
UNIT 13 UNDERSTANDING MAPS

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13.1 INTRODUCTION

In the previous unit we have talked about how children relate to pictures, one way of representing 3D in 2D. In this unit we look at another form of representation of space, namely, maps of different kinds. The reason for discussing this issue is that we use and make maps very often in our daily existence. Further, maps are also a part of the primary school curriculum. However, as you will see in the unit, children find it very difficult to deal with the maps in the textbook. The thrust of this unit is to see why this happens and how we can help them.

We begin with discussing the nature of maps versus that of pictures in Sec.13.2. Over here, we also look at why children need to learn to use maps, how this helps develop their spatial sense.

In Sec.13.3 we look at the way children actually share directions with others — orally, or by drawing routes, or when reading maps presented by others. We bring out the problems that come up related to this, and some possible reasons for them. You will see the way children are expected to deal with maps in the curriculum. As you study the section, you will realise how the present treatment neglects a large part of the requirement for developing in the child the ability to read and understand maps.

Finally, in Sec.13.4 we suggest a variety of tasks that would give children an opportunity to understand and conceptualise maps, read them and draw some themselves.

Objectives

After going through this unit, you should be able to

- explain why children need to learn to read maps;
- explain the essential differences between a map and a picture;
- identify the problems children have when dealing with maps that appear in the primary school curriculum;
- design and use some activities that can be done with children to help them develop the ability to use and make maps.

13.2 WHY LEARN ABOUT MAPS?



Fig.1

Let me start by telling you an experience I recently had. I had applied for a job which required me to undergo an exam. I knew the name of the exam centre and roughly where it was. So I planned to get there 15 minutes before the exam started. However, when I got to the locality, I couldn't find the centre. I told myself there was no need to worry, someone would be able to tell me the way. Sure enough, someone did, but his directions took me to another place altogether! When I asked another person, she said, "Oh, that place is on the other side of the colony. You first walk down straight for five minutes, then turn to your left and go on for a bit, then you'll see a bridge. Go over it and ask anybody there. They'll tell you." You can imagine my panic by now. Just then I noticed a guide map of the colony on a board. I rushed to it, read it and discovered where to go soon enough — not where the lady had been sending me! Fortunately, I just made it to the exam in time!

This experience of mine may have given you some inkling about how the ability to read maps can be useful. There are several situations in which we are required to read maps or to share spatial directions with each other in various ways. For doing so, we require abilities of various kinds. Think about this while doing the following exercise.

- E1) List at least 5 situations in which you have dealt with maps. What abilities did you use for reading them or drawing them?

Apart from the reasons you have seen, children need to be able to read maps because maps are very much a part of their curriculum. They are expected to deal with maps of their district, state and country. The abilities required for dealing with them are a bit different from those needed for reading and drawing pictures. This may surprise you because maps are also 2D-representations. Some examples of maps we commonly see are shown in Fig.2.

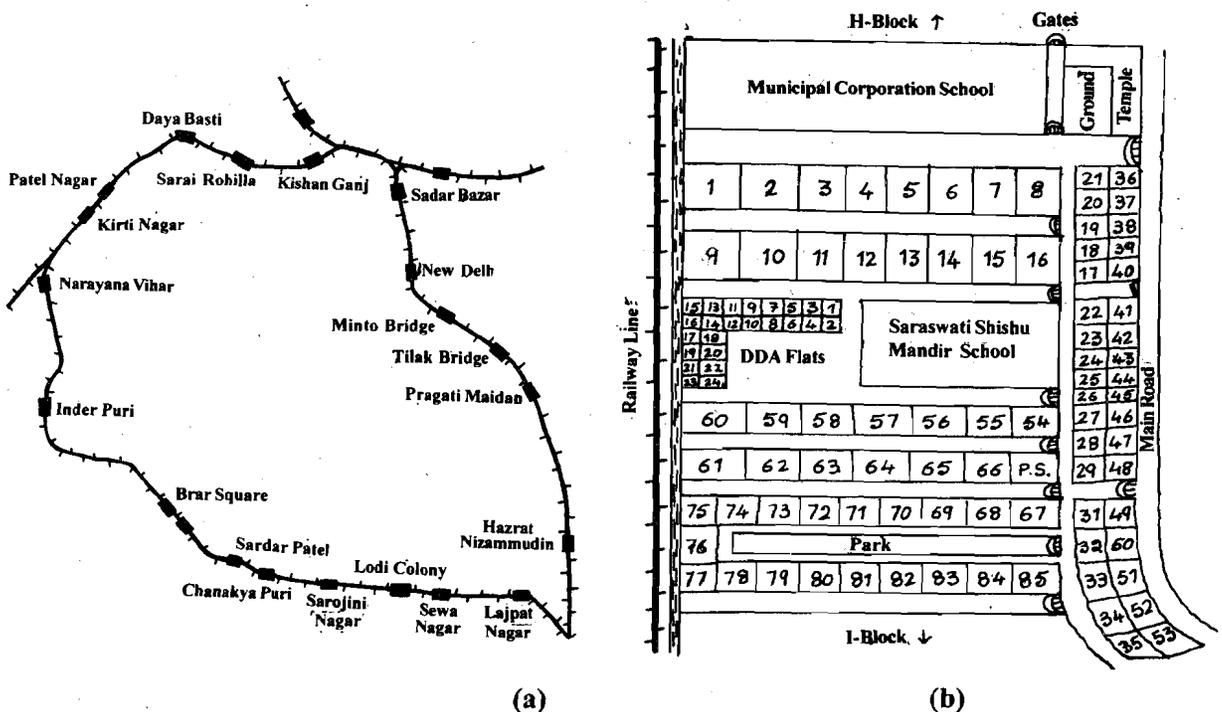


Fig. 2

If you look at these or other maps, you would agree that to be able to read or draw them, we need to be comfortable with the conventions used for creating them. We also need the ability to abstract from reality to a map and vice-versa. You may say that the same is true of pictures. But is using a map not more abstract than reading a picture?

The following example may give you an answer.

Example 1: A friend of mine, Durga, had been teaching young children for several years. She had seen how children enjoy looking at pictures that have familiar things in them. Given the opportunity to interact with still or moving pictures, Durga found that children like to look at them and talk about what is happening in them. She used this insight of hers when she had once gone to another school as an investigator to interact with some children of Class 2. She tried various ways to get them to talk, chat and relax, but to no avail. Then she pulled out some pictures involving animals and people, which she had taken with her and she gave them to the children. As the children looked at the pictures, their shyness broke. They started pointing out different things in the pictures, loudly drawing her attention to the parts they found most interesting. Gradually, as they discovered more and more exciting things in the picture, the whispers turned to more audible remarks.

Later, Durga went to Class 3 of the same school and shared the same pictures with those children. She divided the class into groups, asked them to look at the pictures and talk to each other about whatever they saw in the picture. She was happy with the amount of discussion this activity produced and with the descriptions the children gave. On an impulse, she asked them what they had been studying the previous day. It turned out that they had been studying a map of their district in their book. She asked them to describe what they saw in the map. To her surprise, the children became absolutely quiet and were not able to tell her anything about the map.

————— x —————

This example gives us an indication that maps and pictures aren't the same thing. In order to understand this issue better we need to look at what is represented by a map and compare it with what is shown in a picture. We need also to compare the processes of drawing both of them to bring out the essential differences. Both are representations of the world around us. Both are meant for communicating this information to others. But, do they communicate the same information and serve the same purpose? The example in Fig. 3 may help you answer this.

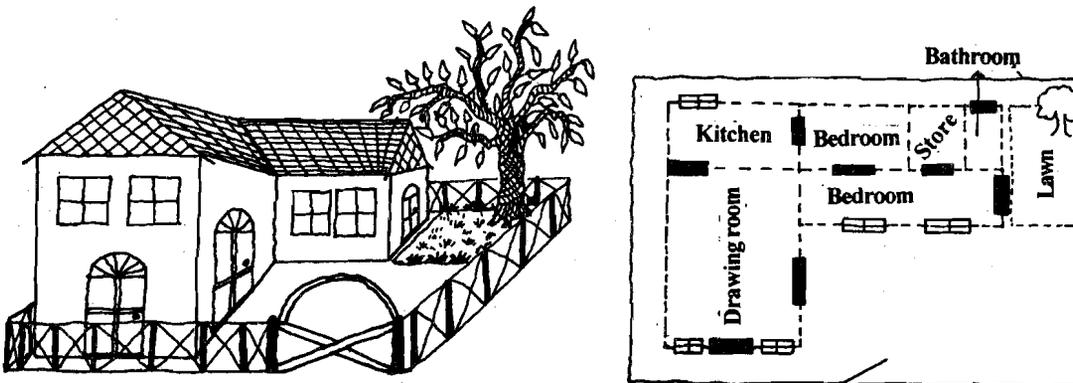


Fig. 3 : Maps vs. Pictures

Let us consider these two 2-dimensional ways of communicating 3-dimensional reality. Both of them are required to follow certain conventions so that regardless

of where and by whom they are drawn they can be read in the same way. (Here we are not talking of impressionistic or surrealist art!) This is, however, where the similarity ends. Now let's see their essential differences.

- i) **Perspective** : If we look at pictures drawn by children of their classrooms, it is obvious that there are many differences in them — in what they show prominently, in what they consider important, etc. In spite of these differences, all the pictures roughly represent the same classroom. Of course, there are major differences concerning the number of desks, number of children, size of the blackboard, position of the blackboard, the position of the teacher's desk, etc.

Can such arbitrary differences, depending on the person who is drawing them, be allowed in a map? Different children may use different symbols, but different maps of the same classroom cannot show a different number of desks or different positions of the board relative to the teacher's desk (say). All the maps would have to be essentially the same, regardless of the position of the person drawing the map. Anyone sitting anywhere in the classroom should make the same map. It is not like drawing a picture where children sitting in different corners would show, for example, the door differently — the ones closer to the door showing it larger and the ones farther away showing it smaller. In other words, **perspective doesn't come into a map, while it must come into a picture**. Thus, a map is a 'flat' representation.

- ii) **Scale** : Whenever you try to read a map, we look for the legend that tells us what scale it is drawn to, i.e., how much of actual distance is denoted by 1 mm. or 1 cm. in the map. So, every map must have a **scale**. This means that if I draw a map, then I have to decide that one centimetre of space in my map shows a certain fixed distance. This scale can vary from map to map, but not within a map. For instance, if I draw the map of my office, I can allow 1 cm to represent 1 metre of actual space. But if I try to fit the map of my city into that same piece of paper, my scale may be '1 cm = 1 kilometre of actual space'. The larger the place and the smaller the size of the map drawn, the greater is the distance represented by 1 cm.

If you look carefully at a typical picture, do you find scale being given any importance? Not usually. However, as we have just seen, it is essential for a map.

- iii) **Type of representation** : The other important difference between a picture and a map is related to the nature of representation. When we draw a picture, we attempt to represent reality as it is seen. So, we use various techniques to show the three dimensions in two dimensions. A map, however, is not an attempt to represent three dimensions. It only represents a two-dimensional surface in two dimensions.

Try these exercises now.

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- E2) What are the basic differences between a map and a picture?
- E3) Sit down with about 10 children from Classes 3, 4 and 5. Show them some maps and some pictures. List the problems you found, if any, that they have in reading maps.
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We have seen that using maps requires some learning, regardless of whether children can read pictures. We also know that even without any formal teaching, children do describe routes and ask for directions to different places. What kind of devices do they use?

13.3 CHILDREN USING MAPS

Have you ever observed the way we give verbal spatial directions to each other? Do you give such directions with various hand movements and with references to familiar landmarks? Would you give the directions in the same way if the other person couldn't see you? And, if the other person is from a different country or a society, would the vocabulary and the landmarks you use need to be different? In such cases, for describing locations or sharing directions it is important to have a shared vocabulary that is precise. Otherwise, we find that, for instance, someone tells us a place is just round the corner and we end up walking quite far before finding it!

How do we help children develop this vocabulary? To answer this we need to know the drawings, language and vocabulary they commonly use for sharing spatial directions.

13.3.1 Spoken Directions

We asked children of different ages to describe how they reach a certain place in their house or a place which is very close to their house. Consider their responses.

- A four-year-old child who stays in a first floor flat was asked how he would reach his friends house (*who stays across the street*). He said, "I will go out of the room, and then down, and then go this way (*pointing with his hand*), and then straight across the road, and (*pointing to the friends house*) there."
- An eight-year-old child described the route from her home to her school by : "Once we come out of the house, we reach a street. Then go straight in it. Then you will reach Holy Chowk. Near Holy Chowk there is a shop and on the other side there is 'Nohara' (*i.e., a big hall*). Go straight from there and you will reach the school gate. Go into the gate, climb the stairs and go on to where the stairs finish. My class is there."
- A child in Class 2 described the route to the fridge in her home from the main gate of her house by : "Walk straight from the main gate and you will reach another gate, and then walk more. You will reach a door. Then walk some more and you reach another door. There, right in front, is the fridge. Open it and take out what you want."
- A girl in Class 6 describes the way to the almirah in the kitchen from the entrance to the house as follows : "Open the main gate, the drawing room will come. Go into the drawing room and walk straight. You will reach the stairs. Keep going on and you will be in the dining room. Turn to the left and walk straight, you will reach the kitchen. The almirah is right in front."
- A four-year-old girl described a similar route by saying, "First open the main door and walk into the courtyard. Then climb the stairs and go into the room. From the room we will reach outside the kitchen. Then we will open the door of the kitchen and go inside. Then we will go near the almirah and open its doors."



Fig.4

What do you observe about these children's spatial vocabulary? In fact, what we observed from these responses and from those of some other children of Classes 2, 3 and 5, was that very few of them used terms like 'turn left', 'go right', etc. Most of them tried to use their body and hands to indicate the directions in which the person had to turn without even saying 'turn'. Almost no one indicated the distance to be travelled to reach a point.

What is clear about these children is that though they are able to locate different places or objects in locations that they have seen, their vocabulary is extremely limited. The instructions they give are not sufficient to help a person understand the route unless she already knows the context fairly well and is roughly aware of the location. Rather than using terms related to directions and distance, they seem to rely more on visual perceptions and landmarks.

Why don't you try an exercise now?

E4) Ask some children of different ages to describe the route from their homes to their schools. Do the descriptions of these longer routes have similar features? What are the common features you found?

So far, we have looked into the way children give verbal directions. We found that their directions are very contextual, highly dependent on places or things that matter to them, based on very limited directional vocabulary, and make no mention of distances involved.

Let us now see the situation when it comes to written directions.

13.3.2 Drawing Routes

The children you just met above were also asked to draw the routes from their homes to their schools. As you can see from Fig.5, the drawings show a lot of variation, but this is not related to the age of the child.

Again, regardless of age, the children tended to make a picture rather than a map. In fact, they made elaborate pictures of their school, their homes and landmarks located at different points along the route. Even the children who gave reasonable oral descriptions drew such 'picture maps'. This could be because of the importance of the landmarks in the context of the exercise given. Aren't these observations the same as the ones we made regarding children drawing pictures of their classrooms in Unit 12?

Let us note down the features of the routes drawn by the children.

1. They do not use symbols to show the places important to them. They draw them as pictures. Also, these places are not drawn in proportion to the distances and other places shown.
2. They do not show distances according to scale. Some distances are shown to be greater and others smaller than what is really so.
3. Their maps are also quite a bit like pictures because they have tried to depict distances between places as well as the heights of some locations.

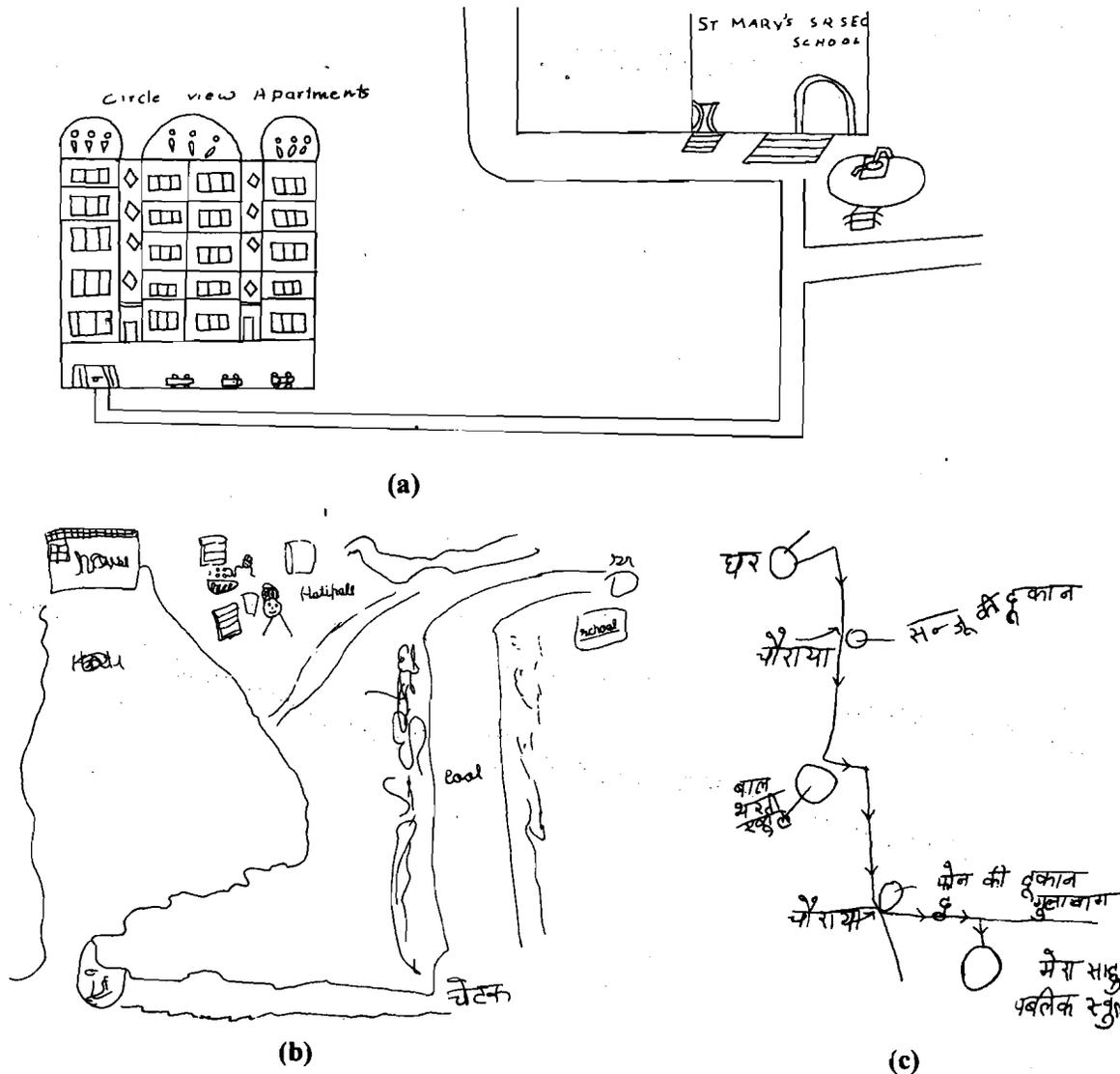


Fig.5

Interestingly, children in upper primary classes do come across various maps in their textbook. In spite of this, there is a big difference between these maps and what the children have drawn as maps. Think about why this happens while doing the following exercise.

- E5)
- i) Ask a few children of Classes 3, 4 and 5 to draw a map from their homes to their schools.
 - ii) Pick up some Class 4 and 5 textbooks and observe the kind of maps that are present in these books. How do these maps differ from those drawn by the children?

Maps are a part of the primary school curriculum. We have also seen that children's maps are quite different from these maps. In fact, the maps in the books use many lines and symbols (as in Fig.6), without even attempting to clarify what they mean.



Fig. 6

13.3.3 Reading Maps

In order to understand how children relate to the maps in their course books, consider the following extract, translated from Gijubhai's book 'Divyaswapna' (The Day-Dream).

The Class 4 students were familiar with the term 'geography' and also with the subject. I asked for maps, and put up a map showing Kathiawad, Gujarat and Bombay on the wall. The children were surprised because I had not taught them geography so far. They started tearing pages out of papers notebooks and making pipes of these papers to place on their little fingers. I asked them why they had made these pipes. One of the boys said, "To point to places in the map." I was astonished.

I asked them to show me Bhavnagar on the map. One boy gazed all over the map, looked at Bombay city, looked at Ahmedabad, Hyderabad and then Poona down below. Then he turned his eyes towards the side and read Porbandar. Two or three other children standing behind me had discovered Bhavnagar. Their pipes were desperate to point it out, and finally, not able to control herself, one of them showed Bhavnagar without being asked. I asked them in which direction Bhavnagar was. The children looked all over — up, down, right, left. Then they made some calculations in their mind and said, "Sir, it is in the North." At this another boy said, "No, no! North is up, this is towards the East!"

I laughed and said, "Above us is the sky. Where is the North?" The children replied, "No, Sir! North above and South below." Another girl said, "Sir, North-South length-wise and East-West breadth-wise." Another said, "Sir, East is in the direction where the sun rises." I said, "Show me where the sun is in this map." All of them were lost. Then I said, "Show me the Shatrunjan river." The children promptly pointed their pipe to the river.

I asked them, "Where does this river meet the sea?"

The children looked at the map and said, "In the Bay of Khambat."

I asked them why it does not go and merge in the Arabian sea.

To this, one boy responded, "It's the river's will! It wants to go towards the Bay of Khambat."

I said, "Why does this river go towards the lower part of the map?"

Another child responded, "Sir, it has to flow in this way. After all South is in this direction, which is downwards."

What are the major points you can gather about the children's ability to read maps from the description above? Would you agree that the children remembered a lot of information and had many facts stored in their mind? They knew in which direction the South was and were also able to identify some locations in the map. But, did they understand how to interpret the map? From this interaction it is clear that children had no comprehension of how maps represent space. For them the map was something to be remembered by rote.

This lack of understanding is nothing to be surprised about. When the Eklavya team was working on developing social science materials for schools in Madhya Pradesh, they went to various upper primary and secondary schools in Hoshangabad District to interact with children about maps, among other matters. They found that

- The children had a very poor understanding of the concept of 'boundary'. They were not able to understand the significance of these lines. As expected, lines of different types to indicate different kinds of boundaries in the maps confused them completely.
- The children did not realise that towns and other locations are depicted by a point on the map. When asked to find the distances between two such locations, they tried to find the distances between the written names of the different towns, rather than the distances between the corresponding dots. The reasoning given by the children was that the towns were identified by their names written on the maps, so the distance had to be measured between the ends of the written names!
- In looking at the world map, many Class 10 children could not understand how the globe and map transform into each other.



Fig.8 : A globe and a world map that children use



Fig.7

- When asked to find the distance to be travelled in going from one place to the other, many of them could not identify the scale used and were not sure of how to transform distances on the map to actual distances.
- They were also not able to answer why a map of India alone was larger than the map of India as part of the world map.

Next, let's take a peek at a discussion with a few Class 5 children of Udaipur who were looking at the map of India. During this interaction, it emerged that these children knew that the Himalayan mountains consist of many high peaks. They also knew that Srinagar was located at a height. In fact, they argued that this was the reason why these places were shown high up on the map of India and the sea shown at the bottom of the map!

Problems such as these children in Udaipur face are because of the differences in the nature of a picture and a map. While doing E3 you would have come across more examples of struggle and wrong generalisations. All these indicate that children are confused about the conventions used for drawing maps. They think that the upper part of the map is either above or behind the position shown in the lower part, a convention they learnt about the pictures they have seen. The confusion of children is often made worse by our attempts to show in the map itself the height of the places shown. We don't make the children aware that the height is being shown through the use of special symbols separately. Many children, therefore, end up being confused about things like whether the map only represents locations or it also represents the heights of the places shown.

Try this exercise now.

-
- E6) Show Class 4 and 5 children a map of their district or state. Talk to them to find out how they understand it. Do not focus on giving them the correct answer, but try to find out their reasoning and analysis.

Also try this activity with children of Class 8 or 9, and record your observations.

What were the differences in the quality and type of understanding of the children of different ages?

We have seen that we expect children to read maps. However, they have very little idea of how to do this. Therefore, they try to manage by rote learning and their exposure to pictures. How can we improve the situation? Let's talk about this now.

13.4 WHAT WE CAN DO WITH CHILDREN

We have seen various understandings children have regarding maps. How can we teachers help children develop their concept of a map as a spatial representation? In this section we will consider some ways of doing so. Of course, all these suggestions boil down to giving children many opportunities that require them to use these abilities and to observe the conventions and essential features of maps. We shall describe some activities with this aim. These can be done inside and outside the classroom.

TASK 1: You could ask the children to describe or draw routes between places they know. Then, with them, analyse the routes they have described or drawn, and

help them identify the shortcomings. In these discussions you could help them focus their attention on the essential aspects of the route that they are representing. You could also draw their attention to relative proportions, etc.

Following such interactions, you could again ask them to do a similar task, and to see how much more they have grasped about maps.

TASK 2 : To help children develop their abilities to read a map you could create games like treasure hunts for them to play, using the maps of the places near them. You could create other games and puzzles also that would help them understand this representation of the area around them. This kind of exercise would help them realise, for example, that a location shown at the top of a map need not be at a higher level than a location that is shown lower down on the map.

For example, children could be shown the map in Fig.9. Then they could be divided into two teams. Each team could ask the other questions like 'The school is to the West of the bus stand. True or false?' or 'How far is the well from the Raja Colony?' Points will be won for each right answer.

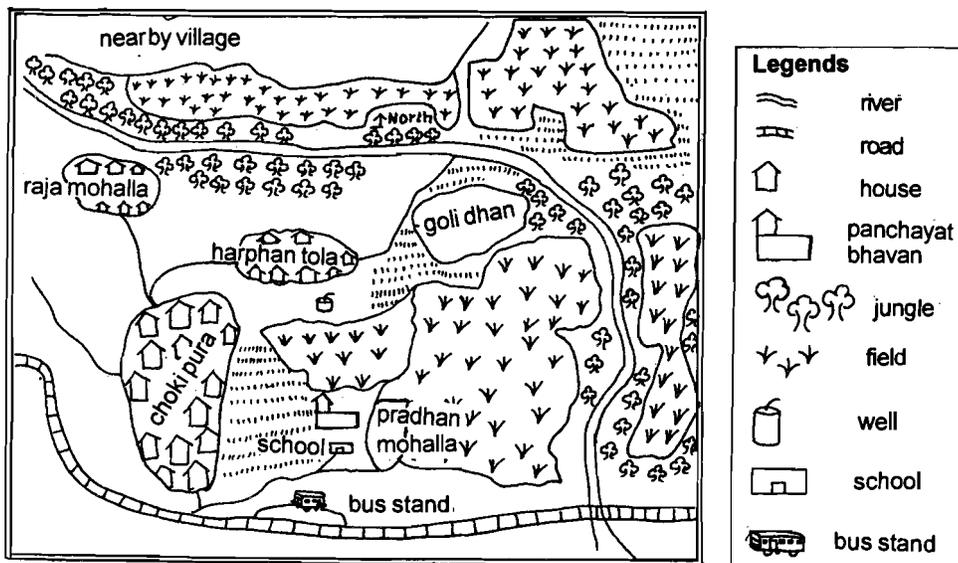


Fig.9

TASK 3 : You could do this activity with children of Class 3 and 4 to help them get used to the idea of using symbols to represent places. This will also help them to represent relative positions on paper. To start the activity, you could draw a representation of the classroom on the board, using points to show the locations of all the children in the class. You could also show the positions of the doors, windows and board on the outline with symbols. The children can then be asked to locate themselves and their friends in the map, writing the name of the child against the dot representing her. You could help in building up this picture by giving a few names to start with. The children may also like to map their classroom on paper.

This activity can be extended by asking the children to set up routes to go from one point to another on the paper. And then they can actually walk along that route in the classroom. This route could go in front of someone, behind someone, up to the blackboard or to a specific window, and maybe, back to the location where the child has got up from.

This task could also be done in groups, and can have many variations. For instance, after playing this a few times, the children can be asked to go and make similar maps for the other classes in the school, using symbols that they feel appropriate.

TASK 4 (Scaling down) : In the earlier tasks, maps were to be made by using an estimate of distance and locating the positions in the map accordingly. An important step in children understanding the concept of a map is in realising scaling, i.e., a proportional reduction in distances. The first step of this exercise is to have children measure the sides of the classroom and draw an appropriate shape on their notebooks using an appropriate scale. For example, they can use one step equal to one matchstick, or 3 steps equal to one matchstick, etc. Once the outline is drawn, they can measure and mark the doors, windows and blackboard in the map using the chosen scale.

Following this, the children can be asked to measure other classrooms, the verandah and any other room in the school and draw up a plan map of the school on paper with match-sticks. The scale for this could be changed to 4 steps or more per matchstick depending upon the proportion that would fit the paper.

TASK 5 : You could give children a map like the one in Fig.10 and ask them to read it. They may also like to make up stories after imagining and filling up names of people in all the houses.

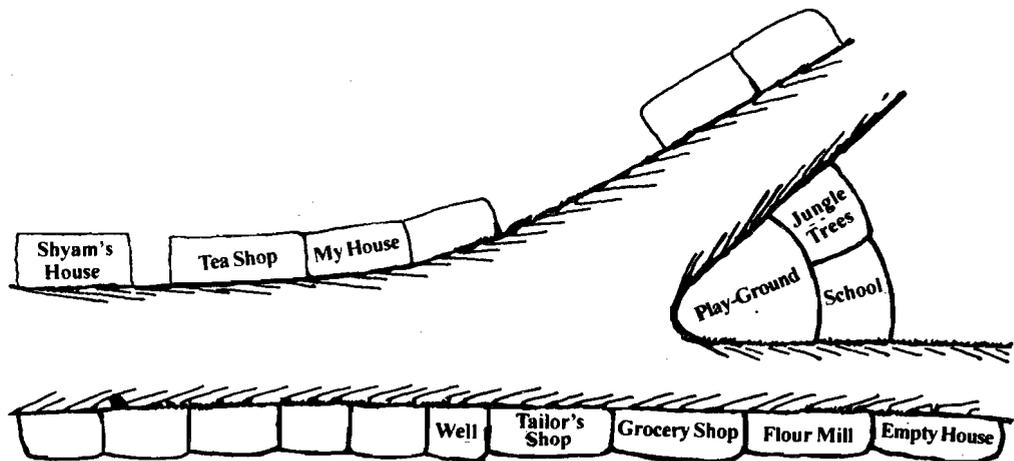


Fig. 10

Then they could make a map of the street they live in. For this the children could be asked to start from their house and make a representation of their street. After they have made their street's map, they can go back and check at the street actually and correct it wherever necessary — regarding location, proportion or direction.

The maps can be discussed among the children. While doing so you could draw their attention to the symbols used, their consistency as well as meaning. You could also talk about the expected sizes of the houses versus what they have drawn, the width of the street and other representations.

Following this, the children could work on the map of their colony/tola. They could, then, combine these tola maps through linking roads, various community buildings and fields to make up the map of the whole village. In showing different locations they could develop their own symbols.

An example from 'Khushi Khushi' to help a child learn to read maps along with exercises relating it to the text and descriptions of maps is given below. This is

meant to help you create similar texts and maps for children to read so that they can slowly understand the maps of large areas like that of a state, country, or even the world.

Gulab Singh was living in Gutkar Village. One day he had to pick his wife up from Bharadighat, and take her to his nephew's wedding at Mangrolu. Since he was not sure of the route, he went to ask the Revenue Inspector.

The Inspector said, "When you go from Gutkar, you'll come across a peepal tree. Turn left over there. After a few kilometres, you will reach the big village. Go straight on from there, and you'll reach Bharadighat after a bit. On the way back from Bharadighat, turn left from the big village. On the way you'll see a big mango orchard. Turn right there. After a bit, you'll see the Dudhi River. Don't go on the path towards this river. Continue on the big road and you will soon reach Mangrolu."

Now look at Fig.11 and do the exercises following it.

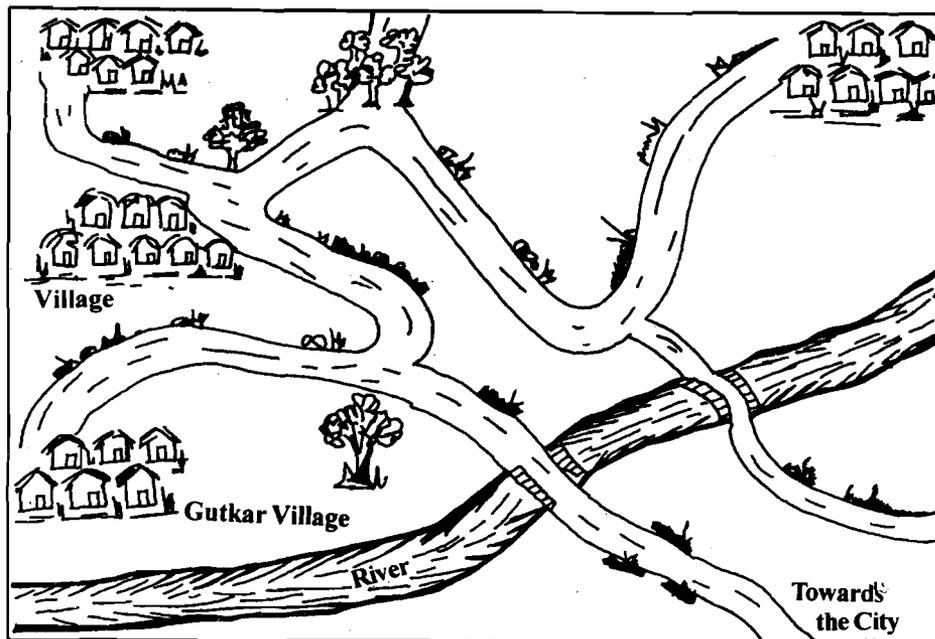


Fig.11

1. Show the route (using) given by the Inspector to Gulab Singh in the map above.
2. Show the big village, peepal tree, Bharadighat and Mangrolu on the map.
3. What is the first landmark that is seen on the way back from Mangrolu?
4. Try and draw the routes to the villages around you with your friends.

Why don't you try this exercise now?

- E7) i) Try the 'Khushi Khushi' exercise with groups of children and see how it works. Write down your experiences during these activities. What observations do you have about the kind of maps the children made?
- ii) Would you prefer to alter the exercise? If so, why and in what way?

In all these activities it is important to make the children realise that the **symbols only depict the location of a place**. They need to understand that **the symbol is not a picture** and cannot depict details available in a picture. Of course, as we have said repeatedly, the children must also realise that a map shows the location of all the places on the same scale, regardless of where they are seen from, i.e., **perspective does not come into play while making a map**.

To help children abstract the understanding and develop a capability to read maps, it is necessary that they are given several exercises that involve relating the area that is mapped to the map concerned. An activity that can help in this is the following one.

TASK 6 : Give children a map of their school. Ask them to work out the distances between any two locations in the map and give the distances in metres using the scale given. They could, then, crosscheck their answer by measuring the actual distance.

The children could, later, be given the map of the block or street and asked to calculate the distance between two places using the scale. This scale would probably be different from that used in the school map. You could make the children aware of the difference in the scales used for the two maps.

If you could also get a telescope, a useful activity would be to use it with the children to see far away objects on the earth's surface through it and try to place them on the map with the scale used.

TASK 7 : This is actually an extension of the earlier tasks. As the children become more comfortable with mapping their street or village, they could be gradually asked to work with maps that include their village/town as well as other villages and towns. They could be given exercises requiring them to fill up details that are not shown or to develop their own symbols for showing different places they know.

Try this exercise now.

E8) When reading maps of the country and the world the realisation that a small pointed edge or curve in a city, state or country actually represents a large distance is very important.. Design a series of tasks that would help children realise this fact.

Let us now briefly gather the points brought out in this unit.

13.5 SUMMARY

In this unit we discussed the following points.

1. A map is a special representation for communicating direction or location of a place. It is a symbolic 2D representation of 2D. For making maps, the choice of scale is very important, perspective is not. Maintaining the proper proportions in distances of different locations being mapped is very important.
2. Maps are an abstract representation of various spaces. Most of us can't visualise space in the abstract. In particular, children have a great deal of

difficulty in dealing with maps. The primary reason for this is the hurry and the lack of readiness with which maps are placed before children. We have brought out the way children give directions, read maps and draw maps. This is important for us to understand how we can help them understand and draw maps according to the usual conventions.

3. We have suggested several tasks that can help children read and draw maps. While they do these tasks, you need to use various ways to highlight the fact that
- i) the appropriate choice of scale needs to be made;
 - ii) all distances must be according to scale; and
 - iii) the map looks the same regardless of the point from where it is read or drawn.

After going through this unit, please try **Assignment 2**, which is based on Blocks 3 and 4. Submit your response to your study centre, where your counsellor will evaluate it. Ask her/him for it back after a month. Her/his detailed comments on your response will help you learn about your own understanding of the course.

13.6 COMMENTS ON EXERCISES

- E1) Some examples of the kind of maps that we encounter are maps of land distribution in connection with agriculture or other kinds of holdings, floor plans and elevation maps of buildings, guides of colonies, rail routes, etc. These are apart from maps of village, block, district, state, country, etc.

The examples of maps given above are quite formal and used in a fairly standard form. Apart from the formal maps there are many more instances which involve the use of some kind of maps. For example, if you want to give your friend instructions on how to reach your home or tell her how to reach a certain location, you would pick up a piece of paper and draw a couple of lines with arrows showing the place that you want the person to reach.

In any kind of map, you would need to follow the conventions used for drawing them. For instance, certain symbols would be used for streets, houses, rivers, etc. You would need to be able to associate these symbols with the objects they represent, and relate this abstraction to the real world situation.

- E2) The major differences between a map and a picture are
- i) a map is a 2D representation of a portion of a two-dimensional surface;
 - ii) a map does not have a perspective, like pictures have;
 - iii) maps involve a scale; and
 - iv) the scale in any map is constant and reduces the real distances proportionately to distances on the paper.

In other words, though both maps and pictures represent reality, they do so in different ways. The first important point about maps is that in a map the scale for all objects or places is the same. Each location has the same proportion as in reality. There is no reference or perspective in the map — objects that are closer to the observer are shown to be of the same size as those that are farther away.

What other differences can you think of?

- E3) Allow the children to look at the maps freely and for a sufficient period of time. Ask them to tell you whatever they can see in the maps. Show them some pictures also and ask them to read those pictures. What are the problems you see in their reading of pictures and maps? For example, are there some objects that they can't identify in the picture? Or, can they compare the distances between different places or locate the position of a place on the map? In order to understand the problems that children are having, you will have to give them many small tasks that require reading of the map or the picture with comprehension and clearly saying what they have understood.
- E4) If the children are able to write, you could ask some of them to write a description. Analyse their descriptions carefully. Do their descriptions start from home and move clearly without unnecessary details, giving distances as well as specific directions in which one has to turn, etc. Or is it that they take up landmarks close to their house as well as to the school and just roughly indicate the route to be followed. Notice the landmarks that they give importance to. Why do you think those particular landmarks are significant for them? Do the older children have a more careful and precise description? Are there significant differences between the descriptions given by the younger and the older children?

A colleague reported the following description given by an eight-year-old child. This reveals some of the points about how you could record the descriptions given by children.

The eight-year-old child described her travel in the school bus, saying, "First I come out from the house and stand opposite the shop. Then the bus comes and I sit in it. We go up to the place where the car had met with an accident. Then we keep on going straight till we reach the road for the 'mela' and water can be seen from the window. We do not go towards that but go on straight for a very long time. Then we reach that school which is being made with lots of bricks. Then we reach a valley and then another valley. After this we climb steps and reach. The first classroom is our classroom."

Does this child use terms related to direction and distance?

Each of the terms used by the child should be carefully heard and written. Collect a few such descriptions and analyse them. One of the questions that you could ask yourself regarding the description is whether children used terms related to directions and distances? How often did they use these terms? Is the use more among older children?

- E5) Notice the features of the child-drawn maps. One of my friends who did this exercise and analysed the maps drawn by children had the following to say :

The children did not draw the different distances involved proportionately. Though the children used landmarks a lot, only a few mentioned the number of steps or the rough distance between the landmarks. They only wrote the names or drew them in some form or the other. Many of them gave street names also. In these 'maps' there was a beginning of an attempt to use symbols of sorts. However, at most places the symbols are

made very elaborate and seem like attempts at making pictures of those places. Also, the maps made lacked the one essential feature of a map — that it can be read by all in the same way (provided the scale and symbols are known).

If we look at even some of the maps drawn by adults for giving directions of locations or examine the descriptions given, we will find that these descriptions and representations are a mixture of indications and hints for the reader to identify the location. They are often not accurate or proportional depictions of the places in question. These features may also be present in the maps made by the children you interacted with. What else can you deduce about the maps made by children?

Children of Classes 4 and 5 come across a fair range of maps in their books. These maps do not have any subjective symbolisation. They are to be read by everyone in the same way. What are the other features of the textbook maps?

- E6) We have given a description of a map reading with children in the classroom. Try and set up similar exercises with children and probe into the way they understand the map. You could ask them questions about lines on the map, flow of rivers, state and national boundaries. You could also ask them to compare sizes of different countries, districts or states and estimate the distances on the map. These could be estimations of the distances between two towns or of the size of a wiggle on the boundary line of these places.

Do the children of Class 8 and 9 show a better understanding of map reading? Are they more comfortable with the kind of questions you asked the younger children? Is there any difference between the reasoning the two sets of children gave?

- E7) The exercise is appropriate for children of Classes 4 or 5. But it can also be tried with older children. While doing the exercise with children, you could make copies of it on a chart paper or you could use the blackboard. Try and get children to do the exercises in writing and analyse their responses. Also keep noting what they are doing, what difficulties they are having, their reactions — are they enjoying the exercises.

Did they need a lot of help? Did they find exercises meaningful? How did you gauge this?

In order to understand some thing, it is important to be able to critically examine and improve it. Think of how you can improve the exercises and why you think it will get improved by the change.

- E8) If we look at the map of the world the entire boundary of India near the sea is serrated. There are many dots representing islands in the Indian ocean as well as in other oceans. These are areas that have many houses, office buildings, markets and lakes and a large populations may be living on them. How do we get children to understand this and realise that the pointed edge or the wiggle on the boundary is actually a big area? You can think of many tasks for this. One could be the following :

Take a 12 cm \times 12 cm square. On its sides attach small squares touching the boundary. These could be of the sizes 2×2 , 1×1 , $\frac{1}{2} \times \frac{1}{2}$ and/or 3×3 (The shape would be a larger version of the one in Fig.12.)

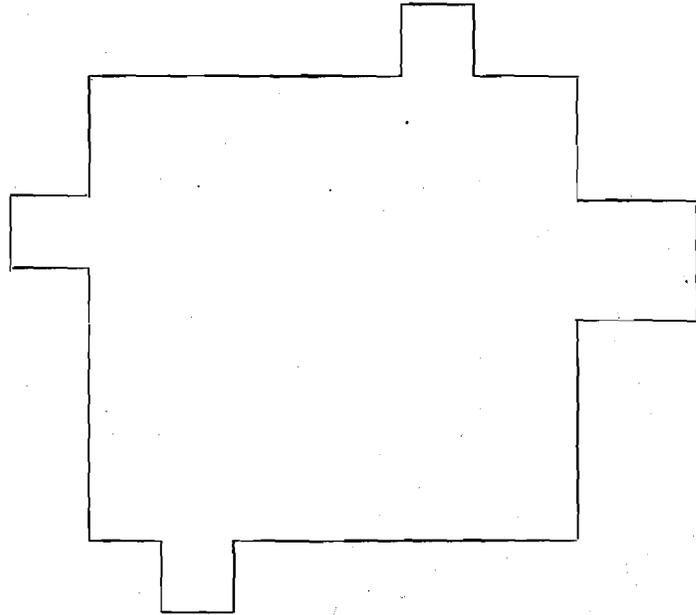


Fig.12

Ask the children to scale down this figure in a way that 1 cm is equal to 2 mm. In the scaled down pictures the squares made of the 4 sizes become comparatively small. In fact, two of them may just be smudges now. You could further scale down this picture by taking the scale as 1 cm = 1 mm.

Think of more such tasks.