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Colored Cylinders

Age

- 3 to 4 years

Language

- thick, thicker, thickest, thin, thinner, thinnest, short, shorter, shortest

Control of Error

- visual disharmony

Material

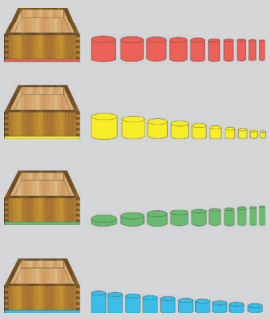
- Four boxes of cylinders, ten cylinders in each box. The four boxes of cylinders, varying in one, two, or three dimensions, form the following graduation of exercises from easy to difficult:

#1 The cylinders are equal in height, but decrease in diameter (two dimensions vary: length and width). The cylinders and lid are red.

#2 The cylinders decrease in height and diameter (three dimensions vary: length, width, and height). The cylinders and lid are yellow.

#3 The cylinders increase in height, while decreasing in width (three dimensions vary: length, width, and height). The cylinders and lid are green.

#4 The cylinders are equal in width, but decrease in height (one dimension varies: height). The cylinders and lid are blue.



Aim

Direct

- development of visual discrimination of size
- sharpens child's visual discrimination of gradations of size in a series
- development of concentration, order, coordination, and independence
- responds to the sensitive need for order in the child

Indirect

- preparation of the mathematical mind - ten cylinders as a preparation for the decimal system
- development of awareness of and appreciation for beauty of design

Point of Interest

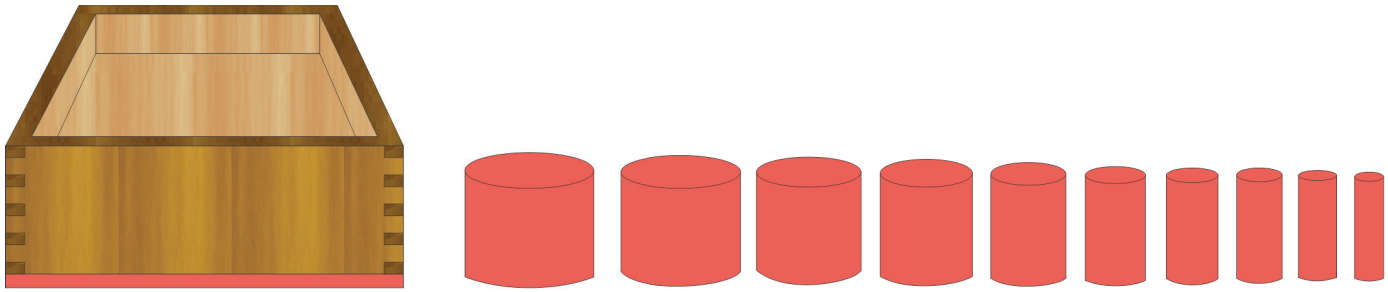
- the progression of sizes of each set of cylinders

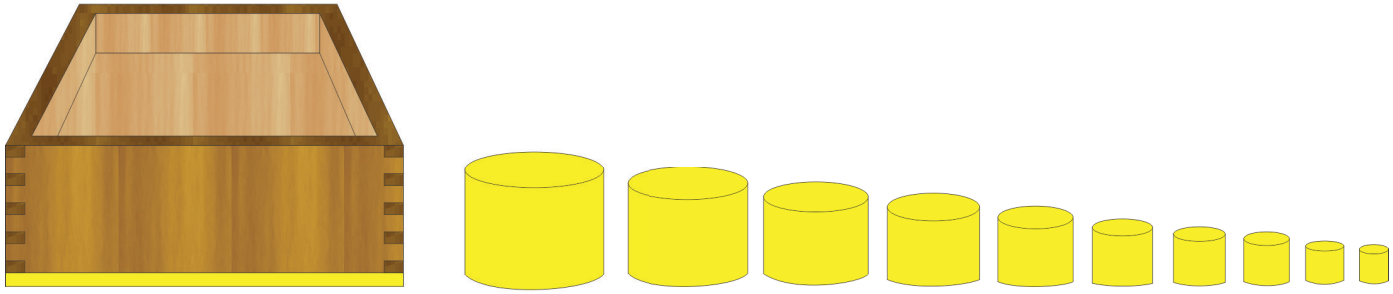
Note

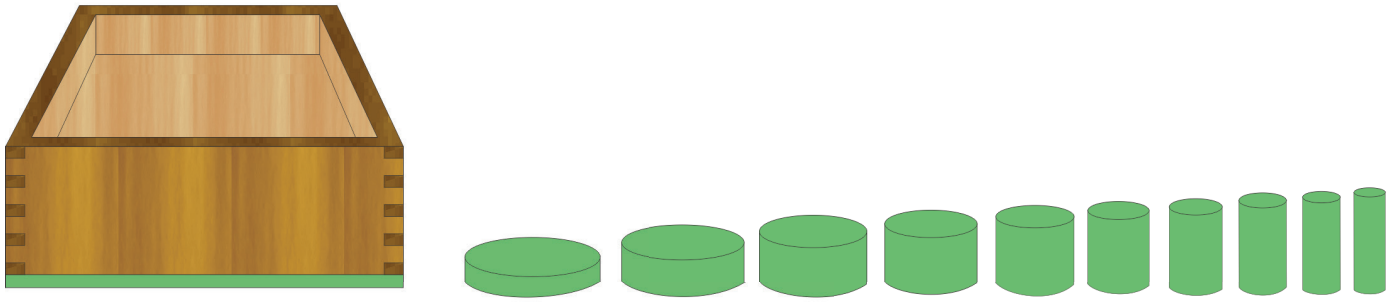
1. Each box of cylinders follows the same order of presentation: (a) horizontal gradation, (b) vertical gradation.

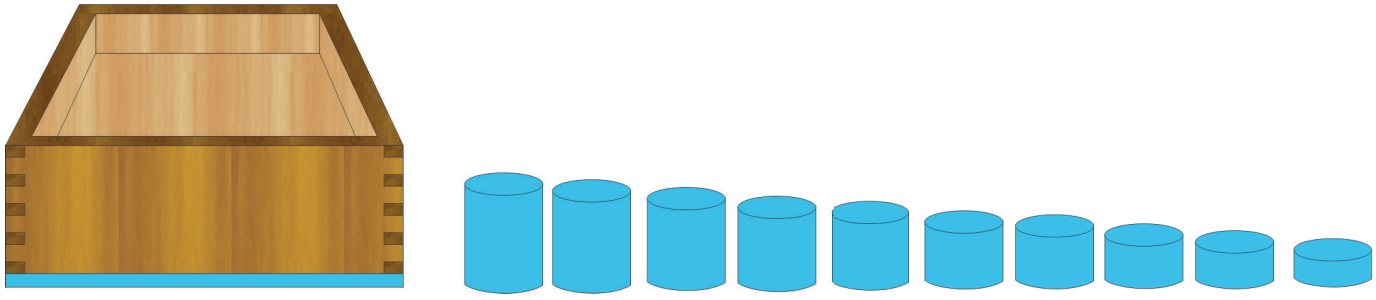
2. Lining the bottom of the box with felt reduces chipping of the cylinders.

3. Replace cylinders in the box, beginning with the largest cylinder, to ensure enough room for all ten cylinders to be positioned upright.









(In Boxes)
Visual Sense
Discrimination of Size
Grading

Presentation 1: Horizontal Grading

When the adult initiates the selection of the material:

1. Invite the child to work with the Colored Cylinders.
2. Show the child where the Colored Cylinders are located on the shelf.

   When the child makes the selection of the material, begin with the third step after naming the material for the child.
3. Indicate the procedure for carrying the material: the unopened box is carried in two hands, thumbs on the top, fingers underneath.
4. Place the box on a table or smooth rug. Place the box in the upper left corner. Remove the lid and place it beneath the box or next to the box if the lid is to be replaced after the materials are removed.
5. Say, "I will grade the (red) cylinders from thickest to thinnest."
6. Remove the cylinders in mixed order in a straight line to the right of the box.
7. Select the largest cylinder and place it to the left and toward the bottom of the work area. Continue with the remaining cylinders, grading horizontally from left to right.
8. Beginning with the largest cylinder, return them one at a time to the box.
9. Return the material to the shelf in the manner indicated in step #3.

Presentation 2: Vertical Grading

1. Proceed as in Presentation 1.
2. Place the largest cylinder on the table in front of the child.
3. Select the next largest cylinder and center it on top of the first cylinder.
4. Grade the remaining cylinders, one at a time, centering each, noting that they are graded from thickest at the base to the thinnest at the top.

Variation 1: Combining Boxes of Cylinders

1. Comparing the red cylinders (#1) with the green cylinders (#3).

   (A) Comparison of Height:

   (1) Place the red cylinder box on the table.

   (2) Remove all the red cylinders in mixed order and then grade them horizontally from thickest to thinnest.

   (3) Place the green cylinder box on the table.

   (4) Remove all the green cylinders in mixed order and grade from widest to thinnest in front of the red cylinders.

   (5) "Can you find any that are exactly the same height?" Child can volunteer other similarities.

   (B) Comparison of Surface Area:

   1. Superimpose the green cylinders on the red cylinders, matching surface areas. "They have the same surface area."

2. Comparing the red cylinders (#1) with the yellow cylinders (#2).

   (A) Comparison of Height:

   (1) Place the red cylinder box on the table.

   (2) Remove all the red cylinders in mixed order, and then grade them horizontally from thickest to thinnest.

   (3) Place the yellow cylinder box on the table.

   (4) Remove all the yellow cylinders in mixed order, and grade from largest to smallest in front of the red cylinders.

   (5) Move the cylinders close so that they may be compared in height.

   (B) Comparison of Surface Areas:

   1. Superimpose the yellow cylinders on the red cylinders, matching the surface areas. "They each have the same surface area."

3. Comparing the green cylinders (#3) with the yellow cylinders (#2).

(A) Comparison of Height:

(1) Place the green cylinder box on the table.

(2) Remove all the green cylinders in mixed order, and then grade them horizontally from widest to narrowest.

(3) Place the yellow cylinder box on the table.

(4) Remove all the yellow cylinders in mixed order, and grade from largest to smallest in front of the green cylinders.

(5) Move the cylinders close so that they may be compared in height.

(B) Comparison of Surface Area of the Bases of the Cylinders:

(1) Superimpose the blue cylinder on the green cylinder that is of the same surface area.

Variation 2: Memory

Proceed as in Presentation 1 through step #3. Place the cylinders in order. Place a second rug a distance away. Select the largest cylinder, and carry it properly to the second rug. Position the cylinder to the left side of the rug. Continue until all cylinders have been graded from largest to smallest, left to right. This is the first memory variation. This is the order:

(a) Order to order

(b) Mixed order to order

(c) Mixed order to selecting the middle cylinder and grading to largest; then complete the gradation by grading to the smallest

Variation 3: Blindfold

Proceed as in Presentation 1 through step #6. A blindfold is introduced to make this a stereognostic exercise.

(a) Grade the cylinders horizontally, as in Presentation 1.

(b) Grade the cylinders vertically, as in Presentation 2.

Variation 4: Mystery Bag

Proceed as in Presentation 1 on a rug, placing the cylinders in the mystery bag. The child feels the cylinders and selects the largest cylinder. Continue in this manner from largest to smallest.

Variation 5: Ordinal Numbers - first, second, third

Proceed as in Presentation 1 through step #6. Verbally assign an ordinal number to the first three cylinders, moving the first three cylinders close to the child. Proceed with the Seguin Three-Period-Lesson. At another time, continue introducing ordinal numbers.

Variation 6: Base Cards

Ten 3" square cards with solid circles corresponding to the bases of the cylinders. Place the ten squares with the solid circle bases on a rug, and place them in a stack at the upper left. Beginning at the left, select a cylinder and match it to the circle base. Continue until all cylinders have been matched to the bases. Then select the thickest cylinder, and move it with the card to the upper left area of the rug. Select the next thickest cylinder, and move it with the card to the right of the largest c. Proceed in this manner until the cylinders with cards are graded.

Variation 7: Base Cards 2

Ten 3" square cards with circles, cut and painted to correspond to the bases of the red and green cylinders. Match the cylinder of red and green to the corresponding card. Stack the red and green cylinders which match the card, and place them in front of the card. Continue with red and yellow cards and green and yellow cards.

Variation 8: Spinner

With a circular piece of cardboard with a spinner in the center, draw the bases of the cylinders. Spin the spinner. The base to which the arrow points indicates the cylinder to be matched to the base. Continue with the spinner until all cylinders have been placed on the bases.

Variation 9: Cooperative Learning

Place the cylinders in mixed order at the top of the rug. Alternately, each child selects the thickest cylinder and places it in graded sequence.

Memory, blindfold, behind-the-back, ordinal number, and base cards may be used in cooperative learning.

Variation 10: Matrix

A large board 33” by 33” with an eleven-space matrix drawn from top to bottom and left to right. Along the top spaces, trace the diameters of the red cylinders, moving from largest to smallest. Along the left side, mark the top and bottom of the blue cylinders, moving from tallest to shortest. Select one cylinder from the box, and place the cylinder in the matrix by height and diameter. Proceed with the remaining cylinders and the remaining boxes.