



# Introduction to Networks

## Lesson Plan: Class 01 / DL / 18



**Overall goal of the lesson:** This class is in continuation with the previous one titled Introduction to Networks that introduced the concept of a network to Std 1 students. In this class, children will learn more details on road, railways network. They will be introduced to telephone and mobile network and the concepts of crossings, junctions in a network.

**Prior knowledge required:** Knowledge of the concept of a network (done in Std. 1, Period 17).

### MODULE 1:

**Module time:** 35 minutes

**Goal:** To revise basic concepts of a network learnt in previous class, explain road and railway networks, and introduce other networks such as telephone and mobile.

**Description:** Children will learn about network basics, different type of networks such as roads, railway, telephone and do simple fun activities and exercises that make them think about networks and their use.

### Material required:

#### Physical:

1. One copy of the worksheet (Introduction to Networks (2)) per child.
2. Writing material to solve the worksheet: pencil and eraser.

#### Electronic:

PPT Presentation for Introduction to Networks (2)

### Procedure Summary:

1. Distribute the worksheets (Introduction to Networks (2)) to the children.
2. Read through the worksheet and discuss with the class the importance of protocols and rules.

### Procedure Details:

1. Begin the class by asking children if they remember what we learnt in the previous class about Networks. Remind them of the Spider's web example.
2. Ask them to spell the word Network loudly. Then jog their memory about other examples of network that were covered in the previous class - road and railways.
3. Next, talk to them about the roads. You can ask them if they take multiple turns to come to school. These roads are different. Some are one-lane, some are two-lane etc. So multiple types of roads are connected to each other. These are known as a network of roads.
4. After this, move to slide #3 titled 'In this class...'. This slide briefly describes what all will be covered in this class. Let the children know that we will revise what was done earlier on the topic of Network. Then, we will learn some new things about Network - such as - paths in a network. There will be fun activities like search for a path in the given network. Later, in this class we will also learn about other examples of network besides the Spider's web, Roads and Railways. Mention the new example of network - Telephone & Mobile Network.
5. Click the PPT and move on to slide #4 titled 'What is a Network'. The objective is to revise what a typical network is and how it is useful and to make children think about connectivity in the context of network. Earlier, in the previous class on networks, we introduced Spider's web, roads and Railways as examples of network. Now we are trying to a level deeper into a generic network - hence we are using terms such as 'thing'. You can explain to children that 'thing' in a network could be roads, tracks, or computers that are connected to each other using a network. Another example to help kids understand the concept of network is as follows: Imagine the 'things' to be islands. And the paths to be bridges between these

- islands. There are people who want to meet each other on the different islands. Without a path (bridge), this would be difficult. Similarly, network paths help to connect different things.
6. Ask Children if they remember what 'things' make up a Spider's web. The answer is: Fine silk-like threads that a Spider spews out. Remind the children that a Spider's web helps a spider to catch insects that can fly, although a spider itself cannot fly. Similarly, other networks help people or goods to reach some place far off; or to share news or messages, just like we do on the mobile phones.
  7. Point to the diagram in the slide and ask children if 'thing 4' is part of the network shown. The answer is 'No'. Tell them that we will soon learn in next slide the reason why it is not part of the network.
  8. Next, move on to Slide #5 where we will introduce the concept of a 'path' in a network. A track or a way between two things connected by a network is called a 'path'. Point the diagram - now we have highlighted the 'paths' in the same network diagram seen in previous slide. Ask Children if they can name the path between 'Thing 1' and 'Thing 2' in the network. You can challenge them and ask if there is more than one path between these two. Discuss with them which is shorter path and why? Ask them if there is a 'Path' to reach 'Thing4'. Answer: No. Remind children that in previous slide we said that 'Thing 4' is not part of the network. Now let us understand the reason. It is because it is not connected to the network. Ask children if there is a way by which 'Thing 1' in the network can reach 'Thing 4'. Answer: No. Now combine these two things to explain to children that as there is no 'path' by which Thing 1 can reach Thing 4, hence Thing 4 is not a part of the network. The basic idea of a network is to connect or help us reach some place. If we cannot reach that place - there is no network there. No coverage. Ask them to think about the times when their parent's cell phone cannot make calls or receive calls when they go outside the city. Help them understand that it is because there is no network. You can also explain by road analogy too, if there is time. Tell them if Thing 4 was some other city and Thing 1 was our local city - there is no way we could reach the city 'Thing 4' from our local city 'Thing 1', as there is no road, no road network connecting Thing 1 and Thing 4. Hence Thing 4 is not in the network.
  9. Move to Slide #6. Here we show a path connecting Thing 4 to the network. As you come to this slide, ask children if 'Thing 4' in the network picture is now part of the network. The answer is - Yes. Ask if someone was at a city named 'Thing 1', can they reach another city named 'Thing 4'? Let children name the paths to take for the journey. If there is time, you can ask them to name other paths in the network too. Highlight the fact that there are things in a network such as 'Thing 3' which do not have a direct 'path' to 'Thing 4' but there are longer paths which can be taken to reach 'Thing 4'. So even though it is not very obvious, Thing 3 and Thing 4 are connected.
  10. In Slide #7, we bring in the Road Network back. Here we will explain newer concepts related to network using Roads as the example. Use the slide to discuss the key points about Road Network - what it is made up of, what is it useful for and who can use the road network. After that, gently introduce the concept of 'crossing'. Ask children if they can find the crossing in the picture on the slide. Ask them which two roads cross each other at the crossing? Answer is Main Road and Another Road. If there is time, make children think and ask them - does a bird need roads to reach some place? Answer: No. Ask them why? Let the children give the reason - birds can fly - they don't need to use roads. Cars, buses, people can't fly so they need to use road network to reach some place. Remind them of another simple example of network that was covered in previous class on networks. Ask them if a bird needs ladder to reach fruits on the tree. Do people need a ladder to pluck fruits from a tree? Answer: Yes. Networks are useful only for those who cannot reach that place on their own. Make children think - do we really need to travel some place to get something such as news or sweets? Answer: Not really. TV network brings news from different parts of the world right to our homes. Delivery network can bring food, goods from one place to another by simply ordering for it. In Slide #8, we show an example of a road crossing. There is animation available if internet connection is there, you can click and show the actual traffic signalling and movement on a road crossing.
  11. Slide #9 has a fun activity for children based on road network example. Discuss the picture on the slide. Make children locate places in the picture - school, park, home, bus-stop, crossing etc. Ask them to carefully observe which roads can take them from one place to another. Now ask them questions on the slide about Road 2. Ask them which two 'things' does Road 2 connect. Answer: Bust Stop and School. Ask children how one can reach from school to the park. Ask them to identify the 'path' of the network they will take to complete this task. Explain to them that in case of road network, a road is actually a network 'path'. Next, Revise the concept of crossing that we introduced in previous slide. Ask children crossings

- are there in the picture? Answer: 1. Ask them how many roads meet at the crossing, also ask them to name the roads at the crossing.
12. Break the monotony of network and roads by asking children if they have taken a train journey. Ask them to show hands if they have. Then move on to Slide #10 and show pictures of a train, railway tracks and a railway station. Discuss with children which train they took and between what stations. Then tell them that Railway is also a network. In the next slide we will learn some important things about the Railway Network. If you have any interesting story related to trains and if time permits, you can share that with the children.
  13. Move to Slide #11. Just as we covered road network, in this slide, we cover Railway Network in terms of - what is it made up of? (Tracks & Trains), how the railway network helps to connect cities that are very far off, who uses the railway network. You can highlight the fact that unlike road network, only trains can run on the track. No people or other vehicles can use the track. Also, mention that there usually are no crossings of railway track unlike roads. But there may be a road and railway crossing. Ask those children who have travelled by train to describe what a rail/ road crossing looks like. Highlight the fact that it has a gate and it is operated such that when a train is passing the gate is always closed. People on the road have to STOP and give way to the train. Ask children what will happen if there is no gate? If there is time, make children think and ask them if they have seen any similar gates on road crossings. Answer: No. Ask them how do vehicles protect themselves at road crossings if there are no gates. Answer: Traffic safely rules and Signals. Discuss with them the importance of both. If time permits, you can ask children on steps to cross a road at the crossing. In Slide #12, there is a picture of Road & Rail crossing for children to understand how it is. There is also an animation available if internet connection permits them to see it in class.
  14. In the next slide #13, children are introduced to the concept of junction in a network using Railways as an example. This is class 1 student level junction definition. First we bring in stations as a place where people board and get off trains. Next we explain that Junction is a special kind of station where two or more tracks coming from different cities or different directions meet. Show the simplified railway network picture on the slide and ask children to point to stations which are 'junctions' - special stations where more than one railway track meet. Answer: Station F and Station C are 'Railway Junctions'.
  15. Slide #14 has a fun activity for children related to railway network. Refer to the questions on the slide about locating stations and finding way between two stations. Ask children to solve this verbally. If there are more than one ways to reach a station, ask other children to think and find another path.
  16. At this point, do a quick recap with children. Ask them if they understood the concepts of what a network is, how it helps, what is a path, what is a road network made up of, concept of crossing, what is a railway network made up of, the concept of junction and the overall purpose of network - to connect 'things'. If there are any doubts, try to clarify those. If there is anything which does not resonate well with children, please notify the content creators and we will do the needful to make the content more child friendly and age-appropriate.
  17. Next, move on to slide #15. In this slide, a simple landline telephone network is shown. We will not get into the nitty gritty of how telephone network works but try to explain to children the concepts of wired connections, local vs. remote (foreign) connections. Using the picture on the slide, first let the children understand and observe all the items in the gray cloud, then in pink cloud and finally the blue cloud. The first gray cloud shows things such as telephone at home, school, mall or grocery store, fire-station and parent's office in the neighborhood. Explain to children that all these telephones are wired. But each telephone is not directly wired. All of them get connected to local exchange first and from there the call is routed / connected to the actual destination. For example, if you dial your parent's phone at work / office, the telephone connects to the exchange first and then a connection is made between exchange and the office. It looks as if you are directly reaching the office phone number. Similarly, if you call up a phone which is in another city, say your parent is visiting head office in a different city, then as you dial the main office number from your home phone, the phone call will first connect to local exchange, then the main exchange in the city where head office is and finally to the head office phone in the pink cloud. If you call someone overseas, or in a foreign country, then the call will go through the foreign exchange before it can be connected to the final phone in the international office in blue cloud. All these clouds show networks. Gray network, Pink Network and Blue network of telephone represent local, remote and far off telephone networks and how these networks themselves are connected to each other with wires.

Wires are fixed path. When you move home, your phone number changes. But if you use a mobile phone your phone number does not change even if you move from one place to another. This is because telephone networks use fixed wires. Therefore fixed phone numbers. But mobile networks do not use wires. Ask children if they have seen wires connecting telephones in their homes and whether there are any wires with mobile (other than charger). Tell them we will learn about mobile networks later.

18. Slide #16 has some key points about telephone network. Use the picture in the previous slide to explain each of the bullet points that talks about telephone network, what it does, presence of wires, how a call is made and connected. Ask children if they understood how connection gets made from the time they dial to the time a person picks up the telephone on the other end. Slide #17 shows how a call is connected on a telephone network via exchanges - refer to the green dotted line to explain the concept.  
#Note: If the following two slides #18 and 19, on Mobile Network appear too complex, please share feedback with CSPATHSHALA team. In these two slides, we are trying to explain the concept of network by taking mobile phone network as an example. If this is difficult for Std 1 kids to comprehend, we can skip these or move it to higher class syllabus.
19. Slide #18, elaborates on the phone network using mobile as an example. We have the same picture as before but instead of fixed or landline phones, there are mobile phones everywhere. Instead of exchange, there is a mobile or signal tower. All these mobile phones are connected wirelessly to the tower that is closest to where the mobile is. Ask the children if they have seen mobile towers on top of buildings or somewhere in their neighborhood. Tell them that when people travel with mobile phone, a path is created between mobile phone and the tower closest to them over wireless. There are no wires. The towers themselves may be connected by wires and wirelessly too. Rest everything is very similar to a telephone network. Highlight the key difference that in case of telephones, the network paths are fixed as the wires and telephone is fixed in a place - say home or school or mall or office. But in case of mobile phones, phones can be taken to any place and they work without wires. So the path between mobile and tower keeps changing as the phone moves. In the next slide, these concepts are highlighted in detail.
20. In the next slide, #19, we introduce the concept of Mobile Networks. Use the picture on Slide #18 to explain each bullet point. Mobile network is made up of mobile phones and towers and it helps people connect up using mobile phones. There are no wires, and unlike road and railway network where paths can be 'seen', in mobile network you cannot see the path connecting the phone to the tower - it is wireless. Ask children what is a path in a 'road' network called? Answer: Roads. Similarly, paths in Railway network are called tracks. Help children understand that in mobile network - the paths keep changing as the mobile keeps moving. If the mobile goes too far off from the tower coverage area, then a path cannot be formed and the phone goes 'out of range'. At that point, mobile phone is not connected to the network. Ask children if they can make calls when the phone is out of range. Answer: No - as there is no path to connect to the network.
21. The last slide is a recap of all that was covered in this class. Ask the children to spell Network, and then ask them what does a typical network help us to do? Answer is in second bullet point on the slide. Next, you can ask children about different examples of network that they learnt in this class and the previous one. Ask them if they understood what is a path in a network, junction, crossing, exchange towers in telephone networks etc. Finally, you can wrap the class by showing them the animation film about how mobile networks work. This is a short youtube video under 3 minutes and it also has kid friendly road network - so while watching kids can relate to network in more than one way. Reference:  
<https://www.youtube.com/watch?v=J1Wkq3TwmqE>

#### **Assessment :**

Answer questions on the activity sheet

**Information Broadcast :** In Networks, the children learnt about the concept of network, different kinds of networks and how networks help in our day to day lives.