17 The brain and the senses

Preparing for the session

SESSION AT A GLANCE

Game
How do you know ?

Information/ Discussion
Our senses and our brain

Story
The remarkable Helen Keller

Information
Thinking, feeling, problem-solving

Home activity
Worksheet 20
Solve this !

Distribution
Factsheet 5
Know your brain

This session begins with a game. It would be a good idea to play this game in an open area like a playground; if this is not possible you could clear an area in the classroom.

The session also includes the remarkable story of Helen Keller that shows how an individual can overcome great physical challenges. The story also helps children understand that differently-abled people are not inferior in any way.

You will have to arrange for materials marked with ✋.

Main ideas

- Our five sense organs help us to experience different things in the world around us.
- The brain interprets and stores these experiences. It thus functions as a memory store.
- Even if some sense organs do not function properly, it is possible, with will and determination, to lead a full life.
- The brain also controls our emotions and helps us to think, imagine and solve problems.
- People's capacities and abilities are different, as are their experiences. It is therefore wrong to call a person 'inferior' because she does not have a particular skill or ability.

To conduct the session you will need

✋ Five or six handkerchiefs and two potatoes (peeled and cut)

- Flipchart : *The remarkable Helen Keller*
- Copies of Worksheet 20 (one copy per child)
- Copies of Factsheet 5 (one copy per child)

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Conducting the session

Activity 1
Game

How do you know ?

Call for 10 or 12 volunteers. Ask them to form pairs. Blindfold one volunteer from each pair, with the help of the handkerchiefs. Take the other volunteers aside and make sure no one in the class can hear the instructions you give them. Give each of them two or three pieces of potato. Tell them that they have to give the potato pieces to their blindfolded partners, but without revealing what it is. Also, they cannot move from their positions - it is their partners who have to come to them. They can, however, guide them through sound. Ask them to take up positions in different parts of the room and then begin the game.

At a signal from you, the blindfolded volunteers have to first find their partners, take whatever is handed to them, and then identify what it is.

(You will, of course, have to warn the remaining members of the class to stay absolutely silent, so that the blindfolded participants in the game can find their partners on their own and identify the objects handed to them without any help.)

The game ends when all the participants have found their partners and have identified the objects given to them.

Activity 2
Information/ Discussion

Our senses and our brain

At the end of the game, use the following questions to initiate a discussion with the class.

- How did the blindfolded participants find and recognise their partners ?
- How did they identify the object given to them ?
- Are there other ways in which they could have identified their partner and the potato ?
- What are the organs we use to get information about things around us ?

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Help the class to understand the following.

Our sense organs – our eyes, ears, nose, tongue and skin - help us to perceive the world around us. They help us to see, hear, smell, taste and feel the various things around us. But they have to work together with the brain in order to do this.

What happens is this : the sense organs send messages to the brain about what we are experiencing. These messages are carried by the nerves. On the basis of these messages, the brain interprets what we are seeing, hearing, smelling, tasting and feeling. This information is then stored in the memory. Thus the memory store keeps growing as we experience more and more things. And in turn, the brain uses the memory store to identify and interpret new experiences.

This also happened in the game we just played. Normally, the volunteers would have recognised their partners using their eyes. But since they were blindfolded, they were able to find their partners by using their ears - because they heard their names being called. They were able to identify the potato because their tongue tasted it and the brain (which remembered the taste of potatoes) interpreted it correctly.

The game also makes one more point. When one of our sense organs is not able to function properly, we often use the other senses to understand things. This is also true of people who have some disability - for example, those who cannot see often have very sharp hearing, and those who cannot hear are able to understand what is spoken by lip-reading.

Activity 3
Story

The remarkable Helen Keller

Use the flipchart to tell the class the story of Helen Keller who overcame tremendous physical odds to become a universal symbol of hope and inspiration.

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Frame 1

Imagine that you are not able to see or hear or speak. Imagine the darkness, the silence, the loneliness. If I told you that you could learn to read and write, that you could listen to music, that you could stand up and give a speech in public, would you believe me ? Chances are you wouldn't. And yet, there lived a person who did all these things in spite of being blind, deaf and mute. Her name was Helen Keller. This is her story.

Frame 2

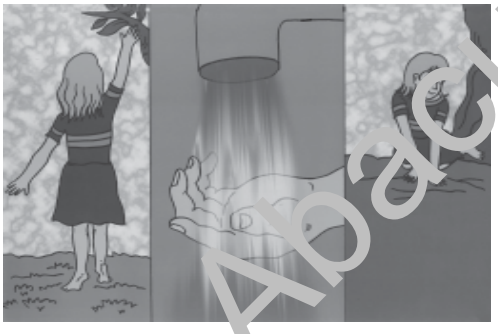
Helen Keller was born in a small town in the U. S.A. more than a hundred years ago. In the beginning, she was able to see and hear; but when she was about a year-and-a-half, she developed a serious illness that made her blind and deaf. By the age of three, it was discovered that she had forgotten the few words that she used to babble as a baby. Now she was called mute too.

Frame 3

She grew to be a strong, attractive girl, but her inability to make herself understood led to terrible behaviour. She would fling herself on the ground and scream uncontrollably. Her parents did not know how to handle her; they gave in to all her tantrums. She was a terror and was destined for misery.

Frame 4

Then, when Helen was six years old, she met a person who was to change her life. This was Anne Sullivan, who had trained at an institution that specialised in teaching children like Helen. When Anne Sullivan came to meet Helen for the first time, she brought her a doll as a gift. After Helen had played with the doll for a while, her teacher took Helen's hand and spelt the word d-o-l-l on it. This was the first time that anyone had made an effort to actually teach Helen.



Frame 5

Over the next few days, Helen learnt to spell new words like 'pin' and 'cup' and 'sit' and 'walk' using this manual language. However, she did not really understand what these words meant. Then one day, Helen's teacher took her to the pump house to draw water. As the water flowed into Helen's hand, her teacher held the other hand and spelt w-a-t-e-r on it. This was a moment of revelation for Helen. She understood that 'water' meant the cold thing that had flowed over her hand. It was as if a light had been switched on in her mind. Her heart throbbed with excitement. She ran through the garden touching everything as she moved, wanting to know the names of everything that she could feel but not see - the ground, the bushes, the pump...

Frame 6

Soon, Helen was learning more and more new words. It was then time to start reading. Her teacher would place a word raised on cardboard - like 'doll' or 'bed' - beside the object, so Helen could feel the words and read them. Miss Sullivan was introducing her to Braille, a language developed to help the blind to read. Helen also

learnt arithmetic and geography. Miss Sullivan would use groups of beads to help her to count. She would arrange straws so that Helen could feel them and learn addition and subtraction. For geography, Miss Sullivan made raised maps in clay and used strings and sticks to denote different features on the maps. Helen also learnt to write and practiced hard to make her handwriting neat and legible.

Frame 7

Travel was a great source of education. Her teacher took Helen to the school where she herself had studied; and here Helen met other children like her, and also found many new books in Braille, that she could read with her fingers. It was not easy but Helen was up to the challenge. She worked really hard at her studies, struggling for hours, refusing to leave a task unfinished. "It will give me strength if I finish it now," she would say when asked to rest. But she also had a lot of fun and learnt how to row and sail, how to swim, and how to ride a bicycle.

Frame 8

When Helen was ten years old she heard of a deaf, mute and blind girl like her, who had learnt to speak. With the speed of lightning she spelt "I must speak" on her teacher's hand. Her teacher took her to a school for the deaf, where the principal, Sarah Fuller, began by first teaching her how to hear. By putting her finger into the teacher's mouth and feeling the movements of the tongue, teeth and throat, Helen was able to make

out different sounds. She began to practice to say them - vowels like 'a' and 'o' and then words like 'mama' and 'papa'. Within a month of taking her first speech lesson, Helen was able to speak her thoughts. And what do you think was the first real sentence she spoke to her teacher ? She said, "I am not dumb now."

It was, of course, a great struggle. But Helen persisted, and for weeks and months and years, she worked hard to improve her speech. She used her fingers to feel her teacher's expression, the way her throat and tongue and mouth moved when she spoke, and then she repeated the words and sentences over and over again. She also learnt to read lips - she would place her middle finger on the speaker's nose, her forefinger on the lips and her thumb on his throat. By sensing their vibrations she was able to 'hear' what was being said. She could 'listen' to singers and musicians, and she was even able to catch the vibrations on a radio.

Frame 9

Helen Keller continued to work hard. She went to college, and with Anne Sullivan's help, graduated with special honours in English when she was twenty-four.

Later, teacher and student travelled around the world, to make people understand the problems of the deaf-blind and the importance of educating them. Helen Keller wrote books, gave lectures, made recordings, acted in a film, raised money for the blind and received several degrees and awards from all over the world.

Helen Keller died when she was 88. But even today, she is regarded as a symbol of how the human spirit can rise above the greatest of difficulties, of how determination and hard work can conquer almost any handicap. Her life and work continue to be an inspiration to all of us.

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At the end of the story, invite children to respond to it. Encourage them to talk about the things they liked about the story, and to share experiences of people with visual / hearing / other disabilities they may know about. Help them understand that such people are **differently-abled** that is, they have developed other senses to overcome their handicap. Instead of pitying or ridiculing them, we need to be sensitive to their needs; while they may sometimes need our help, many of them overcome their problems with courage and determination, and are therefore to be admired.

Activity 4

Information

Thinking, feeling, problem-solving

Ask the class whether they can think of any other function that the brain performs, apart from co-ordinating the work of different organs, helping us to remember things and to perceive and understand the world around us. Then tell them about the brain's capacity for thinking, feeling and problem-solving.

It is our brain that helps us to think, imagine, and solve problems. In fact, while thinking, the brain actually analyses different pieces of information it has stored, connects them and uses earlier experiences. This capacity of the brain is what allows us to learn, and grow.

Our emotions and feelings are also controlled by the brain. Whether it is anger, fear or pleasure, our brain helps us to experience these emotions and to express them.

Although there are some basic functions which our brain performs that are similar for all of us, individual capacities differ. That is why people have different abilities. For instance, some of us find it very easy to remember dates and names (as we have to do in History) while some of us find it easy to learn new words (when learning a new language); some of us find it easy to do Arithmetic while others are good at Drawing. Not only in school, but even at home, we like to do different things - we are good at some but may find others difficult. In fact we may not be

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very good at studies but some of us may be good at cooking and other household tasks, others may be mechanical-minded and able to repair things, yet others may be skilled at gardening or stitching or story-telling. One should not label people as 'stupid' or inferior because our skills and talents are different. What all of us can do, however, is to try to do new things, even if they are difficult, and improve our special talents, because the brain, like many other parts of the body, gets sharper with use !

Home Activity
Worksheet 20
Solve this !

Distribute copies of Worksheet 20 to the class. Tell them that they should complete it at home and file it in their folders. The answers to the puzzles are given on the following page. You could share them with the class after a few days, once the children have had a chance to solve them.

Distribution
Factsheet 5
Know your brain

Distribute copies of Factsheet 5. Ask the class to read it at home and file it in their personal folders along with their worksheets.

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Answers to the riddles :

- First, the boatman will take the goat across the river. On returning he will take the tiger across the river. He will leave the tiger on the other side and bring the goat back (otherwise the tiger will eat the goat). He will now leave the goat on this side and take the bundle of grass across and leave it there. (The tiger is not interested in the grass so it is safe there !) Now the boatman will return to this side of the river and take the goat across the river again. In all, he will have to cross the river four times in order to take the tiger, the goat and the bundle of grass safely across the river.

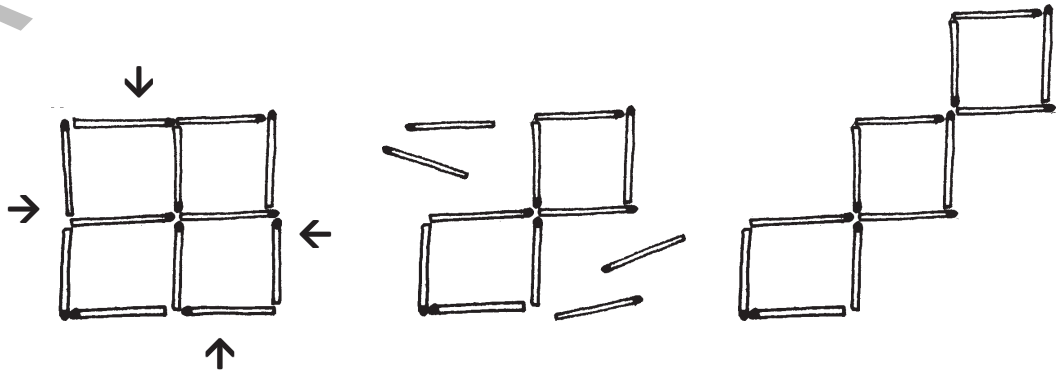
- A kilo of cotton.

- With the five-litre measure the milkman will first pour out five litres of milk in the vessel. Then he will use the two-litre measure twice, and put four litres of milk back from the vessel to the can. In this manner the customer will have one litre of milk left in the vessel.

OR

- He will use the two-litre measure thrice, and put six litres of milk into the vessel. Then he will use the five-litre measure to put back five litres of milk into his can. In this way, only one litre of milk remains in the vessel.

<u>Matchstick Puzzle</u> :



Solve this !

We know that the brain improves with use, so here is a chance to sharpen your brain. See how many of these problems you can solve.

☺ A boatman has to take a tiger, a goat and a bundle of grass from one side of a river to the other. The problem is, his boat is small and he can only take one animal or thing at a time. He cannot take the grass across leaving the tiger and the goat together, for the tiger would kill the goat. In the same way, the goat and the grass cannot be left together, for the goat would eat up the grass. How can he take the tiger, the goat and the grass safely across the river ?

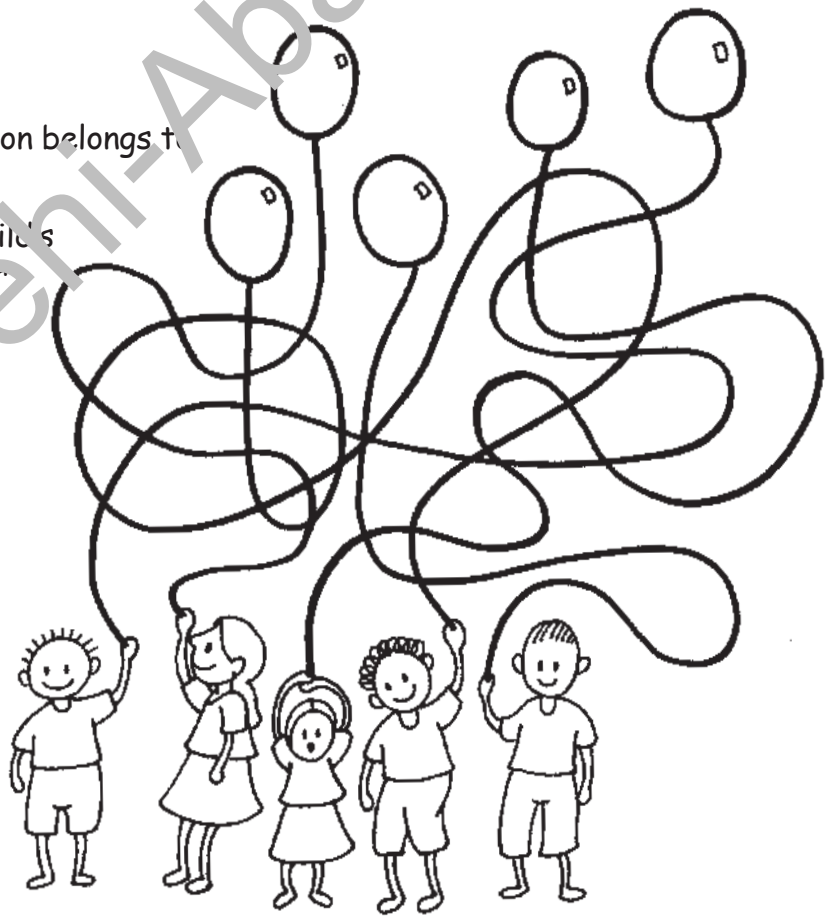
☺ What would take up more space to store - a kilo of iron or a kilo of cotton ?

☺ A milkman wants to give a customer one litre of milk. The problem is, he has containers that measure 2 litres and 5 litres, but no container that measures 1 litre. How will he pour out the correct measure of milk ?

Whose balloon ?

☺ Find out which balloon belongs to which child.

Then colour each child's clothes and his / her balloon in the same colour.



Name :

Date :

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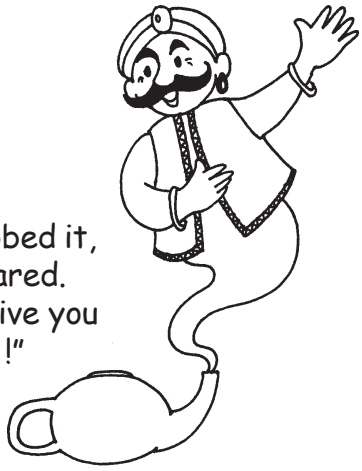
Solve this !

Chintu and the Magic Lamp

Chintu found a lamp

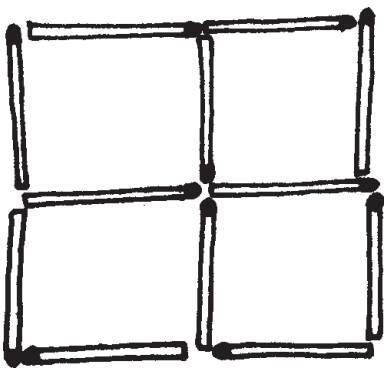
When he rubbed it, a genie appeared. He said, "I give you three wishes !"



☺ What would Chintu wish for ? Draw or write your answer.

Matchstick Puzzle

☺ Arrange 12 matchsticks as shown in this figure. Now move four matchsticks from their places and rearrange them so that they make three squares instead of four.



Factsheet 5

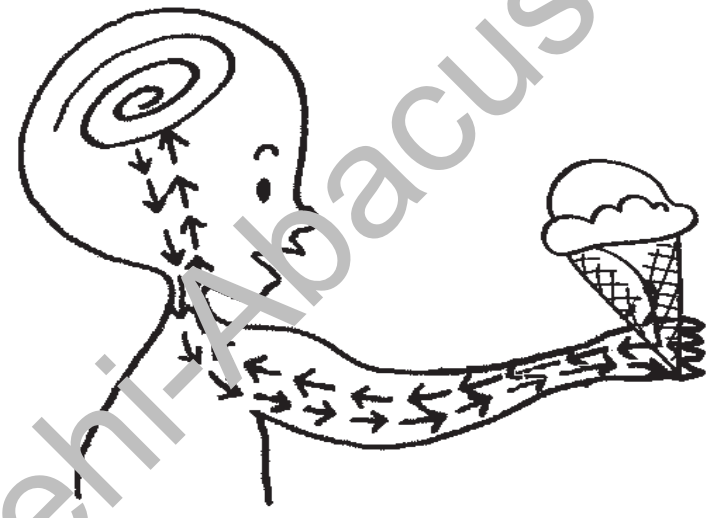
Know your Brain

- Our brain gets sharper with use. If not used it gets rusty and blunt like an unused knife.

- Unlike other cells in the body, brain cells are not replaced when they die. Therefore as we grow older, some of the brain cells may die out and affect the brain's functioning. This will happen to all of us when we grow old. That is why older people often find it difficult to remember things. Remember this, and don't be impatient with your grandparents or other elderly people the next time they forget something !

Did you know ?

- By the time a child is six years old, the brain has reached its full weight of 1.4 kg.
- Intelligence cannot be measured by the size of the human brain.
- We use only a small part of the brain's capacity - more than 90% of the brain's capacity is usually not used !
- The brain performs so many functions that if it were to be converted into a computer, one would need a whole room to store it !



- Messages can zip to and from the brain more than 30 times in just one second.
- About 85% of the brain is water !