

CUBE-IT

Creation of an Educational Toy and  
an Educational Substantiation of the Product

An Honors Creative Project (ID 499)

by

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Ball State University

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## CUBE-IT: Creation of an Educational

### Toy and an Educational Substantiation of the Product

CUBE-IT is an educational product which functions as an entertaining toy as well as an educational aid to learning. This toy, as it can be called, is based on the building block idea which interests many children and serves as an exercise in muscle control and finger dexterity. My additions to this basic idea consist of incorporating color and texture onto the faces of the blocks. Also included with the blocks are small placards with visual symbols which correspond to the alphabetical letters. Initial sounds of the symbols relate to the sound made by the letter, for "A" ...apple. Acetate overlays, which can be attached to the placards, are printed with the names of the symbols.

The toy, in its entirety, consists of twenty-six small (2"x2"x2"), white, vinyl cubes arranged in layers of nine. Each layer rests on a placard of visual symbols. The kit is contained in a larger, white vinyl cube which has gripper snaps that can be easily manipulated. The cubes are constructed of non-toxic, malleable vinyl and stuffed with a soft substance. Three of the six sides of the cube are used for motivation of the child. One side of the cube is "painted" a color and no two cubes have the same shade. The second side has a textured material which is "color-keyed" to the painted side. This material is visually patterned or tactically stimulating. Textures ranging from canvas to chamois are used. The third side has the alphabetical letter in the same color as the painted side.

The illustrated placards each have nine squares arranged in rows and columns of threes. From left to right, are colorful but accurate symbols in alphabetical order. For example, on the first card, in square one, is an Apple.

Two acetate overlays are provided with each placard. One sheet has the words in capital letters and the other in lower case letters. Each word falls into the square with the corresponding symbol.

### Educational Substantiation of Product

CUBE-IT is for use by the two to eight year old. This chosen age group is based on early childhood language development. This age span covers the period in a child's life when basic concepts are learned, identification begins and reading and language skills formulate. It is never too young to introduce a child to stimulating materials. For this reason, this product is not restricted to use by school-aged children. "Parents wrongly think that it is soon enough for a child to learn when he starts school. In fact children find great pleasure in learning and practicing their new skills and from early infancy they should be given the necessary play materials. The child will then learn to use his hands with his eyes, to investigate, to explore, and to use his imagination"<sup>1</sup>

This product can be a pre-school tool. Many children can read before entering kindergarten and proper stimulation can aid this process. Other children, not as advanced in this area, are in need of drills to strengthen motor control as well as their abilities to learn serial order of letters and identification of sounds.

A child forms concepts through his ability to perceive form through visual motor contact.... As the child gains experience relating to objects in space, he learns a great deal about them as well as himself. Through tactual and kinesthetic experience he comes to know sizes, shapes and textures. As his color vision matures he is able to differentiate color. <sup>2</sup>

This product successfully fulfills these needs. The cubes represent objects in space which can be directly handled and manipulated. They can be moved at will and explored for their different qualities. The tactile experiences are numerous: vinyl,

and dozens of textured fabrics and materials. The colors are vibrant and cover a wide range of shades and blends.

The cubes can be used as rudimentary building blocks. They can be used, according to the interests of the child, around one focal point. One day the letters may be arranged in order to make small words. This is significant for the pre-schooler, in that, "A fairly common age to begin to recognize letters is at  $3\frac{1}{2}$  to 4 years of age."<sup>3</sup> Another day may bring about the manipulation of colors.

All of these play-practices increase eye-hand control which is so stressed as a pre-reading skill. "Eye-hand coordination skill includes the ability of the eyes and the mind to direct the hands in the reaching out and grasping and manipulating both independently and as a coordinated team. It means getting the 'feel' of differences in size, shape, texture, and spatial relationship that enables children to be conscious of likenesses and differences, an awareness that is so essential to reading."<sup>4</sup>

"Research is showing...that vision itself is aided by movement .... Movement in relation to objects is absolutely essential for the child to learn directionality, and later on for the child to be able to remember visually what his body has learned, so that he can, for example, eventually focus visually upon a word at the top of a page in a book."<sup>5</sup>

The placards are also significant to this pre-school group. The pictures can interest a child as young as two years of age. At two, a child is able to name pictures of things familiar to him. Thus the picture cards could be quite stimulating to a child of this

age. He would be able to expand his recognition to eventually include all symbols in the kit. "The 2 to 2½ year old often likes tiny pictures. That is why he often likes a picture ABC book filled with little, separate colored pictures." <sup>6</sup>

When replacing the cubes in the kit, more coordination is stressed. To replace nine cubes on every placard (and in three layers) requires skill. In reference to wooden building blocks, a related statement can be made, "At clean up time all the blocks must be put back on the shelf, again requiring eye-hand coordination." <sup>7</sup>

Pre-school learning greatly influences later achievement. Certain skill building tools can enhance early motivation. The following list describes the emphasis that productive pre-school training can provide. The child should:

1. Become aware himself through spatial relations. These should be particularly designed to develop gross motor control and coordination, balance, laterality and directionality.
2. Have opportunities to develop fine muscle control and especially those involving eye-hand coordination.
3. Have many opportunities to manipulate objects in order to gain knowledge that will lead to concept formation.
4. Have many opportunities to manipulate objects in a time-space sequence in such a manner that the child learns to control both his own movements and things in his environment.
5. Have many opportunities for verbal communication, so that as his body learns, he is able to learn verbal symbols for what he knows. 8

This toy can successfully support these ideas.

As the child enters kindergarten, many of the same skills

learned in nursery school are reemphasized. However, the age of the child brings on new interests and abilities.

"Five loves anything to do with letters." <sup>9</sup> At this point the toy can be used to further emphasize sequential order of the alphabet as well as the recognition of words. The cubes can be used to form words and the placards can stress the learning of the alphabet. The left to right order (in rows from top to bottom) strengthen the need to perceive printed matter from left to right. When following the alphabetical symbols (or replacing the cubes in order) the child also learns the top to bottom movement needed in reading a page in a book.

The acetate sheets can now be placed over the visual symbols and strengthen word recognition and association. "...at the later age of 5 to 5½ (a child) can move from pictures to recognition of printed words. The child's progress in recognizing single words moves rapidly at 5½ to 6 years. He is now beginning to recognize selected words on a page. " <sup>10</sup>

As word recognition begins, language development increases. Words take on meaning and significance. According to Piaget, "Language, a very important symbolic activity, also has its most rapid development during the early years of this stage (concrete operations, 2-11 years). Words come to stand for things, and action can sometimes be replaced by thought. " <sup>11</sup>

"Six wants to know the sounds of the initial letter." <sup>12</sup> Considering this, the sounds of the letters on the blocks take on new meaning for the child. The symbols on the placards, correspondingly, begin with the initial sound of the letter being

stressed. "The six-year-old is beginning to read words as well as letters. In recognizing words, he makes major use of the initial letter, a trait which is characteristic of his increasing interest in beginnings." 13

Because of the emphasis placed on letter sounds, CUBE-IT supports a phonetic learning approach (as opposed to the newly used i.t.a. method). Stress is placed on our known letters and the sounds they can make. The use of the symbols on the placards, along with their included spelling, requires awareness of both sounds of words and their spellings. "... as we isolate the initial sound from these known words, we are using a phonetic element. Therefore, this may be known as a linguistic-phonetic approach." 14

By the age of seven, lower case letters can be introduced and used in printed material. The acetate sheets provide spelling drills and visual contact with small letters.

The symbols on the placards were chosen with care. The initial sound of the word was considered first. The most common sound made by a letter was important. An object was chosen which could generally be called by only one name. Consonant blends (gl,bl,cr) and diagraphs (sh,th,ch) for initial word sounds were eliminated, except in the unavoidable case of "qu".

### Skills and Attitudes Developed in Kindergarten (abridged)

- I. Getting ideas from pictures
  - A. Telling about a picture
    - 1. Increasing language facility
    - 2. Recognizing objects
    - 3. Making interpretations beyond what is seen
  - B. Arranging pictures
    - 1. Awareness of sequence in action and in time
    - 2. Development of the left-to-right mechanics in reading
    - 3. Telling stories from picture sequences
- III. Handling books
  - B. Awareness of left-to-right sequence and top-to-bottom procedure
- IV. Auditory and Visual Perception
  - A. Listening for and identifying common sounds
  - B. Perceiving and locating sounds
  - C. Listening for likenesses and differences in sounds
  - F. Seeing and feeling likenesses and differences in form

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### Skills and Attitudes Developed in First Grade (abridged)

- I. Preparatory Experiences
  - A. Auditory Perception
    - 1. Recognizing likenesses in beginning word sounds
    - 2. Developing ability to name many words when an initial sound is given
    - 3. Developing ability to supply missing words when sentences are read and an initial sound for the missing word is given
  - B. Visual Perception
    - 1. Noting likenesses and differences in letter forms
    - 2. Noting likenesses in beginnings of words
    - 3. Noting differences in lower and upper case letters
- III. Phonics
  - A. Initial consonants
  - B. Digraphs (sh, ch, th)
  - C. Initial consonant blends
- VI. Picture Clue
  - A. Noting that a picture illustrates content
  - B. Using pictures as an aid to understanding

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### What's Involved in Being Able to Read?

- 1. Gross motor control
- 2. Fine muscle control
- 3. Eye-hand coordination
- 4. Ability to perceive a figure in space

5. Directionality - that is, the ability to perceive and orient oneself to the top, bottom, sides, front and back of the object (letters, page, etc.)
6. Ability to organize a temporal-spatial relationship, moving the eyes sequentially from one word to the next, left to right, top to bottom and page to page
7. Ability to differentiate characteristics of letters that make up words, small and capital letters, and words and pictures
8. Ability to classify or recognize common characteristics of words, pictures, numbers, letters, etc. 17

## The Disadvantaged Child

CUBE-IT could be used to teach the disadvantaged. Culturally deprived children often do poorly in school due to the lack of pre-school motivation and stimulation. The children did not have the tools with which to explore, experiment and manipulate. Many areas of interest cannot be pursued by the child and he fails to know about:

- a) differences in colors of objects
- b) differences in sizes of things
- c) differences in shapes of things
- d) words that express how objects feel<sup>18</sup>

Because of the lack of stimulation, the deprived child often has slow language development and a small vocabulary. CUBE-IT covers many needed areas in reading education through its symbols, letters and words. "In summary, disadvantaged pre-school children need a) to build ideas and concepts through intellectual stimulation and b) to develop oral language facility." <sup>19</sup>

## Footnotes

<sup>1</sup>R.S. Illingworth, "How to Help a Child to Achieve His Best," in Understanding the Young Child and His Curriculum, ed. B.C. Mills (New York: The Macmillan Co, 1968), p. 194.

<sup>2</sup>Ellen DeHart, "What's Involved in Being Able to Read?" in Understanding the Young Child and His Curriculum, ed. B.C. Mills, p.310.

<sup>3</sup>Frances L. Ilg, "The Child from Three to Eight - Implications for Reading," in Understanding the Young Child and His Curriculum, p.317.

<sup>4</sup>Verna D. Anderson, Reading and Young Children (New York: The Macmillan Co., 1968), p.77.

<sup>5</sup>DeHart, p. 309.

<sup>6</sup>Ilg, p.317.

<sup>7</sup>DeHart, p.312.

<sup>8</sup>DeHart, p.311.

<sup>9</sup>Ilg, p.318.

<sup>10</sup>Ilg, p.318.

<sup>11</sup>David Krech and others, Elements of Psychology (New York: Alfred A. Knopf, 1969), p.388.

<sup>12</sup>Ilg, p.318.

<sup>13</sup>Arnold Gesell and others, Vision: Its Development in Infants and Children (New York: Harper and Row Publishers, 1949), pp. 137-138.

<sup>14</sup>Anderson, p.183.

<sup>15</sup>Anderson, P.241.

<sup>16</sup>Anderson, p.243.

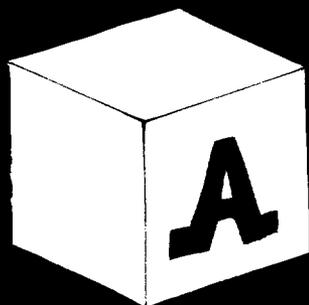
<sup>17</sup>DeHart, p.307.

<sup>18</sup>Mildred Betty Smith, "Reading for the Culturally Disadvantaged," in Understanding the Young Child and His Curriculum, p.326.

<sup>19</sup>Smith, p.327.

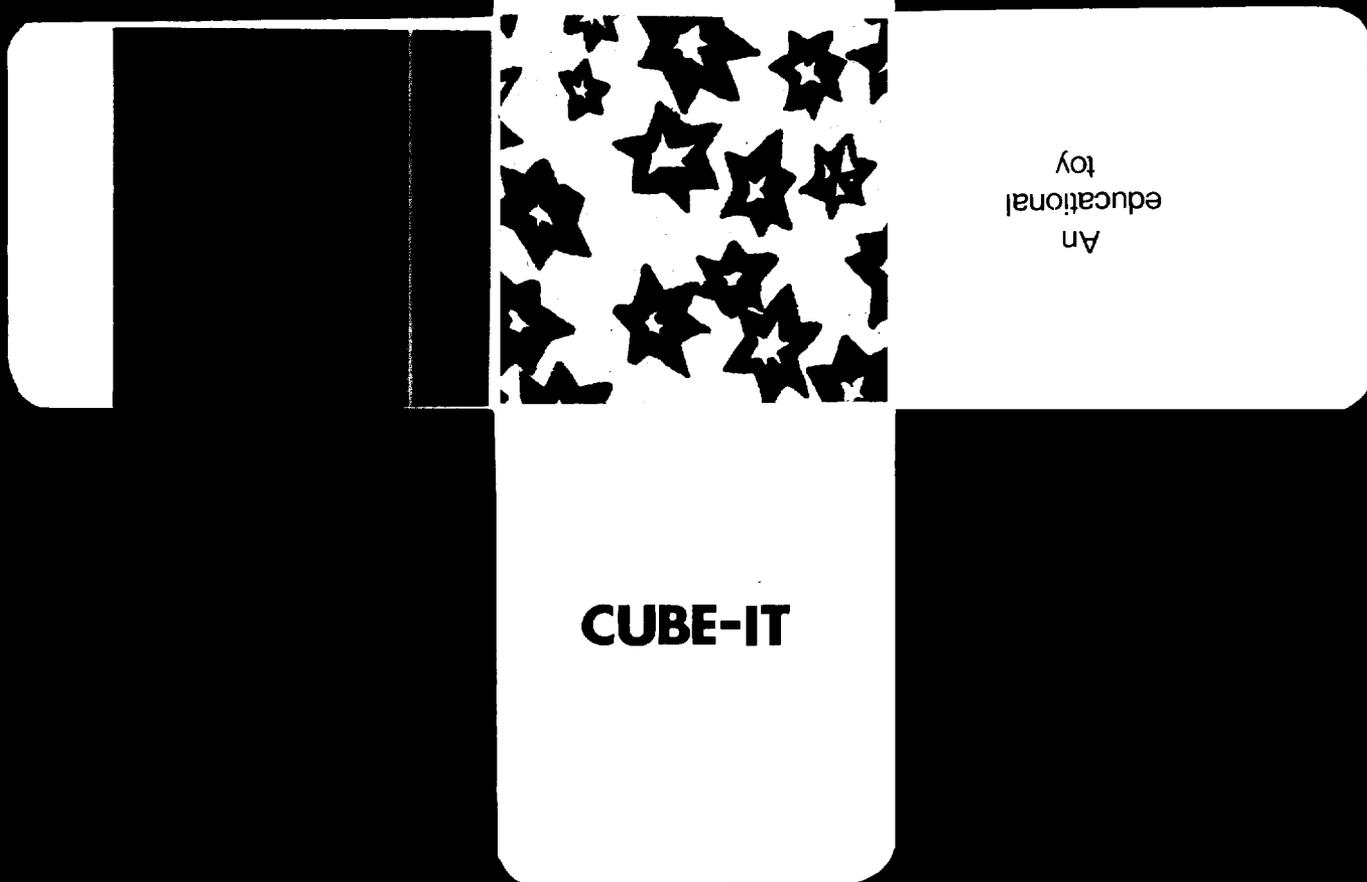
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## CUBE-IT

# PROMOTIONAL MAILER