LOGICS ACADEMY
…a playground for innovative minds

First Lego League Curriculum - Ontario

Activity Sheet	
Gr 5 - Lesson #5	Stop at Angle – Hidden Treasure
Date:	Name(s):

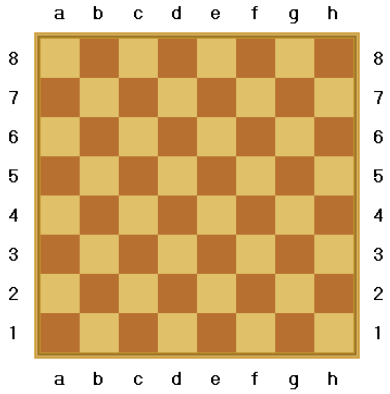
Check That I'm Done ☑		
☐ Commented on my code	☐ Modify it task	☐ Coding Challenge

Learn

It's very important for people to be able to communicate an exact location. Maps do a good job at this using GPS Coordinates.

There are a few different systems for communicating a location. Almost all of them make an area into a grid, and tell you how far sideways (horizontal) and up (vertical) to travel from a starting point.

For example, a chess board uses letters a-h to name the vertical columns and numbers to name the rows.

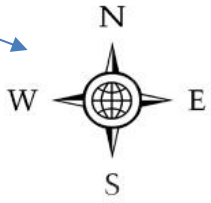


Another similar example is the game battleship.

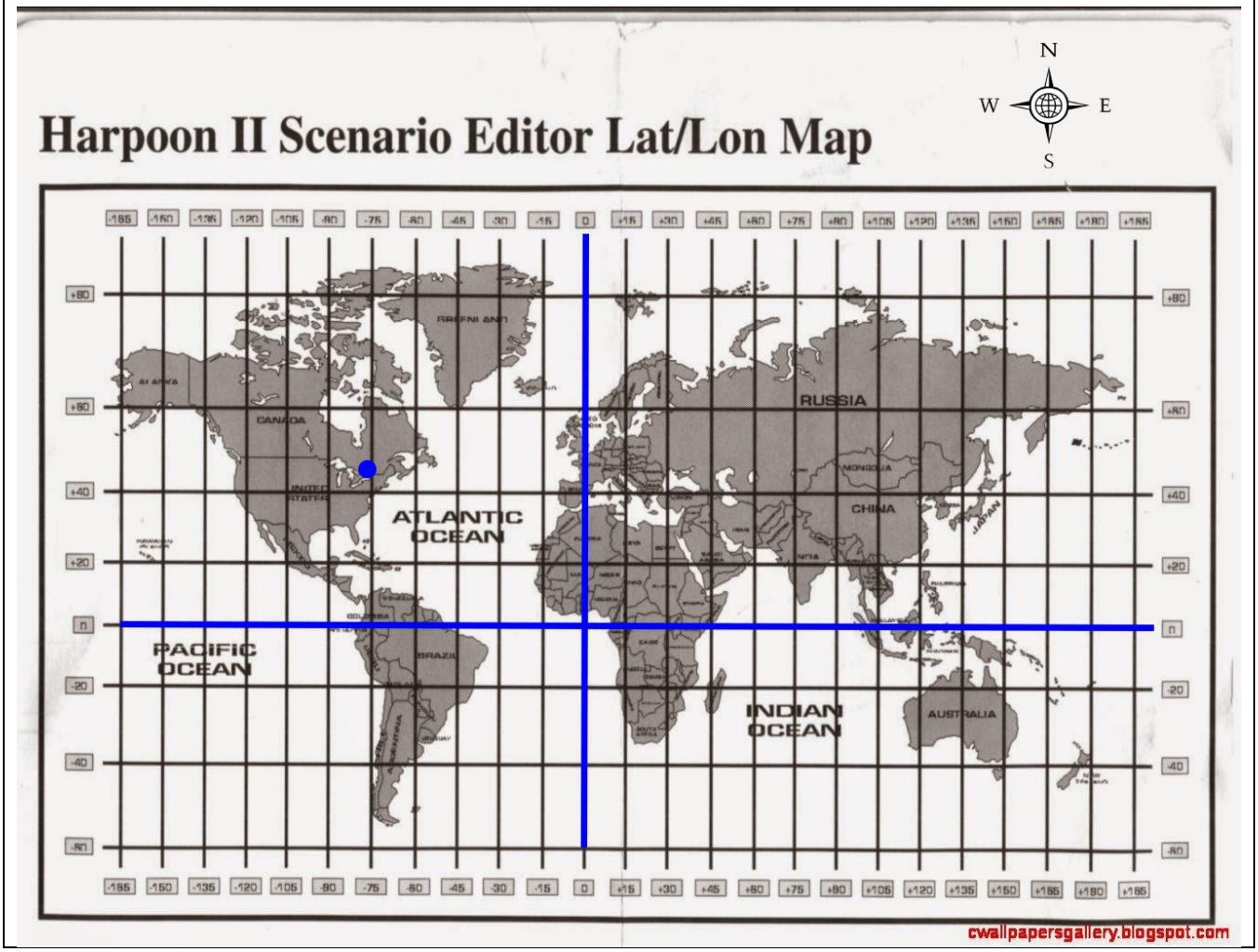
These letter-number systems are easy to use because there's no confusing rows and columns. However the downside is you can't designate a location in between a and b for example, like you can with numbers.

Phone: 905.604.8445
Email: info@logicsacademy.com
Website: www.logicsacademy.com

Because of this, maps use numbers for both the vertical and horizontal directions. When we're talking about a place on earth, we use the direction cardinal directions: North, South, East and West.



You can clearly communicate a location anywhere on earth using only two numbers; which is pretty neat.
This is done by indication how far North (up) and how far East (right) you are from the middle of the map.
See example below for Toronto On. (43.7N, -79.4E).



Phone: 905.604.8445
Email: info@logicsacademy.com
Website: www.logicsacademy.com

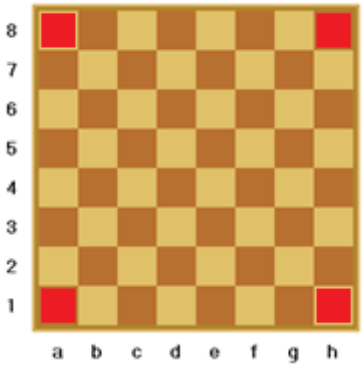
Because Toronto is actually to the left of the (0N,0E) point, it has a negative East value.

Take a minute with a partner and try and see if you can get them to guess the country you're thinking of by telling them a GPS coordinate (North and East).

There are more of these location coordinate systems but this will do for now.

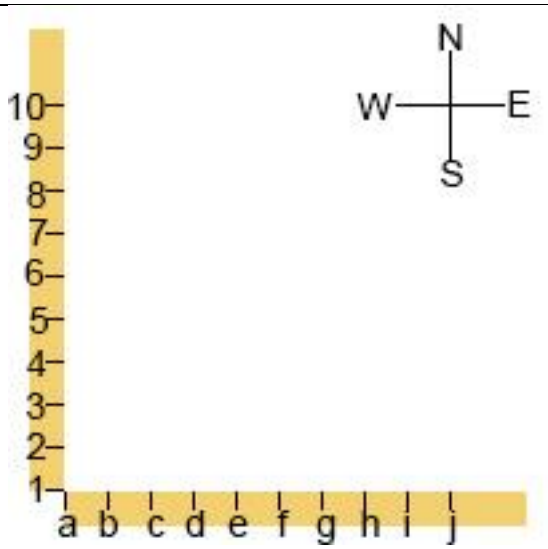
Predict and Plan

Write the coordinates for the four corners of a chess board.



Demonstrate/Design/Discover

- ✓ Construct a large (~1mx1m) grid on the floor that is at least 8x8. You can do this with two large pieces of masking tape and a pen. This grid will be similar to a chess board, but also include a compass rose. See below.

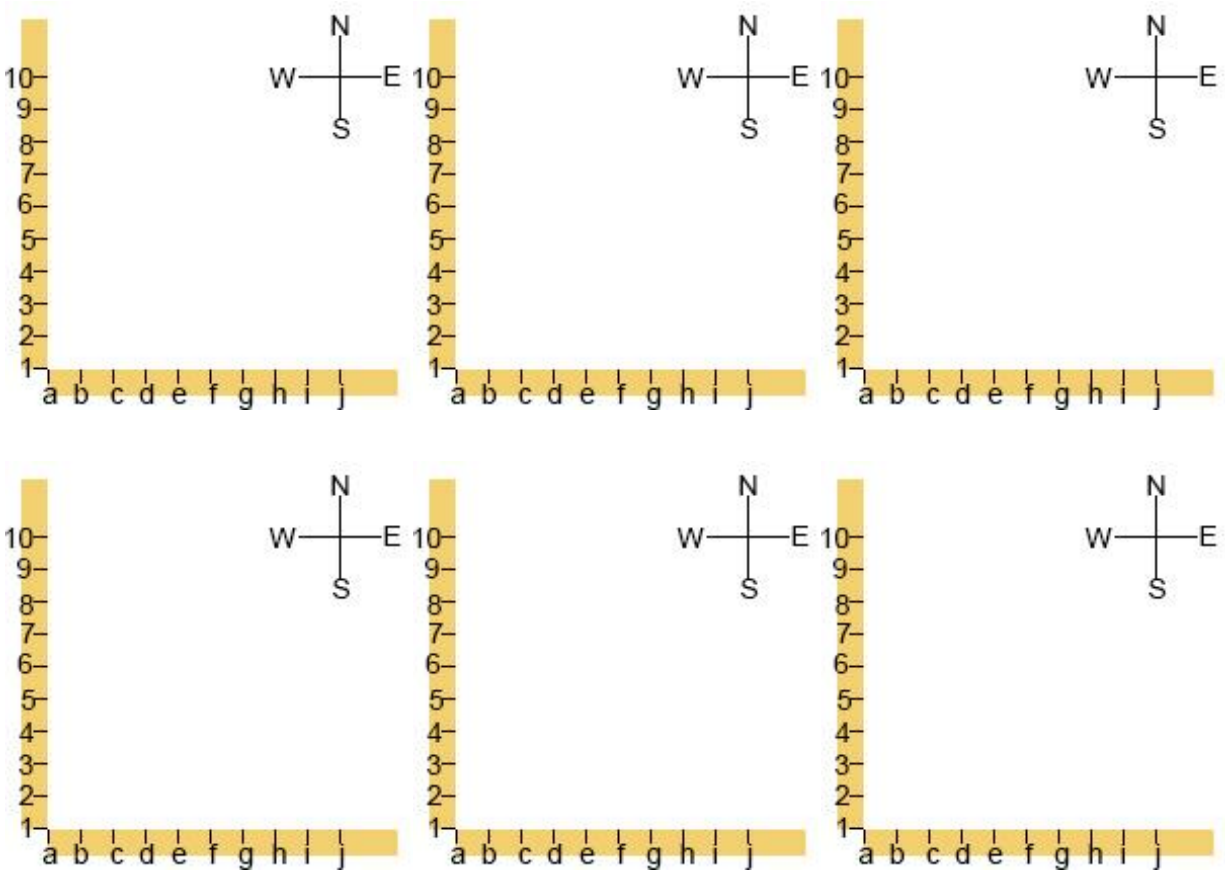


- ✓ You and your partner are going to take turns playing a game. First, one of you will secretly mark down the location of your 'treasure' on the grid below using an "X". You partner will put their robot down at a random location. You will then tell them whether they are North and East of the treasure, or purely South or whatever happens to be the case. These two hints must be accurate, but don't need to include any distances.

- ✓ Your partner's job is to use their 90 degree turns, (and driving forward) they learned in the codding lesson to see if they can get closer to the treasure. Each time, changing their code based on your hints (if they lift their robot off the course to download code, they must place it back where it left off). They must also always drive along a grid line, so 90 turns only. When they are successful, tell them "you found it" and switch roles. Allow them to be a few centimetres off the exact target. Do this at least twice each (but more if you have time).

Phone: 905.604.8445
Email: info@logicsacademy.com
Website: www.logicsacademy.com

- ✓ Below are grids for you to use to mark down the treasure. (If you want you can also mark down their path as they hunt).



Tips: Learning how far your robot travels in one rotation can save you lots of trial and error. Figure this out to help your estimations.

Record
How many turns did it take you to reach your parters treasure each time? Game 1: _____ Game 2: _____ Game 3: _____

Phone: 905.604.8445
Email: info@logicsacademy.com
Website: www.logicsacademy.com