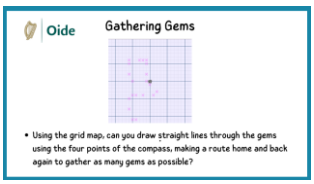
Gathering Gems

Stage	Strand	Strand Unit
3	Shape and Space	Spatial awareness and location

Learning Outcomes	Maths Concepts
• Through appropriately playful and engaging learning experiences children should be able to describe, interpret and record directional instructions and location.	• Directions and locations can be described with increasing precision, using more formal measures of distance and direction (60 km east) and simple grid reference co-ordinates (A6).

Learning Maths

In this learning experience, learners engage in a mathematical game designed to promote strategic thinking, problem-solving and spatial reasoning. They use compass points to navigate and describe paths on a grid map (created by themselves or using interactive versions available online), to collect gems or other objects of choice.



Learners plan and describe routes using directional language (north, south-east, diagonally, right etc) and are encouraged to share strategies thereby creating opportunities to evaluate and refine their thinking.

Understanding and Connecting	Communicating	Reasoning	Applying and Problem Solving
The learner			
Follows/ creates accurate routes on the grid map to collect gems. Relates the grid map to real-world navigation, e.g. using a map or following street directions.	Uses directional language to describe movement (north, south, left, right, above, below etc.…) Explains choices, such as why a certain route is shortest or most efficient.	Strategically chooses and orders their moves. Justifies direction choices using an understanding of cardinal direction and a clear sense of orientation.	Plan routes efficiently within given constraints. Considers the order of collecting the gems to avoid extra moves or getting stuck.

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Teaching Maths

Fostering Productive Disposition

Praise strategies and reasoning, not just correct answers.

Frame the task as a real-life adventure or mission.

Encouraging Playfulness with Mathematics

Encourage learners to draw their own maps, walk routes on a floor grid and use toy characters/ Beebots to navigate their routes.

Emphasising Mathematical Modeling

Facilitate learners to draw or construct their own models using arrows, colour codes, labels etc.

Using Cognitively Challenging Tasks

Add constraints/ conditions to challenge learners:

- "Can you collect all the gems in exactly 12 moves?"
- Add lakes, walls, or mountains on the grid etc.

Assign different values to gems, e.g. red=5 points, blue=3 points and challenge learners to find the highest value route they can make in 5 moves etc.

Promoting Maths Talk

Use open-ended questions to encourage reasoning and justification and the development of key mathematical language (directional, spatial, instructional etc.)

- "Why did you choose that route?"
- "How do you know that's the shortest/most efficient path?"
- "Can you prove that works?"

Assessing Maths

- Is the learner exploring, testing and revising their route?
- Does the learner use terms like '*left, right, north, between, diagonal,* etc' accurately?
- Do the learner's routes follow a coherent, structured order?

Source

Adapted from https://nrich.maths.org/problems/gathering-gems

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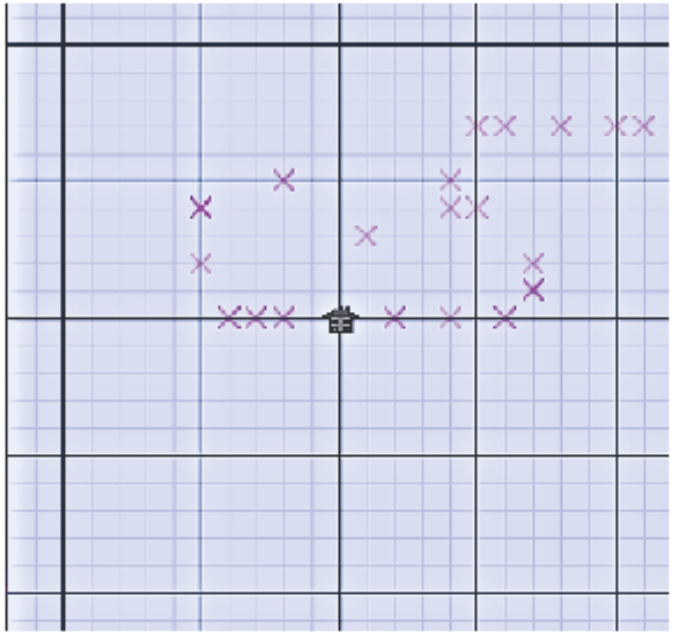

Using the grid map can you draw straight lines through the gems using the four points of the compass, making a route from home and back again to gather as many gems as possible.

Adapted from https://nrich.maths.org/problems/gathering-gems