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ABSTRACT

The purpose of this sequence of a working paper intended for inclusion in a curriculum manual to be published in the future, is to provide the child with concrete experience, opportunities to represent things symbolically, and to learn the nature of symbols and how to read them. Examining objects, acting them out, and experimenting with them, the child learns to make representations. By feeling, smelling, watching and describing, as well as dealing with real objects, the child's understanding is increased. At Object Level, children use real objects and places, while at Index Level, a child is helped to remember the whole object, given only one aspect or part of it, and uses his own mental images. (For related documents, see PS 006 089-091 and PS 006 093-094.) (RG)

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LEVELS OF REPRESENTATION

Part I: Experience with Real Objects:
The Object Level
and
The Index Level

High/Scope Educational Research
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THIS IS A WORKING COPY. It is being revised for inclusion in a curriculum manual we hope to publish in 1972.

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HIGH/SCOPE EDUCATIONAL RESEARCH FOUNDATION

PRESCHOOL DEPARTMENT

LEVELS OF REPRESENTATION

Young children learn about the world primarily through concrete active experiences with real objects. What is known about the world can be represented by various means: pictures, dramatic play, imitation, gestures, spoken and written language. Children are by nature strongly motivated to represent, not only as a way of expressing what they know but also as a way of dealing with and mastering events and objects, social roles, fantasies, and feelings.

Activities in our cognitive preschools are sequenced according to what we call levels of representation. We begin at the Object Level, giving children experiences with real objects and places. At the Index Level, we help children to remember the whole object given only one aspect or part of it. At the next level, the Symbol Level, we begin to represent things by means of pictures, models, and forms of play which resemble, but are separate from, the real objects and events they represent. This prepares children for the Sign Level, where written words, numerals, and other conventional and arbitrary representations are used - generally not until elementary school.

There are two purposes for this sequence. One is to provide the child with concrete experiences (object and index level), which are the basis for representation. The second is to provide the child with opportunities to represent things symbolically (symbol level), to learn the nature of symbols and how to "read" them; these skills are the basis for understanding the more abstract representations called "signs", by which we express language and mathematical relations in writing.

Experiences with Real Objects:

I. The Object Level

In order for a child to be able to form mental images of things, he must first be exposed to as many aspects as possible of real objects and events. By acting on objects and experiencing events, the child is establishing a basis for the ability to symbolize, or make representations.

Circle the numbers which precede activities that are Object Level activities:

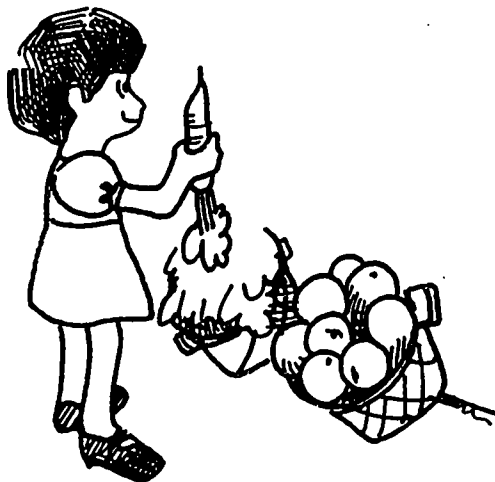
- 1) Reading a story about Jimmy's trip to the airport and looking at pictures of the airplanes he saw.
- 2) Making papier mache oranges and apples; painting them orange and red.
- 3) Making a zoo with unit blocks; putting rubber animals in the cages.
- 4) Taking a walk to the grocery store - looking at the shelves of food in cans, looking at the dairy products in the cooler, touching and smelling the fruits and vegetables, etc.
- 5) Making trucks, buses, and cars out of cardboard boxes and paper plates.
- 6) Baking cookies.
- 7) Looking at the Shape Book, picking out the round things and square things on each page.
- 8) Examining the puppy Jimmy brought to school, touching his fur, finding his eyes and nose and tail, etc.
- 9) Using dishes and utensils in the doll corner, washing them with soap and water at cleanup time.
- 10) Making people out of playdough - putting on arms, legs, heads, etc.
- 11) Galloping like horses, slithering like snakes, etc. to music teacher plays on the piano.
- 12) Peeling and eating oranges at a group time.

Answers and Discussion

- 1) Reading a story. . .No. Reading a story about an airport or an airplane will probably be meaningless to children who have never seen an airplane. To begin on the object level would mean taking a trip to a real airport, looking at the big, big, big airplanes and talking about the different parts the airplane has. It would be really great to go inside the plane and actually experience its bigness. Without such experience, it would be reasonable to expect many children to think that planes are really only little specks that make noise and fly in the sky!

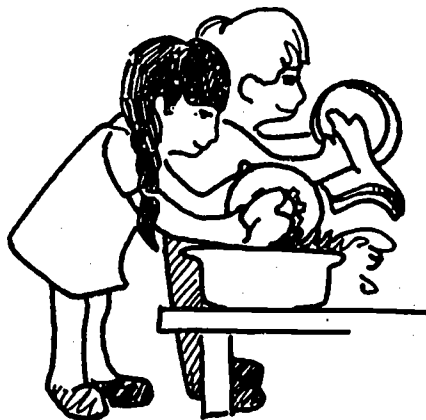
- 2) Making papier maché. . .No. Making round papier maché balls, letting them dry, and painting them orange and red may be a meaningful follow-up activity at a representational level. This would be an excellent follow-up to an object level experience with oranges and apples. In order to make meaningful representations of an orange a child must first be provided with opportunities to see, feel, squeeze, smell, taste, and take apart an orange. He must be able to see its seeds, its sections, its skins - and how its parts fit together to make up the round, orange thing he has come to know as an orange.

- 3) Making a zoo. . .No. This would also be a good follow-up activity to help children represent an experience that was already real to them. For many children, however, zoo animals are not real. Having never seen an elephant or a giraffe, a child has no way of mentally visualizing its bigness, fatness, or tallness. If the only clues a child receives come from small rubber animals or story book pictures, the many aspects of elephantness will not become real to him. Consequently, an object level experience means a trip to the zoo to see the elephant.



- 4) Taking a walk. . .Yes. This is a very basic and real experience for children. Many preschool and kindergarten teachers enjoy "playing store" with their children. In the light of our framework, however, the real experience of going to the store, seeing the food arranged on the shelves in various categories, and watching the butcher, cashier, etc. would provide the groundwork for the later activity of representing a store by using blocks and empty food cartons in the classroom.
- 5) Making trucks, . . .No. This might be a meaningful activity with cars, the school bus, etc. However, in order to insure meaningful representation, it would be wise to begin at the real object level. Looking at the school bus or teacher's car from all sides, finding its parts, talking about all aspects of it, and perhaps taking a ride in it would be a good starting point. "Truckness" can mean many things, and a child should be exposed to a real truck (inside and out) in order to help him mentally represent it - and then construct a cardboard replica of it.
- 6) Baking cookies. . .Yes. This is an excellent classroom experience provided the children are involved themselves in the mixing, baking, and eating. Can you think of ways in which this experience may be reenacted on a representational level? How could you help children mentally reproduce this experience?
- 7) Looking at the Shape Book. . .No. Shapes are quite abstract things for young children anyway - and looking at pictures of shapes will not necessarily teach shape. Can you think of a better starting point? Beginning with familiar objects in the room would be possible. Focusing on one shape (roundness), the children might make a collection of round things. This would also provide opportunities for feeling, rolling, and talking about roundness. Only after kids have a clear conception of roundness based on experience with many, many different round things would two-dimensional pictures of round things help children to form mental images of "roundness."
- 8) Examining the puppy. . .Yes. What could be more "object level" than watching a puppy move, patting its head, tail, legs, and letting it lick you! Can you think of follow up activities which might help the

children to recreate this experience, to recall what the puppy looked like, how he moved, etc.?



- 9) Using dishes and. . .Yes. In our Ypsilanti preschool we use real dishes and utensils. Dishwashing soap and water also add to the reality of this experience. Where it is not possible to use real dishes or utensils the best substitute would be realistic looking materials on a smaller scale. Water is free!
- 10) Making people out of. . .No. Again, making playdough people is an excellent learning activity, but it is not at the object level. Before a child can construct a representation of a person, putting the arms, legs, and head in the right places, he must have an understanding of how he himself is put together as well as how other people are put together. Object level activities dealing with self concept might include games in which body parts are named and used in different ways ("Hokey Pokey." "Head, Shoulders, Knees, and Toes," "Simon Says," etc.)
- 11) Galloping like horses. . .No. This certainly is an activity which involves the child's whole body in a very motoric way. But, this is not an object level activity. The children are being asked to represent the movements of a horse, a snake, an elephant, etc. How can a child really make himself move like a snake unless he has seen a snake's slithery way of crawling across the ground. Object level activities would involve really watching a horse galloping or a snake slithering or an elephant lumbering around in his cage.
- 12) Peeling and eating. . .Yes. This is what we were discussing in question 2. To really experience the various qualities of an orange, children must have first-hand contact with one. (This doesn't mean just watching the teacher, either.) Squeezing, peeling, smelling, pulling apart the sections, tasting, spitting out the seeds - these are all important ways for children to find out about oranges. This is an object level experience.

Questions and Answers About the Object Level

Q. Why is it so important to start with real objects if kids seem to be able to handle representations such as pictures of objects?

A. Are you sure that kids really understand the many aspects of an object simply because they can correctly label a picture of that object? As teachers we often make the mistake of equating labeling with understanding. To provide children with real learning experiences it is usually wise to provide real objects or experiences as a matter of course, before expecting kids to use representations.

Q. What if the real object can't be brought into the classroom to be fully experienced at the object level first? Can't we start with pictures and models?

A. In such cases it would be better to start with a field trip. There will be plenty of time in elementary school and in front of the TV set to learn through symbols and signs. A cognitive preschool or kindergarten should consolidate a child's experience with real objects and with the nature of symbols, rather than provide learning through symbolic means only.

Q. If a child only uses an object in one way, how can you get him to see other aspects of the object or other ways to use it? Should you just let him "do his own thing?"

A. What you really hope to give children is a "method of attack" on objects or an awareness of every object's potential. You may want to begin the year by using group time as a time to explore familiar objects in the room. Since one of your goals is familiarizing children with room areas and materials, you may want to take materials to your table and help kids discover different things about the objects - what they look like from all angles, what you can do with them, how they feel, etc. There are also many opportunities during work time to build onto the knowledge a child has about the objects he has spontaneously chosen to work with. Well chosen questions on the part of the teacher may encourage the child to look at his truck in a slightly different way or to find still another way of using it. This need not be an artificial situation, learning can occur naturally as part of the child's play.

Object Level Activities

Comments:

- 1) Note the availability of objects listed. Although some activities would not be appropriate in all geographical areas, the activities listed were all initiated and implemented quite easily and with little expense by our teachers.
- 2) These are activities which have been successfully implemented in a Head Start center. This is more than a list of remote suggestions! They have proved to be helpful and meaningful object level activities!
- 3) Many of the activities listed would be appropriate as group time activities or work time activities with small groups of children.
- 4) All of the activities listed provide important learning steps for children. These real experiences are giving kids the basic skills which will be so necessary for grouping, classifying, and seriating.
- 5) Outline used for organization:
 - I. Objects and their uses
 - II. Real experiences
 - III. Collections of objects that children can help make and explore

I. Objects	How Used?
1. Animals (cat, gerbil, snake, tomato worm, turtle, frog.)	feel skin, etc; find body parts (head, tail, eyes, etc.); watch it move, watch it eat, drink, turn over; listen to it; describe it; see it from all angles
2. Fruit, nuts, vegetables	feeling, smelling, descri- bing, taking apart, identi- fying different parts (seeds, peeling, sections) putting parts back together, tasting, <u>Nuts</u> : Rolling, cracking, shaking
3. Pumpkins	feel smoothness, ridges; scoop out insides, identify seeds, feel mushiness, taste and smell, roast seeds, make pudding, pumpkin bread, pie
4. Car	getting inside of it, walk- ing around it, looking under- neath, identifying parts, feeling different surfaces (body, tires, grille), watch- ing different parts work (horn, wipers, locks)
5. Boat	get inside of it, move steer- ing wheel, watch it move, find different parts, listen to its horn, engine, etc.
6. Radio	turn station selector, volume knob, listen to loudness, softness, music, speaking (Fla. children went to sta- tion, watched D.J. - heard his voice later on radio at school)
7. Telephone	aide and teacher take their groups to their homes - call and talk to each other - let children dial - find differ- ent parts to telephone

- | | | |
|-----|--|---|
| 8. | Real tools, nails,
wood | find out different things
tools can do - experiment
with hammer and nails, saw-
ing wood, etc. |
| 9. | Water, soap, dishes | housekeeping area |
| 10. | Seasonal things:
(leaves, snow, turkeys,
cocoon) | let kids experience things
in their natural setting
first! |

II. Real Experiences

1. Planting - indoor or outdoors, looking at seeds, planting them, using real tools (hoes, rakes, Shovels), watering plants, observing growth process.
2. Trips to lumberyard, brickyard, houses under construction, etc. - watch bricklayers, carpenters, how they put things together (mortar and bricks). Collect some real materials to bring back to school.
3. Trip to used car lots.
4. Trip to furniture store.
5. Trip to fire station, police station, - look at fire truck, police car, try on uniforms, see where men stay, sleep, eat, listen to bells, sirens, watch doors move up and down.
6. Trip to pet store, local pound, veterernarian - look at animals, feel their skin, fur, see what they eat, drink, how they move, identify body parts.
7. Airport, bus station, train station - get on vehicles, see how big they are, feel surfaces, ride on them, etc.
8. Cooking activities (Make excellent group time activities)
 - ice cream
 - instant pudding
 - apple sauce
 - cookies
 - soup
 - salads (fruit or vegetable)
 - playdough

III. Exploring Objects and Making Collections of Objects

1. Explore possible ways to use magnets and magnifying glasses in conjunction with other objects.
2. Finding lots of different ways to use: (Art corner activities or group time activities).
 - a-soapflakes
 - b-playdough
 - c-fabrics (different textures)
 - d-shaving cream
 - e-paints, finger paints, water colors
 - f-crayons
 - g-chalk
 - h-clay
 - i-paper (foil, rough, corrugated)
3. Making collections
 - a-all kinds of buttons
 - b-fasteners (snaps, zippers, buckles, hooks and eyes)
 - c-stretchy things (rubber bands, elastic)
 - d-rocks
 - e-gourds
 - f-plants, flowers
4. Things children can take from home
 - a-round objects
 - b-square things
 - c-long objects
 - d-things that have different smells
 - e-things that make different sounds
 - f-bottles
 - g-boxes
 - h-cans
 - i-jewelry

(Provide a special table or place set aside where children can add to collections and explore objects that others have brought. Encourage parents and volunteers to add to collections, too.)

Note: This list provides a good starting point; but, in terms of our focus on levels, it becomes necessary to think further about how each of the above activities may be extended to the index and symbol levels. So - start thinking!

Experiences with Real Objects:

II. The Index Level

An index is a mental reconstruction of the whole object when (a) only part of it is seen, (b) when it is perceived through senses other than sight, (c) when a part is missing, or (d) when something causally related to the object such as an imprint or shadow, is seen. At the index level, some part or aspect of the real object must be present, serving as a clue for identifying and mentally reconstructing the whole real object.

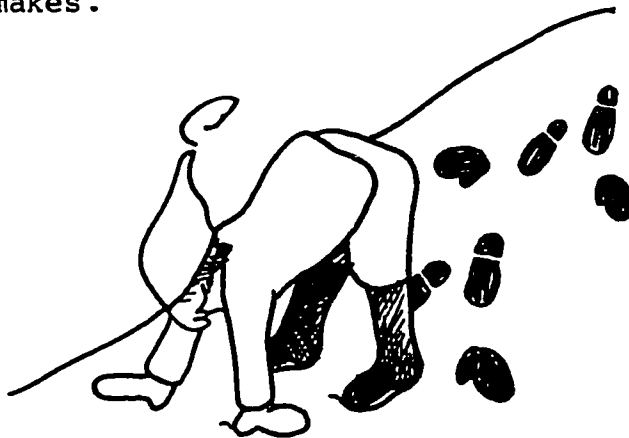
Which of these are index level activities?

1. Identifying a paint brush by feeling it in a mystery bag.
2. Making a clay dog.
3. Drawing a picture of Mommy.
4. Pretending to be an elephant.
5. Hearing a dog bark and identifying the source.
6. Matching an apple to the word "apple."
7. Responding "dog" when asked what says "bow-wow."
8. Holding a toy dog and asking the child to make the sound a dog makes.
9. Making an imprint of Timmy's body in the snow.
10. Identifying an apple by tasting it with eyes closed.
11. Identifying a toy truck when part of it is covered.
12. Identifying an orange by smell alone.
13. Seeing a tire and identifying it as part of a tri-cycle.

Answers and Discussion

- 1) Identifying a paint brush. . .Yes. This game requires the child to identify objects by the sense of touch alone. He cannot see the item and must "guess" what it is by recalling from his previous experience items which felt like the one in the bag. It is important that the child have many chances to explore the whole object before being expected to identify it by clues.

- 2) Making a clay dog. . .No. Making a clay dog would be a symbolic activity, a representation of a real object. To make sure that this is a meaningful activity, many opportunities to explore the whole object and its parts should be provided first.
- 3) Drawing a picture. . .No. Again, this is a representation. The drawing has a resemblance to the object represented but no part of the object need to be present.
- 4) Pretending to be. . .No. The child is imitating the actions and sounds of an elephant. These actions and sound represent the elephant to the child but no part of a real elephant is present. This is a good activity for transition periods if the children have had opportunities to watch a real elephant.
- 5) Hearing a dog bark. . .Yes. In this example, the sense of hearing is being used to identify a sound made by the object itself. Many "natural" events such as this can be incorporated into the school day. Identifying sounds of cars, planes, trees blowing in the wind, birds, people walking and running are a few examples.
- 6) Matching an apple. . .No. This would be a representational activity at the "sign level." The word "apple" does not resemble a real apple in any way but instead is a group of letters which have been arbitrarily assigned to stand for the real object, the apple.
- 7) Responding "dog". . .No. True, the child is using his sense of hearing as a basis for his judgement. The sound he is hearing, however, is not a sound made by the real object but a sound of a person imitating the real object. To be an index, a dog would have had to make the barking noise.
- 8) Holding a toy dog. . .No. A toy dog is a representation of a real dog. The child must first decide what the toy is representing and then imitate the sound the represented object makes.



- 9) Making an imprint. . .Yes. This is an excellent index level activity. Because his body and those of his friends are being used, Timmy is able to see the relationship between a print and the object which makes the print. Hand and feet molds are other good index activities using the child's body. Molds enable the child to go back at a later time and fit his hand or foot back into the imprint.
- 10) Identifying an apple. . .Yes. The real object is present and the child is trying to identify it by using the sense of taste. An activity such as this would be an interesting variation at juice time.
- 11) Identifying a toy truck. . .Yes. The child is identifying the whole object from seeing just a part of it. Talking about objects which are partially hidden can happen naturally during work time and cleanup.
- 12) Identifying an orange. . .Yes. The child is relying on his sense of smell to identify the object. He is using his previous experiences with the object as a basis for his judgement.
- 13) Seeing a tire and. . .Yes. The tire is a part of the whole object. The child is using this part to identify the whole object.

Questions and Answers About the Index Level

Q. How do index level activities prepare the child to deal with symbolic representations?

A. The index level experiences in dealing with parts and aspects of real objects give the child further knowledge of the properties of objects. As the child's understanding of real objects increases, he becomes less dependent on having real objects to refer to and thus he gains the ability to represent objects without requiring their physical presence.

Q. What is the difference between the index level and the object level?

A. Object level activities require the presence of the whole real object. Index level activities require the presence of some part or aspect of the real object. In index level activities, the child uses his mental images of objects to make judgments about them from sensory clues (i.e., smell, taste, sound, touch), or from seeing only parts of them, or from the imprints or traces he has, at some point, seen them make.