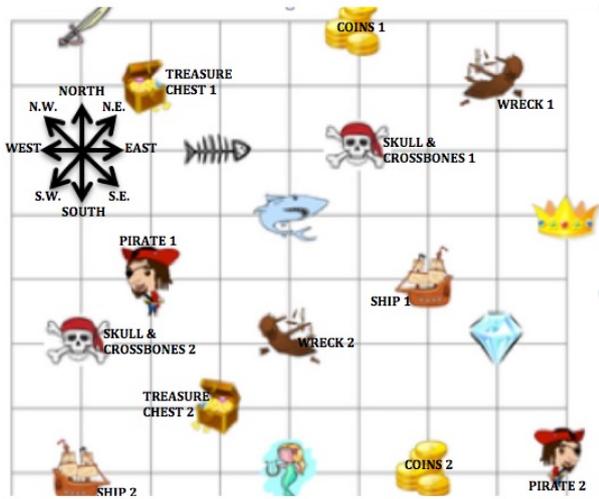




# NEXT



Picking up everything he meets on his way, Pirate 1 goes 3 squares North, then diagonally 1 South East, 2 squares North East, 2 squares South, 1 square South West, 4 squares East then 4 squares South.  
 Where does he get to and what does he pick up on his journey?

## NOTES FOR TEACHERS

### SOLUTION

From (0;1) to (2;4) is 2 steps to the right and 3 back in the room (up on the page).

From (1;0) to (2;3) is 1 step to the right and 3 back in the room (up on the page).

Go 2 columns across and 1 row back from (1;1) you get to (3;2)?

To go from row 3 to row 1, go 2 steps down the page (towards the front).

To go from column 4 to column 0, go 4 steps across from right to left (negative direction).

Ships at (1;1) and (6;4).  
 Skull and crossbones at (1;3) and (5;6).  
 Cutlasses at (1;8).  
 Pirate at (2;4) and (8;1)  
 Treasure chest at (2;7) and (3;2).  
 Fish bones at (3;8).  
 Mermaid at (4;1).  
 Rowing boats at (4;3) and (7;7).  
 Shark at (4;5).  
 Coins at (5;8) and (6;1).  
 Diamond at (7;3).  
 Crown at (8;5).

To get to the diamond Pirate 1 must go 4 steps East and 1 step South, 4 to the right and 1 down.

To get to the diamond Pirate 2 must go 2 steps North and 1 step West, 2 up and 1 to the left.

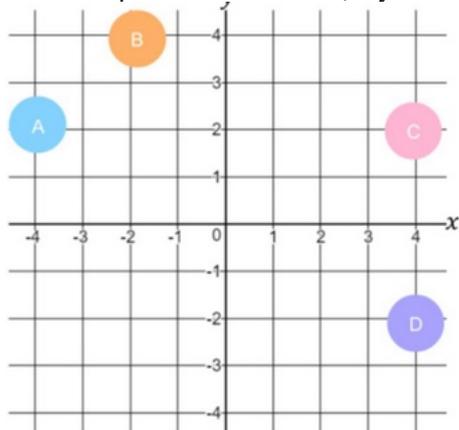
Solutions to the NEXT task.

Pirate 1 will pick up a treasure chest, fishbones, coins, skull and crossbones, shark and the crown. He will get to (8;1) the position of Pirate 2.

### Diagnostic Assessment

This should take about 5–10 minutes.

- Write the question on the board, say to the class:



Which point marks the coordinates (-4, 2)?

- “Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D”.

- Notice how the learners responded. Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.

- Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.

- Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4

fingers. Notice if there is a change and who gave right and wrong answers. It is important for learners to explain the reason for their answer otherwise many learners will just make a guess.

- If the concept is needed for the lesson to follow, explain the right answer or give a remedial task.

**The correct answer is A**

Learners giving these answers do not understand coordinates.

A common misconception is to choose the point (2;-4) interchanging the x and y coordinate positions.

<https://diagnosticquestions.com>

## Why do this activity?

This activity can be used to introduce coordinates who have not met them before, or to review coordinates. The larger the class the better!

In other lessons it can be extended to introduce compass directions (given as an extension activity here).

At every stage in school learners can work on plotting graphs in the positive quadrant or in all 4 quadrants. Learners standing on grid points can be asked to raise their hands if their own coordinates satisfy an equation or inequality and the show of hands will give points on the graph of that function, relation or region.

## Learning objectives

In doing this activity students will have an opportunity to:

- learn about Cartesian Coordinates;
- to practise plotting points;
- to learn about the changes in x and y as you move from point to point on the grid.

## Generic competences

In doing this activity students will have an opportunity to learn about using a grid system and positional coordinates that have extensive real world applications.

## Suggestions for teaching

*Before the lesson, prepare coordinate cards, one for each learner. Prepare to take the class into the hall or outdoors and plan how to arrange the positions of the learners in rows and columns.*

If your class has never met coordinates before you can start with the first part of the activity and use the Diagnostic Quiz at the end of the lesson to assess how much they have learned in the lesson. Otherwise start the lesson with the Diagnostic Quiz.

Some classes still sit in single desks in rows and columns and if so you can start this activity with the learners sitting in their usual places. Give them a copy of the worksheet on page 1 or draw it on the board. Give the learners a few minutes to read the question and to talk to their partner about what answers to give. Then take the parts of the question one by one, ask the learners what they think the answer should be, and explain the answer.

Then take the learners outdoors, or into your school hall, organise the class into rows and columns so that each one holds their coordinate card and stands on the spot matching their coordinates. Then ask them to raise their hands if their first coordinate (number) is 2 and ask what they notice. Then repeat this for similar examples. Then ask for directions if they were to walk to (0;0) – don't do it just think about it. Everyone will have a different answer and you can ask individuals to give their answers with reasons.

In the second part of the lesson, with the learners back in the classroom, help the learners to extend their mathematical language skills by introducing the new words and notations and writing them in their workbooks..

Then give out the Pirate Chart or draw it on the board the and ask the learners to work individually to answer the questions in Part 2. Meanwhile draw the Pirate Chart on the board. When most of the

class has finished this, invite learners to come to the board and explain the answers to the class pointing to the Pirate Chart.

## Key questions

- How would you know where to find the point (5; 7) if it's not already marked? Or any other point.
- Show me which way is 'right'. Which way is left?
- Which way is up? Which way is down?
- What is special about the point (0;0)?

## Follow up

Give the whole class the activity in the NEXT box on page 1.

Run more lessons outdoors, or in the school hall, to reinforce the idea of coordinates and to explore more ideas such as points in a straight line, points on the x-axis or on the y-axis.

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and up to Secondary 5 in East Africa. New material will be added for Secondary 6. For resources for teaching A level mathematics see <a href="https://nrich.maths.org/12339">https://nrich.maths.org/12339</a> Note: The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is beyond the school curriculum for Grade 12 SA.				
	Lower Primary or Foundation Phase Age 5 to 9	Upper Primary Age 9 to 11	Lower Secondary Age 11 to 14	Upper Secondary Age 15+
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6