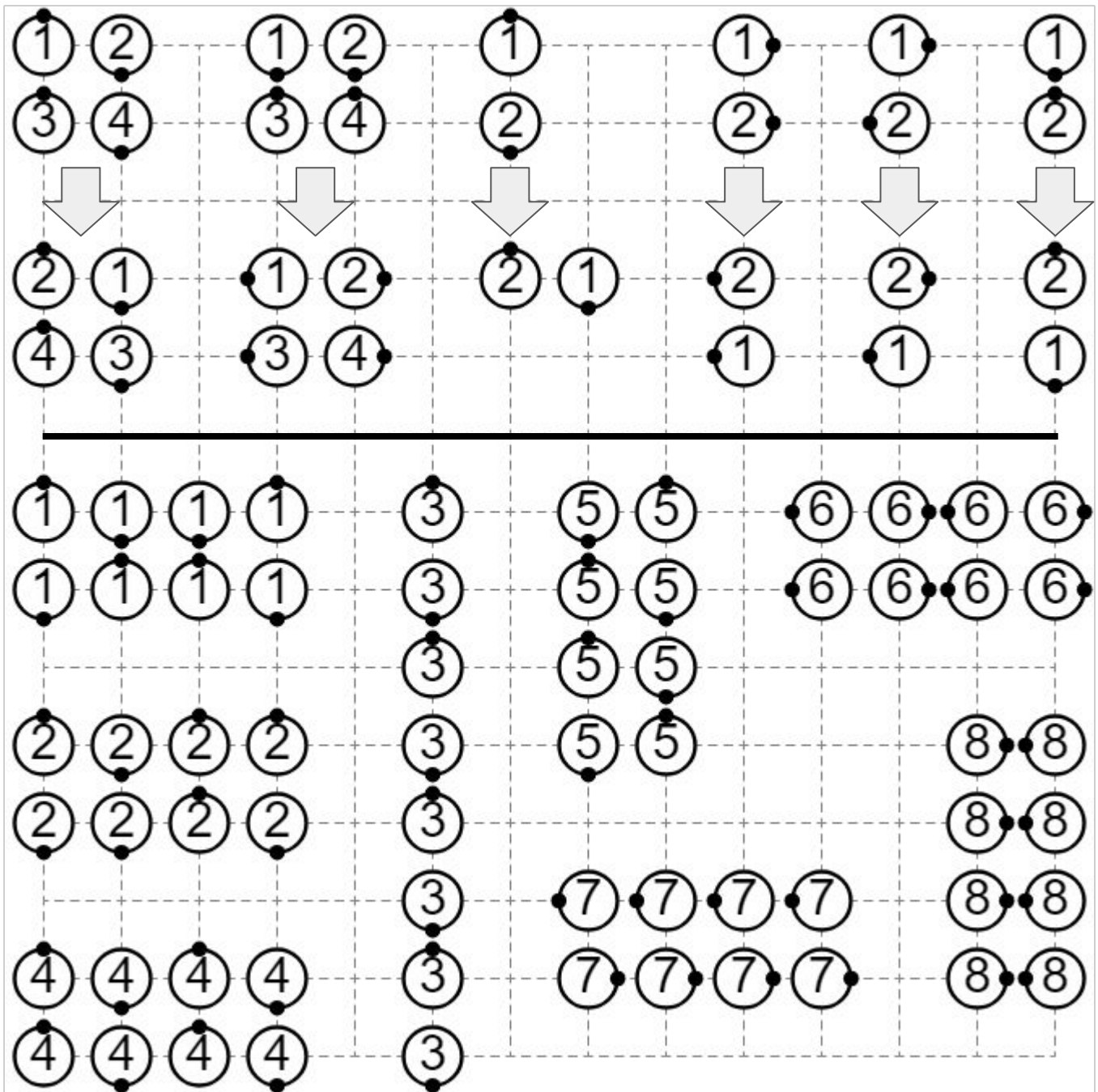
Scout Back

Square Thru

Right Roll

Trade (2 cases)

Pass Thru



# Tiana

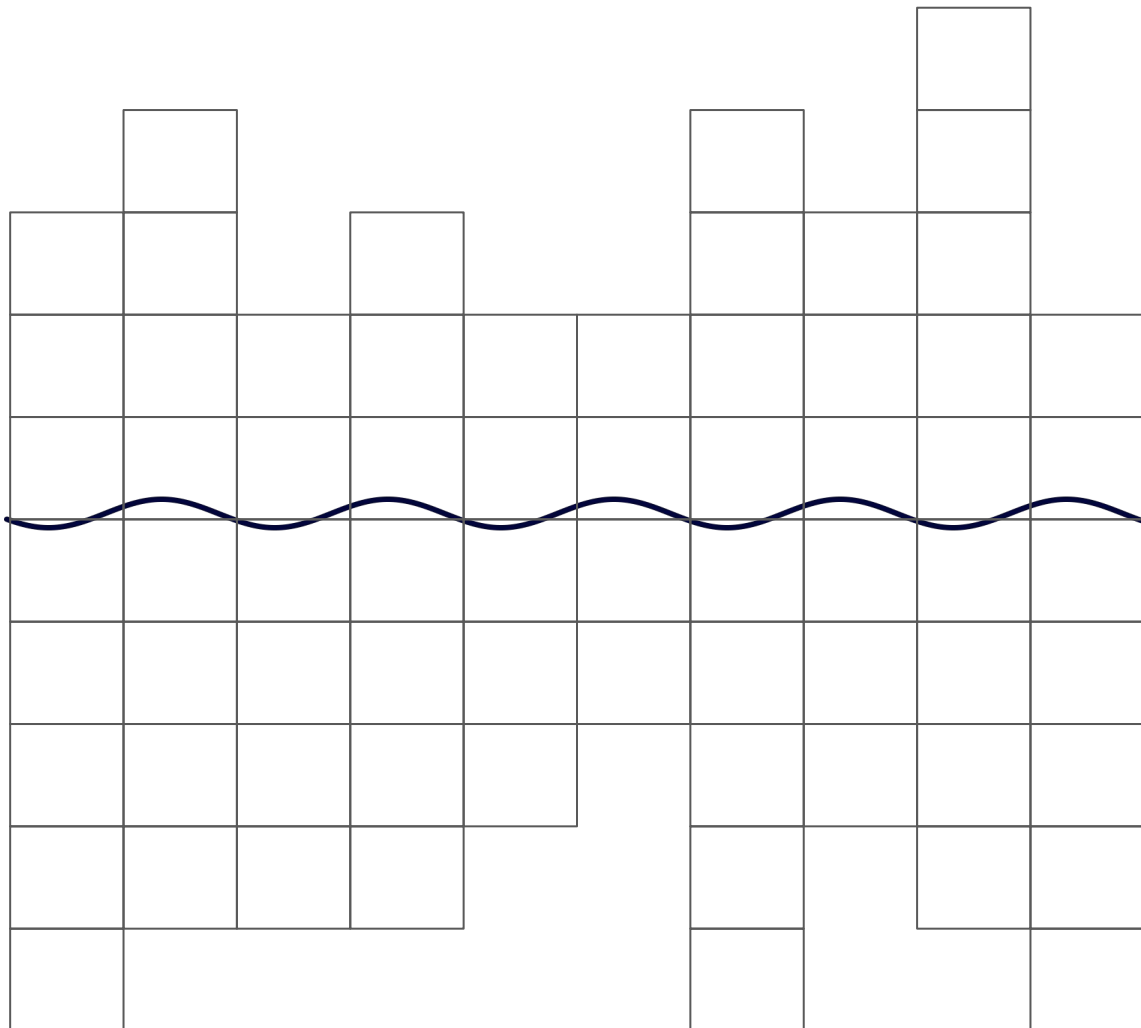
*At the bayou, Tiana sees some objects partially submerged in the water.*

## **Above water**

Opposite of pro, in debate  
Challenged, perhaps in a party game  
Perform an action  
Not doff  
It might be decked with boughs of holly  
Not out  
Baby food  
Short sleep  
3.14159...  
I told you \_\_\_

## **Submerged**

\_\_\_\_\_ in handy  
Having a high ratio of mass over volume  
\_\_\_\_\_ stepmother  
A piano has 88  
Family  
Atop  
Was in debt  
Gives a number of stars  
Hotel units  
Ironic





# Ariel (META)

*Ariel has heard these words being used to refer to the gifts she's received. She has also heard about the gifts coming from the "green grasshopper island". Can you figure out where that is?*

blattdingleis

dinglehopper

grasssnarf

hyperdingle

hypergreenis

landdingleate

snarfblatt

snarfdingle

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green grasshopper island

# Feedback

Thanks for doing the puzzle hunt! Please answer this form for your whole team.

How many members does your team have? \_\_\_\_\_

How much experience do you have with puzzlehunts?

On a scale of 1 (least) to 6 (most), rate each puzzle's **difficulty** and **funness**.

	diff.	fun		diff.	fun
e.g. Intro	<u>1</u>	<u>6</u>	Mulan	_____	_____
Belle	_____	_____	Pocahontas	_____	_____
Cinderella	_____	_____	Snow White	_____	_____
Elsa	_____	_____	Tiana	_____	_____
Moana	_____	_____	META: Ariel	_____	_____

Any comments about our **PUZZLES**?

Any comments about the **HUNT FORMAT**?

Any other comments?

If you would like to be added to the Puzzle Club mailing list, write your emails here.