

# Map skills in Primary geography focusing on the year 4 syllabus

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“In contrast with previous belief and with the appropriate teaching approach, young children have been found to be skilful in interpreting spatial information”



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## Introduction

For use in everyday life and particularly in the teaching of geography, maps are an invaluable resource. It may be assumed that they are solely used by adults and that map reading may not be accessible to young children. Using maps is not easy but researchers have shown that, in contrast with previous belief and with the appropriate teaching approach, young children are skilful in graphicacy which is the skill of interpreting spatial information.

## Piaget's influence

The indirect effect of Piaget's work (1956), for instance has been the widespread belief that young children are not yet 'ready' for map work. It used to be thought that children have great difficulty in using maps primarily because they were constructed from such an unfamiliar viewpoint (the plan or bird's eye view). This creed partly stemmed from Piaget's prominent 'three mountain experiment'. Children were confronted with a model of three mountains each topped by a different feature (snow, a red cross and a house). They were asked to describe the model from the point of view of a doll put at the other side of the table. Young children before the age of seven repeatedly described their own view rather than that of the doll on the opposite side. Consequently, Piaget's conclusion was that children were unable to decentre or adopt another viewpoint. Their own perspective is the only viewpoint they can understand. He extended this idea to map reading and assumed that very young children would, therefore, find it difficult to use maps. Unfortunately, an important consequence emerged from this work: exercises in map reading were abandoned with children younger than the age of seven. This is the case with the present Maltese primary syllabus (1997) - officially map work starts in year 4 when children are around seven to eight years old. It is now generally agreed that children are not so restricted by their own viewpoint. One must keep in mind that Piaget's work was conducted before there was a television in every home. At this day and age, the plan view has become to be a more familiar viewpoint both directly and indirectly through experience of holiday flights as well as computer games which involve flying in some form or another. Furthermore, there

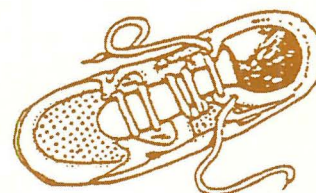
have been a number of recent studies showing that experiments like that of the 'three mountains' can bring about different results if the nature of the model is modified e.g. by using more familiar features like shops and houses rather than physical features like mountains. Donaldson (1986) makes the further point that the task becomes very difficult if the materials used are either psychologically abstract or not associated with the children's interests and feelings.

## The four map skills

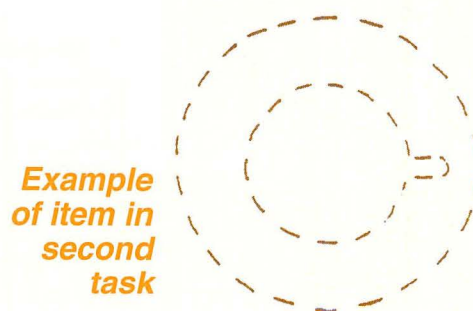
Map skills in general can be subdivided into four particular elements: plan view, map language, arrangement and proportion. My study attempted to examine the abilities and shortcomings regarding these four map skills experienced by twenty-five year 4 pupils who formed the sample to represent the 7-8 year old cohort. The work followed a very basic three-phase procedure: input, testing and evaluation. The number of lessons delivered were concluded with activities on the skills separately as well as in conjunction.

### Plan view

One of the activities asked the children to name several objects (teapot, hand, cup and saucer, teaspoon) shown in plan view, which were depicted in an abstract style and not in a pictorial manner as in a previous exercise. Abstraction, which is characteristic of maps, rendered the task to be more demanding than the first one because the plan views did not go much beyond a mere outline.



Example of item in first task



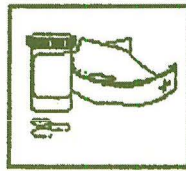
Example of item in second task

The hand had a 100% facility level because it is not alien in any way to the children. One third failed to recognise the teaspoon because it is normally shading (which was absent) that gives the drawing of a teaspoon its unmistakable distinctive features. The cup and saucer had a difficulty level of 56% - eight year olds do not actually drink tea or coffee and when they do, it is probably not from a cup and saucer. Ten from eleven correct answers came from girls because it is, normally, girls who play with tea sets. The teapot proved to be the most difficult because while it is not typical of our culture, children have a very limited contact time with the object. The most obvious finding in terms of plan view was that as soon as the task extends beyond the children's reality, they find it more difficult to perform well. This was evident when, for example, the teapot presented more problems than the hand.

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### Map Language (symbols, words, numbers, colour)

In one of the activities, the children had to draw a symbol for fourteen names of places in an empty box e.g. wedding hall, hospital. Of the 350 symbols the children produced, 65 were compounds i.e. the symbol included a combination of objects. 285 efforts showed single symbols, which were pictographs (i.e. as they appear in the actual world) rather than ideographs (i.e. symbols).



Compounds



Single

These were further subdivided into symbols showing buildings (50), people (33) or objects (200) related to the concept. This tendency by the children to represent the places by single objects seems to imply that following instruction, children should not have major difficulties in understanding the need to use symbols and also to interpret the reality behind symbols in maps.

### Arrangement (Location, Direction, Orientation)

One of the tasks about location asked the children to give references of objects presented in a grid and also to draw objects in the correct place according to grid references given to them. Results showed that the children could handle both items well enough. The errors they made did not demonstrate a failure to understand grid references but rather a lack of practice and polish in writing grid references

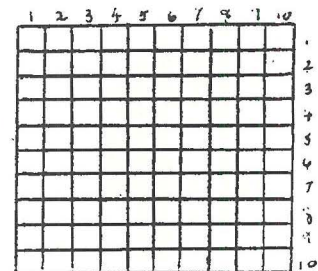
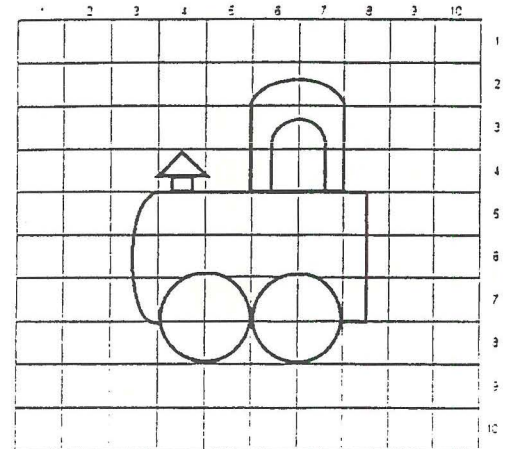
e.g. 4 F, F'4 or F, 4 rather than 4 F. In strict terms, one can argue that 4 F is incorrect but the failure is only in procedure rather than an inability to understand the concept and function of grids in maps. One feels convinced that with a bit of practice, these imprecisions might be easily corrected.

The other task intended to see how familiar the children were with using the correct directional terminology in Maltese. They were asked to give both the four cardinal points (N, E, S, W) as well as the four intermediate ones (NE, SE, SW, NW). The pupils were given a signpost map and they had to write down the direction in which the character in the middle needs to move to go to different destinations.

Results showed that they had no problem identifying the various points of the compass. The item that created problems was 'Ibic' (SW) - many of the incorrect answers wrote 'Ivant' (E). A possible explanation for this could be that since children find it easier to name the compass points through a mnemonic, the fact that east and southwest both start with the letter 'I' in Maltese, could have confused them.

### Proportion (scale, size)

The children had to scale down a drawing of a locomotive engine made up of a set of geometric shapes (e.g. circle, triangle) to one half the original size.



The difficulty of the children of this age in fully grasping the Skill of scaling may be seen by the fact that only 5 Out of 25 children scaled down the drawing correctly in proportion and alignment. Others drew the engine correctly in proportion but not in orientation. Most had a correct part but somehow their drawing had a

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task manageable could be the fact that the items they had to place in the grid covered a specific square. Conversely, the scaling down task indicated that once an item spreads over several squares, they might encounter problems.

The concluding message for educators is that it is feasible to start teaching elements of map skills to children as early as possible (a new syllabus which includes map skills for the kindergarten level is in progress). Furthermore, map skills need to be integrated in geographical studies right through progression. Last but not least, map work should permeate throughout the curriculum, not just in geography lessons.

The area of map skills in relation to children's abilities and shortcomings is in need of serious local research. It stands to reason that one cannot make sweeping statements on the performance of children in relation to map skills from one group of children.

Furthermore, several factors that affect performance in general like intelligence and gender have been completely ignored. Further studies should look into a more profound and detailed work in specific skills.

This would definitely fine-tune the findings of this research and therefore the understanding of children's accomplishment in each map skill.

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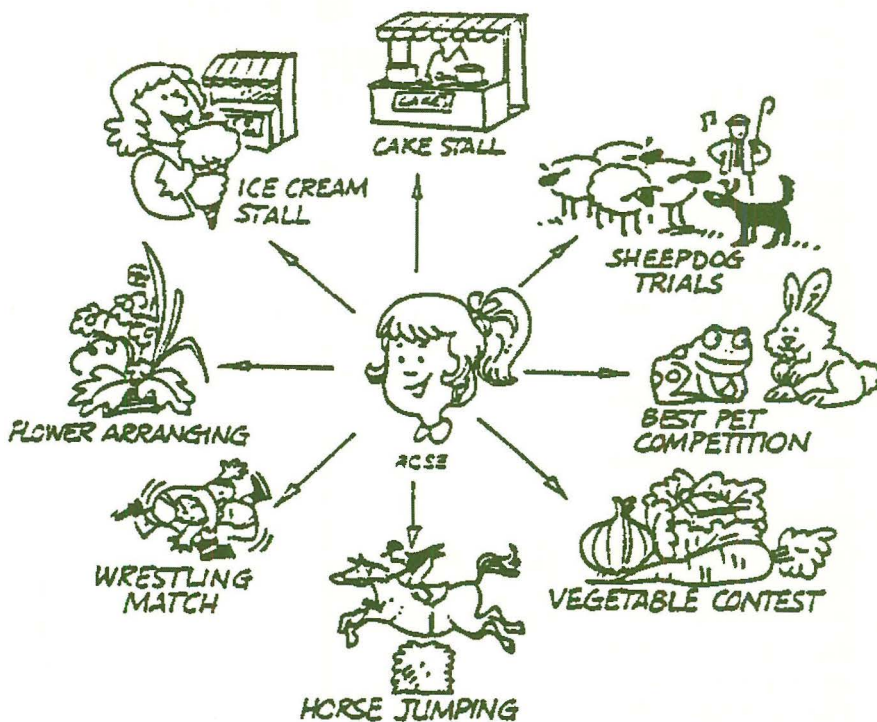
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few deficiencies especially in the lines or curves that did not fall correctly on the grid line. A few demonstrated very serious problems in that their shape was absolutely not aligned and lacked an acceptable degree of replication to the original. The general conclusion is that eight year olds may find it difficult to handle certain aspects of scale in maps.

## Conclusion

Crick (1976) states that 'no map is a total representation of reality in the sense of charting all its features. All maps are selective because there is a "point" to their construction which makes only certain kinds of phenomena significant'. This characteristic in maps reflects the idea that they cannot reproduce all detail. For instance, a farm may be reduced to a square filled with a particular colour. It seems that this change generally creates difficulties for children. The teaspoon item in the plan view activity, for instance, showed that the more abstract a representation becomes, the more difficult children find it to interpret that abstraction. The difficulty in accepting abstraction was also shown in their choice of symbols to represent a number of places. More frequently, the children selected a pictograph rather than an ideograph to stand for the entities. In terms of arrangement, they were skilful at the alphanumeric system of coordinates (e.g. A6). However, the reason that they found the

### A signpost map



Which way will Rose need to turn to see the horse jumping?