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Pupils' construction interests in the fourth grade

Pupils Construction Interests.... Fourth Grade.

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PUPILS' CONSTRUCTION INTERESTS IN THE FOURTH GRADE

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

STATEMENT OF PROBLEM AND PREVIOUS RESEARCH

The purpose of this study is to discover the construction interests of fourth grade pupils in relation to school and out-of-school activities.

For many years little has been known about the nine-year-old. More is known about the ages above nine, these groups being easier to obtain data on. Large numbers of teachers, educators, psychologists, doctors, and parents are recognizing the need to study this age group, as well as all age groups in order to develop programs in and out of school that will meet their needs.

The nine-year-old in this survey is a youngster who normally entered grade 1 at six years of age, and through normal promotions is nine years old in grade 4. Data on children below and above age nine were carefully scrutinized for developments of interest and construction growths.

The construction interests of the children were found under the headings of: hobbies, arts and crafts, handicraft, club activities, 4-H club work, scouting, activities, manual arts, curriculum, and interests. In all these activities interests was the governing factor in determining the activity pursued.

Concerning interests and efforts Dewey[1] states, "It is the sole guarantee of attention, if we secure interests in a given set of facts or ideas, we may be perfectly sure that the pupil will direct his energies toward mastering them." In essence pupils will do well in the things they like to do.

Good teachers have long recognized the importance of interests and the importance of learning by doing. Children like to work with their hands; they like to make and do things. Classroom teachers should be cognizant of the things that children make or construct and direct these interests into the classroom, thus having a room of bubbling interests and purposeful activities. Nine-year-olds, as well as other age levels, like to make things, to work with their hands, to make real things. This energy should be directed by the classroom teacher in presenting her daily program.

If children don't possess certain interests that a teacher would like to build upon, Davis[2] states, "It is the unifying element in attention which builds up associations, determines sequences and selects their order of importance." He further states that:

> Interests may have a natural basis in the environment of the child or it may be stimulated

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[1]John E. Dewey, Interest and Effort in Education (Boston: Houghton Mifflin Company, 1931), p. 1.

[2]Robert A. Davis, Psychology of Learning (New York: McGraw-Hill Book Company, 1935), pp. 331-332.

> by artificial means. The work of the classroom is often a case of artificial stimulation of interests in materials for which the child has little background for natural development. In such a case artificial interests should be developed until a genuine interest has been aroused.

The purpose of this investigation was:

1. To find out what fourth grade pupils like to construct;
2. Why fourth grade pupils like to construct certain things;
3. How interests change as the child grows;
4. The uses the classroom teacher can make of these construction abilities in planning her daily program.

Related Findings

The study of the nine-year-old and especially the construction activities of this age have not been explored to any extent. Other age groups have received much fuller treatment. People in education are becoming more and more concerned in the interests of children, in the work-shop classroom, in the classroom being a beehive of activity. The formal classroom where children sit soberly in rows listening to a teacher should be a scene of the past. If we have these classrooms of purposeful activities, where children learn by doing, we should have an insight as to their interests and what they can do with these interests. With these facts in mind we can then develop a child-centered curriculum.

Dewey[1] states,

> If we can secure interests in a given set of facts or ideas, we may be perfectly sure that the pupil will direct his energies toward mastering them. If we can discover a child's urgent needs and powers and if we can supply an environment of materials, appliances, and resources: physical, social, and intellectual, to direct their adequate operation, we shall not have to think about interest.

Gesell and Ilg[2] in relation to the nine-year-old state,

> The nine-year-old has absorbing interests such as constructing with mechano sets. Some Nines enjoy making scrapbooks for hospitals. The teacher needs to realize that Nine is an individualist, that he has rather positive likes and dislikes.

In relation to doing in a classroom the 1947 Yearbook of the National Education Association[3] believes that:

> When teachers accept the philosophy that children--learn by doing--and understand the meaning of the term, small classrooms full of furniture become frustrating.
>
> An excellent example of participation of members and resources of the community in the elementary school program is that of a school system working on several social studies units emphasizing the use of the community as a laboratory for teaching pupils.

In a recent study by Stewart[4] pertaining to children's preferences as to types of assignments it was found that,

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[1]Dewey, op. cit., p. 1.

[2]Arnold Gesell and Frances Ilg, The Child from Five to Ten (New York: Harper and Brothers, 1946), pp. 206-207.

[3]Organizing the Elementary School for Living and Learning, 1947 Yearbook, Association for Supervision and Curriculum Development of the National Education Association, Washington, D. C., 1947, pp. 31, 93.

[4]Dorothy Stewart, "Children's Preferences in Types of Assignments," Unpublished Master's thesis (Boston: Boston University, 1945), p. 59.

"Construction was the first choice for boys as well as for girls in grade four, and reached an all high for all three grades at that level." This result would suggest that assignments that pertained to construction would be very successful for boys and girls in grade 4.

It was brought out at a conference on reading by Corey[1] that:

> While it is true that children at this age, many children develop a deep love of reading, and some of them are disposed to spend most of their time with books, a great majority still get maximum enjoyment from manipulating materials, making objects, sewing, building, taking things to pieces, going places and seeing things.

In relation to construction activities Lee[2] relates that,

> There has been much construction in the more progressive schools that needs to be carefully evaluated. In fact, activity, learning and construction have become synonymous in the minds of many teachers. The construction activity is a means not an end. These suggestions may help to avoid some of the more common difficulties:
>
> 1. Construction should be carefully planned in advance.
>
> 2. Construction should be based on some research. Even a kindergarten child can make beginnings.
>
> 3. A proportionate amount of time should be devoted to the construction. If it represents planning, expression of research, opportunity to work together,

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[1]Stephen M. Corey, "Characteristic Interests and Needs of Pupils That Aid in Defining the Nature and Scope of the Reading Program," Adjusting the Reading Program to the Individual (Conference on Reading, University of Chicago, 1941), p. 51.

[2]Murry Lee and Doris May Lee, The Child and His Curriculum (New York: D. Appleton-Century Company, Inc., 1940), p. 247.

it will take time, but there are many other outcomes than the finished product. Too long a job destroys interest.

4. Construction as a rule should be large to allow children to play in it or work it. This gives the child a further identification with the experience and should result in increased insight. Muscular development is another factor which supports larger construction rather than small models.

5. Fairly large blocks of time are needed for construction work. With too short periods they no sooner get started than they have to clean up.

In an investigation by Dawson[1] it was found that children preferred to do those things which are most immediately within their experiences. The younger child had a greater variety of conversation pertaining to things that he liked to do and make. As he grew older he narrowed his interests. Many factors that he considered important in earlier life are now to him routine.

Fryer[2] states that,

> Teachers should recognize that interests develop largely because of the type of experience a child has had along that particular line. If it fills a need of his, either directly or indirectly, by giving him satisfaction of attention or approval he does not otherwise obtain; if his experience with it has been successful and satisfying; if it presents a challenge, a problem which he is able to solve without too much difficulty; if he feels its relationship to himself, or his needs, it will probably have developed into an interest.

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[1]Mildred A. Dawson, "Children's Preferences for Conversational Topics," Elementary School Journal, 37:427-437, February, 1937.

[2]Douglas Fryer, Measurement of Interests in Relation to Human Adjustment (New York: Henry Holt, 1931), p. 223.

In carrying construction from an early play stage through to mature hobbies Hurlock[1] relates that,

> Early forms of constructive play consists of making mud pies, constructing mountains or tunnels from sand, and playing with blocks, beads, scissors, clay, paint, crayons, and paste. The child uses these to make things that have a definite meaning and can be recognized as such, though their practical use is of secondary importance. Constructive play is popular in late childhood and manifests itself in the building of tents, playhouses, huts, snowmen and dams.
>
> At first the child is pleased with whatever he makes and proudly displays it to anyone who happens to be present. Later, however, he becomes more critical of his workmanship and not only ceases to boast about it, but often covers it up or even demolishes it. This is especially true of drawing or painting. As the child reaches the adolescent years, his interests in constructive play wanes rapidly unless he has a definite talent for painting, carving, or clay modeling. Under such conditions, it becomes a hobby which is engaged in as his favorite form of solitary plan, then and into maturity.

Studies have been undertaken to determine what children like to do outside of school in order that programs can be developed that will be most developmental to the pupils in the classrooms. It was divulged that children in the nine-year-old groups like to participate in varied activities of a physically creative nature. They like to use their hands in constructing, modeling, and designing.[2]

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[1]Elizabeth B. Hurlock, Child Development (New York: McGraw-Hill Book Company, 1942), p. 263.

[2]Children's Interests, Twelfth Yearbook of the California Elementary School Principals' Association, Oakland, California, 1940, p. 114.

In relation to construction activity Isaacs[1] states that,

> The value for social education of all the arts and handicrafts, when taught with practical sense and adapted to real needs, is very great. Children will not learn cooperation, needless to say, through formal lessons or through handicrafts mechanically taught. There is no social education for a class of forty children in all making the same paper or cardboard or wood model at the same time. There is such an education when the end is a common one and the making is shared, each having his own individual contribution which may differ from everyone else's and yet help to create the whole, especially if the whole to be needed is for a definite purpose, a series of maps, a wall design, a cooked meal, an illustrated class magazine, a set of boxes to keep materials in, the costumes and scenery for a play. Crude and simple these things will have to be, but they can be done and bring much delight in the doing.

From research it was clearly emphasized that the nine-year-old showed much interest in construction and in doing things in general. He is no longer interested in the make-believe but insists on making the real thing, using the materials and tools available. Interests as to how things are made or produced are steadily increasing and construction of the same on arriving home is noticeable. If interests are of a specialty nature such as science or mechanics, other activities may be brushed to the side.

In the classroom it is suggested that teachers learn the construction interests of the children in and out of school and utilize this knowledge in developing a child-centered

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[1]Susan Isaacs, The Children We Teach, Seven to Eleven Years (London: University of London Press, 1937), pp. 108-109.

curriculum. These activities capitalized on should be a means not an end.

A classroom where all children are formally constructing the same article is less desirable than one in which all children are contributing to the whole. The value of social training and the preparation for social living was brought out in several social studies programs.

As most adults would like to travel rather than read a book on travel so would children like to construct a frontier town rather than read from a text and answer questions afterwards.

There is a great deal of educational interest and value derived from doing. All teachers and persons dealing with children should be cognizant of their construction abilities and interests, developing them to the fullest, whether in a classroom, a camp, a Brownie or Cub room, a 4-H meeting, a club or the home. Learning by doing is an accepted philosophy of many educators.

Research has clearly stated that construction is an important factor of learning in grade 4, as well as in other grades. Construction interests of children in and out of school should be known by the classroom teacher and worked into her daily program. All activity programs should be purposeful, planning should be thorough, and the interest abilities of the children utilized to the fullest extent.

Construction should be a means not an end. The development of the complete child should always be kept in mind. Equal opportunity for all children and the carrying of the child as far as he is capable of developing, with construction as a contributing factor in this process, should be the aim in grade 4, as well as other grades.

CHAPTER II

PLAN OF THE INVESTIGATION

Preparation

Prior to the distribution of the questionnaire in which fourth grade children were asked to list the things they made, a record was kept from observation, informal questions, and general activities of objects children liked to create. This record was very valuable because fourth grade children are too immature to be introspective when listing the objects they themselves prefer to construct.

Class folders were examined but the inadequacy of data did not reveal any significant information on construction; test data being the chief finding. Permitting or inviting children to talk about what they did or were doing revealed many interesting factors.

Lee[1] relates that,

> The things children have come to be interested in may best be located incidentally. A direct questionnaire may be helpful in some cases but directly misleading in others. Children of elementary-school age are not old enough to be introspective. The most valid and valuable technique of direct investigation is the paired comparison.
>
> The simplest and most valuable method from many angles is that of observation and recording.

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[1] J. Murray Lee and Doris May Lee, The Child and His Curriculum (New York: D. Appleton-Century Company, Inc., 1940), p.124.

> Anecdotal records are being kept more and more. The more records of this type that are kept for each child the more chance there is of understanding him and helping him in his development of an integrated and well-adjusted personality.

The type of instrument to be used was given careful consideration in view of the fact that children's construction interests are so closely related to their experiences and that they are so introspective. The realization that children would like to construct newly presented ideas as they were introduced into the activities program was also realized.

What activities a child liked to pursue out of school, in his basement, in a friend's work-shop, in the back yard, were noted; prior to and during the investigation. The zest at which a youngster worked in constructing a grass fort or connecting wires in a toy signal tower were as much a part of construction as the physical labor itself.

This is substantiated by Isaacs[1] when she directs her thinking in these two main directions.

> First, at all his freely chosen out-of door pursuits, in the home, the garden, the playground, or in the street---the games he plays, the things he makes with his hands, the books he reads, the questions he asks, the paths he wanders, and secondly, at all those school pursuits which he does with zest and pleasure. Whatever activity brings light to the eye and eagerness to the voice and gestures can be taken as a clue to some inner need of growth.

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[1] Susan Isaacs, The Children We Teach, Seven to Eleven Years (London: University of London Press, 1937), p. 125.

The Questionnaire and Observation

The questionnaire[1] used consisted of a single sheet of mimeograph paper with a space for the child's name, a place to check for boy or girl, a space for answering the questions -- How old are you? and--When is your birthday? Below the heading it was stated: Some boys and girls like to make things. Write here the names of things you have made since Christmas of 1948.

The questionnaire was distributed in the spring of 1949. The sheet could be written on both sides and if the youngster desired a second sheet, it was given to him. A sufficient length of time was given; the teacher collected the papers when the group was through. The average length of time to complete the questionnaire was determined by timing sample sheets given to other groups. The average time figure arrived at was twelve minutes.

Paralleling the questionnaire, an observation data sheet[2] was kept in which outside construction activities of the nine-year-old were noted. His interest in pursuing an activity was also recorded.

Boys' clubs were visited where the age range generally runs from eight to eighteen. The game rooms, libraries, workshops, and other activity rooms yielded information which pertained to construction.

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[1]See questionnaire in Appendix

[2]See observation data sheet in Appendix

Cub Scout and Brownie units were observed during their weekly meetings and the activities programs noted.

Four-H Club work was noted in which their whole program is centered around real and living things. The use of one's hands in construction and the making of things is the heart of this whole program.

Method of Administering the Questionnaire

Before the questionnaire was presented to the fourth grade pupils, the teacher was acquainted with certain data and practices that were to be employed in administering the survey.

The teachers in each respective classroom where the questionnaire was to be used received a copy of "Directions to the Teacher".[1] The teachers were asked to provide a classroom situation in which the children would be free to list the things that they had made. The person conducting the room survey was asked to obtain as accurately as possible the honest and complete listings of construction done by the fourth grade child since last Christmas. The teacher was further asked not to influence the nine-year-old in formulating his list of the things that he constructed, rather that they come wholly from him.

For statistical reasons teachers were asked to give the intelligence quotients for certain groups in the survey.

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[1] See Appendix

Pupil Population

No particular area or group of children were selected in the distribution of the questionnaire. Children from the fourth grade of Framingham, Needham and West Bridgewater in Massachusetts, and children from Concord, New Hampshire were used. The schools were both large and small, rural and urban. All schools investigated were typical in their nature. There were 771 fourth grade children that answered the question sheet and approximately 65 children that were observed.

Limitations

The survey had definite limitations in that only 836 children were used in obtaining information. Also children in the elementary school are often too immature to be introspective. Pupils often are influenced by liking a particular teacher or supervisor, and liking this particular activity because it is taught by a person they like. The type of day or mood of the child might on another day present a different list of things constructed. To overcome these limitations as much as possible it was endeavored to enlist the best efforts of the youngster as far as it was humanly possible.

CHAPTER III

ANALYSIS OF DATA

The purpose of this investigation was to discover what the nine-year-old likes to construct or make, both in and out of school.

More specifically, the purpose of this investigation was to find the answers to the following questions:

1. What do fourth grade boys and girls like to construct or make?
2. Why do fourth grade children like to construct or make certain things?
3. How do interests change in the nine-year-old?
4. What uses can the classroom teacher make of these construction abilities in planning her daily program?

Related studies were reviewed prior to the undertaking of this study. Material was found on activity programs and interests of this general age group, but specific information on the nine-year-old, and especially construction activities, was limited. His physical, emotional, and social pattern of behavior was given much fuller treatment.

Table I shows the number of pupils and the number of different things that they have constructed.

TABLE I

CONSTRUCTION ACTIVITIES OF THE NINE-YEAR-OLD IN RELATION TO THE NUMBER OF PUPILS AND THE NUMBER OF THINGS MADE

	Boys				Girls		
	No. of Pupils		No. Things Made		No. of Pupils		No. Things Made
Bulk of Pupils	28	7%*	0	Bulk of Pupils	19	5%**	0
	45		1		30		1
	38		2		52		2
	61		3		52		3
	46		4		45		4
	43		5		42		5
	35		6		36		6
	20		7		22		7
	18	87%*	8		22		8
	9		9		13		9
	5		10		13	88%**	10
	4		11		9		11
	6		12		7		12
	4		13		2		13
	6		14		4		14
	4		15		5		15
	3		16		7		16
	2		18		1		17
	1		19		1		18
	1		20		3		19
	1		25		2		20
	1	13%	31		1		21
					1		22
					1	12%	26
	381		249		390		279

*7% is included in the 87% **5% is included in the 88%

The number of things that the boys and girls made as related in Table I revealed several interesting factors. Of the 771 pupils tabulated, 528 articles of construction were made.

The boys constructed 249 units, the girls 279. As there were more girls than boys the number of things made was very close.

An interesting fact brought forth was that 28 boys, or 7 percent of the group, didn't make anything, while 19 girls, or 5 percent of the girls, did no construction.

The bulk of the boys' group, 87 percent, made 0 to 8 articles of construction, whereas 13 percent of the group made from 9 to 31 articles of construction.

In the girls' group 88 percent made 0 to 10 articles of construction, whereas 12 percent of the group made from 11 to 26 articles of construction.

It might be drawn from this that the minority of the children do the bulk of the construction. Teachers, parents, camp and club directors would do well to draw more children into constructive activities as a factor in child growth and development.

The fact was pointedly brought forth that nine-year-olds like to construct and make things that they can feel and see. They like to make things of movement and action, things that have a meaning. The age and times we are living in have a marked influence on what children like to construct. We have atomic factors in the classroom as much as we do in Los Alamos.

From observation of interests in grades leading up to grade 4, there was a carry-over from making mud pies, sifting sand, playing with dolls and doll houses to cooking with

mother, sewing, drawing, playing house or playing school. Boys run from crossing two sticks or using a heap of lumber for a plane to making a product either from a construction kit or a more complete model when he is nine.

An appalling fact brought out from this survey is the poor teaching done on construction and activities in many of our public schools today. A classroom was visited in a country school, or this could have been a city school, that consisted of 34 children, ages eight to eleven, in grade 4. The children were sitting formally and quietly in five rows of desks. The children were of a low division.

The teacher was discussing a nature lesson from a book. These children who were truthfully slow would be slower when the teacher concluded her lesson. To be in the room made one feel slow and low.

These children should have visited the outdoor classroom. They should have constructed and made things close to nature in their classroom such as growing pine trees from seeds, making a nature exhibit, or constructing animal dens.

This lesson on nature in which isolated facts were given was empty of meaning and very boring for the children. These children needed activity; they needed to do, they needed to work and make things with their hands. Children at age nine as well as other ages need doing. The classroom needs to be

alive, active; it should be filled and decorated with things that the children have made or done. All elementary grades could profit greatly from what is constructed in the kindergarten.

An important fact brought forth was the value of presenting construction from a social science point of view. The construction is taught as a social problem emphasizing the part played as that of being a worker in the community. The youngster is made to realize the failures and achievements of the world of which some day he is to become one of its citizen members. The aptitudes of children should be drawn on and developed whenever possible.

In relation to drawing, painting and construction in art classes of which more and more is being offered to children as a fundamental means of self-expression, appreciation of the art is of more importance than the mastery of technical principles. The necessary techniques are provided as the youngster feels the need. The artist child at age nine is in a free and imaginative stage in that he can relate what is in his own mind symbolically, giving very little attention to proportions but much attention to decorative details.

Children at this age become more and more interested in constructing a product that is good. The toy hut, the home-made sailing vessel, or the doll house or doll clothes, which were constructed clumsily at first, now take on the appearance

of more skill.

From nine on, children seem to engage in fewer activities. They begin to have special interests, giving more time to these specialties, thus dropping other things that they were doing. Making butterfly collections or building a tree hut will crowd out other forms of manual activity.

In the construction activities up to age nine, interests of both sexes appear to be similar, but after that age there is less that involves both sexes. Although there is an overlapping, children seem to pursue activities in relation to sex patterns.

Table II points out the significance of the difference between the number of things constructed and intelligence quotients.

In relation to construction and intelligence quotients as related in Table II, 84 percent or the bulk of the construction was done by children with intelligence quotients from 80-109. Children with intelligence quotients between 110 and 129 did 16 percent of the construction.

An approach to the interests and as a factor in learning, construction activities could be a means by which learning processes could be developed in the low to average I.Q. brackets. The interests of the high I.Q. bracket groups, in many instances, as stated by them, was in reading and not in construction. Few in the high group cared to construct; they expressed a desire

TABLE II

SAMPLING OF THE CONSTRUCTION ACTIVITIES OF FIFTY NINE-YEAR-OLDS IN RELATION TO INTELLIGENCE QUOTIENTS

I.Q. Range	No. of Cases	Number of Different Things Constructed by Each Pupil			Per Cent
		Boys	Girls	Total	
120-129	2	1	3	4	4
110-119	6	3,4, 4	3, 8, 9	31	12
100-109	16	2,2,4,4,5,5 9,13,18	1,3,3,3,5 6,12	62	32
90-99	13	1,3,5,6,7 14	0,1,8,13 16,16,16	106	26
80-89	13	3,3,3,3,5,5	2,2,3,6,8	43	26

Mean in Relation to Number of Different Things Each Constructed			I.Q. Range
Boys	Girls	Both	
1	3	2	120-129
4	8	6	110-119
5	3	4	100-109
5.5	16	11	90-99
3	6	4.5	80-89
* 4	5	4.5	80-120 *

* Group Mean

to read books in several fields.

In the number of different things constructed there was no significant difference in the means of either boys or girls.

Intelligence and health have an influence on the type of construction activity pursued. Pupils having a high intelligence quotient tend to construct and make things that are of a more complicated nature and they prefer to work alone or with someone of equal capacity. Healthy children are inclined to make more things than do pupils who are in poor health. The abundance of energy possessed by the nine-year-old over and above what he needs for daily activity is spent on further activity.

Table III shows the mean relationship between the number of different things constructed by the boys with those of the girls.

TABLE III

MEANS OF CONSTRUCTION ACTIVITIES OF THE NINE-YEAR-OLD

	Mean		
	Boys	Girls	Total
No. of different things constructed	10.5	11.5	11.0
No. of different pupils doing the construction	6	7	6.5

For the number of different things constructed, as shown in Table III, there was no difference between boys and girls. There was also no difference in the number of pupils doing the construction. The mean for the number of different things constructed was 11; for the number of different pupils doing the construction 6.

This would show that boys and girls are equal in the number of things they make and in the number that do construction.

The value of mental health was brought out by observing the zest and zeal of youngsters as they pursued a construction activity that they were genuinely interested in. An active, alert, well-balanced mind, which is developed through the happy coordination of the physical and mental, is bound to result in a balanced personality. The opportunity to express one's individual abilities, the pros and cons of social contact, the feeling of doing, all help to promote proper mental health.

One of the cardinal principles of education, "The worthy use of leisure time", is a factor which is of prime importance in grade 4 as wlll as in to adult life. Interests and construction practices in the grades may well develop into activities of later life. A vocation or avocation through activities developed in the grades may result in one of life's most worthwhile pursuits. The ability may have been general when started, but is now specific, resulting in a trade or manual profession.

A danger to watch out for in handwork or construction by teacher, parent, camp or club director, is the timing of the interest span. Working within the child's ability to do and complete is as important as is the timing of the interest span. Ability grouping in constructive arts is as important as it is in reading groups although considerably less obvious. The aptitudes of children should be drawn upon as fully as possible, the teacher creating artificial stimulus as the situation demands.

The element of play in construction as it was deducted from observation is not nearly exploited as it should be. All healthy personalities like to play, whether they be pupil or adult. The lack of play adds negativeness to a personality. The teacher should capitalize on the play interests of children in the making of things through games, for this affords an excellent opportunity to learn and to have fun in the learning.

Table IV lists the general groupings of construction by 381 boys.

Table V lists the general groupings of construction by 390 girls.

The things constructed by boys and girls of grade 4 were similar in many respects while different in others.

They continued to express a desire to construct airplanes, cards, Christmas and Valentine, carving, club houses, drawings, paintings, scrapbooks, puzzles, snow houses and snow men, and articles that are cooked or baked.

TABLE IV

GENERAL GROUPINGS OF THINGS CONSTRUCTED (BOYS)

Groupings
1. Airplanes, jets, hangars
2. Atomic bombs
3. Bird houses, feeding stations
4. Boats, ships, canoes
5. Bows and arrows, tomahawks
6. Cards, Valentine, Xmas
7. Carving, animals, men
8. Club houses, forts, lean-tos
9. Construction, steam shovels, cranes, bulldozers
10. Cooking: fudge, cookies, hamburgers, bacon
11. Cowboys and Indians--costumes and scenes
12. Drawings: planes, animals, houses, guns, planes, ships, communities, railroads
13. Firetrucks
14. Guns, pistols, automatics, anti-aircraft
15. Making villages, farms, calendars, posters
16. Paper people, animals, farms, forts
17. Puzzles of all kinds, made and bought
18. Scrapbooks of cards, Western ranches, animals, baseball players, baseball
19. Snow houses, forts, men
20. Spears, swords, knives
21. Trains, engines, diesels, tracks, switches
22. Trucks, trailers, jeeps, automobiles, racers

TABLE V

GENERAL GROUPINGS OF THINGS CONSTRUCTED (GIRLS)

Groupings
1. Airplanes
2. Bean bags
3. Boats
4. Candles
5. Cards, Christmas, Valentine
6. Carving animals, churches, people
7. Cooking: cookies, fudge, jello, pancakes, making of cook-books
8. Gimp, belts, ties
9. Hide-outs, secret passages
10. Houses, huts, camps
11. Knitting: squares, runners
12. Lantern slides
13. Movies, stages, acting
14. Painting: pictures of animals, houses, people, sliding, snow men, winter scenes, villages
15. Puppets, puppet shows
16. Puzzles of maps, places, people, things
17. Scrapbooks of cards, clippings, pictures, maps
18. See-saws
19. Sewing: dresses, skirts, stockings, helping mother sew
20. Snow houses, men and women, slides
21. Stores, grocery, clothing

The boys expressed desires in the direction of ships, jets, bows and arrows, knives, steam shovels, cranes, guns, forts, trains and tracks, jeeps, trucks, racers, baseball, cowboys, Indians, boats.

The girls expressed a desire to construct in relation to knitting, sewing, stages, acting - expressed a greater desire for cooking, puppet shows, to draw houses, people, villages, scenic views, see-saws, slides.

The girls showed constructive expression along a quiet avenue while the boys were interested in movement and action.

In selecting what the fourth grader should do, it is important that we choose things as far as possible that he is actively interested in doing. Teachers realize that doing is desirable but often choose what the pupil shall make without taking inventory of the child himself. The survey showed that children are interested in making things of action and movement. In construction of any kind, the making of the real thing is of prime importance to the nine-year-old. A text cannot be substituted for the doing of the real thing. The diversified construction activity of the nine-year-old is keenly felt day in and day out, and it is only when a child is actively doing and thinking that he is developing completely.

Tables VI and VII show the frequency of the construction interests of 249 items as constructed by 381 boys and the frequency of 279 items as constructed by 390 girls.

The items made by the boys suggest the age of mechanics and glamour in which we live. Speed, power, motion, adventure, excitement are well represented in the first 170 items of construction which represents over half the total list of items constructed. These factors occur 2½ times greater than do other items of construction. The construction involves other people and in many items listed an extension of the child's personality is shown.

As the list proceeds down the items seem to be more peaceful and more conventional. Puzzles would be factors offering challenge while later items such as making villages and farms challenge dexterity. Groupings from number 12 down on the list have possibilities of being good craftsmen.

The girls in their groupings and number of constructions are almost in reverse to the lists compiled by the boys. Boys have boats and airplanes on the top whereas girls have them at the bottom. The extrovert interests have moved down, environment is having its effect in quieter and more dextrous construction activities.

The girls are very domestic until at the bottom of the lists. Approximately 110 items of construction were purely domestic.

Tables Vi and VII show the difference in the articles constructed by boys and girls. The extrovert desires of boys in their desire for speed, power and motion in comparison to the

domestic and environmental paths followed by the girls should be a challenge to the classroom teacher in planning a curriculum that is purposeful and meets individual needs.

TABLE VI

FREQUENCY OF 249 ITEMS CONSTRUCTED BY 381 BOYS

Groupings	No. of Constructions
1. Airplanes, jets, hangers	16
2. Trucks, trailers, jeeps, automobiles, racers	16
3. Drawing planes, animals, houses, guns, planes, ships, communities, railroads	15
4. Guns, pistols, automatics, anti-aircraft	15
5. Trains, engines, diesels, tracks, switches	15
6. Club houses, forts, lean-tos	14
7. Construction, steam-shovels, cranes, bulldozers	14
8. Scrapbooks of cards, Western ranches, animals, basevall players, baseball	14
9. Bows and arrows, tomahawks	13
10. Snow houses, forts, men	13
11. Spears, swords, knives	13
12. Boats, ships, canoes	12
13. Puzzles of all kinds, made and bought	12
14. Bird houses, feeding stations	11
15. Paper people, animals, farms, forts	10
16. Carving animals, men	9
17. Cowboys and Indians - costumes and scenes	8
18. Firetrucks	8
19. Cards - Valentine, Christmas	7
20. Making villages, farms, calendars, posters	7
21. Atomic bombs	4
22. Cooking: fudge, cookies, hamburgers, bacon	3

TABLE VII

FREQUENCY OF 279 ITEMS CONSTRUCTED BY 390 GIRLS

	Groupings	No. of Constructions
1.	Cooking: cookies, fudge, jello, pancakes, making of cook books	21
2.	Sewing: dresses, skirts, stockings, helping mother sew	20
3.	Knitting: squares, runners	19
4.	Scrapbook of cards, clippings pictures maps	17
5.	Stores, grocery, clothing	17
6.	Gimp, belts, ties	16
7.	Puppets, puppet shows	16
8.	Puzzles of maps, places, people, things	16
9.	Snow houses, men and women, slides	16
10.	Carving animals, churches, people	15
11.	Movies, stages, acting	15
12.	Cards, Christmas, Valentine	14
13.	See-saws	14
14.	Painting: pictures of animals, houses, people, sliding, snow men, winter scenes, villages	13
15.	Houses, huts, camps	10
16.	Bean bags	9
17.	Candles	8
18.	Hide-outs, secret passages	8
19.	Lantern slides	6
20.	Airplanes	5
21.	Boots	4

From the observation of 65 individual pupils, it was noted that activities of action and doing lead all other pursuits. Children like to work with their hands, they like to see and feel what they are doing. In this group a keen interest and much enthusiasm was shown when construction was suggested by the teacher or suggestions were presented by the pupils. The range of items to be constructed was large; children were very spontaneous in making many and varied suggestions. The types of articles to be constructed closely follow the lists in Tables IV and V plus the making of impossible items such as real airplanes and submarines.

It was especially noted from observing the 65 pupils that:

1. Children like to make many and varied items.
2. They like to see and feel what they are making.
3. They act and play the real part in the construction or the operation.
4. Team work and fellowship is developed in group projects.
5. Hidden aptitudes and skills are brought to light that heretofore remained hidden.
6. Certain discipline cases were eliminated.
7. Interest in the school program was better.
8. Adult vocations were suggested by pupils in that--"I would like to be an electrician when I get older."
9. Children learned more and were better in attacking their daily assignments.
10. Some children showed no desire for construction and were very anti-social in relation to group activities.
11. In general, much interest was shown in relation to construction activities.

OBSERVATION DATA SHEET OF 65 CHILDREN OBSERVED

Pupil's Name John Hill School Eaton

1. Items child likes to construct.
   airplanes, birdhouses, huts

2. Why pupil likes to construct.
   Interested in them.

3. Items of construction suggested by pupil.
   Model planes, airport, maps

4. Why pupil suggested these items.
   Likes planes. His father is a salesman, he likes to travel.

5. Interest factor during construction.
   Much interest was shown.

6. Conversation or comments noted during construction.
   (Pupils were constructing an airport)
   "Should have done this better. Those jets are some planes."

7. Pupils approach to problem.
   Assembled materials, went to work immediately.

8. Comparison of construction to other work.
   Tries to do well in all his subjects, his interest is greater in the making of things.

9. Comments by classroom teacher.
   An average youngster, does better in construction than in straight academic work.

Observation Data Information

The observation data sheet used was in notebook form, the surveyor completing as many items as the information warranted. Most children were very free and forward in answering questions and in expressing their desires.

One general answer received many times when the question was asked - Why do you like or want to make a racing car or whatever the child expressed a desire to construct was - I like to do it, it is interesting to do. Interest seemed to be a paramount factor in all instances.

Another favorite comment made by the children in relation to construction was that we can see and feel the thing we are making. Certain subjects such as the reading of a language text causes our minds to wander and we do not care too much about the material.

The conclusion drawn from the observation of 65 children revealed a strong desire to learn by doing and they showed a great desire to learn when their interests were aroused. Very intelligent pupils preferred to work alone or with someone of their own calibre on detailed projects. Slow children seemed to be happier in their work.

Much work needs to be done in acquainting pupils how to attack and pursue problems. A great deal of time is wasted in getting started and in working on the item. Work study skills should be an integral part of construction.

A readiness state exists in construction as in other aspects of learning and that teachers should carefully plan a construction activity. Interest spans should be carefully fitted to meet pupil personalities.

As a result of studying what children like to do and make, teachers are becoming considerably more sensitive to the fundamental needs of children. They in return, consciously or unconsciously, feel that the teacher has a greater interest in them and what they are doing. There is a need in all schools for a comprehensive interest study of all pupils in order that a child-centered curriculum may be developed. In all interests, construction plays a prominent and important role.

CHAPTER IV

SUMMARY

The purpose of this study was to discover the construction interests of nine-year-old children in grade 4, both in and out of school.

It is hoped that teachers will be desirous of obtaining the interests of her groups in the fields of what they like to do or make, what they are interested in, or have done, and with this information develop a child-centered interest school program. School curriculum which is most developmental to the pupil can only be obtained when we have an insight into these inner fields.

The questionnaire, which was distributed to 771 grade 4 children, gave them the opportunity to freely list the things that they had constructed or made, in and out of school. The 65 children observed were asked what they had made or why they were making the current object now under construction.

In listing the things constructed it was found that 47 children didn't list making or doing anything. The totality of this statement is doubted for teachers had noted some construction but their amount of activity is indicative of the figure 0. Several children in the high I.Q. group who listed only a few articles constructed, stated their preference for

reading.

The types of things made or constructed showed that the boys especially liked action and movement. The girls preferred doing things that were not as active as were the boys and were inclined on the domestic side. Both groups expressed a desire for doing, for working with their hands, and in seeing the product when done. Many were impetuous in that they wanted to complete what they were doing immediately.

The element of interest was high in all general aspects of construction. They preferred the activity in the construction of a transportation mural to talking or writing about it. The companionship in working together on a unit of construction gave warmth to the children as they worked. They were unconsciously growing socially from working as a body. Construction has great value in social training,for adults as well as children have better understanding and appreciation in the contacts of work.

Children in the fourth grade like to work and make things with their hands. There is great opportunity for a youngster to develop his own particular aptitudes which may later result in a trade or work skill.

The articles of construction as listed by the children might be a means by which teachers could reach children that have been difficult to draw into the group. Difficulties a child might be having could be eliminated if his interest were

aroused. He might not see any real worth in arithmetic from a textbook point of view, but if he likes carpentry and is put in charge of scenery he might see a reason for finding length and width or how many feet of lumber needs to be purchased.

Learning can be more meaningful if the child sees, feels, and works on the project or unit. It has size, shape, proportion; he has a picture in his mind and not a haze of what is being done.

The introspective nature of grade 4 children in the number and kind of things made would warrant checking in a paired comparison or other suitable instrument. Case study, observation, or the use of anecdotal records of which more are being scientifically kept, would give a greater insight of what and why pupils like to do and make.

A program should be developed in all elementary schools in which the interests of children are known. These interests, if inadequate, should be artificially stimulated. Children like to construct things; they like to work with their hands in the building and making of all sorts of things. This factor should be capitalized on by each classroom teacher in developing a daily program of interest and learning.

The realization that the bulk of the boys, 87 percent of them, preferred to construct from 8 to 0 articles, while 88 percent of the girls preferred to construct from 10 to 0

articles, should make the teacher realize that children have limits in construction. In the largest number of things made, 4 boys constructed an average of 24 different articles whereas 5 girls constructed an average of 18 different articles. The lows and the highs in construction should be realized when assigning work jobs to pupils in unitary or daily work programs. Some pupils will be able to assume a great deal of responsibility whereas others have definite limits. Individual differences have to be provided for in construction similar to reading or spelling.

It is desired from this study that teachers, principals, educators, camp or club instructors or any person working with children, be aware that much working and teaching information can be obtained from children if we know what they like to do or make, in and out of school, and that this information is a natural mode in the learning processes of children.

BIBLIOGRAPHY

Children's Interests, Twelfth Yearbook of the California Elementary School Principals' Association, Oakland, California, 1940.

Corey, Stephen M. "Characteristic Interests and Needs of Pupils that Aid in Defining the Nature and Scope of the Reading Program," Adjusting the Reading Program to the Individual. Chicago: Conference on Reading, University of Chicago, 1941.

Davis, Robert A. Psychology of Learning. New York: McGraw-Hill Book Company, 1935.

Dawson, Mildred A. "Children's Preferences for Conversational Topics," Elementary School Journal, 37:427-437, February, 1937.

Dewey, John E. Interests and Effort in Education. Cambridge: Houghton Mifflin Company, 1931.

Fryer, Douglas. Measurement of Interests in Relation to Human Adjustment. New York: Henry Holt Company, 1931.

Gesell, Arnold, and Francis Ilg. The Child from Five to Ten. New York: Harper and Brothers, 1946.

Hurlock, Elizabeth B. Child Development. New York: McGraw-Hill Book Company, 1942.

Isaacs, Susan. The Children We Teach, Seven to Eleven Years. London: University of London Press, 1937.

Lee, J. Murry, and Doris May Lee. The Child and His Curriculum. New York: D. Appleton-Century Company, 1940.

Organizing the Elementary School for Living and Learning, 1947 Yearbook, Association for Supervision and Curriculum Development of the National Education Association, Washington, D. C., 1947.

Stewart, Dorothy H. "Children's Preferences in Types of Assignments." Unpublished Master's thesis. Boston: Boston University, 1945.

APPENDIX

Directions to the Teacher

1. This sheet is to find out the names of things children in the fourth grades have made or constructed since last Christmas (1948). (The survey was conducted in the spring of 1949.)

2. Please have the children list the names of things that they have made on the mimeograph sheets, using both sides of the paper if necessary.

3. Each teacher is asked to provide a classroom situation in which the children are free to list the things that they have made.

4. The teacher is further asked not to influence the fourth grader in formulating his list but that the information come wholly from him.

5. The length of time suggested for this information is 12 minutes, but the teacher may add or subtract as the situation warrants.

Name

Boy ( ) Girl ( )

How old are you? When is your birthday?

Some boys and girls like to make things. Write here the names of things you have made since Christmas of 1948.

OBSERVATION DATA SHEET

Pupil's Name	School

1. Items child likes to construct.

2. Why pupil likes to construct.

3. Items of construction suggested by pupil.

4. Why pupil suggested these items.

5. Interest factor during construction.

6. Conversation or comments noted during construction.

7. Pupil's approach to problem.

8. Comparison of construction to other work.

9. Comments by classroom teacher.