Simple Activities To Motivate Data Compression
Lesson Plan: Class 04 / IP / 01

Goal of the lesson: To make the children understand what is meant by compression.

Procedure Details

1. Start by asking all the kids to spell the word compression along with you.
2. To make them understand this word we need to take few examples.
3. The first example is stuffed toys. Every kid will love them. Quite a few will have them as well.
4. Ask them about stuffed toys, how many of them has it and to name them. Start telling them a story about a girl Priya who has lots of stuffed toys. She plans to go for vacation to her grandmother's house and she wants to take all her stuffed toys with her.
5. Her parents want her to pack all her toys in only one cardboard box. She puts all the toys into the box, but the box is overflowing. Does she need a second box? But she is not allowed to have a second box?
6. Slides 3, 4 and 5 talks about the above points.
7. Ask the students how they can help Priya close the box?
8. Tell them that the toys can be squeezed and packed into the box.
9. Ask the students whether the toys will lose shape or size due to squeezing them?
10. Ask the students the reason behind squeezing the toys?
11. Priya had to squeeze the toys and pack them since her parents had given her only one box into which she has to pack all her toys. She has a limitation of space.
12. Now tell them that instead of using the word squeeze they can say compress. Emphasize on the word compress.
13. Continue the story where Priya reaches her grandmother's place and she unpacks her box of toys.
14. All the toys popped up. The toys did not lose shape. Tell them that instead of using the word popped up we can use the word decompressed.
15. Make them understand that decompression means restoring compressed things to its original shape of form
16. Make the kids clearly understand the reason behind compressing the toys by Priya.
17. Slide 14 & 15 talks about another examples that is springs.
18. From the picture ask them to tell which is in the compressed form and which is in the decompressed form.
19. Ask the students which form occupies less space?
20. Slide 16 talks about one more example for compression and decompression. This again you can create a story of kids going on a vacation with their family.
21. Ask them what all they need to do before they go for a vacation. One of the things which they need to do is pack clothes
22. There can be different types of clothes like Shirts, Trousers, Sarees, and Skirts etc. All these needs to be packed into a suitcase.
23. Ask them how they can do this? They need to fold/compress them neatly so that all of them fits into the suitcase.
24. Tell them that the clothes will not lose shape or size and hence compressing them is absolutely fine.
25. When they unpacks their bags, the clothes will still have the same size and shape.
26. Now tell them like we can compress clothes, toys and spring we can also compress data.
27. Since the kids already know about data and information just give them a review of the same.
28. Slides 20, 21 and 22 talks about data and information.
29. Now ask them what they understand by the term data compression. Start explaining to them using examples.

30. Another story… Ram and Shyam are friends. They decided to play a game of sending messages. Ram decides to send the message. He has only few strips of paper and he needs to fit only one message into a strip. He cannot use another strip for the same message. Make them understand the restriction of paper size here.
31. The first message that Ram wants to send to Shyam is AAAA, BBBB, CCCC, DDDD, EEEE..ZZZZ.
32. Ram was unable to fit the above message into a single paper strip. So he thought of a way to send this to Shyam. He decided to compress the message.
33. How did Ram do this? Ask the students to carefully see the message and understand the pattern.
34. Ask the students what is common in the message? There are repeating characters.
35. Ask the students if the repeating characters can be eliminated by indicating the number of times it is repeated.
36. Show them how it can be done. Slide 26 discusses this.
37. Ask them whether Shyam will know about the way Ram has compressed the message.
38. No Shyam will not know. So Ram has to inform Shyam about his compression rule before he sends the message.
39. Once Shyam receives the message, he can either decompress the message by applying the rule or he can store the message and decompress it whenever he wants to do so.
40. Discuss again the reason behind Ram's compression rule. The limitation of space forced Ram to go in for compressing the message (data)
41. Now tell them that in both the stories Ram and Priya went in for compression due to limitation of space.
42. So not only physical things can be compressed even data can be compressed as along the compression rule is known to all.
43. Another example on Data compression using a nursery rhyme. The rhyme is given in slide 29.
44. Ask the students if the rhyme can be compressed and how it can be done? Ask them to look for repeating words.
45. Give them the option of framing their own compression rule. It need not be the same as given in the slide 30.
46. Once they have framed the rule ask them to compress and write the rhyme.
47. Go through the points again and emphasize on what is compression, decompression and compression rule.
48. Give them the worksheets.