
Paper 3B : Development of Sensorial Activities

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Introduction of Sensorial Activities

The Sensorial activity is also a developmental activity like “Exercise of Practical life”.

When we observe a person to perform this activity; the most outstanding activity, seems to be Sensorial; so it is call sensorial activity.

Voluntary movement; will; senses; emotion etc are all become active when the child performance the activities, al the senses are with him. It is also means of total development and also fulfil the needs of child for his development in a particular time of season.

The child needs to perform the sensorial activity during the same period when he needs ‘Exercise of Practical life’. So both the activities are parallel.

In a ‘House of Children’ we start ‘Exercise of Practical life’ before sensorial activity because :

- (i) 'Exercise of Practical life' actually prepare the child to be able to perform for sensorial activity.
- (ii) Sensorial materials are not familiar to the child. These are available only in the "House of Children"; where as the tools of 'Exercise of Practical life' is very much familiar with the child. So 'Exercise of Practical life' helps the child to settle down in the environment and then we offer sensorial materials.
- (iii) The presentation of Sensorial activities are almost individual. Before settle down the child are not in a position to take individual presentation. So we offer sensorial activity to the child, who are settle down and ready to get individual presentation.
- (iv) The child is not aware of the needs of sensorial activity Sensorial activity don't have any outer attraction; as that the tools of E.P.L. has — The child may even reject them. That is why their interest, will and intelligence are stimulated through E.P.L before we start with Sensorial work.
- (v) When a child does "Exercise of Practical life", he discovers the right way to do the work as he does it, and thereby works to perfect it. In Sensorial activity, the materials itself shows up the error, therefore the child gets an opportunity for corrections his mistakes.

Why is there only one set of material?

The reason is that there are so many activities in the environment, that there is no need for more than are set of material. E.P.L. helps the child to have a minimum control over his movement to do the Sensorial activity.

Our Senses :

Only human being needs education in our own senses. Which those senses are and what role they play in Human life?

There are so many senses;

- (i) **Visual Sense :** This Sense organ located an eye. Size, colour, dimension shapes of things i.e. all physical property of matter observe by eye i.e. visual sense.
- (ii) **Acoustic Sense :** This Sense located with ear to hear and stimulate 'sound' and their loudness.
- (iii) **Gustatory Sense :** It is sense of test located with tongue. It helps the child to distinguish between sweet, bitter, salt & sour.
- (iv) **Olfactory Sense :** This is sense of smell located in our nose.
- (v) **Tactile Sense :** This is sense of touch. It can pursue rough & smooth of a surface in gradation.
- (vi) **Baric Sense :** It is sense of weight.

- (vii) **Kinesthetic Sense or Muscular Sense** : It is also located in our muscles. It registers movement carried out by various parts of our body.
- (viii) **Stereo Gnostic Sense** : This Sense helps to recognise the dimension of a solid without looking but by touching.
- (ix) **Thermic Sense or Sense of temperature** : We have two sets of sense organs — One set register the temperature which is below our body temperature, and another set register the temperature which is above our body temperature.

The Role of the Senses :

Every human works in his own environment. In this environment, it is his task to create a world of his own, which are call supper nature. Intelligence is the main instrument, a man uses for his work. Intelligence is needed to perform any conscious work. Men builds an experience gathered from the past to apply his intelligence according to the environment and nature of the work. Intelligence is a spiritual force, not a material one. It is not directly applied to the environment. There is data and information in the environment around us. The Senses gather that information. But we cannot utilise the information unless our intelligence uses it to arrive at a decision and apply it in the environment through the senses of the body.

At the age of 2½ years, a child needs to become a conscious master of the wealth, and until he becomes conscious of this wealth he cannot grow as a human being. Dr. Maria Montessori says this is second birth of human beings. At birth the physical man enters the world, but at 2½ years a physical man enters this world. At 2½ years a child needs our help to become conscious of his impression. Every visual impression will have to be analysed into its components and re-integrated consciously. He will have to become conscious of all the physical properties of matter which exists in this world.

We will have to help him to understand physical properties of matter by materialised abstraction, so that he can form an idea. When he becomes conscious of all the physical properties of matter he can classify of all the impressions he has gained and help him to develop a well ordered mind. He is also in a position to re-enter and re-explore the world consciously, intelligently, methodically and systematically with his abstract ideas.

All the developmental activities at this stage can be possible with proper tools.

The material which forms an abstract idea and helps to a child to know all the physical properties of matter are called sensorial material.

The Characteristics of Sensorial Material :

1. Material should be very attractive.
2. Sensorial material should be scientifically prepared with all precision and they are universal.
3. Sensorial Material should be physically proportionate to a child's capacity.

4. As a rule, there should be only one set of Sensorial Material.
5. Sensorial material have to be displayed.
6. Maintaining the material is one of our duties and the material should be clean and intact.

Presentation using Sensorial Material are always given individually, Why?

1. All the children do not need the presentation at the same time.
2. Each movement is such a presentation is so precise, it is not possible to show it to more than one child at a time.
3. To help the child to understand the purpose of our activity, our physical movement are not enough, but our mental movements will have to be expressed also. On giving a presentation our face and hands should express our movements, but we should not speak.

Basic Activity Presented and Performed by Sensorial Material :

1. Pairing Activity :

We have sensorial material in pairs, where each property is found in duplicate.

- (a) **Complementary Pairs :** Members that possess all the physical property which the other member also possesses, it makes complete set.
- (b) **Identical Pair :** They are identical in every respect.
- (c) **Partial Pair :** A part of one of object is similar to a part of another object. Pairing activity helps a child to form a consciousness of each of the physical properties and differences between them.

2. Gradation :

Gradation activities with sensorial material helps a child to realise that each physical property differs in degrees and intensities.

Grading follows pairing because pairing as an activity is easier than grading.

Direct Aim :

To help the child to become conscious of all matter, the physical aspect of matter, by means of his senses.

Indirect Aim :

1. Related to refinement of certain types of motor — co-ordination.
2. Preparing the child for the next phase of intellect-based activity.

Activity 1 □ Visual and Muscular Sense

“Cylinder Blocks”

Material description :

There are four cylinder blocks which are highly polished and varnished of natural colour of wood. Each of them have 10 sockets. Over the middle of each cylinder there is a knob which is 1 cm high and it is as thick as like ordinary writing instrument. The body and the base of all cylinders and the inside of the sockets are polished no varnished.

Four series of cylinder blocks have their dimension mathematically graded and therefore four series of cylinder blocks materialise all the four ways in which objects can differ in dimension.

Cylinder Block of “A”

Diameter — 2.5 cm

Height — 1 cm to 5.5 cm.

They materialise one dimensional difference.

Name — “SHORT” & “TALL”.

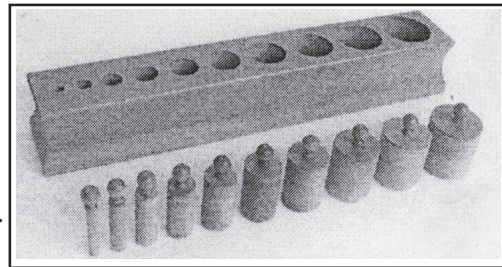
Cylinder Block of “B”

Diameter — 1 cm to 5.5 cm

Height — 5.5 cm

They materialise two dimensional difference.

Name — “THIN” & “THICK”.



Cylinder Block of “C”

Diameter — 1 cm to 5.5 cm

Height — 1 cm to 5.5 cm

They materialise three dimensional difference.

Name — “SMALL” & “BIG”.

Cylinder Block of “C₁”

Diameter — 1 cm to 5.5 cm

Height — 5.5 cm to 1 cm

They also materialise three dimensional difference.

Name — “THICK” & “SHORT” & “THIN & TALL”

Display :

The cylinder blocks are displayed on an open shelf. They are kept together and in a geometrical succession from left to right.

Presentation :

[We give presentation with 'B' block first. If for some reasons block 'B' is not available, then we present either C or C₁ block. We should avoid presentation with block 'A' at first.]

Take the child to the place where the material is kept and show the child how we carry it. The two sides of the block hold firmly in between the palms of two hands, the three fingers on one side of the block and thumb at the opposite side and the little finger at the bottom.

The block is placed at the place of presentation in such a manner that the thickest cylinder is on your right.

Ask the child to watch what you are doing.

Ask the child, "We have to take out all the cylinders from the block." Show the child how you hold the knob of the cylinder with your middle finger, index and thumb. Now slowly raise the cylinder vertically and bring it out of the socket, keep it behind the block. Take out all the cylinders in succession but keep them scattered. We first pick up thickest and lastly thinnest cylinder from the socket. Then ask the child "now watch how I put back the cylinder into the socket."

Adult pick-up any one cylinder and first observe the diameter of the cylinder and then diameter of the socket. Secondly, bring the cylinder to that socket which Adult think corresponds to the cylinder. Lastly the final verification should be done before putting the cylinder into the selected socket by one intentional movement. Do not release the cylinder before it reaches the bottom. Repeat the same activity with others cylinders. When putting the cylinder into the socket, do not make any noise.

Control of error : Lies in the material

Direct Aim :

To help the child become conscious of the three linear dimension (i.e. length, breadth & height), their variations and combinations by means of visual sense.

Indirect Aim :

To help the child acquire prehensile co-ordination involved in holding a writing instrument with necessary and sufficient fingers and thus to help him prepare himself indirectly in writing or other graphic arts.

Age of presentation : 2½ years of old.

Possibilities :

One block at a time — A or B or C or $C_1 = 4$ possibilities.

Two blocks at a time — A+B, A+C, A+C₁, B+C, B+C₁, C+C₁ = 6 possibilities.

Three blocks at a time — A+B+C, A+B+C₁, A+C+C₁, B+C+C₁ = 4 possibilities.

Four blocks at a time — A+B+C+C₁ = 1 possibility.

i.e. 15 possibilities.

Exercises

Reverse Pairing :**1. Activity at random using an indicator :**

Ask the child to bring the block at the place of presentation and take out all the cylinders and keep it scattered way behind the blocks. Then Adult takes an indicator and put it in one of the employ socket and tell the child, “Let us try to find out the cylinder which fits exactly in the socket.”

Continue the activity as long as the child needs to do so.

In a presentation we find out Socket for the cylinder, but here we finding cylinder for their corresponding socket. So this is reverse pairing.

2. Activity in Succession :

The same activity can be done by indicating the sockets in succession with the index finger. Finding cylinders for the sockets in succession leads him to the grading activity — but without being aware of the fact.

Grading Activity

Grading activity can be done in two ways :

(a) **With the block nearby.**

(b) **Without the block.**

(a) Invite the child and ask him to bring the cylinder block and take out all the cylinders and scatter them on the working mat.

After scattering then keep the block close by and ask the child to find out the thickest cylinder, then next thickest cylinder and so on; arranging all the cylinders in succession (according to their gradation) on the mat, then keep the empty block in front of the cylinder and put back the cylinders into their sockets, for control of error.

(b) Some activity like (a) but here hide the empty block from the child ask him to arrange the cylinders from thickest to thinnest.

After arranging them, bring the block and check it for control of error.

Memory Activity :

M₁ : Invite the child and ask him to bring the block and keep the cylinders together at a distance, so that child cannot see them. Keep the block at the place of presentation. Indicate a particular socket with an indicator and ask the child to bring the corresponding cylinder. Though he cannot see the cylinder visually he can, by using his memory, bring the corresponding for the particular socket.

This activity can be extended by asking the child to bring the cylinders one by one according to their successive gradation, corresponding to the sockets in the block.

M₂: Invite the child and ask him to bring the block and keep it between both of you. Then ask him to take out the cylinders and keep them in ten different places in the environment.

Keep the block at the place of presentation. Now indicate a particular socket and ask the child to bring the corresponding cylinder.

This activity can also be done in successive gradation as in M-1.

Check your Progress :

Q.1. *How many Blocks in Cylinder Blocks? Which one we offer first in a 'House of Children'.*

Ans. There are four Blocks in Cylinder blocks.
In a 'House of Children' we offer first 'B' block.

Q.2. *How many possibilities are there in cylinder blocks?*

Ans. There are 15 possibilities in cylinder blocks.

Q.3. *In a 'House of Children' why we avoid 'A' block for presentation?*

Ans. In 'A' block — the diameter of the cylinder are same, only differ in height. If a child make any mistake at the presentation time, he cannot rectify it by yourself, he need's other's help. So, in a 'House of Children' we never present 'A' block first.

Pink Tower

Material description :

It consists of 10 wooden cubes pink in colour. The cubes are graded uniformly with the smallest being a 1 cm cube and the largest is 10 cm cube, where each cubes have six square faces.

It is display on a stool of 20 cm height and the surface should be 14×14 cm.

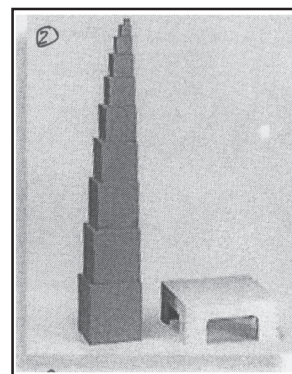
A thin long strip of wood, 10 cm long is fixed parallel to the one side of the surface and 2 cm away from the sides of the surface.

Presentation :

Take the child to the place where the pink tower is displayed and show him how to carry the cubes to the working mat.

Hold the cube such a manner that the thickness comes in between the thumb and the fingers of the right hand. The thumb will be placed that square phase which is nearer to you and other fingers opposite of that square phase where the thumb place.

By holding in this manner we will know the differences of the cube's thickness not only with our eyes but also with our muscular senses and it also helps us to refine his prehensile movements.



Muscular preparation is done before holding a thing. This movement which he prepared for hand before holding a thing which is called "Prehensile Movement". Bring the cubes are at a time and keep it scattered on the mat in front of the child, so that all the cubes are visible and within his reach. Clear some space for "Building up" the cubes.

Find the largest cube and place it in the middle. Then try and find the next largest one amongst the remaining cubes and having found it, draw the child's attention to the way you try to place the cube on top of the first are in one intentional movement. Repeat the same movement till the whole tower is complete. When the child continues to repeat this activity, see that he does it with one intentional movement. After the tower has been built, inspect the tower from the base to the top. Let the child see that you are inspecting the regularity of placement of each cube.

Control of error : Lies in the child's visual sense

Direct Aim :

To help the child become conscious of the three linear dimensions; their variations and combinations, by means of his visual sense.

Indirect Aim :

- (1) To help the child refine his prehensile movement.
- (2) To help the child acquire greater control over his intentional movements.

Age : 2½ years to 3 years of age.

Exercises

Ex. 1. : Invite the child and ask him to bring the cubes and make a tower. Then asks the child to close his eyes, and take out any cube and place it beside the tower. Now ask the child to find out from where the cube has been removed, by saying, "From where have I taken this cube?"

Ex. 2. : Ask the child to close his eyes and take out any cube and hide it. Then tell the child to open his eyes and ask him, “From where is the cube missing?” The child find out the proper place for the missing cube and then he can put back the cube at its proper place.

M₂ : M₂ can be done with all graded materials.

In Pink-tower, M₂ exercise is possible like cylinder block. Ask the child to keep the cubes in 10 different places in the environment and their ask him to build up the tower.

Foot Note :

Name-Lesson is possible with this material :

- (1) Ordinary Name-Lesson — “Small and Big”.
- (2) Name of Degree in Comparison — “Small and Smaller” or Big & Bigger.
- (3) Name of Superlative Degree — “Small, Smaller, Smallest” or “Big; Bigger; Biggest”

Check your Progress :

Q.1. How many cubes in ‘Pink Tower’?

Ans. There are ten cubes in ‘Pink Tower’.

Q.2. What type of activity we do with Pink Tower?

Ans. Grading activity.

Q.3. Why M₁ is not possible here but M₂ is possible?

Ans. For M₁, memory is not work here because all the cubes are kept in the same place.

But M₂ is possible in pink tower because it is graded material and ten cubes are kept in ten different places. So for making a tower memory will be work, to bringing the cubes.

Brown Stairs

Material description : Brown stairs consists of 10 square prismatic blocks of wood, Brown in colours. All these prisms share are of their dimension is common which is 20 cm. Other dimension go from starting 1cm in the thinnest & 10 cm the thickest. Other dimension go an increasing by 1 cm.

Special stool is required to display the brown stairs.

This is 30 cm high. Length & breath i.e. 24cm × 59 cm. Area of the surface of the stool is 24×59 sq. cm. Over the surface of the stool, 2 very narrow wooden strips 20cm

long each making right angles one to the other and at the distance of 2 cm away from the 2 edges of the stool. The colour of the stool should be any colour which goes well with the brown-colour.

Characteristic of the material : (1) They are grading material. (2) They are according to mathematical succession. The volume of the stairs are $1 \times 1 \times 20$ Ca. Cm. $2 \times 2 \times 29$ Cm Cm etc. $10 \times 10 \times 20$ Ca-Cm i.e. $1^2, 2^2, 2^2 \dots 10^2$.

They differ only in two dimension i.e. height & breath ; because one dimension common. It is just like cylinder block d. Here the difference of 2 dimensions is more stand out or more easily noticeable.

Presentation : (IA—IP) : The activity will be done on working mat because there is plenty of space for scattered the stairs and arranges them.

Adult ask the child, “Are you like to show Brown stair ? Come.”

If the child agree, adult bring child to that place where the Brown-Stairs display.

The stairs are hold one at a time and use one hand. It hold at middle. When we separate from the other, we first move the lowest stair forward with two hands, hold at the two sides of the stair and then hold the stair at middle. Hold the stair between thumb and four fingers. By thus child grow its muscular sense, by the thickness of the stair. Child can understand the thickness by the distance of the thumb & fingers. His muscular sense also give a chance to appreciate the thickness of the different prism.

They should taken the Prism one at a time and scattered them on the working mat.

Here put the prisms not only scattered but also scattered in different— direction.

So that they are within the reach of the child’s eye and hand. No one side the other.

Then we clear same space for construction from right top to left base of the working-mat. Here I clear the space along the diagonal on the working mat of the adult’s and child for clear of construction.

Then I start to compare the square faces of the Prisms. After finding the thickest prism and put it diagonally. Find out the rest one and put it as near as possible to the first one and use both hands at two sides to inspect the square faces are at the same line i.e. the sides are coincide. So that the child can understand the difference of dimensions, because here the lengths of the stairs are common. Now compare the thickest of square faces of the prisms which is put on the next are.

Here constructed the stair from thickest to thinnest.

When we present the activity to the child, we build the stair obliquely.

Point of Interest : (1) While building the stairs, to make sure the breaths of the prisms are coincide perfectly.

(2) No space there in between the prisms, while building the stairs.

Control of error : Lies in the child's visual sense ; Consists on the examining of the regularity of the prisms.

Direct Aim : To help the child become conscious of the three linear dimensions, their variations and combinations by means of visual sense.

Indirect Aim : To help the child further refine his prehensile movements.

Age : When child 2 1/2 years to 3 years. After the child have plenty of experience of working with Pink-Tower.

Exercise : Same as Pink-towers.

Activity 2 □ Visual Sense

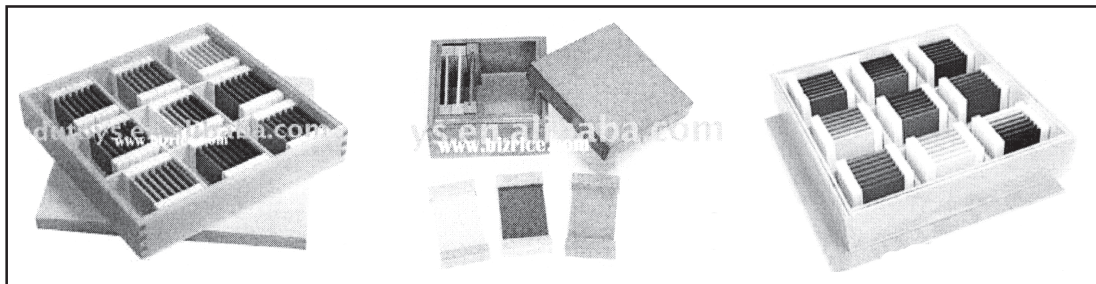
“Colour Tablets”

Material Description :

They are rectangular wooden tablets coloured all over both the edges and surfaces. Two shorter sides are fixed with good wooden strips with natural wood colour. These two strips help us to handle the tablets without touching the colour and these strips serve as protectors of colours.

There are three boxes of colour tablets.

1st Box : In the 1st box, we have tablets in RED, YELLOW and BLUE colour tablets, each in pair. They are primary colour.



2nd Box : In this box there are three primary colours i.e. Red, Yellow and Blue, and three secondary colours i.e. Green, Orange and Violet, three tertiary colours i.e. Brown, Gray and Pink and also white and Black. So there are eleven colour tablets each in pairs.

3rd Box : There are nine compartments and have nine colours graded according to their intensities.

1st row — Grades of primary colours.

2nd row — Grades of secondary colours.

3rd row — Grades of tertiary colours.

There are seven tables of each colour.

Presentation (I.A. – I.P.) :

With 1st Box

Invite the child and bring the box at the place of presentation and keep the box at the right side of adult. Ask the child to watch. Take out one colour tablet and hold the colour tablet within two frames, so that colour portion remain untouched. Draw the child's attention to it. Show him another tablet of second colour. Then third one also would be the same colour of the second one. Then show him the tablet of third colour. Then keep the box in front

of the child and take out last two tablets one at a time. If the child wants to take over encourage him. (Presentation should be in this manner — A, B, B, C, A, C or C, A)

After giving all the tablets ask the child to watch. Compare the tablets (their colour) and keep same colour tablets one beside the other making a pair keep different colour tablets one below the other.

Also show the child how to put back tablets in the box without any noise and without touching the colour.

Control of error : Lies in the child's visual sense

Direct Aim :

To help the child grow in consciousness with regard to colours and also help him to realise that the number of colours are limited where unlimited number of shades and intensities by means of his visual sense.

Indirect Aim :

To help the child prepare himself for intelligent and aesthetic appreciation and application of colours and also for symbolic purpose.

Presentation of 2nd Box

The presentation of this box is an extension of 1st box. Here the colours are more in number. We first give some suggestions to the child if it is needed. Scatter the tablets on the chowki on mat.

1. Make a vertical line with one set of tablets and scatter the other set and then make a pair.
2. Scatter all tablets and make pair.

2nd box we use for name-lesson and then bring whole box.

Presentation with 3rd Box

After the child knows the name of the colours from the 2nd box then we present 3rd box. Ask the child choose any one colour and then take out all the 7 shades of that colour on a tray.

Take the 4th one of the colour tablet and show it to the child and ask him, "What colour is this?" Then take the first one and ask the child though it is same colour but it is lighter than the previous one. Then take the 7th one and ask the child this is also the same colour but darker than the 4th one.

Ask him, we put the colour from left to right according to their darkness, i.e. dark to light.

Exercises of colour tablets

M_1 and M_2 activity is possible here like cylinder blocks.

Exercise with 3rd box :

- (a) After arranging the 7 graded tablets and ask the child “close your eyes”. Then adult pick up one of the tablet and putting the tablet in front of the child and ask him “open our eyes and from where the tablet coming from?”

Then child picks up the tablet and compares the tablet with the tablets and find out the exact place and puts the tablet there.

- (b) Ask the child, “close our eyes”, then pick up any one tablet and hide it. Then ask the child, “open your eyes and find out from where the tablet is missing?”

The child looks at the gradation of colour tablets and points out the place.

Check your Progress :

Q.1. How many box in colour tablet box?

Ans. There are three boxes in the colour tablet.

Q.2. How many colour in the 1st box? What they are?

Ans. In the 1st, there are three colours and they are Red, Yellow and Blue.

Q.3. In the 1st box, why there are Red, Yellow and Blue colour?

Ans. Because they are three basic colours.

Q.4. Why in the 2nd box have 11 colours?

Ans. By the help of 2nd box, child will learn 11 names of colour by name-lesson and these 11 colours are Primary, Secondary and Tertiary colours.

Q.5. Why we offer 3rd box?

Ans. It helps the child about the different shades of colours in gradation.

Activity 3 □ Tactile Sense

Finger Tips Bathing Activity

Material Description :

For the bathing finger tips, there have a largest tray, the floor of it is covered with oil-cloth and at the middle of tray there is a nice finger bowl with a indication mark at 3rd height. At the right side of this bowl, there is a Jug, blue in colour, with an indication mark. Just below the spout of the Jug and it will filled with cold water. There is another Jug pink in colour containing hot water and covered with lid and keep it behind the cold water. At the left base of the tray, we have a Turkish towel and at the left top corner have a piece of cotton. It is use if any water drop fell, then wipe.

Presentation :

This activity we done only when we needs to trace any material, e.g. TOUCH BOARD.

This activity will be done on a chowki. Invite the child and bring the materials bathing finger tips and keep it on a chowki. Ask him to unfold the napkin and keep it on left top corner of the tray. Now tell the child “you can see the indication mark in this thin bowl. Now pore cold water in it up to this indication mark”.

Then ask him to pour some hot water into the same bowl and tell him to feel whether the water has become a little warm.

When he feels the water has become warm enough, then tell him to bathe the finger tips of his right hand in this water. After bathing his finger tips, ask him to rub until his fingers being to tingle. Now ask him to throw the water of the bowl and put back the tray at its place.

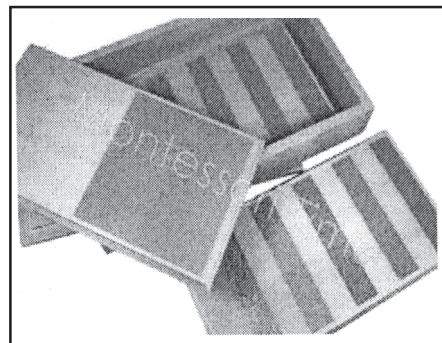
Touch Boards

Material Description :

It is a fixed part of the tactile material.

There are four touch boards. All the four boards have same dimension and same height, same weight. The four sides are slighting, so it is easy to hold.

1st Box : The first touch board — The surface of the board presents two types of textures. The left area of the surface present rough surface and other half smooth surface.



The second board : In the same box below this board we have a second touch board. In the second board, here we have five rough surfaces and five smooth surfaces alternatively. The left most is the rough surface and the right most is the smooth surface.

2nd Box : The third touch board is in this box and here one have five surfaces of graded roughness. The left most area is very rough. Thus the roughness ranges from rough to least rough.

In the same box below of this board, we have the fourth touch board which we have five surfaces of graded smoothness. It ranges from smooth to least smooth.

Presentation with 1st Touch board

Before this presentation, child must do finger tips bathing activity. Then ask the child to bring the touch board and show him how to hold the board, by placing the fingers of both hands below the board and the thumbs at the middle of the inclined edges without touching the surface. Keep it on the chowki and place the rough surface on your left. Hold the left base corner angle of the board. With the thumb and index finger making a 'L' type of shape so that it cannot move. Now show him how to trace the surface. When trace the surface, the hand is flat, fingers are together and thumb kept apart. The right elbow should be unsupported for it will make the movements easier. When tracing the rough surface pronounce the word, "ROUGH". After tracing the rough surface then trace smooth surface and pronounce the word "SMOOTH".

Let the child do the activity and tell him to trace the surface very lightly. Then suggest the child to close his eyes and trace and feel Rough and Smooth.

Presentation of 2nd Touch Board

Here we use only two finger tips for tracing the surfaces. First child do this activity with eye's open. Child touches two finger tips on the top of the rough surface and trace below and then touch top of the smooth surface and trace below. Child does it rapidly at the end of the board. Then offer the child to do it with eyes close.

After the use of 2nd touch board, child can use either 3rd or 4th touch board.

Presentation with 3rd Touch Board

Here we have one type of surface (i.e. rough) but in 5 degrees. We place the board on the chowki from roughness to more roughness. Child can understand the gradually differences of roughness successively. Here the distance of the 5 degrees are not same as 2nd board; but child can control his muscular movement here. Child can manage the greater space. At first child do the activity with open eyes and later ask the child to do the activity with close eyes.

If the child make mistake motor distance and tactile sense control. If the child make tactile mistake, muscular sense control. If the movement are not regular then tactile sense help him to control. So, one control for other's mistake.

Control of error

No need for First Board. Second board lies in child's tactile movement. In the 3rd and 4th board tactile in perfection control by muscular and motor control by tactile sense.

Direct Aim :

To help the child to become conscious of roughness and smoothness and their various degrees by means of his tactile sense.

Indirect Aim :

To help the child to prepare himself indirectly for writing, drawing etc. by—

- (1) acquiring lightness of touch.
- (2) and also by acquiring the capacity to move his writing fingers in a control manner both in vertical direction as well as horizontal direction (left to right).

Age : Round about 3 years on as early as possible.

Check your Progress :

Q.1. Why we needs finger-tips bathing activity before presentation of any tactile material?

- Ans.** (a) After bathing finger tips, it will be more sensitive and finger tips will be clean.
(b) Develop his concentration power.
(c) Stimulate the child for the next activity.

Q.2. What is the Direct and Indirect aim of the Tactile materials?

Ans. See Direct and Indirect Aim.

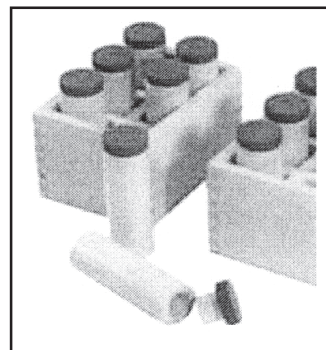
Activity 4 □ Acoustic Sense

Noise Boxes

Material Description :

There are two containers. In each of the containers there are six cylindrical wooden boxes. Their bodies are in the natural colour of wood, highly polished.

The tops and base of the boxes of one container are in blue and the boxes of other container are in red. The six boxes when shaken produce noises which are graded according to their pitch. Boxes of one container make pairs with boxes of other containers. We hold the boxes within our one hand to their breadth and when shake our wrist should loose.



Presentation :

The activity should be presented on working mat or chowki. Bring the boxes and keep them on the right hand side of the adult.

Take out the longest box and keep it in front of you and child. Draw the child's attention by saying, "Look how I hold it; when you hold it in the middle of the long part with your fingers on one side, and the thumb on the other side. But remember never hold it on top and bottom of the box.

Then shake the box with vertical movement and use only wrist and tell the child, "Look how I shake it?" Shake the box near your ear and hear the sound with intentness. Show the second box (softest sound). Ask him to hear the sound by himself. Again show the 3rd box (softest) and then show him 4th box (hardest) from the same container.

(Follow the method — A, B, B, A and in case of 3 pairs, A, B, B, C, A, C and C, A)

Again ask the child to watch. Keep the Blue and Red boxes in two places. Take one box from your right side. Shake one box & hear the sound and keep it. Take one box from your left, shake and hear the sound. If the sound of two boxes are same, keep them together. Again shake others and if the sounds are same, keep them together. Ask the child to hear the sounds shaking the boxes all by himself and also ask him to hear with other ear.

Continue the activity till the child takes over. Finally check up for the control of error.

Grading Activity with Noise Boxes

Presentation :

Ask the child to bring any one container. Ask him to take out all the boxes and keep them all mix-up.

Ask him to watch. Listen to one box and keep it. Listen to another box. Listen to the first box again. If it is louder, keep it at the left side of the first box. If it is softer than the first box keep it at right. Take another box and listen it. Listen to the first. Again listen to the third box. If the first one is louder than the third one, make a place between first and second. Listen the second. If the third one is softer than keep the second one in the vacant place and keep the third one in second place. Then listen another one and again listen previous boxes. Keep the box in its proper place. Do the same with other boxes and ask the child to hear the sound of the boxes one by one.

Ask the child to perform the activity again. After completing the activity ask him to listen the noise of each box separately for his control of error.

Control of error

As far as pairing activity is concerned it lies in the child's acoustic sense helped by his visual sense.

As far as grading activity is concerned it lies entirely an acoustic sense.

Direct Aim :

To help the child to become conscious of noises and the degrees of softness and loudness of noises.

Indirect Aim :

To help the child prepare himself indirectly for writing in two ways, by refining his wrist movements and by making him conscious of the sound of his spoken language, which is an indispensable preparation for writing.

To help the child overcome the unreasonable fears of noise and sounds, by making them interested in sound and noise and by investigating their meaning, direction source and distance.

Exercise

Name-Lesson is possible by this noise boxes.

Names are — "LOUD" AND "SOFT".

Check your Progress :

Q.1. Why we move our wrist vertically in Noise-box?

Ans. Indirectly it helps the child for writing by refining his wrist movement.

Q.2. Why we give loud by first?

Ans. Child is more acoustics with larger sound.

Activity 5 □ Muscular Sense

“Long-Stair”

Material Description :

There also consists of Ten prismatic wooden rods, red in colour. The height of each rod is 2.5 cms. They all materialise in one dimension and the length of the rods go on increasing gradually by 10 cm. Starting from 10 cm to the smallest to 100 cm the largest.

It materialise the natural number of mathematical succession i.e. 1, 2, 3 10.

Display :

A special stool wants to display the material. The height of the stool is 30 cm. The area of the surface of the stool is $104 \text{ cm} \times 29 \text{ cm}$. Two low thin stripes of wood, each 25 cm, making a right angle are should be fixed at the left side of the stool 2 cm away from third edge.

Presentation :

Invite the child and show the child these rods brought to the working mat.

Shortest one we take first. So that the square faces of the rod is between the two hands and at least 3 fingers on the square faces and thumb and little finger supporting it. Bring the rods one at a time kept in different directions and all mixed-up.

Now we clean the left top of the mat. We first search the tallest one and put it on the left top corner. Then the 2nd one which put in front of 1st one and make sure that the left square face is the same line (i.e. use our left hand palm for arrange same line of the edge). In this manner we continue till the stairs are build.

Control of error : Lies in the child visual sense

Direct Aim :

To help the child become conscious of the three linear dimensions, their variations, and combinations by means of visual sense.

Indirect aim :

- (1) To help the child acquire co-ordination over the large movements of his own body.
- (2) To help the child prepare for arithmetic by forming his sensorial base in appreciating natural succession of numbers.
- (3) Helps the child have a sensorial experience (visual and muscular) of the meter and its regular sub-division.

Age : 2½ to 3 years of age.

Exercise : In long-stairs — two exercise are possible like pink-tower.

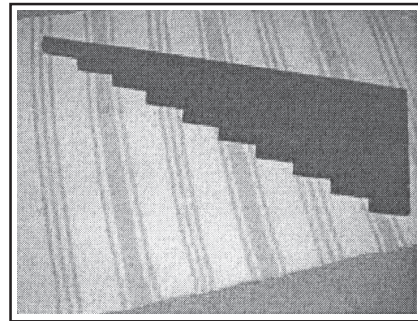
Special Exercise with Long-Stairs

Ex. 1. : Bring the rods and arrange them in succession on the mat. Then put the big rod at the top of the mat and then put the 2nd largest rod near the previous one. Then child see a gap and search the rod which will fill-up the gap.

In this way child will do the activity.

Ex. 2. : Keep the longest on top of the mat and keep any one rod below the longest rod and make a gap. Child will search the proper rod which will fill up the gap.

In case of 5 no. rod, there is no other rod like 5. So this rod take double for fill-up the gap.



Ex. 3. :

(a) Invite the child and bring all the rods and keep it succession on the mat.

Isolate any one rod and then put any one next to it and fill up the gap. [Every time gap has been fill; put all the rods back to the circulation and continue].

(b) Same as (a) but here keep the rods in scattered.

With Long Stairs 'Name-lessons' are possible here.

Names are —

- (1) Short and Long
- (2) Short-Shorter, Long-Longer.
- (3) Short-Sorter-Shortest
Long-Longer-Longest.

Check your Progress

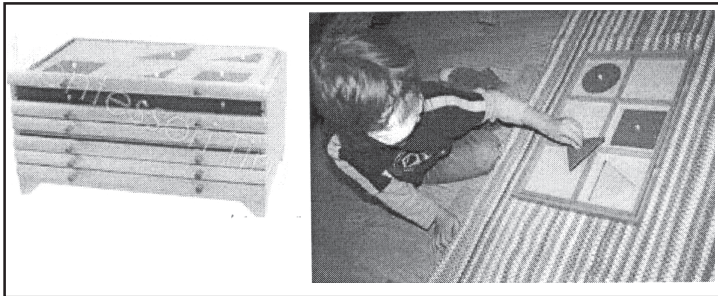
Q.1.

Ans.

Geometrical Cabinet with Geometrical Tray

Material Description :

In a geometrical cabinet, there are six drawers with two knobs in each drawers. In the drawers there are geometrical inset. These insets are light blue in colour and cut out of square plaques of wood. The plaques in which these figures are fixed. The measurement of the plaques are 14 cm × 14 cm and yellow in colour. In middle of each of these figures have a knob, identical like knob of cylinder bocks. Floor of the drawer is also of the same blue colour as those of the figure.



Content of these drawers :

1st drawer : In the top most drawer we have a series of triangles (according to the sides and angles) :

(1) Equilateral triangle; (2) Isosceles triangle; (3) Scalene triangle; (4) Right angled triangle; (5) Acute angled triangle; (6) Obtuse angled triangle.

2nd drawer : In the 2nd drawer here we have a series of rectangular quadrilateral. One of the pairs of these rectangles is 10 cm and other goes decreasing from 10 cm to 5 cm.

3rd drawer : There are series of polygons. All the polygons are inscribed on 10 cm circle. The base of the polygons are parallel to the base of the frame. The polygons are pentagon, hexagon, heptagon, octagon, nonagon and decagon.

4th drawer : Here we have series of six circles, whose diameter ranges from 5 cm to 10 cm.

5th drawer : Here we have four figures. These four figures are fixed in these manner; one side with Trapezium and Trapezoid and other side with Rhombus and Parallelogram and the space between the figures filled with either plaques or wood.

6th drawer : Here we have four regular curvilinear figures.

One side with “Ellipse” & “Oval” and other side with “Curvilinear triangle” & “Rosette”. The space between the figures filled with either plaques or wood.

In addition with the cabinet, we also have a tray, which we call “Presentation Tray”.

Tray : This is a wooden tray whose dimension corresponds to flat of the drawers. In this tray we have three basic figures in the form of insets. The sides of the square; and triangles and the diameter of circles are all 10 cm. On the top of the board, there is a triangle

between two entire plaque of wood. Below the row, is an entire plaque of wood between the square and circle.

There is a wooden framework attached to the back of tray by hinges. When closed by means of hooks and eye arrangement it keeps the frame immobile. This is the tray we are going to use for Presentation.

Presentation :

Presentation can be given on a mat or chowkie.

Invite the child and ask, “would you like to see same activity with geometrical cabinet”?

Then bring the presentation tray at the place of presentation.

Now say the child, “Pick up the figures from the board. The figures are hold like cylinder block and keep it on the mat as a scattered. Child does this. Now adult pick-up any figure (here circle) with left hand and say the child, “Watch, what I am doing”.

Then adult look the figure and put the index and middle finger’s tip of the right hand below the figure, and then tracing the figure as light as possible and say the child, “Watch”. He stops the tracing where he start and tracing the figure at clockwise direction.

Then adult invite the child to do the same. Child take the figure and trace the figure like adult. After tracing, child kept the figure on the mat. Then adult pick-up the figure and say the child, “Watch, in the board, which gap is fit for this figure.” Child search the board and indicate the gap which is fit for that figure.

Adult says, “Are you sure, it is for that? Please trace it feel that it is same as before figure.” Then adult show the child, how to trace the gap of the frame. Adult put same finger’s tip as the top of the figure of the frame and tracing anti-clockwise direction and stop where he start. Child do the same. Then child put back the figure on the gap of the frame. Then take another figure and do the same.

Here we use not only our visual sense but also our muscular sense. The muscular sense helps the child to understand the movement of the pattern.

Foot Note :

- (1) The child must be free to presented in the presentation tray; then child can free to do the activity with any one of the drawer.
- (2) He also free to use more than one drawer at a time.

Control of error

As far as tracing is concerned it lies in tactile sense.

As far as the activity is concerned it lies in the material.

Direct Aim :

To help the child become conscious of the fundamental geometrical shapes by means of his visual sense and also muscular sense and then conscious of shapes in general.

Indirect Aim :

- (1) To help the child to prepare himself for systemic study of plane geometry.
- (2) To help the child to prepare himself indirectly for writing and reading by further prehensile co-ordination of three writing fingers involved in holding a writing instrument.
- (3) His writing fingers acquire lightness of touch through practicing.
- (4) To help the child to acquire the motor capacity to trace and therefore be able to reproduce the well defined shapes of letters.
- (5) Also helps the child to develop muscular memory for shapes and visual memory for reading.

Round about 3 years of age.

Check your Progress

Q.1. Why do we present the presentation tray not the other tray in the geometric-cabinet?

Ans. In Presentation tray there are three basic figures.

Geometrical Cards

Material Description :

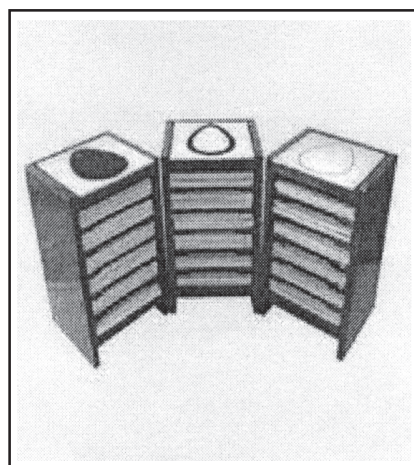
There are three sets of cards. These cards are square in shape and 14cm × 14cm measurement. These cards reproduce all the figures found in geometrical insets and also all the figures found in the Geometrical Cabinet. The colour of the cards same as the colour for the Geometrical Insets i.e. Blue.

1st set : The 1st set of cards show the entire area of those figures with blue colour.

2nd set : The 2nd set of cards reproduce those figures as bounded by 1 cm wide outline.

3rd set : In the 3rd set of cards we found the imprints of same figures but as bounded by outline which is 1 mm narrow wide outline.

In each of the sets there are 6 groups of cards corresponds to found the Geometrical Insets.



So the 6 groups of cards are found in different compartment in the boxes which we have Geometric cards. The figures of geometry are drawing in the side of the geometrical cabinet, by seeing this drawing child can understand that which figures are in which compartment.

There are 3 boxes; which contain 6 cabinets.

Presentation : (I.A. – I.P.)

Invite the child to choose any one group of cards from the 1st set and invite the child to put them nicely on the working mat such that there are no space between the cards. Now ask the child, “To see this figure, bring the Geometrical Inset’s drawer where the figures are.” Then child take out all the figures from the drawer and he put back the empty drawer. Then adult says, “watch, what I am doing?”

Then adult takes any figure and compare with the card’s figure. When he reaches the conclusion regarding the identity of the figure and then keep the figure on the card with one intentional movement. Thus it is the pairing activity of the cards and the figure. Then take other figure and do the same.

Here if child makes any mistake then he understand the own mistake and correct it by himself.

In the same manner child does the activity with 2nd and 3rd set of cards.

Control of error : Lies in the child’s visual sense and help in the material.

Direct Aim :

To help the child associate the three dimensional representation of geometrical figures (Geometrical Inset) with the two dimensional representation (Geometrical Cards) for all practical purpose and thus move towards farming concepts of figures as areas bounded by lines.

Indirect Aim :

- (1) To help the child to prepare himself for systemic study of geometry.
- (2) To help the child prepare himself indirectly for reading by further developing for visual memory for shapes.

Age : Round about 3 years of age, after plenty of experience of geometrical insets.

Check your Progress :

Q.1. What is direct and indirect aim of Geometrical cards.

Ans. See Direct and Indirect aim.

Constructive Triangle

Material description : There are four boxes of constructive triangle.

First Box : It is a rectangular in shape. In this box are find— one pair of equilateral triangle, each of these have a narrow black line along are of its side and the colour of the triangle are yellow. **Two pairs of right angled isocetes triangles ; one pair green** having a black line on the hypolenus & **one pair yellow** having black line one of its shorter side.

Three pairs of right angled. Scaleu triangles ; **one pair** yellow in colour having black line along the shortest side. **One pair** gray having black line along the hypotenus.

One pair green having black live along the longer Cathetur, **One obture angled scalene triangle red in colour** & having black line along its longest side.

One right angled scalene triangle (shorter than the farmer) **red** is colour having black line along the longer side which is equal to the longest side of the obture angled scalene triangle. There triangles are found arranged in an orderly manner but they should not kept in that manner they assumed after performing the actively correctly.

In the same box on the lid there are **all blue triangles without any black lines** along their sides.

There are **one pair** of each triangles. **One pair equilateral triangles ;** One pair right angled isosceles triangles ; and one pair right angled sclene triangles. There are also **one obture angled** scalene triangle and **one right angled Scalene triangle similar to the red triangles.**

Over the floor of the lid (reverse side) the different figures are printed which can be constructed with the triangles.

Along the shorter (outside) side of the box, a green dot and on the reverse side of the triangles there are the same green dot keep for the indication mark.

Second Box : It is an equilateral triangle in shape. In this box there have **one large gray equilateral triangle** without any black line. **Two identical** green right angled scalene triangle each having a black line along is longer cathetur.

Three yellow obtuse angled isosceles triangles each having black lines along the two equal sides.

We have **four small red equilateral triangles.** Here black lines of three of them for one side and one of them black lines in all sides for perimeter. (These four form equilateral triangle divided into quators by medials).

The shape of the 2nd Box is triangle. So it is triangular box.

If the fraction of a figure triangle ; which have been cut in minimum number figures ; we get again triangles.

There is a yellow **dot** in the wall of the 2nd box and yellow dot in the reverse side of the triangles of this box.

Third Box : There are 10 obtuse angled isosceles triangles; a third of large triangle in the 2nd box.

Two of them are red in colour with black lines along their largest side (which form rhombus).

Two of them are gray in colour with black lines along are of their equal sides. (We can form a parallelogram with joining the black lines and can also form reflex angle quadrilateral).

There are rest are yellow colour obtuse angled isosceles triangle. Three of them have black lines along their all the sides and rest three have black lines along their longest side.

Here we also have one large equilateral triangle— yellow in colour ; identical of the gray triangle in the 2nd box.

(This big equilateral triangle is half of a hexagon.)

On the reverse of each of the triangles in this box have a red dot & the same dot have also an the wall of the 3rd box.

The Fourth Box : Here we have fourth box. We callit quarter of fourth's. Here we have small eleven equilateral triangles.

(a) Two of them are red in colour. Each triangles have black live one of the sides. These triangles form Rhombus.

(b) Three of them are green in colour. Black lines are two sides of are triangle and two of them black lines have are side.

(c) Six triangles are there gray in colour. Each of them have black lines twoof its sides and they make a hexagen. This made by six quaters.

In the same box, we have six red obtuse angled isosceles triangle ; even there are quaters though they similar but they are not equivalent.

So here nice scope for the child to discover the all point of view ; the phenomenon.

See ; this black line here and another also. Then join the black line with opposite direction & say, "Look" then child said that "It is a square."

1st easier phenomenon to discover the *Identical* in respect of all senses.

2nd easy phenomenon to discover the similarly.

3rd easy phenomenon to discover the equivalent.

Here also we have are entire yellow equilateral triangle in 4th box. No black line on it.

Blue dot have at the reverse of the all triangles & also on the wall of the box.

The dots help the child to know to which box it belongs and with the figure of different box be can make various discoveries.

Presentation with the 1st Box

(I.A.—I.P.) : The child who have a plenty of experience with geometrical Insets and started knowing the names of the figures then we present there constructive triangles. The child also know the names of quadrilaterals & hexagon. The child must be aware of the triangles and conscious of the triangle and discover that the triangle is the various constructor then he comes in conclusion by this triangle.

The activity should be performed on the working mat one at a time & keep them all mixed-up.

Tell him to hold the traingles along the sides and corners with his two hands. Ask him to take any one triangle (except Red). Then ask him to find out the triangle which is exactly the same. Then we explain to him, the same colour, shape & size. Ask him, let's make sure whether they are same by putting them together. Then ask the child to find out other triangles which are exactly same.

Then two red triangles are left which are not same in all point of view.

Tell him, "There are left only two triangles which are not same in shape & size but same in colour. So we put them to-gether."

Then choose the two triangles which can make a square. Square is a familier shape to the child. So we choose these two triangles first. It is easier to recognise for a child. Draw his attention to the black lines of the triangles and ask him to put them in such amanner that the black lines will be together, not in the out-side of the figure.

Them tell him, "Look, it is a square."

Then take other pairs ask him to make other figures in same manner. Always draw his attentions to the black-lines of the triangles. Then lastly draw his attention to the red pairs. Put them together which makes a trapizium.

Every time the child taking & putting back the materials, he come accross the bue triangles. If he asks about them & if he want to see presentation, then we give him presentation with blue-triangles.

Presentation of Blue Triangle

(I.A.—I.P.) : Ask the child to bring the material & ask him to take out and mix-up all the Blue triangles. Ask the child, "Do you remember the figures first we made ? If you forget please look at the lid of the box, where the pictures have which we made first by the triangles of 1st Box. Look there are many other figures which we don't make at the first time. Please make the figures using the triangles & make the new figures breaking the former figures."

If the child cannot understand then show the figures painting with the different colours of the triangles of the 1st box ; at the reverse side of the lid. The child watch the painted figures & then he can make the figures without guiding by black lines.

If the child say that the painted figures are small & the triangles are so big ; then ask him first to make the figures using the multicoloured triangles. Then he understand the

activity. Then ask him to construct the figures using the blue triangles & ask him to make other figure breaking the former figure.

We do not present any other box to the child but we suggest to them to use the boxes and to see that every black line is used to put the triangles together. The child can manage the second, third and fourth boxes by himself and we can suggest to the child that no black line should be seen outside the figures constructed. When the child is ready to use all the boxes, then he can discover all the possibilities.

Control of error : No black line should be seen from the border of the figure constructed.

Direct Aim : To help the child to discover the function of the triangle as the construction & the divider.

Indirect Aim : To help the child prepare himself indirectly for the systematic study of plane geometry. (e.g. working with the constructive triangles help him to come across the geometrical phenomenon, identity, equivalence & similarity).

And also help him to consider figures from the point of areas and the concept of fraction.

Age of Presentation : Round about $3\frac{1}{2}$ years after the child have plenty of experience with geometrical insets.

“Baric Tablets”

Material Description :

We present baric tablets for Basic sense which are located in our muscle register.

We have 3 boxes for baric tablets. These three boxes are made of wood, in natural colour, rectangular in its shape. They are all highly polished and brightly varnished.

There are 10 tablets on each of the boxes. Each of the tablets in 1st Box; 12 gm weight and the 2nd box 18 gm weight and in the 3rd Box; 24 gm weight. The colour of the 1st box tablets are brown and the 3rd box are dark brown.

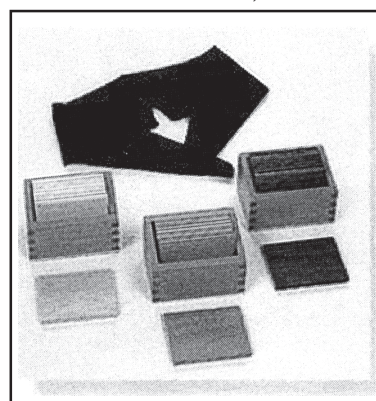
Presentation : (IA. – I.P.)

Adult and child goes to the place where the baric tablets are displayed. They bring two boxes i.e., 1st and 3rd.

The boxes are kept at the right of the adult.

Adult take one light baric tablet and say to the child, “Will you feel the weight of the tablet?” If child agrees then adult show him how it is put on the fingers which are spread and how to move the hand up and down slowly.

Then child spread his fingers and adult put the tablets on the finger and move the hand up and down slowly.



After moving it sometime, adult ask the child, “Let we take another tablet also on the other hand.”

Now adult show the child how two hands move at a time; just like balance i.e., one hand up and another down.

The adult take one baric tablet and put it on the other hand of the child. Child move two hands and feel the weight.

Child says, “One is light and other is heavy”. Adult ask the child, “Put down one tablet,” Suppose child put down light one; then adult give another heavy tablet on that vacant hand and say, “Move, as the same.”

Child do this and say, “Two are same weight.”

Adult say, “Sure; you are more sure; do this by exchange the tablets of two hands.”

Child do this and say, “I am sure; they are same weight.” Adult ask, “Keep them one upon other on the mat.”

Then adult give two light tablets of same & child do same activity and makes pair.

Here child use only four tablets. After that child can use all the tablets of 2 boxes.

Child also do this activity with eyes close.

Control of error : Lies on the visual sense

Direct Aim :

To help the child to become conscious of heaviness and lightness of weight by use of Baric Sense.

Indirect Aim :

Nothing particular.

Age : Around about 3½ years of age.

Foot Note :

With this material we give name-lesson as below :

Ordinary— light-heavy.

Comparative— light-lighter

or

heavy-heavier.

Superlative — light-lighter-lightest

or

heavy-heavier-heaviest.

Acknowledgements

I am particularly grateful to the under-mentioned books.

- (1) The Absorbent mind — Maria Montessori
- (2) The discovery of the child — Maria Montessori
- (3) Helping one helping all (1) — A.M. Joosten and S.R. Swamy