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Signature Lawrence Alan Hutchinson

Date 12/22/76

THE DEVELOPMENT OF IMAGERY LESSONS IN LANGUAGE ARTS FOR FOURTH GRADE

by

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ABSTRACT

The purpose of this study was to develop example imagery lessons in language arts for fourth grade. Four areas of research were investigated before any lessons were developed; child development, information processing, imagery as related to the split brain theory, and language arts textbook publications.

The child development framework of the study was based on Piaget's concept that children must pass through predetermined physiological and psychological development.

Information processing was based on Bruner's theory that any concept can be presented to a child if the initial construct is sequenced in such a way as to be recognizable to the child in his developmental stage. The importance of imagery was supported by Ausubel. He stated that the initial construct should be presented in the form of a concrete image.

Imagery was found to be related to the right hemisphere of the brain while language was related to the left hemisphere. It was discovered that most conventional instruction is presented to the left hemisphere which processes verbal and written symbols. It was found that imagery abilities tended to be lost after several years in primary school.

A review of language arts textbook publications confirmed this assumption. The writer did not find any specific imagery development lessons in the reviewed textbooks.

Four lessons were presented to experts in elementary education at Montana State University. The results showed imagery stressed in all four lessons. Three of the four lessons were reported suitable for fourth grade while one lesson was recommended for fifth and sixth grade.

CHAPTER I

INTRODUCTION

Comenius (1932) stated:

> For more than a hundred years much complaint has been made of the unmethodical way in which schools are conducted, but it is only within the last thirty years that any serious attempt has been made to find a remedy for this state of things. And with what results? Schools remain exactly as they were.

Man has struggled to improve the educational process for hundreds of years. Even though there have been many technological innovations devised to facilitate the acquisition of knowledge (individualized instruction, programmed learning, computer assisted instruction) many students still become frustrated and lose interest in school because of its emphasis on factual knowledge. Educators have assumed that students willingly and actively involve themselves with learning materials.

In the last fifty years much research has been conducted concerning how a child learns. Piaget has been a leader in this area of child development. In his theoretical structure, he stated that every child must pass through certain predetermined stages of physiological and psychological development. It is assumed that the educator must wait until the child is ready to advance to higher

conceptual levels. The emphasis is on allowing the child to continue to build concepts within a single developmental stage.

Bruner (1967) supported Piagets theory that all children must pass through stages of development. His development of the theory contributed the idea that material could be sequenced so that the beginning steps could be adapted to the child's stage of operation.

Another interesting discovery within the past several years has been the discovery of the functions of the right and left hemispheres of the brain. McKim (1972:18) explained the functions of each hemisphere:

> The right hemisphere of the brain (which controls the left side of the body) is a neurological center for such symbolically left handed processes as sensing and imagining. And the left hemisphere (which crosses over to control the right side) is a center for each symbolically right handed processes as verbal reasoning and mathematical description.

Most contemporary education is directed to verbal reasoning and mathematical description. A child has a natural ability to use the sensing and imagining hemisphere of his brain, but as he progresses through his formal years of schooling ". . . it begins to wither away from lack of use" (McKim, 1972:89).

The use of imagery in the elementary school is an invaluable asset to the student. McKim (1972) says educators should continue training in imagery throughout a child education. He commented that children quickly lose their ability to use imagery early in their school years, but this ability could be partially regained with visual calisthenics.

If imagery does increase a childs ability to function better in school by giving a child more thinking strategies, it would seem beneficial to develop lessons using selected topics in content areas which would employ imagery training.

Statement of the Problem

Research has shown that imagery can be of great benefit in learning. This paper will develop background and imagery materials that can be applied to language arts. Appropriate topics will be selected and imagery techniques applied to develop sample lessons for fourth grade students.

Need for the Study

Much research has been conducted in the area of imagery but little has been done to apply this wealth of

knowledge to content areas. The writer has researched the ERIC materials, the Educational Index, and current publications of content materials in the area of language arts and found very few materials that incorporate imagery. McKim (1972:84) made the observation:

> Contemporary education (here I use the term in the broadest sense) seriously neglects inner imagery in two ways. First, it fails to make the individual aware of his inner imagery. Second, it affords little opportunity for him to develop this inner resource.

McKim (1972:24) stated that other modes of thinking, other than verbal and mathematical, should be utilized.

> Outside of art and design education few educators are aware that thinking can occur in other than verbal and mathematical modes. Yet sensory modes of thought, especially the visual mode, are at the very heart of thinking.

Only in kindergarten and first grade is education based on the cooperation of all the essential powers of the mind but ". . .visual expression usually ceases early in primary grades" (McKim, 1972:24). Beyond these early educational experiences there is little evidence that children are exposed to visual imagery techniques. Therefore it seems appropriate that a concern of this study be the development of materials and sample lessons which

utilize visual imagery. The lessons will be in the language arts.

Definitions of Terms

Flexibility in thinking: A term describing the ability to move from one thinking strategy to another when engaged in an activity.

Imagery: The ability to produce sensory images, visual, verbal, tactile, smell, or taste.

Thinking levels: A term used to describe the four known levels of brain activity which include beta, alpha, theta, and delta. The conscious or awaking state will be classified as beta. When there is a reference to imagery, the alpha level will be implied in this study.

Thinking strategies: A term that includes analysis, the ability to dissect an object or material into parts; induction, the ability to move from a particular observation to a general concept; deduction, the ability to move from a general concept to a specific observation.

Limitations of the Study

The review of literature was limited to materials

available in the Montana State University and the writer's personal library.

The review of materials in the content area of language arts was limited to publications after 1965 and only for fourth grade.

In reviewing the literature, many different descriptions of imagery were found. This study was limited to only those considered pertinent to the development of imagery lessons.

The materials developed should be considered supplementary to existing programs.

The sample lessons have not been tested in fourth grade classrooms.

Questions to be Answered

The following questions will be answered in the review of literature. Each question has been researched using materials described in Limitations of the Study.

1. What current theories of learning should be considered in the development of new programs?

2. What changes in psychological theory mandate new teaching strategies?

3. How much are imagery development techniques stressed in teaching materials used in contemporary education?

4. What imagery techniques would be most appropriate in presenting content materials?

5. What topics would be most appropriate for the development of sample lessons utilizing imagery?

6. What kind of model or lesson prototype should be developed to train for visual imagery in the language arts.

General Procedures of the Study

The investigation for this study began with a general overview of contemporary psychological theories of child development. The research of these theories was then used as a basis for the development of lessons for fourth grade in the language arts.

The second area of investigation that was considered essential to the development of lessons was the split brain theory. It was in this area that the investigator discovered an imbalance in the teaching of content material. Further investigation lead the researcher to conclude that perhaps more emphasis should be focused on material that

is more receptive to the right hemisphere (imagery) rather than the left hemisphere (math and language).

A review of language arts publications (after 1966) showed little was done to develop the right hemisphere. As a result of those findings specific topics and materials in the language arts were chosen and imagery techniques developed.

Finally an evaluation instrument was developed to be given to experts in the fields of language arts and visual perception.

Summary

For hundreds of years educators have attempted to improve methods of instruction. There has been a gradual shift in emphasis from the material in the content areas to the child. Piaget has been a leader in this field. His theory suggests that children must go through physiological and psychological stages of development. Little can be done to speed a child through these stages unless certain prerequisites are met which allow a child time to interact with material and formulate concepts with which to reorganize existing structures. These newly formulated

structures could eventually serve as bridges to higher developmental stages.

Consideration must be given to the split brain theory in the development of new material, especially the right hemisphere. The right hemisphere is thought to process spacial information (imagery) while the left processes language and math information. Schools have long emphasized the processing of language and mathematical symbols. It is the researchers belief that more should be done to readjust the emphasis, and encourage the development of the right hemisphere. The ability to visualize exists in young children but they quickly loose it as they progress through school.

The problem of this study was to develop materials utilizing imagery that could be adapted to the language arts at the fourth grade level.

CHAPTER II

REVIEW OF LITERATURE

The development of this program included a review of literature in educational psychology and learning theory, the split brain theory as related to imagery, and publications of language arts texts from 1966 to 1972.

Many have attempted to interpret Piaget's theory. One of these interpretors is Guy Lefrancors (1975:227). Two of his explanations are:

> 1. The basic theory can be summarized by referring to Piaget's view of intelligence. Intelligent activity is the result of the interaction of assimilation and accomodation (functioning) in response to the environment, and in accordance with mental structures (schemas). Behavior (content) occurs as a result of this process; its occurrence justifies the inference that structure exists. Change in that behavior justify the inference that functioning has occurred.
> 2. Piaget describes developmental as proceeding through four major stages. Each stage is qualitatively different from the other, but each results from the one that preceeded it, and prepares the child for the one that follows.

Phillips (1969:11) interpreted Piaget's stages as not bound to a certain age:

> . . . all age ranges are approximate. In children of any age range one can usually find manifestations of more than one stage or period. The important point is that the same sequence of development occurs in every child. Many previously learned behaviors will occur even though he is capable of new and better ones. Piaget conceives

> intellectual development as a continual process of organization and reorganization of structure. Each new organization integrating the previous one into itself.

Where as Piaget saw a sequence in psychological and physiological development, Bruner saw a sequence in the actual material of a concept. Bruner (1967:44) stated "any idea or problem or body of knowledge can be presented in the form simple enough so that any particular learner can understand it in a recognizable form."

In this way if an instructor could identify a sequence of learning tasks for a concept, he/she should be able to successfully teach or introduce any concept to the learner no matter how difficult. Bruner (1967:49) stated:

> Instruction consists of leading the learner through a sequence of statements and restatements of a problem or body of knowledge that increase the learners ability to grasp, transform and transfer what he is learning. In short, the sequence in which a learner encounters material with in a domain of knowledge affects the difficulty he will have in achieving mastery.

The sequence of materials is not of itself a solution for mastery of skills. Material, to be part of a curriculum, should have a more powerful sequence. Bruner (1967: 35) commented: "A curriculum should involve the mastery of skills that in turn lead to the mastery of still more powerful ones, the establishment of self reward sequence."

Another well known educational psychologist (1958:96) says in his theory of developmental stages:

> To demonstrate the existence of developmental stages it is only necessary to show that certain qualitative differences in process arise consistently at definite points in a developmental cycle which differentiate the greater mass of children at a given age level from adjacent age groups.

Ausubel viewed learning as sequenced steps similar to that of Bruner. Ausubel (1958:559) noted that if steps were missed there could develop a false concept.

> In certain instances where the verbal symbol is learned by rote in the absence of preceding steps, it has no ideational referents and does not represent a genuine concept.

Both Ausubel and Bruner believed that the first introduction of a concept was important in establishing a good foundation from which to base futher concepts. Ausubel (1958:560) commented on the function of imagery in the initial stages of interaction with a concept.

> At first concrete images are employed to represent a general class of objects, but these are gradually replaced by more abstract representational symbols detached from the stimulus properties they signify.

Douglas, Gumeruk, and Ghatala, Levin reported in similar studies, the importance of concrete imagery in initial memory tasks.

As the child uses these new concepts, they begin to become more flexible in usage. Ausubel (1958:560) wrote how concepts gradually attain independent status. "With increasing age they become conceptualized and attain independent status in their own right. They can then be applied to any relevant object or situation."

Dienes (1963:xvii) commented on the learning of a statement through previously learned statements.

> To accept a new statement we require usually that it be capable of proof, by which we mean that there should be a chain of statements each depending in some admitted way on some or all previous statements; the end of the chain is the new statement.

The importance of prior knowledge in learning tasks was substantiated in studies by Briggs and Gombrick.

It was Dienes (1963:27) belief that statements could be transitions from one stage of development to another. And that these ". . . transitions can be artificially induced by suggesting problems to children after they have had a certain amount of free manipulative or representational play with any given material."

Dienes thought it very important that a child be allowed to manipulate materials. In this way the child will discover rules and begin to organize these materials

into meaningful structures. Dienes (1963:23) commented: ". . . the rules themselves will be the objects of manipulation and the situation is open again at a higher level."

Physical events are very important in the dovetailing of the interactions of materials with theoretical models. Dienes (1963:xvii) reported:

> . . . although we might be guided by theoretical models in terms of which we explain and try to predict future events, the ultimate verification always lies in dovetailing actually occurring physical events with the requirements and consequences of the theoretical model.

As a child advances through his stages of development, he acquires more experience which he turns into knowledge. With this knowledge he solves problems which in turn gives him more knowledge. Phillips (1969:130) stated: ". . . growth in the ability to use this knowledge in the solution of particular problems, including those problems which, when solved augment the learners original store of knowledge." Dienes (1969:24) stated a similar observation: "Awareness increases with accumulation of experience."

Split Brain Theory

Before the 1970's the split brain theory was not accepted by major psychologists. However, within the last

few years new discoveries have suggested that the split brain theory be given new consideration.

Studies on retrieval of verbal information suggested a separate processing of verbal and non verbal stimulus, however, there was not sufficient evidence to support the theory. An example of such a study was conducted by Douglas and Brooks (1973). Their findings suggested that both phonetic and imagery attributes were processed independently.

Still the controversy of the split brain continued. The problem seemed to be a mixing of information from one hemisphere to the other. Lindsey (1973:322) explained: "Normally, the two hemispheres appear to build up duplicate memories in a learning task, even when the sensory messages may be restricted to one half of the brain.

Yet, psychologists continued to get slight and sometimes significant results in verbal processing tasks. Posner (1973:103) observed:

> ". . . if normal subjects are required to make a physical match among letters, they are faster if information is presented to the right hemisphere, while if required to deal with names, they appear to do better with information presented to the left hemisphere.

Another observation was concluded by Lindsey (1973:321)

about the ability of the right hemisphere to recognize language.

> The right half of the brain is limited in its ability to recognize language. It is very good at comprehending concrete nouns, but somewhat less good at comprehending verbs or nouns derived from verbs (such as "locker," "clipping," or "fall."

In the normal brain, the right hemisphere function was primarily to structure spatial information, while the left hemisphere usually structured math and verbal information. Lindsey (1973:323) explained:

> It is not known why the left hemisphere usually controls language. The two hemispheres seem to start off the same, and from appearances there is no reason why one should be better suited for dealing with language than the other. Yet, language usually develops in the left half, non verbal skills in the right.

Ferguson (1973:177) expressed his view on the functioning of both hemispheres:

> For what ever reason, the right hemisphere is superior at spatial reasoning.
>
> In most individuals, speech resides primarily in the left hemisphere which is in touch with what happens to the right hand.

This statement of right handedness was a major topic of disagreement for many psychologists; however, this theory proved itself.

The concept of spacial processing was not limited to visual stimuli. Speech, as noted above, is primarily a function of the left hemisphere; however, Posner (1973:103) noted that music tended to be processed by the right hemisphere which corresponded to the left ear, while perception of words seemed to be better with right ear stimulation.

The processing of information has been generalized by Ferguson (1973:177). He concluded: "The left hemisphere tends to analyze the whole into parts while the right sees the whole."

If the solution to how the different hemispheres were ever to be formed, there had to be a way of separating these seemingly independent functions. Carr (1973:49) explained the physiological functions of the brain. Nerves are funneled to a group of ganglion cells located directly behind each eye. At this point the nerves split up. Half remain on the same side as the eye and the remaining nerves cross over to the opposite hemisphere. The crossing over is the only nerve link between the two hemispheres. Posner (1973:103) reported an observation made by Gazzanizer. Gazzanizer noted that persons that experienced epileptic seizures would develop a mild impulse in the left hemisphere. When this impulse would transfer to the right

hemisphere the patient would experience a seizure. Gazzanizer cut these nerves at the crossover point and the seizures stopped; however, there were some interesting side effects. When the patient was presented visual information through the left side (corresponding to the right hemisphere) the patient could not make any verbal report of what he saw. In fact, Posner noted (1973:103) the patient would deny knowing anything about the material presented if asked about it.

Lindsey (1973:319) reported a similar observation of a split brain patient when he encountered visual stimulus. "If a visual image is presented to the left visual field, he states that he sees a flash but cannot make out details." But, when the stimulus was presented to the right field of vision he was able to verbally identify it. Lindsey (1973: 319) explained this phenomenon by saying that ". . . the sensory input reaches the left hemisphere, it makes contact with the language centers."

This inability to identify objects was not related only to visual stimulus. Tactile stimulation was also involved. Lindsey (1973:319) reported that when a split brain patient was presented an object in his left hand and asked to name the object, the patient reported that his left hand felt

numb and that he could not reply. A similar observation was made by Ferguson (1973:177). A split brain patient encountered several objects presented to his left hand. He was asked to pick out a toothbrush, which he promptly did. When asked later during the same experiment to identify verbally the toothbrush which he held in his left hand, he could not. However, he did make motions that demonstrated the function. The patient could recall an object and correctly identify it even hours after the initial contact but he still could not name the object.

Lindsey (1973:319) concluded after the results of this experimentation:

> . . . although the right half of the brain can not use language normally, it can use concepts. The right half of the brain then, while independent of language, is nevertheless still capable of intellectual tasks.

Imagery

A child learns about his world through his/her senses. The sense impulse arrives at the brain and the brain interacts with the stimulus. McKim (1972:6) called this internalizing process of information "visual thinking." "Visual thinking pervades all human activity, from the abstract and theoretical to the down-to-earth and everyday."

McKim (1972) believed the capacity for visual thinking is inherent in everyone when young, but school discourages the use of imagery by emphasis on the left hemisphere (language oriented) processes. As schooling advances language is used more and more to compress, to represent, and to express experience. As a result of this emphasis, imagery ". . . begins to wither away from lack of use" (McKim, 1972:89).

Since childhood emphasis has been placed on labeling items. These items have become so generalized that the child has learned that the identification of the proper label (speech) is more important than the close observation of that item. McKim (1972:947) wrote: ". . . the only things which we commonly see are those which have been labeled for us and then stamped in our minds."

In a society that demands reality-adjusted thinking only, we would find the schools almost exclusively "right handed" (McKim 1972:19).

Perhaps because of this lack of "left handedness," some people claim they see no after image. McKim (1972: 84) believed that imagery is not necessarily a common human ability and that some people have more potential for imagery development than others. He stated:

> It is not, however, a common human capacity. It is not a common human ability, and training may be necessary for some people before they become aware of their after images. Failure to become aware of imagery is due chiefly to inattention to and consequent lack of familiarity with internal channels of stimulation.

Each individual has a different capacity in which to utilize imagery. Each projection that the individual internalizes is highly related to personal interest and past experiences.

A study conducted by Schapiro (1972) attempted to relate the use of visual imagery to material. He concluded the form in which an image appears and the manner in which it is experienced by an individual depends on the degree of organization. Morris (1972) noted a difference in the facility of imagery in people with regard to different sensory modalities. In an observation of McKim (1972:43), he concluded:

> . . . seeing is more than sensing: seeing requires matching an incoming sensation with a visual memory. The knowledgeable observer sees more than his less knowledgeable companion because he has a richer stock of memories with which to match incoming visual sensations.

Education that encourages different sensory modalities, develops new thinking strategies, and encourages the use of

visual imagery is essential to contemporary education.

McKim (1972:3) presented his argument for imagery education in this way:

> Education that develops skill in thinking by the vehicle of sensory imagery has several advantages. First, it vitalizes the sensory and imaginative abilities that are often allowed to atrophy by contemporary education. Second, it provides vehicles that are frequently more appropriate to the thinker's needs than are language symbols. Words are clearly not adequate to the thinking of a painter. Words and numbers are also often inadequate to mathematical, scientific, and other non-artistic modes of thinking. Third, education in sensory thinking encourages flexibility in thinking levels: the importance of dreaming, for example, becomes more evident to the thinker who attends this form of inner visual imagery. And finally, thinking by sensory imagery encourages the thinker to utilize thinking operations that are not within the realm of language thinking.

Visualization training is important in all segments of life. Bruner (1967:34) made a comment on his view of visualization:

> I do not think that we have begun to scratch the surface of training in visualization--whether related to the arts, to science, or simply to the pleasures of viewing our environments more richly.

Review of Language Arts Publications

Each publication will be discussed in view of imagery content only.

1. The Roberts English Series

Paul Roberts

Hartcourt Brace and World

N. Y. 1966

There was no mention of imagery in either the table of contents or the index. Each section began with a poem but instructions asked only for listening or reading activity. No specific type of guidance for imagery was given.

2. English is Our Language

Harry Sartain

D. C. Heath and Company

Boston, 1966

There was no mention of imagery in either the table of contents or the index. Chapter 4, "Telling Stories," and Chapter 5, "Writing Stories" were the only link to imagery. Under the "Instructional Approaches" to chapter 4:82, in the teachers edition, the author commented on stimulating imagination: "Stimulate the children's imaginations by reading stories to them, by showing them illustrations from magazines, and by listing beginning sentences on the board."

In the text, page 94, the author wrote under "Ideas for Stories:"

Use your imagination! Do the following groups of words give you ideas for stories?

1. an empty house
   a boy
   a sad ghost
2. a playful puppy
   a doll
   a rainstorm
3. a moon
   a spaceship
   a boy or a girl

Another suggestion given by the author to encourage imagination was given on page 94 of the teachers manual, "Let one child who you know is imaginative tell his story first in order to encourage the others."

3. Ginn Elementary English

   Carol Jamieson

   Ginn and Company

   Boston, 1967

Chapter two, lesson six, page 59, is the only mention of imagery in the table of contents, however references to imagining were made throughout the book. Lesson six was called "Using your Imagination on the Things Around You." There was no mention of imagery in the index. The author suggested having the children keep an idea book. The author commented in the teachers edition (T.M.47), the purpose of the chapter:

> Explain to the class that the purpose of learning about words is to be able to use and combine words to share ideas. Suggest that telling stories is one of the most interesting ways to put words together. Tell the pupils that the next few lessons they will be using words to tell about the things they have seen or imagined.

Lesson seven stressed knowing the proper word to describe a scene. A picture is to be displayed. The teacher is to ". . . encourage the pupils to imagine that they are at the scene, and call upon them to suggest words to tell about the scene."

Lesson eight (T.M.49) again stressed the use of words to describe or label.

> Suggest that when a person writes a story, he usually has a picture in his mind about what he plans to tell. He must choose words to describe that picture so that his listeners or readers will get a clear image in their minds.

The author suggested games in which children could practice describing.

4. Our Language Today

   Conlin Lefcourt

   American Book Company

   N.Y. 1967

Chapter seven, "Kinds of Paragraphs" is the only mention of imagery or imagination in the table of contents. No reference was made to imagery in the index. Chapter

seven has a section called "Imaginative Descriptions" (168) and "Imaginative or Real" (172). The author defined "imaginative descriptors as (168): "Imaginative descriptors are written according to the way the writer feels about what he sees. There are many ways to express feelings, opinions, and personal judgments."

The students are required to read a piece of literature and try to imagine themselves in the situations. After reading the literature, the students are required to answer seven questions that are related to the piece of literature.

The section called "Imaginative or Real" is to give the student practice distinguishing between imaginative and factual descriptions. An example of the authors directions for the students is:

> Which of these words describe things you can touch.
> Kindness hope surprise car love
> playground fence worry peace kitchen

5. English: Language, Linguistics and Composition

   Shane, York, Hester, Street, Lock

   Laidlow Brothers

   Palo Alto, California, 1967

There was no mention of imagery in either the table of contents or the index. In the teachers edition (p. 24), in a poetry section under behavior outcomes, the authors did discuss mentally visualizing pictures: "He may be expected to develop traits such as mentally visualize the picture described by the words of a poet."

There were no suggestions of how to do this. Page 83 under behavioral outcomes under the title "Word Pictures in Poems" the authors again expected the students to:

1. mentally visualize the pictures the poet creates with his words.
2. Recognizes the different feelings a poet creates with the words of his poem.

The assumption was made that students can naturally do this without any type of training or suggestions to develop the ability to mentally visualize pictures.

6. New Directions in English

Harper and Row Publishers

N. Y., 1969

In the table of contents under composition, there were two listings for imagery. The first was called "Just Imagine" (198) and the second was called "How do You See It?" (288). Both of these listings were a unit at the end of the book. The "Unit Purpose" (198) was: "To encourage the students to use their imagination and to wonder."

The unit consisted of stories that the student is to read and then answer questions that the teacher asks. Later in the unit the student is requested to invent their own make believe worlds. The students are to make folders they can write their ideas down. Most of the emphasis was on writing.

7. Language and How to Use It

Schiller, Monroe, Nichols, Jenkins, Huck

Glenview, Ill., 1969

There was much emphasis on creative writing but no mention of imagery or imagination. The lessons had much emphasis on writing from descriptions or from illustrations presented in the text.

In the teachers edition page 226, under emphasis the author wrote: "Pupils study excerpts from children's literature to see how writers use words to create imagery. Pupils then try to improve a group of unimaginative sentences." Page 229, the authors again describe the emphasis: "The movements, shapes, and colors in a blazing fire suggest the imagery in 'Pictures in the Fire.' Children are encouraged to write about a time when they, too, imagined unusual sights."

8. Exploring in English

Hand, Harsh, Ney, Shane

Laidlow Brothers Publications

Palo Alto, Calif., 1972

There was no mention of imagery in either the table of contents or the index. Emphasis was on the written part of English. There was much poetry but the student was required to listen.

Summary

Every learning theorist that was reviewed thought a child passes through certain predetermined stages of development. Piaget was used as the basic child development expert. His stages of development is in someways similar to that of Bruner. Bruner was chosen as the basis for the argument that material can be broken down into certain sequencial steps. If these steps are presented to a learner in a manner that he/she can recognize, then it is possible to present the learner with any concept and the child is capable of utilizing that concept to interact with other concepts. Bruner believed that the final skills sequence should be the establishment of a self reward sequence.

Ausubel emphasized that concrete images are important in the initial establishment of a concept. Later these images coalesce into more abstract representational concepts or symbols.

An emphasis on learned statements was also stressed by Dienes. It was Dienes belief that transitions could be made if a child had sufficient time in which to manipulate the presented material. This material could be set up so a child might be guided to a self discovery of a rule on which he could base further discoveries. Dienes further stressed that dovetailing of actually occurring physical events with the requirements and consequences of the theoretical model was a key to successful understanding of a rule or statement.

All of the educational psychologists suggested that the more a child involves himself with the learning experience the more working knowledge he/she gathers.

The split brain patients substantiated that certain kinds of information are processed by different hemispheres of the brain. Math and language symbols are processed by the left hemisphere while imagery or spacial representation is processed by the right hemisphere. The introduction of imagery in language arts would coincide with Ausubel's

theory of the importance of imagery in the initial steps involved in concept development. A balanced development of both hemispheres would result if imagery was introduced as a major teaching technique in contemporary education.

The ability to create inner imagery is thought to be inherent in young children. As they progress through school the emphasis is focused on mathematic and language symbols (left hemisphere) and imagery (right hemisphere) begins to fade away. This ability to image is not the same in all people but it is possible to strengthen imagery through material presented to school children.

Material reviewed in language art publications included very few guided imagery techniques. Stress was placed on reading (left hemisphere) and writing (left hemisphere). Of the eight publications only three listed imagery or imagination in either the table of contents or the index. Of the three publications that listed imagery, two presented imagery at the end of the text. Six publications mentioned imagery in relation to story writing or poetry but no suggestions were given to strengthen imagery. The Ginn publication did list several games in the teachers manual that could be played to practice describing pictures or objects.

CHAPTER III

PROCEDURES OF THE STUDY AND DEVELOPMENT OF LESSONS

A general philosophy for the sample imagery lessons was determined through reviewing several leading educational psychologists. The main basis of the investigation can be summed up in what is called the Identical Element Theory presented by Bigge (1964:265) in his book entitled Learning Theories for Teachers. Bigg stated:

> The Identical Element Theory of transfer means that learning is facilitated in a second situation to the extent that it contains identical factors in an element which occurred in an earlier learning situation.

This identical element theory has been supported by all of the reviewed psychologists in one way or another. Each psychologist has put different labels on observed phenomenon and has produced his own theory. Ausubel (1958), however, has interjected two slightly different ideas that may be applied to imagery. The first is if the sequence of a concept did not follow proper steps, a false concept could result. He referred to the rote verbal chain that is sometimes found in schools. An example of this kind of chain might be given if a child was directed to understand (memorize the sequence) certain verbal commands in which to accomplish a task. It is assumed that the child

understands the directions but the question is, does he understand the reasons for these verbal commands. If the child does not understand, he is susceptible to concluding a false concept. Second, concrete imagery is important in the initial forming of concepts. These concrete conceptual forms are then transformed after a period of time to more abstract concepts through manipulation of materials and internalizing the results of these manipulations.

In a study conducted by Shapiro (1972), he noted the form in which an image appears and the manner in which it is experienced by an individual depends on the degree of organization the individual has had previous to the specific stimulus.

Along with the general theory of identical element theory, the writer considered information processing of the two hemispheres of the brain. Douglas and Brooks (1973) concluded language (phonetic) and imaginal (picture) attributes were processed independently. McKim (1972), Posner (1973), Lindsey (1973), and Carr (1972) suggested that indeed, spacial and verbal information was processed independent of each other in separate hemispheres of the brain even though, in normal individuals, there tended to be some "cross over" of information.

Bruner and McKim called for more emphasis on the right hemisphere, especially in the area of visual imagery. There is a need for awaking senses through stimulation of brain receptors through specific, sequenced, activities (McKim, 1972).

The writer chose the area of language because of its association with the left hemisphere or "right handedness." Visual imagery and language is actually complementary in learning concepts. McKim, (1972:22) wrote:

> Visual and verbal thinking are also complementary by virtue of differences in structure. Verbal and mathematical symbols are strung together linearly in conventional patterns such as those afforded by grammar. Mentally tracking these linear structures automatically enforces certain thinking operations.

The development of a sample lesson in these two content areas should have some type of initial visual imagery as well as some type of concrete manipulation of materials. These materials should be sequenced in such a manner as to allow the child time in which to gather experience and eventually begin to internalize these experiences. McKim (1972:40) explained the active involvement of materials as externalized thinking, "External thinking involves actively manipulating an active structure much as one would manipulate the structure mentally."

Dienes (1963:22-24) explained the learning of a concept could be broken into three sections. The first is exploratory or manipulative play. During this stage the childs curiosity is prompted by play and he becomes aware of the properties of the materials. After this stage comes representational play in which the object stands for something they are not. Dienes suggested that it is during this stage that imagination is added. The third stage of concrete learning is a search for regularities. This stage the child begins to see patterns and seeks out a formation of a rule structure that is a kind of closure which ties in all the loose ends of the past experiences.

The sample lessons attempted to lead a prospective student to a discovery of rules but not give a verbal or written chain of instructions. Dienes (1963:31) wrote:

> There is a great difference between children discovering the regularities through manipulation and being given a game which already has a rule structure that they themselves were eventually intended to learn and abstract.

Time seems to be a crucial element to successful learning. McKim (1972:111) commented ". . . insight usually follows a prolonged contest with the elements of a problem." The sample lessons will attempt to stimulate a childs interest. Lowenfeld (1970:14) stated that little

was being done to have a child find the rewards of learning from within. The acquisition of knowledge should be for its own sake and more important, the sake of self worth. This knowledge will help in later discoveries of related materials. Bruner (1962:82) stated "Discovery favors the well prepared mind."

When a child is interacting with materials, it is important that he be relaxed. In contempory education, tension is usually caused by the teacher that slams a book on a desk to get the students attention. The sample lessons stress a quiet environment to set a mood. After the mood is set, the children have an opportunity to work with the materials. McKim (1972:25) commented: "Visual thinking whether it be in the context of seeing, imagining, or drawing, is best performed in the paradoxial state of relaxed attentiveness."

Both Bruner and McKim cited when major scientific "discoveries" were made the individual was in some way in a state of relaxation. McKim (1972:9) pointed out that Albert Einstein, Kukule, and Curie were all at a state of relaxation when they made their discoveries.

The sample lessons are not so much oriented to the material content (although there is a content structure) as

they are oriented to the method of presentation. The child must be allowed to explore and play with the materials and not be stopped, as Lowenfeld (1970) points out, in the middle of an expression to be shown the "proper" way to do things.

Language Arts - Root Words

The topic of root words was chosen because of its adaptability to imagery. A paper prepared by the District of Columbia Public Schools (1971), studied the effects of Latin instruction to vocabulary testing with sixth grade students. The results of the testing showed that students that had prior instruction in Latin scored higher in the vocabulary test than students that had no Latin instruction. The assumption, perhaps, that could be made, is the identical element of the Latin word to the English root was carried over to the vocabulary test. Bigge (1964:263) concluded, "The more economical method of learning English words is to emphasize the roots and sequence of Latin which are identical in English words."

A study conducted by Beard (1975) concluded that students performed better in recall tests if students studied word segments rather than whole words. Einbecker's

(1973:20) study noted, "Observation of the data revealed that exposure to root words is meaningful to increasing vocabulary."

The development of the imagery lesson using root words involved: the use of illustrations, structure (sequence of tasks for each root), identification of the common root, closure, tracing the word in a "road course," and creating a new word using the root with prefixes and suffixes.

The entry prerequisites that are required to successfully react to the program are: a reading level of third grade, prior instruction in the use of prefixes and suffixes, and a pencil.

There are five root words to which the child must react and give responses. The last root does not complete the entire sequence. The child is to draw his own road course and does not combine prefixes and suffixes to create a new word. This is to be an activity to allow the child freedom of expression, to reduce anxiety thus encouraging inner imagery, and a means by which students might finish the program within a time period for evaluation of the program.

Illustration was used to increase the appeal of the program to children. Stewig (1975) wrote: "Illustrations

are easy to locate and much interest to children." These illustrations are to assist the student to (1) help in the definition of the root, (2) illustrate the closure, and (3) identify the printed root.

An example of helping in the definition of the root is illustrated in Figure 1. This represents the cartoon character "Rooty" looking at stars. This first root word is "astro" which means star or starlike.



Figure 1. Rooty.

The illustrations are not meant to attempt to give a complete definition but rather assist in its definition. Gombrick (1972) wrote that while visual images can serve some of the functions of language, unaided images can't match the statement function of language.

Each root has the same sequence of steps. This was done to have the lesson structured so that the child will be able to anticipate the next sequence of the following root word. A study conducted by Boswell (1975) resulted in the conclusion that students were able to extract more information if materials were structured. After each

response that is requested, the student is directed to an answer sheet at the end of the lesson.

The first response requested of the student (for each root word) is an identification of the common root in four given words. This is done by having the student circling the common root and checking his response on the answer sheet.

The five roots have a closure technique of incomplete lines representing the printed root. Figure 2 represents Rooty driving in a heavy fog. The students are required to connect the broken lines and form a root word. In the case of Figure 2., the root represented is ASTRO.

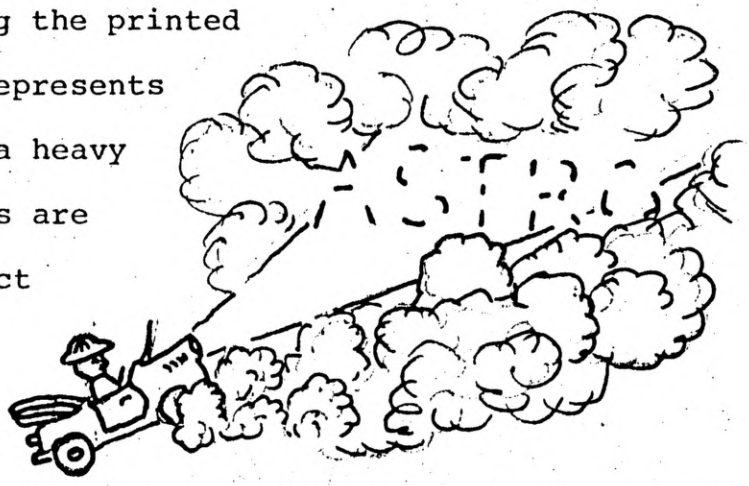


Figure 2. Rooty driving.

McKim (1972:58) wrote that the first step to all perception is pattern seeking. He demonstrated a pattern seeking problem as a series of lines and dots that the eye puts together to make a complete image. An example of this is demonstrated in Figure 3. When someone looks at the

pattern (provided they have proper background) one can see a violin. McKim (1972:56)



Figure 3. Taken from McKim (1972:12)

explained: "So powerful is your percentual tendency to perceive meaningful patterns that you will fill in missing parts."

The next response from the student is a "road course" in which the student traces the course of the cursive root using a pencil. This response is to allow a child to see what the "cursive" word looks like and to use eye-hand coordination. This section can serve as an indicator for those children having difficulty in spacial relationships. Figure 4. represents Rooty in a road course. The directions are:

> Imagine yourself as a race driver. Can you get through this road course without running off the road? Can you see what the name of the road course is? Its a root you have seen before. Be careful! Some of the curves are dangerous.

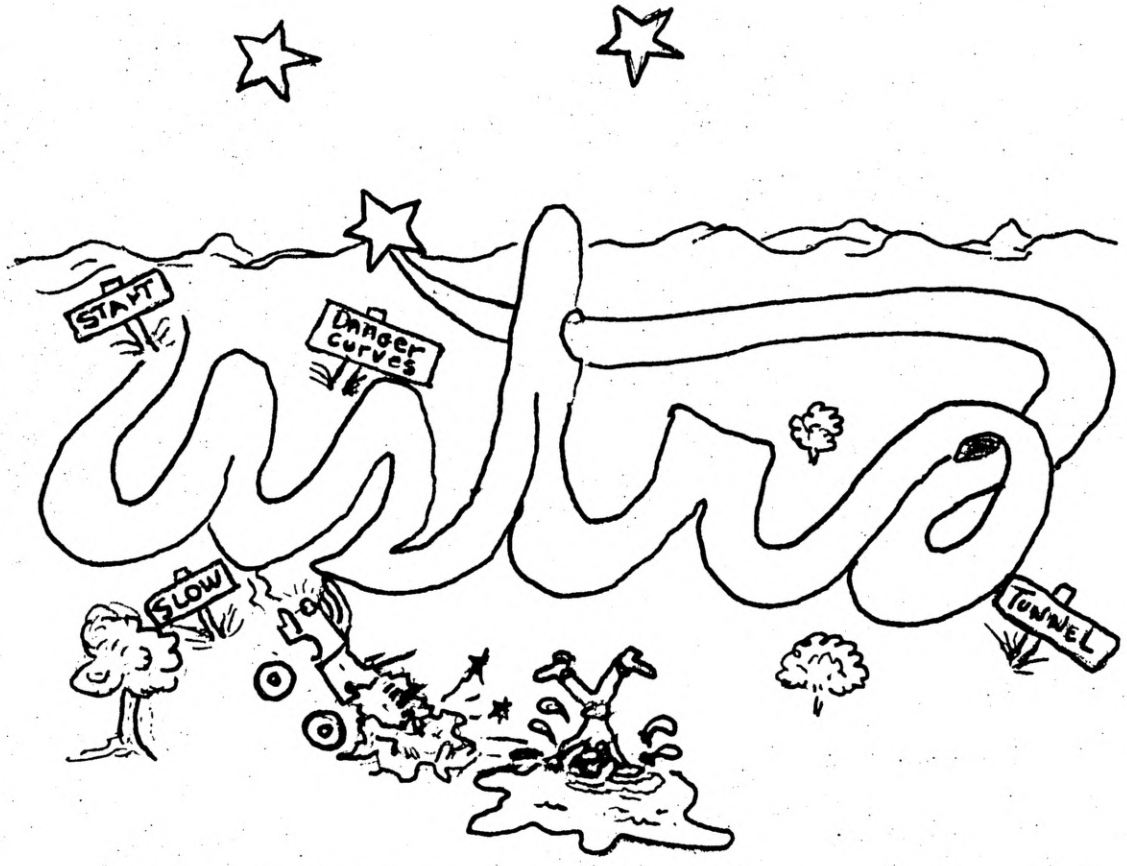


Figure 4. Road course.

Spacial components correspond to imagery. The spacial task of the "road course" is to assist the student in recognizing the root when seen again. Dale (1971:3) explained the steps usually taken in the understanding of a meaning of a word.

1. I never saw it before.
2. I've heard of it, but I don't know what it means.

3. I recognize it in context--it has something to do with . . . .

4. I know it.

Siegel noted that students that studied pictorial representations of a word with a given meaning scored higher on recall tests for the word meaning than students that studied the written word with its meaning.

The active involvement of the student when using a pencil is intended to develop some kinesthetic imagery. McKim (1972:61) wrote, "Seeing is polysensory, combining the visual, tactile, and kinesthetic senses." McKim (1972: 66) further explained:

> The muscular sense has much to do with defining the order of position of things seen, felt, and heard. . . . Such visual scanning, involving the muscles of the eye, is similar to exploration of an object by hand . . ."

This active involvement has also been researched by Danner (1973). His results indicated subjects that actively drew pictures remembered the test words better than students that just looked at the words in an attempt to learn the word with the meaning. The writer has applied studies which support the assumption that if a child actively traces a root word using a closure or spacial technique, he will at least recognize that he has seen the

root before and according to Dale (1971) it is a start to the understanding of the meaning of the word. Levin (1975) substantiated the above assumption in his study that resulted in positive results with children that traced words with a pencil while they looked at the words to be learned as opposed to children that just studied the printed word with its meaning.

The final interaction that the student is required to undertake is to actively search for prefixes and suffixes that are provided at the end of the program. This interaction with the root is to provide a working problem that the student creates himself. He creates his own word through the selection of prefixes and suffixes. He is also required to give a definition for his newly created word.

"The Black Cat"

This lesson consists of several parts. Each part may be altered to adapt to a particular class. Some of the parts of the "Black Cat" story may be resequenced if students or teacher desire change.

The environment should be free from noise distractions. Soft music could be played to allow the right hemisphere to

prepare for mental imagery (Posna, 1972). The lighting should be dim.

The lesson could be considered a concrete experience from which to base future experiences. Bring several pieces of soft black material such as fur or velvet to the children. Black was chosen because of the color contrast that is created when colors are put on a black background as opposed to another color background. The children are to close their eyes and "feel" the softness of the fur until they can mentally "feel" the material without actually touching it. This experience provides a tactile sense of imagery. A second tactile experience would be to bring in a soft black haired cat or kitten. The children would again close their eyes and become aware of the softness of the fur by touching it. After several minutes request the children to close their eyes and see if they can feel the fur without touching it.

Preparation for the Lesson

Each child should place a tape recorder somewhere in the room where they would be alone and not near another child. Once the tape recorder is placed, request the

student to move about ten feet away from it and still maintain a distance from other children.

When the children are seated, review phrases or words that the children might not know such as the phrase "snow capped mountain" in the Black Cat story.

Begin the lesson with a deep breathing excercise. The children are requested to sit in a relaxed position, close their eyes, and listen to each breath. As they breath, remind them to inhale deeply and think of the syllable "re." When they exhale, remind them to allow the air to flow out and think of the syllable "lax." Breath slowly and do not force the air out. As the children repeat this type of breathing, remind them to become aware of their lungs and muscles in their chest expanding and relaxing with each breath.

Ask the children to imagine the black cat lying on a big soft pillow of black fur. The cat does not talk but you can hear a voice in your head saying:

1. Imagine yourself standing in a field of yellow daisies looking toward a snow capped mountain (a slash/ indicating a pause of ten to fifteen seconds),

2. the daisies turn from yellow to blue/

3. bend down and touch the petals/

4. feel the softness of the petals/ breath deep and slow,

5. feel the dryness of the pollen tickle the inside of your nose/

6. walk to the top of the hill in front of you and notice the huge waterfall/

7. listen to the water thunder and splash as it hits the rocks below/ breath deep and slow,

8. feel the cold spray of water on your face/

9. feel the cool droplets of water form on your eye lashes/

10. you notice a mountain berry bush/ breath deep and slow,

11. pick a berry and feel the sweet juice squirt in your mouth/

12. pick another berry. This berry is sour and you feel the sour taste in the back of your mouth/ breath deep and slow,

13. bend down and get a sip of water with your hand/

14. feel the cold water trickle down your throat,

15. the sun is going down and the shadows are making things dark/ breath deep and slow,

16. the sunset is purple and pink/

17. you must start moving toward your tape recorder/ breath deep and slow,

18. look at the sunset change colors/

19. remember what you see on the mountain as you go back to the tape recorder,

20. quietly record what you saw.

Evaluation

Several hours after this experience have the children play back their experiences and translate these experiences to verbal or written expression. The child should wait before being allowed to translate this lesson so that he/she can enjoy the visual expression without the interference of written symbols. The recording immediately after the experience should be similar to a dream type of reporting.

During the written reporting, questions might be asked such as: "What was the most difficult part of the lesson for you?" "What was the easiest part for you?" "What part was the most fun?" Through this kind of questioning a student might reveal where he/she is having problems.

During the actual lesson take note to movements of hands, facial expressions, or other changes in behavior that might indicate visual imagery.

Analytical Seeing

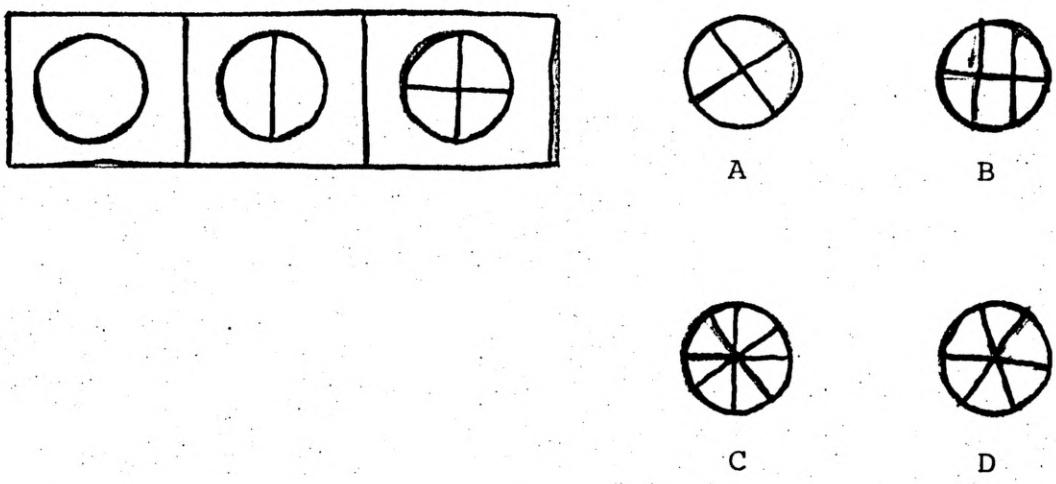
This lesson is designed to develop analytical seeing. The requirements for this lesson are several dozen pieces of different colored cloth or paint chips that could be given to the children. Once the children have these colors they are to match these colored objects to objects in their environment.

The children are to become aware of the subtle changes in color. For example: one yellow is more orange than another yellow, or one red is brighter than another red.

Spatial Analogy

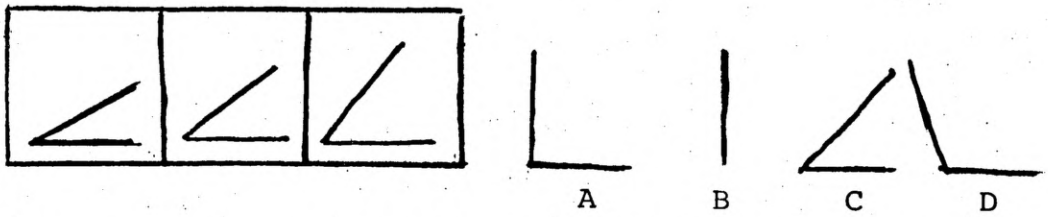
These lessons are designed to assist the student in becoming aware of sequence and differentiations in spacial relationships.

A.



In the above exercies the child is asked to look at the relationship of the first three circles and mark either A, B, C, or D for the answer that he believes would be the next sequenced circle.

B.



This exercise the child is to look at the relationship of the first three angles and mark either A, B, C, or D for the answer that he believes would be the next sequenced angle.

An evaluation instrument was developed utilizing EPIE, (Educational Products Information Exchange). The basic format was used with slight additions and alterations to adapt to imagery lessons. This form of analyses was thought to be flexible enough to adapt to the differences in the four lessons and yet give the evaluator guidelines to review and comment on the lessons. Each expert was given a copy of the four lessons, an introduction and explanation of the evaluative instrument, an example of a completed instrument and one evaluation sheet for each lesson.

The evaluation instrument and imagery lessons are listed in the Appendix as: Appendix A, evaluation instrument; Appendix B, introduction and explanation of instrument; Appendix C, Root Word Lesson; Appendix D, Analytical Seeing; Appendix E, the Black Cat; Appendix F, Spatial Analogy.

Summary

The development of the lessons were based on the identical element theory. This theory base presumes the learning of a concept must have preestablished elements from which the new concept is formed.

Learning to develop imagery should be based on the identical element theory, the materials, and enough time to interact with the material so that proper initial concepts can be formed to base further concepts so that a degree of mastery can be achieved. The materials should be sequenced so that the prospective learner can identify similar elements of past experiences. In this way, he may develop the new concepts in a more guided way.

Another factor that was given consideration was relaxed attentiveness. Mental imagery is associated with the right hemisphere which is also associated with dreaming and day dreaming. If a child is in a state of relaxation the right hemisphere is more active which prepares the individual for spacial information.

There were four lessons developed utilizing different aspects of imagery. The first lesson was developed from an existing topic in language arts. This topic was root words. There were six imagery related tasks that the prospective student must encounter, (1) the same sequence of tasks for each of the five roots, (2) the use of illustration, (3) identification of the letter sequence of each root, (4) closure (use of incomplete printed word, (5) eye

hand coordination in a cursive "road course", and (6) the creation of a new word from a list of provided prefixes and suffixes.

The second lesson was a practice session in mental imagery called "The Black Cat." The preliminary tasks are to practice tactile imagery with the use of fur or velvet. A kitten is also used so children will feel the fur, close their eyes and imagine themselves petting the animal without toughing it. After this warm up session, the children relax and imagine themselves in a story that the instructor reads to them. Tape recorders are provided so that the child can record their experiences.

The third lesson is designed to develop analytical seeing through the use of colored pieces of material that are matched to the childrens environment.

The fourth lesson is designed to assist the student in recognizing sequence and relationships of spacial figures.

CHAPTER IV

EVALUATION OF LESSONS AND INSTRUMENT

Four experts in the field of elementary education were approached to evaluate four sample imagery lessons developed in the area of language arts for fourth grade students. All the experts taught at least five years and were members of the Montana State University faculty at the time this paper was written.

Each evaluator was presented a packet containing: (1) the four imagery lessons (2) an evaluation sheet for each lesson (3) and introduction and explanation of the instrument (4) an example evaluation sheet.

The results of each lesson was reviewed in regard to the comments of the four evaluators. The evaluation sheet for each lesson has five main sections: (1) production description (2) objective (3) content (4) methodology (5) comments (see Appendix A). The author presented his expectations for each of the five sections for each lesson as an introduction. Following the introduction, general statements are presented summarizing the results of the information gathered from the evaluators. A summary of each lesson is provided after each review.

Lesson 1 Root Words (Appendix C)

Product Description

A. Curriculum Role

This lesson was designed as a possible approach to a basic vocabulary development program; however, since the lesson was so short, the lesson would serve as a supplement to existing language arts programs.

Evaluators summary: The four evaluators reported the lesson to be related to language arts or reading curriculum. Three noted the program would be supplemental and the fourth reported the program could be either supplemental or a basic program in word development skills.

B. Students

The lesson was developed for fourth grade students.

Evaluators summary: Results of the instruments showed three evaluators believed the lesson was designed for fifth or sixth grade students. One expert reported the lesson was not specific as to grade level.

C. Instructional Approach

The lesson was designed with a pencil and paper,

workbook approach. It is an individualized programmed lesson.

Evaluators summary: The results of the evaluation sheets showed that two evaluators noted that the lesson was structured in a workbook format. Two evaluators noted that imagery development was part of the instructional approach. Other comments reported: the lesson was systematic, structured using written form and individualized.

D. Components

The lesson consisted of illustrations, closure of the printed root, tracing of the written word, identification of the letter components of the root, and the formation of a new word utilizing a list of prefixes, suffixes with definitions. The lesson consisted of the main body, an answer sheet, and a list of prefixes and suffixes.

Evaluators summary: Evaluators noted a worksheet and an evaluation sheet. Other observations included: a supplemental page with prefixes and suffixes, visual stimulus (the writer interpreted this comment as the use of illustrations), completion of images (the writer assumed

this comment to refer to closure and tracing), and sensory items.

Objectives

The objectives of this lesson were to give students an opportunity to use eye hand coordination utilizing imagery and interact with word roots that were expected to be new to the student yet within their vocabulary capability.

Evaluators Summary

The four evaluators reported that development of word attack skills using roots was the main objective. Other comments included: imagery development (the writer interpreted this as eye hand coordination), effort to help children to understand and see root words within larger words, sensory awareness, word shape, and understanding the meaning of selected structural parts of words.

Content

The content of the lesson was designed for language arts or reading.

Evaluators Summary

Results of the instrument showed the evaluators

believed the content consisted of clear meaning of roots, affixes, immediate help or correction, introduction of selected structural parts of words to find root words in large words, and to help children visualize.

Methodology

The lesson was individualized using a sequenced approach. Each root had the same components in the same sequence using guided discovery.

Evaluators Summary

Three evaluators noted a sequence in the lesson. Two experts reported an individualized approach using guided discovery. Other comments included: reinforcement through immediate feedback using the answer sheet, motivative by cartoon and workbook activity.

Comments

Evaluators Summary

Three experts commented that the lesson was attractive and easy to follow. Other reactions included: motivating, a list of words should be checked to match individual reading needs, establishment of form and review of

morphenes, good lesson, a need to generalize using tactile learning and a need to remember previous learned material to reach a generalization.

Summary of Lesson 1

The lesson was perceived as a supplement to existing language arts programs or reading curricula. The lesson was thought to be for upper elementary grades that could include fourth grade. The instructional approach was perceived as an individualized structured, sequenced, workbook format. The major components were identified as well as the objectives. The lesson was considered attractive, motivating and easy to follow. A suggestion was made that individual reading needs should be developed using a word list corresponding to the grade level.

Lesson II Analytical Seeing (Appendix D)

Product Description

A. Curriculum Role

The lesson was designed to supplement any existing program in the school curriculum.

Evaluators summary: All the evaluators reported that they viewed the lesson as supplemental. Three experts believed that the lesson could be correlated in language arts. Other curriculums that were mentioned included: science, writing, art and reading.

B. Students

The lesson was designed for students in the fourth grade but all school age children would be able to learn from this lesson.

Evaluators summary: The evaluations showed that the lesson was thought to be at any elementary grade level.

C. Instructional Approach

The lesson was designed as a group activity of individual exploration in a open ended setting.

Evaluators summary: Three of the experts reviewed the lesson as group oriented with individual exploration. Two respondents noted the lesson was open ended.

D. Components

The components included visual discrimination of colored pieces of material and the environment.

Evaluators summary: The evaluation revealed the following observations: verbal responses in describing color is implied, colored cloth or paint chips are matched to the environment, visual discrimination of subtle differences in color and form with respect to matching is also implied.

Objectives

Objectives for this lesson included the critical observation of pieces of material, visually perceiving color and matching the color to objects in the environment.

Evaluators Summary

The four experts perceived the objectives of the lesson as the development of abilities to distinguish color change. Other observations included: oral exercise in description of color, to recognize the role of color in life, holding color in mind as students match objects to the environment, and helping children develop powers of visual observation with specific emphasis on greater visual understanding of color.

Content

This lesson could be applied to any existing content area.

Evaluators Summary

Two experts reported color naming was the main content of the lesson. Other observations: development of the ability to describe color difference, remembering shades of color, and the development of visual understanding of color.

Methodology

The lesson was individualized and materials were provided to develop open ended discovery.

Evaluators Summary

Two experts responded that the lesson was teacher directed. Other comments mentioned: skill observation, open ended inquiry, self directed, stations, discovery of visual information about color and environment, and group activity.

Comments

Evaluators Summary:

The general comment was that there was not enough background to allow a child an adequate foundation from which to base analytical seeing.

Summary of Lesson II

The analytical seeing lesson was perceived to be a supplement to any content area at any grade level. The lesson was reviewed as a group oriented, individual experienced, open ended lesson. The objectives included noting subtle color change with respect to the environment. Methodology was described as teacher directed with no observable product to be evaluated. The general comment was that there was not enough background in the introduction for a child to receive the most value from the lesson.

Lesson III The Black Cat (Appendix E)

Product Description

A. Curriculum Role

The lesson was designed to be a supplement to a language arts curriculum.

Evaluators summary: The general response was that it would be a supplement to a language arts program. It was also suggested the lesson be developed in a special curriculum area such as sensitivity training, imagery through sensory awareness, a enrichment in visual arts.

B. Students

The lesson was developed for fourth grade students; however it could be used K-12.

Evaluators summary: The evaluators reported K-4, 4-6, and all grades.

C. Instructional Approach

The approach was a relaxed attention technique using a teacher directed, individualized experience for a group of children.

Evaluators summary: Two experts stated that the program was teacher guided and two remarked that the lesson would take place in a small group situation. Other comments concerned: individual experience, concrete experience, listening, and writing.

D. Components

There were three major components to the Black Cat. A preliminary component that involved breathing exercises and tactile imagery. A second major component was the reading which involved, visual, auditory, and tactile imagery. The third major component involved the recording of the experience on a tape recorder and later either an oral or written report of the experience.

Evaluators summary: Three evaluators reported an evaluation or recall period. One evaluator reported the three components as (1) teacher's guide, a reading, and an evaluation. Other comments revealed components as: development of the ability to write about experience, tactile imagery, and guided experience through imagination.

Objectives

The major objective was to introduce students to tactile, visual, and auditory imagery and later communicate this experience through verbal or written expression.

Evaluators Summary

All of the evaluators noted that different imagery

experiences were a major objective. Three of the respondents reported a written component was included.

Content

The lesson was written for the language arts content area.

Evaluators Summary

All the evaluators reported the lessons pretained to the general area of language arts with emphasis on imagery through sensory awareness.

Methodology

There were three different approaches to methodology. The first was teacher directed toward sensory awareness using concrete models and relaxation. The second approach was teacher directed sensory awareness through the reading of a story with the children experiencing individualized imagery. The third approach was student directed using a tape recorder to record their experience and later report in oral or written expression.

Evaluators Summary

The evaluators reported that the lesson was group

oriented with each child experiencing the lesson alone. Imagery development was reported as teacher guided. A follow up lesson or evaluation was noted as open ended as was retention of image through written or oral expression.

Comments

Evaluators Summary

Three of the evaluators noted the lesson has good potential in a classroom. One comment suggested the reading of the story could closely relate to hypnosis. Another evaluator did not see the connection between the lesson title and the content of the story.

Summary of Lesson III

The lesson was perceived as a supplementary lesson to language arts or reading. Several comments alluded that the lesson could be developed to adapt to such curriculum areas as, sensitivity training (imagery through sensory awareness) or enrichment in visual arts. The range of grade levels went from kindergarten to twelfth grade. The lesson was viewed as a teacher directed, group orientated but individualized experience. The three components of sensory training through relaxed imagery, the reading

section, and follow up activity were identified. The potential effectiveness of the lesson in a classroom was thought to be very good.

Lesson IV Spatial Analogy (Appendix F)

Product Description

A. Curriculum Role

The lesson was developed as a supplement to the language art curriculum or visual imagery.

Evaluators summary: All reports noted the lesson was supplemental. Math, geometry, reading and imagery were suggested as areas to which the lesson could apply.

B. Students

This lesson was developed for fourth grade students.

Evaluators summary: Three of the four evaluators commented that the lesson was best suited for upper elementary grades. One reported the lesson could be for third or fourth grade.

C. Instructional Approach

The lesson was designed as an individualized work sheet.

Evaluators summary: The results of the evaluation sheets revealed that the lesson was an individualized work sheet. It was reported that the lesson was systematic and structured in its approach.

D. Components

The components of the lesson consisted of an individual work sheet with introduction and an answer sheet.

Evaluators summary: The respondents noted an introduction was present along with an individual work sheet.

Objectives

The major objective of the lesson was to introduce a child to spacial analogies. The child was expected to look for a relationship among the first three figures and generalize an answer to complete the development of a figure.

Evaluators Summary

Logical sequence and generalization of a figure to complete an analogy were the major objectives reported by the evaluators.

Content

The lesson was designed to match any content area.

Evaluators Summary

Specific areas were noted. For example: geometric progressions and spacial relationships were reported. One evaluator wrote the analogies progressed from simple to complex.

Methodology

The lesson was designed to be an individualized work sheet using a simple to complex sequence.

Evaluators Summary

All evaluators reported that the lesson was individualized. Only one respondent reported a simple complex sequence.

Comments

Evaluators Summary

All evaluators noted that the lesson was interesting and challenging.

Summary of Lesson IV

The spatial analogy lesson was reported to be supplemental to math, geometry, reading and imagery for upper elementary grades. The lesson was described as a structured, systematic, independent activity in work page format. Logical sequence and generalization of a figure to complete an analogy were described as the major objectives. General comments noted the lesson was interesting and challenging.

Summary

Chapter IV is a presentation of the results of the evaluation instrument. Each section begins with an introduction explaining the writers perceptions. The evaluators comments follow. A summary is included for each lesson.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this paper was to develop imagery lessons in language arts for fourth grade students.

For hundreds of years educators have faced the problem of presenting material to students that was thought to be important for the development of a child's mind. Children have faced the problem of learning material so that he/she would not be ridiculed, beaten, or get "bad" grades. Mind development has been far from important to the child himself. Thus, he or she would memorize information that would be soon forgotten, cheat to pass tests, or play dumb and sit in a corner wearing a dunce cap. He many times has attempted to get through school with the least amount of pain.

Educational psychologists began to study this problem and gradually the focus shifted from the content material to the child. Jean Piaget was a charter member of this movement and contributed much insight to child developmental theories through the analytical observation of his own children. The basis of this paper was founded on Piaget's

concept that children pass through certain predetermined physiological and psychological stages of development. Little can be done to speed a child through these stages unless certain prerequisites are met which allow a child time to interact with material and formulate concepts with which to reorganize existing structures. These newly formed structures eventually serve as bridges to higher developmental stages.

The shift of focus from material to the child alleviated a lot of sore spots the child was having, but the problem still remained: how to get a child to learn content material. Jerome Bruner suggested that content material be broken down into sequenced steps. His theory stated that any concept can be taught if the material is sequenced and if the initial constructs are presented in such a way that a child can recognize and understand the construct in his stage of development. Bruner believed each newly formed construct is based upon previously learned constructs. After the initial foundations are set, the child can then utilize the past experiences to logically analyze new problems and attempt to solve them. David Ausubel hypothesized that initial contacts with material should be in the form of concrete images. The

theories of Bruner and Ausubel substantiated the writer's belief that material should be sequenced upon previously learned constructs and that the initial presentation of a new concept should be presented in the form of concrete images.

Discovery of the split brain theory revealed information is processed by two different processes. In the normal brain there is a carry over of information from one hemisphere to the other but in split brain patients the information processing is isolated to the respective hemispheres. Verbal and mathematical processing is controlled by the right hemisphere and sensory-spacial information is processed by the left hemisphere.

Primary teachers have acknowledged the importance of right hemispheric development in teaching, for example, the alphabet. Students may touch cut out letters made of sandpaper to receive tactile information, or a child may finger paint to become aware of the movement of muscles in the arm and fingers when they form a letter. But this sensory information stops soon after first or second grade. Perhaps the assumption is made that since the child knows his letters he can learn to read language symbols (words). The emphasis is progressively shifted from the sensory

receptors to language receptors through out the child's school life. The longer a child progresses through school the more language is emphasized. Oftentimes the only opportunity a child has to strengthen his atrophying sensory receptors is in an art class or outside of school when the child plays "make believe."

A review of language arts publications confirmed the researchers belief that language arts text books did not meet the imagery needs of fourth grade students. There were several texts that mentioned imagery and several expected the students to produce some kind of imagery in their minds, but no specific imagery development was discussed. The writer attempted to develop example imagery lessons in language arts to explore the possibility of future development of imagery materials in the language arts. Educational and psychological theories were considered in the development of the lessons as well as the functional differences of information processing in the two hemispheres.

There were four lessons developed utilizing different aspects of imagery. Each lesson was reviewed and evaluated by four staff members in the elementary education department at Montana State University. An evaluation sheet was

provided for each lesson. The evaluator reviewed each lesson with respect to (1) Product Description (2) Objectives (3) Content (4) Methodology (5) Comments. The results were compiled and reported in Chapter IV.

Conclusions and Recommendations

The imagery lessons developed in this study were found to be compatible with language arts. The results of the evaluation indicated all the lessons could be used in the upper elementary grades. Three evaluators indicated that the Root Word lesson was more appropriate for fifth and sixth grade than for fourth grade. Two of the evaluators commented that the Spatial Analogy lesson might fit better in a fifth or sixth grade than a fourth grade. The comments on the other lessons indicated a range from kindergarten to twelfth grade.

The instrument was successful in soliciting responses to evaluate the lessons. The evaluators, however, did not respond to each section of the evaluation sheet as expected. Sometimes the item content was understood to mean content of the lesson instead of content area; thus, content and components were interchanged. The similarity of Instructional Approach and Methodology may have caused

some reversed responses. The instrument might have been more effective if the number of sections were reduced by combining similar items.

Although lessons were reviewed by experts in the field of elementary education the only way to truly evaluate the effectiveness of the lessons is to introduce them into the classroom.

Since the lessons were based on relaxation techniques, and psychological, educational, and split brain theories, it is recommended that teachers be informed about these areas so that both students and instructor will receive the optimum benefit from the program. Most of the emphasis of the four lessons were focused on the development of the right hemisphere (spacial processing). The writer assumed that since awareness of materials is received through the sensory receptors, the processing of that initial information must be controlled by the right hemisphere. Spatial background should be solidly formed before the child need transfer the initial experience to the left hemisphere. This waiting time would allow a child to formulate concrete structures from which to base logical thought which is associated with the left hemisphere.

This deficiency in a child's school life must be brought to the attention of all educators if we truly want to develop a child's mind to his fullest potential. Education implies an understanding of how knowledge can be utilized; however, if there is an imbalance in how information is presented to children, then, perhaps, it could be assumed that there is an imbalance in a child's understanding of how knowledge can be utilized. When the right hemisphere is used, there is a tendency to move away from the usual viewpoint and look at a problem in a different perspective. This ability in ones thinking is closely related to creativity. McKim (1972:2) stated that there are three major conditions that foster creative thinking: (1) Challenge (motivation), (2) Information (material), and (3) Flexibility in Thinking. The four imagery lessons attempted to meet these conditions so that a child would have different viewpoints from which to approach a problem. Bruner (1962:82) noted "Discovery favors the well prepared mind."

APPENDICES

HUTCHINSON IMAGERY PROGRAM, by L. Hutchinson

Lesson:

1. Product Description

   Curriculum Role:

   Students:

   Instructional Approach:

   Components:

2. Objectives

3. Content

4. Methodology:

5. Comments

APPENDIX B

FRAMEWORK OF INSTRUCTIONAL DESIGN*

Design Analysis

Purpose of Analysis

The main purpose of this analysis is to look for congruencies among the main constructs. The analysis of such congruencies will tell the writer a great deal about the overall integrity of design within the instructional product (see enclosures). Once descriptive profiles of characteristics within each design element have been completed for the program, please look for consistency within each element and congruence among them. Teaching-learning methods should for example, be consistent with the objectives: sensory awareness and imagery consciousness. An example of a completed analysis on the Aardvark Reading Sines has been provided for your examination (see attached sheet).

*This analysis was developed from an Instructional Design Analysis Instrument (called EPIEform (A)) based on the work of Dr. Maurice Eash of the University of Illinois, Chicago Circle.

1. Product Description

On the form provided, please describe the product by identifying how you perceive the program's curriculum role, students, instructional approach, and components.

2. Objectives

Expressions of the intentions and purposes, the expected results of any course of action, are the goals and objectives of instructional materials. Goals are usually thought of as being general categories, each of which includes more specific objectives. Both goals can be stated in varying degrees of specificity (e.g., reading at grade level versus skill in decoding initial consonants under certain conditions). Both can also focus on process (giving children access to certain kinds of reading-related experiences) or product (actual learning outcomes or changes in behavior), and both can deal with either long- or short-term expectations. In any given set of materials, in the instructional program of a school, or in the classroom practice of any teacher, goals and objectives can be either explicit

or implied; they can be stated, or understood with differing degrees of clarity. Often it is possible to infer goals and objectives from provisions which are made for other elements (constructs) of an instructional design--scope and sequence, methodology, and (especially) what is evaluated. This is true even though statements of goals and objectives do not necessarily designate or even suggest the means that should be used to attain them. Finally, objectives can be fixed or variable in the sense of being exactly the same for all, or varying with individual differences.

On the form provided, please describe the objectives of the programs as implied by its content.

3. Content

The content of instructional programs and materials is usually thought of as the range of subject matter or skills which is to be introduced (or "covered") in the pursuit of goals and objectives.

On the form provided, please describe the (scope of content in the program).

4. Methodology

Major kinds of teaching-learning approaches include didactic instruction, program sequencing, guided pupil discovery (induction) or predetermined skills and understandings, and more open-ended inquiry by students. Often several approaches are combined. Reading-specific methodologies include basal reader, individualized-literature, phonics and "linquistic," and language experiences approaches. These reading approaches not only share in the more general methodologies above but also are loosely correlated with the content areas described earlier.

The methodology within an instructional design involves mainly the kinds of teaching and learning activities (transactions) that are carried on by teacher and learners in order to pursue their goals and objectives through selected content. Differences in methodology involve differences in regard to four considerations:

--The kinds of activities necessary (and sufficient) to achieve desired ends.

--Whether teachers, students, or others initiate the activities and assess their quality and outcomes.

--How to organize people and resources to facilitate the instructional process, including where the activities should take place (in the classroom or elsewhere) and how students should be grouped to carry them out.

--Who makes the decisions regarding the management and the organization of learning and instruction.

On the form provided, please describe the methodology of the program as implied by its content and teacher's guide.

5. Analyst's Comment

On the form provided, please make any comments you deem necessary as to format, attractiveness, presentation, printing, or other characteristics.

APPENDIX C

LESSON 1 ROOT WORDS

Name _____

1. 

Hi! My name is Rooty. I'm a construction worker. I build words using word parts called roots. I'm going to use these word parts (roots) to build different words.

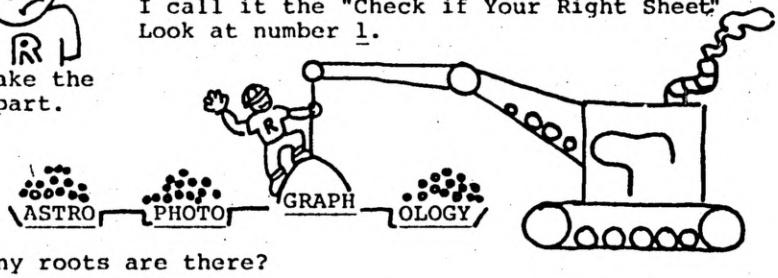
2. Have you ever seen this word before?



A S T R O P H O T O G R A P H O L O G Y

Can you guess the meaning? Turn to the back of the program to the blue sheet. I call it the "Check if Your Right Sheet". Look at number 1.

3. Lets take the word apart.



How many roots are there?

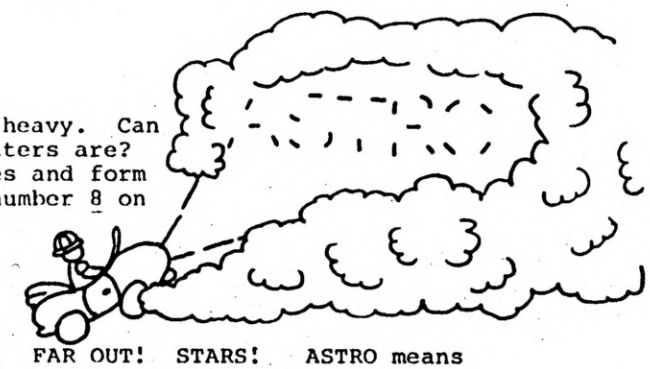
Put your answer here → _____ Look at number 5 on the blue sheet.

4. Look at these four words closely. Each word has the same root in it. Circle the same root in each of the four words.

MACROASTRONOMY ASTROLOGY BIOASTROPHYSICS ASTRONAUT

Check number 3 on the blue sheet.

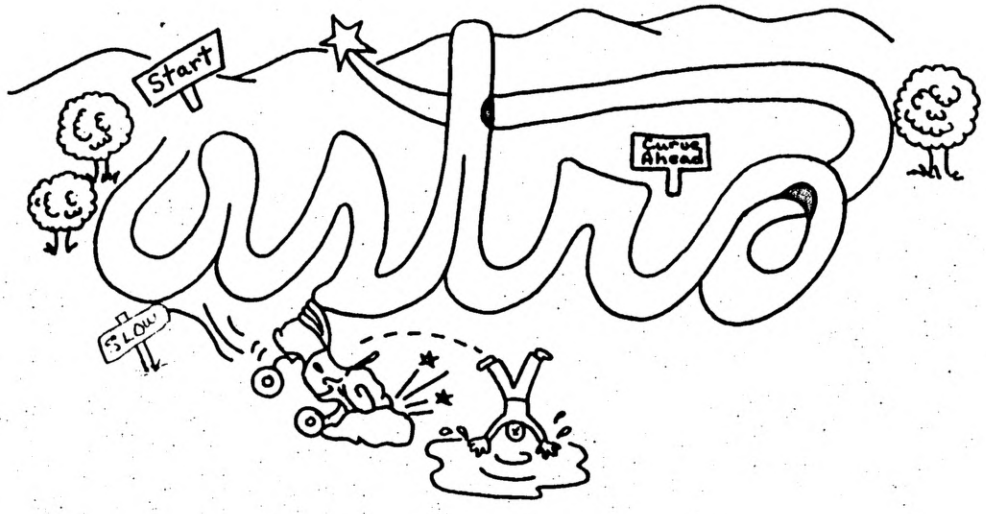
5. Some nights fog gets heavy. Can you tell what the letters are? Trace the broken lines and form a root word. Check number 8 on the blue sheet.



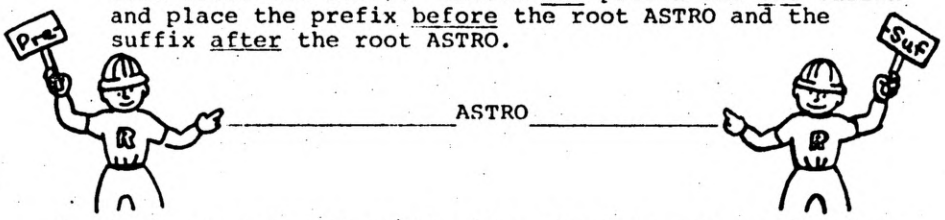


6. FAR OUT! STARS! ASTRO means star! Lets look at the word astronaut. If naut means something to do with sailing. What is your guess for the meaning for astronaut? Write your idea here→_____
Check number 11 on your blue sheet.

7. Imagine yourself as a race driver. Can you get through this road course without running off the road? Can you see what the name of the road course is? It's a root you have seen before. Be careful! Some of the curves are dangerous.



8. Now turn to the green sheet for a list of Prefixes and Suffixes. (Prefixes come before the root. Suffixes come after the root). Choose one prefix and one suffix and place the prefix before the root ASTRO and the suffix after the root ASTRO.



9. Look at number 11 on the blue sheet to see how to place the meaning below the root. Also place the meaning to the prefix and suffix you used in number 8 on the lines below.

prefix, root, suffix → _____ + ASTRO + _____ =

meaning - → _____ + _____ + _____ =

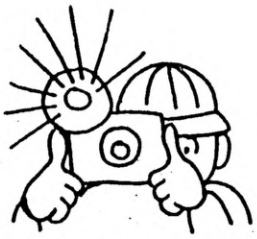
10. Look at these four words closely. Each word has the same root in it. Circle the same root in each of the four words.

Photography, electrophotoplate, photocell, metaphotology

Check number 7 on the blue sheet.

11. After blasting it is hard to see. Can you tell what the letters are that form the next root?



12. 

Bright! Have you ever looked at a flash bulb when it goes off. What makes you blink? It's the LIGHT. Lets look at the word astrophoto. Again, lets take it apart and put the meaning below each root.

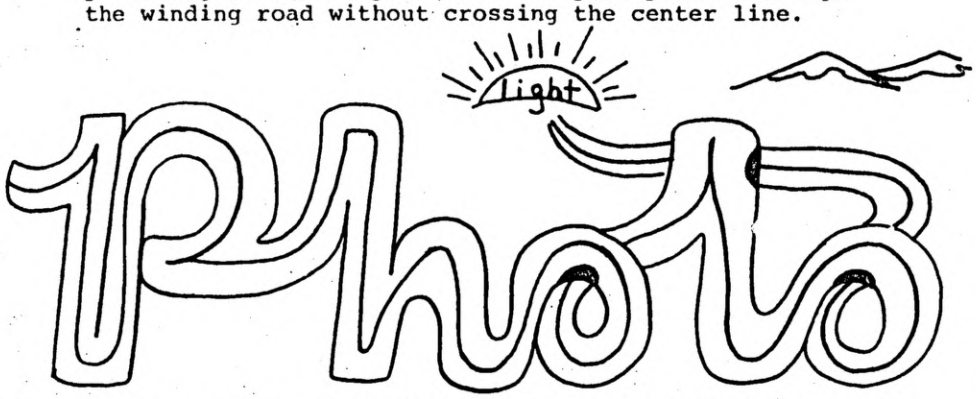
What is the meaning?

ASTRO + PHOTO =

_____ + _____ =

Look at number 2 on the blue sheet.

13. Pretend you are a truck driver. Your 10-4 is at the yield sign. See if you can trace your pencil through the winding road without crossing the center line.



14. Turn to the green sheet and choose any of the prefixes and suffixes and put the prefix before the root and the suffix after the root.

prefix_____ PHOTO_____suffix

15. Look closely at these four words. Circle the same root.

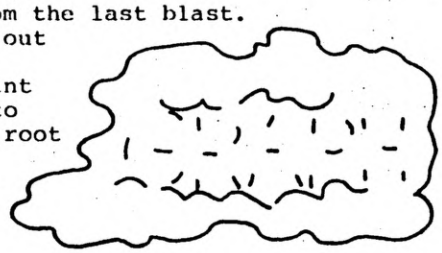
Autograph Paragraph Phonograph Biography

check number 10 on your blue sheet.

16. The dust still has not cleared from the last blast.



Can you make out the letters? Trace and print each letter to see the next root

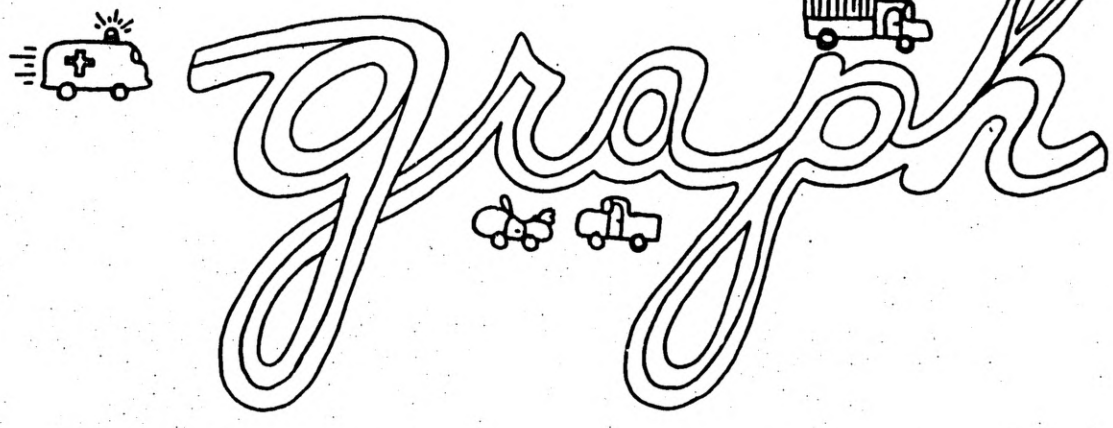


17. 

See if you can guess what Rooty is doing. Check #13 on the blue sheet after you write your guess here

_____.

18. Pretend you are an ambulance driver and you need to get to the hospital in a hurry! This time you can use the whole road. Be careful you don't run into anything.



19. Now look up a <u>different</u> prefix from what you used before. And also, a different suffix and place them before and after the root. Use the green sheet to help you decide what to use.

prefix + root + suffix _____ + GRAPH _____

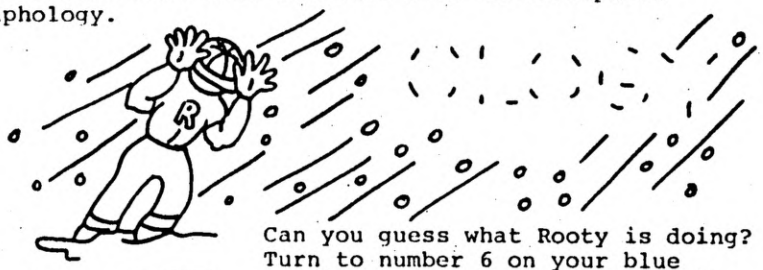
meaning _____ + _____ + _____

20. Look carefully at these four words and circle the same root.

ANTROPOLOGY BIOLOGY ZOOLOGY ASTROLOGY

Check number <u>4</u> on the blue sheet.

21. When the snows set in, it's hard to see. Can you trace the letters that form the last root in Astrophotographology.

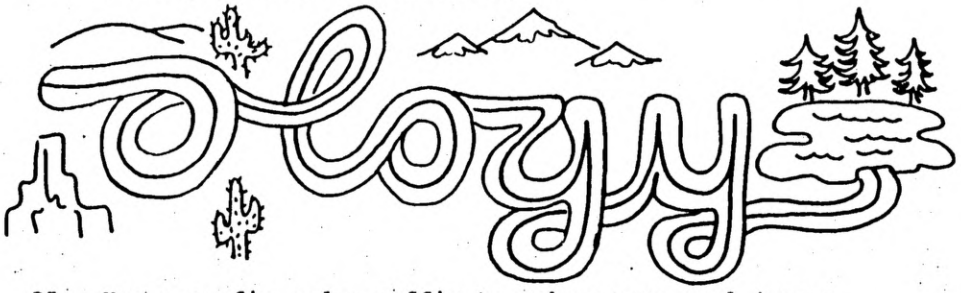


22. Can you guess what Rooty is doing? Turn to number <u>6</u> on your blue sheet.



23. Did you guess right? Do you think that big word has something to do with studying? Well I guess it does!

24. Imagine you are driving your van on a vacation. Take your time and don't cross the solid middle lines. You may pass on the broken ones.



25. Use a prefix and a suffix to make a new word (green sheet).

_____+OLOGY + _____

meaning _____+_____+_____=

26. You have now completed studying the 4 roots in the word Astrophotographology. Take the word apart by placing one root on each line. Then below see if you can put the meaning to each root.

_____ + _____ + _____ + _____ =

_____ + _____ + _____ + _____ =

27. There is one final root Rooty would like to show you. Then you will be finished. Look at these final four words and circle the same root in all four.

infinite finish final finite

check number 9 on the blue sheet.

28. 

Rooty is finally finished with his construction job. Can you now guess what the root fin means? Check number 12 on the blue sheet.

29. Can you make up a road course using the root FIN?

THE "CHECK IF YOUR RIGHT SHEET"

1. I hope you don't know that word or I couldn't explain what each root in that big word means. By the time you finish you should know what the whole word means.

2. ASTRO + PHOTO = Star light

3. Did you circle Astro? How are you doing so far?

4. Did you circle ology? How did you do?

5. Did you write the number 4? Well that's how many there are.

6. Rooty is studying. Ology means to study or it can mean the science of something.

7. Did you circle Photo?

8. ASTRO. Did the fog clear?

9. Finally. Did you circle fin?

10. Did you circle graph?

11.

ASTRO + NAUT = Star sailor

STAR + SAILOR = Star sailor

12. Fin means end. You are now at the end of the program. I hope you enjoyed it. Goodby! See you again, maybe.

13. Rooty is writing. So graph means write.

PREFIXES

Prefix	meaning	example
ante	before	antewar
anti	against	antifreeze
auto	self	autograph
bi	two	bicentennial
by	near	bystander
co	together	coworker
hemi	half	hemisphere
extra	beyond	extraordinary
hyper	over	hypersensitive
il	not	illegal
kilo	1,000	kilometer
micro	small	microscope
multi	many	multicolored
oct	eight	octopus
re	again	reread

SUFFIXES

Suffix	meaning	example
ade	action	parade
ard	person who	coward
ation	action	multiplication
cule	small	molecule
en	made of	golden
er	person doing	driver
ful	enough to fill	spoonful
gram	something written	telegram
ion	process	revolution
ist	person who	biologist
le	repeated action	twinkle
less	without	fatherless
oon	big	balloon
ry	collection of	poetry
ward	direction	westward

MORE ROOTS AND THEIR MEANINGS

root	meaning	example
alpha	beginning	alphabet
anim	life	animal
annu	year	anniversary
atmos	vapor	atmosphere
bio	life	biology
cav	hollow	cave
crat	rule	democratic
hydr	water	hydroelectric
ject	throw	project

APPENDIX D

ANALYTICAL SEEING

This lesson is designed to develop analytical seeing. The requirements for this lesson are several dozen pieces of different pieces of colored bloth or paint chips. Distribute these materials among the children and have them match the colored materials to the environment.

The children are to become aware of the subtle changes in color. For example: one yellow is more orange than another yellow or one red is brighter than another red.

APPENDIX E

"THE BLACK CAT"

Introduction

This lesson consists of three sections, (1) a preliminary experience to introduce the student to tactile imagery, (2) reading the lesson, (3) an evaluation and past experience. Each section may be altered to adapt to a particular class or resequenced to provide change for student or teacher.

The environment should be free from noise distractions, and lighting should be dim. Soft music could be played to allow the right hemisphere to prepare itself for mental imagery.

1. The preliminary section should be considered as a concrete experience from which to base future experiences. Bring several pieces of soft <u>black</u> cloth made of "fur" or velvet. Have the children close their eyes and feel the texture of the cloth until they are able to "mentally feel" the material without touching it. A second experience is provided by bringing in a <u>black</u> soft haired kitten or cat. These experiences provide tactile imagery that will help the child in the actual lesson.

2. Before the reading have each child place a tape recorder somewhere in the room where he is alone and away from other children. Once the children have placed their recorders in the environment, request that they move about ten feet away while still maintaining a distance from other children. When the children are seated, review any words or phrases that might be unclear or confusing such as "snow capped mountain" in the Black Cat reading.

Begin the lesson with a deep breathing excercise. The children are requested to sit in a relaxed position, close their eyes, and listen carefully to <u>each</u> breath. As they breath, remind them to inhale deeply and think of the syllable "re." When they exhale, remind them to allow the air to flow out and think of the syllable "lax." As the children repeat this type of breathing, remind them to breath deep and slow and become aware of their lungs and muscles in their chest that expand and relax with each breath.

When reading the imagery story to the children, pause after each slash (/) at the end of each sentence for about ten to fifteen seconds.

Ask the children to imagine the black cat lying on a big soft pillow of black fur. The cat does not talk but you can hear a voice in your head saying:

1. Imagine yourself standing in a field of yellow daisies looking toward a snow capped mountain/

2. the daisies turn from yellow to blue/ breath deep and slow

3. bend down and touch the petals/

4. feel the softness of the petals/ breath deep and slow/

5. feel the dryness of the pollen tickle the inside of your nose/

6. walk to the top of the hill in front of you and notice the huge waterfall/

7. listen to the water thunder and splash as it hits the rocks below/ breath deep and slow/

8. feel the cold spray of water on your face/

9. feel the cool droplets of water form on your eye lashes/

10. you notice a mountain berry bush/ breath deep and slow/

11. pick a berry and feel the sweet juice squirt in your mouth/

12. pick another berry. This berry is sour and you feel the sour taste in the back of your mouth/ breath deep and slow./

13. bend down and get a sip of water with your hand/

14. feel the cold water trickle down your throat/

15. the sun is going down and the shadows are making things dark/ breath deep and slow./

16. the sunset is purple and pink/

17. you must start moving toward your tape recorder/ breath deep and slow/

18. look at the sunset change colors/

19. remember what you see on the mountain as you go back to the tape recorder/

20. quietly record what you saw.

Evaluation

Several hours after this experience have the children play back their experience and transcribe these experiences to verbal or written expression. The child should wait before being allowed to transcribe this lesson so that he/

she/ can enjoy the visual expression without interference of written symbols. The recording immediately after the experience should be similar to a dream type of reporting in that the child might appear to be sleepy.

During the written reporting, questions might be asked such as: "What was the most difficult part of the lesson for you?" "What was the easiest part for you?" "What part was the most fun?" Through this kind of questioning a student might reveal where he/she is having problems in imagery.

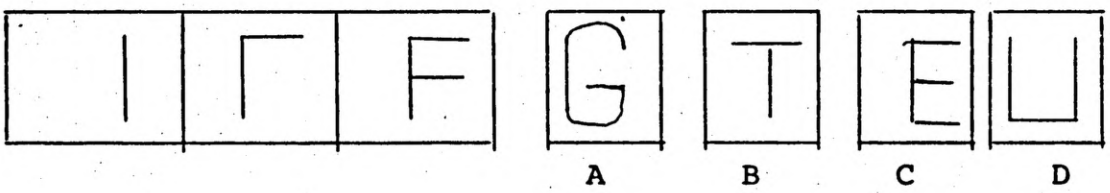
During the actual lesson take notes to movements of hands, facial expressions, or other changes in behavior of the students that might indicate visual imagery.

APPENDIX F

SPATIAL ANALOGY

Below there are three problems that have figures inside boxes. Look at the first three boxes of each problem and see how the figure changes. Look at the four figures next to the three and circle the box that you think would come next. Here is an example.

Circle the box that shows the next change of the line.



If you marked C you are correct. The first box has one line, the second box has two, and the third box has three lines. Box C has four lines so it is correct.

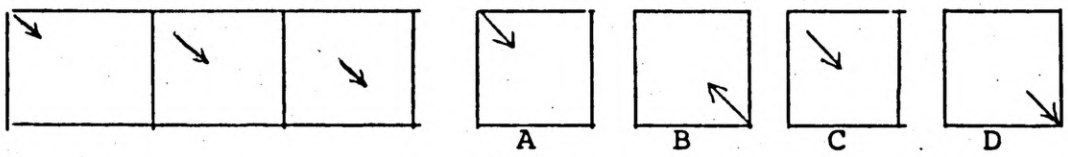
Now look at the three problems below and see if you can tell which figure would be next, then circle the correct box. Remember:

A. look at the first three boxes, and see how the figures change.

B. look at the four other boxes and think which one would be the next chance.

C. circle the box you picked.

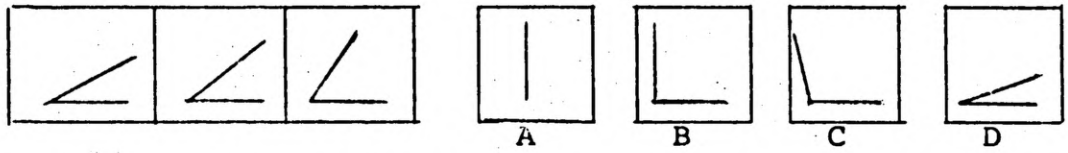
1. Circle the box that shows the next change of the arrow.



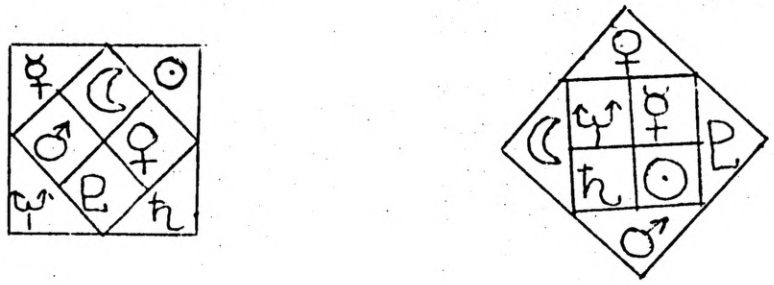
2. Circle the box that shows the next change of the circle.

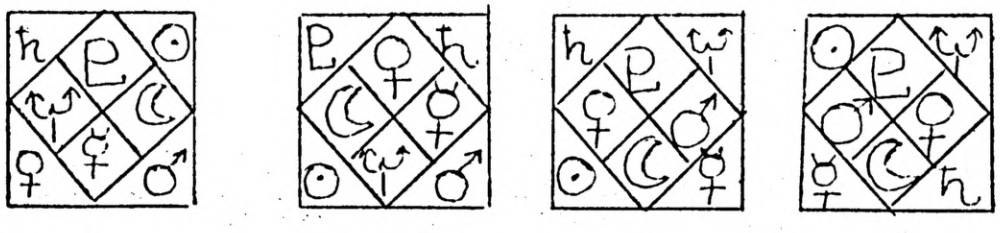


3. Circle the box that shows the next change of the angle.



This next problem is a hard one. Take your time and study the first two boxes, then see if you can "see" how the second box changes. Then look at the four boxes and circle the box that you believe is the next change.





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