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A Study of Practical Application of an Activities Approach in an Educational Setting

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A STUDY OF PRACTICAL APPLICATION
OF AN ACTIVITIES APPROACH
IN AN EDUCATIONAL SETTING

by

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"In order to enter the Kingdom of God,
you must humble yourself
and enter as a little child."

-Jesus Christ

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CHAPTER I

INTRODUCTION: THE PURPOSE

> The created visual image that a child makes with his hands and eyes together links the inner vision with the outer vision that shapes his felt experience into symbols.
>
> -G. Kepes

Introduction

"Practical Application of an Activities Approach in an Educational Setting." What does it mean? It is a title that suggests action. Once the child is committed to action, he will be able to dive into the ever-widening universe of knowledge that compels him to team learning and inter-personal commitments.

Only recently in history have children in America quit playing games. They no longer ask, "Mother what can I do today?" The television tube engages their time and concentration; and they have become passive onlookers and armchair critics of action.

Children need mental "musculature" comparable to physical musculature which develops as they engage in large-muscle sport activities. They need to think alone.

They need to solve problems. They need to remember. They need to create.

This study is not an apology for the use of activities in the classroom. In this puritanical world, the teacher is many times put in a position where he finds it difficult to defend the use of activities, games or play in the classroom. How do you defend something which is "fun" in a stifling academic atmosphere? Administrators, other teachers and parents all look at teachers who use activities with an eye of discernment, all of which leaves the teacher bewildered. The teacher only "knows" that he is right in using activities in the classroom.

Today the semanticist has won part of this battle for the teacher through labeling. If the teacher avoids words like play, activities or fun, and uses words like "learning activities" administrators, other teachers and parents consciences will be soothed somewhat. Yet, it still leaves the teacher with that residue of guilt which says, "It is all play. I have rationalized it with others; but, how can I do it with myself?" Carl Rodgers said this in <u>On Becoming A Person</u> (1961).

> Let me turn now to some other learning which are less concerned with relationships, and have more to do with my own actions and I can trust my experience.
>
> One of the basic things which I was a long time in realizing and which I am still learning, is that when an activity feels as though it is valuable or worth doing, it is worth doing. Put another way, I have learned that my total organismic sensing of a situation is more trustworthy than my intellect.
>
> All of my professional life I have been going in directions which others thought were foolish, and about which I have had many doubts myself. But I have never regretted moving in directions which "felt right," even though I have felt lonely or foolish at the time.
>
> I have found that when I have trusted some inner non-intellectual sensing, I have found that when I have followed one of these unconventional paths because it felt right or true, then in five or ten years many of my colleagues have joined me, and I no longer need to feel alone in it.

So to all the lonely teachers, the best advice is to "follow through." Follow through with what is best for you. Follow through with what is best for your students.

Defining a Cobweb

> We do not know when man begins to play. Play may start before birth, with the kicks and the turns of the fetus; it certainly is present in the infant; and it continues throughout our lives.
>
> When play is suppressed, both the individual and society suffer. When play is encouraged, both benefit. The reasons for this are not clear, but somehow play is essential for man and many other social animals.
>
> Unlike most behavior, play has not been exhaustively studied. Scientists have difficulty taking it seriously. They argue about what play is. Some have narrow definitions; others would agree with Tom Sawyer that "Work consists of whatever a body is 'obliged to do . . . Play consists of whatever a body is not obliged to do."
>
> Editorial in Natural History
> Journal of American Museum of
> Natual History, December 1971.

Eventually one must face the problem of finding a working definition for activities, along with finding a word the educators and philisophers all agree on. The two words most commonly used by authorities are activity and play. One can easily see from some of the examples collected by Sapora and Mitchell (1968).

Play:

Lazarus: Play is activity which in itself is free, aimless, amusing, or diverting.

Sterm: Play is voluntary, self-sufficient activity.

Pangburn: Activity carried on for its own sake.

Dictionary of Education: Any pleasurable activity carried on for its own sake, without reference to ulterior purpose or future satisfaction ...

Curti: Highly motivated activity which is free from conflict, is usually though not always pleasurable.

It is obvious that (activity is play and play is activity. Yet, even with the help from the above definitions, it is obvious that we have come no closer to finding a workable definition for either activity or play.

In school students can be allowed time for activities. The teacher hands out a math activity sheet which is given with the intent to check if the students are learning their math skills. So what started out as play has turned out to be work or a drill sheet. At the same time, the same activity sheet could be given with the intent of having races. For instance, the teacher can check to see how many in the class finish the activity sheet correctly in the required time limit. Both situations require an equal amount of energy, but the first activity has become work. While the second activity requires the same amount of energy, the students will not have their individual scores checked; thus the activity will remain play for them since there are no burdensome consequences.

It is not the activity then, but the reason for the activity taking place which determines whether it is work or not. The criteria for play is not observable. The criteria for "play" or "not play" is inferred from the sources of satisfaction. Activity done for its own sake is seen as play; activity done for an external reward, salary, or pay is work. But even this criterion presents problems. If you look at people who really enjoy their jobs, there is often a quality of playfullness.

We can also use "seriousness" as a criterion for distinguishing work from play; work being a serious activity and play being frivolous. Using this criterion, anything that is frivolous can be considered play; but if yoü look at children in their dramatic play activity, very often it is hard to find anything that is frivolous about it. Children's play is often as serious as anything that you can possibly observe.

The problem with these definitions and criteria is that they tend to be used in an "all or none" fashion. We tend to see activities as being either all work or all play, and to think that if something is work it cannot be play and if it is play, it cannot be work.

Eva Neuman in The Elements of Play (1971), analyzed the literature on play and came up with some definitions and criteria of play. She concluded that you can judge an activity and determine whether it is play or not play by using three criteria, not as "all or none" criteria but rather in terms of where the activity is on a continuum from "work" to "play," with most activities falling somewhere in the middle. The three criteria are:

1. Control. There is a difference between internal control and external control of activities. To the extent that control is internal, it is play. To the extent that the control is external, it is work. In most cases the control is neither totally internal nor totally external. The only time a person can totally control his own play activity is when he is playing alone. As soon as more than one player is involved, there is a sharing of control and therefore a move from internal to external control for each individual.

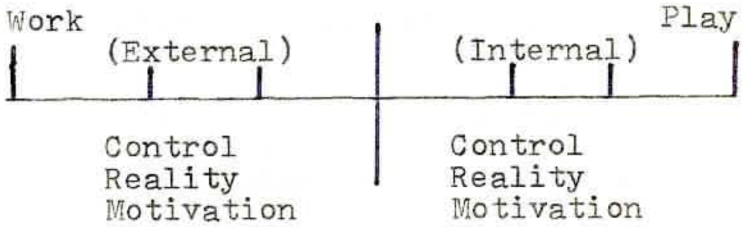
2. Reality. Neuman also differentiates between internal reality versus external reality. One of the criteria of play is the ability of the player to suspend reality, to act "as if," to pretend, to make believe, to suppress the impact of external reality, to let the internal reality take over. To the extent that activity is tied to the "real" world, it stops being

play. To the extent that one can act in an "as if" way, one is acting in a playful manner. There too, however, most play maintains some tie with external reality.

3. Motivation. To the extent that an activity is internally motivated, it is play. As soon as motivations become external, they stop being play. Seldom is the motivation entirely external.

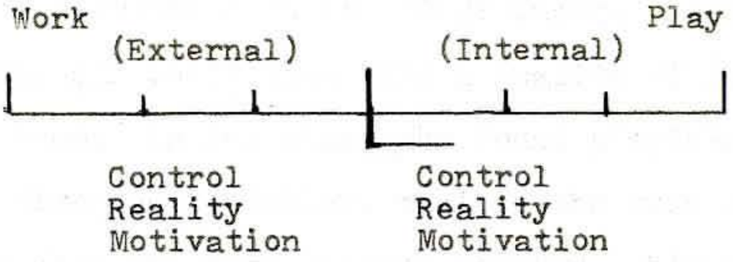
Neuman's continuum can be put easily on a scale. The scale below is one I have made, adapted from her materials.

This scale will be used in this study where necessary for classification of learning activities.

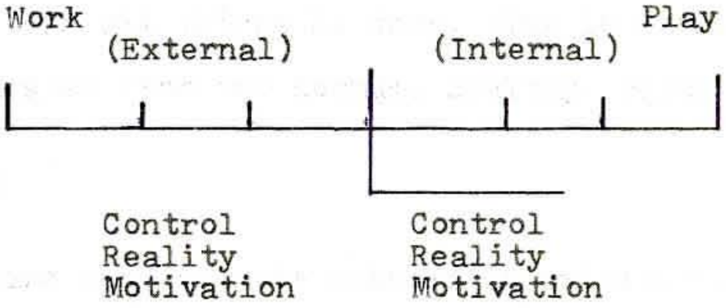


A game can be analyzed in the following manner. I will use the math board game, Morris; and put it on the scale to show you what happens.

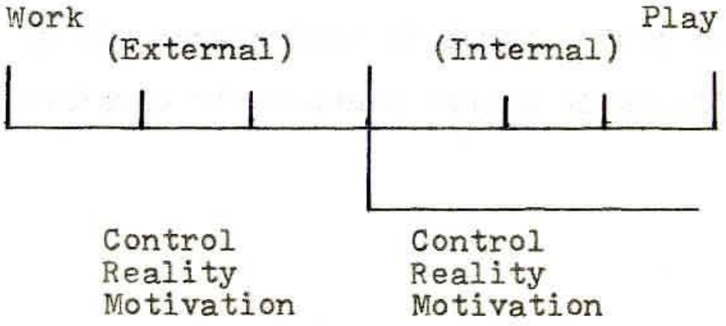
It takes two people to play Morris, so it lessens the internal control in half, so it is played on the scale shown on following page.



The game is in no way tied to the "real" world. It then receives a maximum score on reality, and is placed on the scale as below.



Last to be put on the scale is motivation. The motivation to play this game is totally internal; again it receives a maximum score on the scale. Morris' final score is high on the internal side of the scale.



J. Nina Lieberman (1965) developed a set of criteria for what she considered to be "playfulness." According to Lieberman, all activities have a quality of playfulness related to them. In her study she found playfulness related to divergent thinking, that is the more creative thinker was also the more playful thinker. Lieberman's five criteria for playfulness were: physical, social, cognitive spontaneity, manifest joy, and a sense of humor.

Last and most important, Virginia Mae Axline (1947) believes that play is the child's natural medium of self-expression. In all things he does, play is expressed and can be separated from the normal, healthy, happy child.

The Problem

There are many private schools in existance, and it appears that some of them will continue to exist for years. The architectural design of these buildings and severe lack of funds does not lend itself to an "open school". The concern of this research was the effect of learning activities, designed to fit inside the traditional setting, accompanied by the severe lack of funds. This study investigated the attitude of students toward alternative learning through the use of varied "learning activities."

The title of this study is therefore, Practical Application of an Activities Approach in an Educational Setting.

Definition of Terms

The following definition of terms were used for this study:

1. Activity is sometimes used synonymously with play. Play is the child's natural medium of self-expression (Axline, 1947).

2. Attitude Toward School is of ideas about schooling held by a student and is related directly or indirectly to the student's behavior in the school situation (Cook, 1959).

3. Encounters is sometimes used synonymously with game. (Avedon, 1971).

4. Facilitator - the person responsible for the individual and environment in the classroom. The provider of materials, information, and advice, understanding and direction to help individual learn.

5. Game is sometimes used synonymously with play. A contest, physical or mental according to set rules for the amusement or for a stake.

6. Organismic Whole is when the whole person is working together in complete physical, mental, emotional and spiritual harmony.

7. Play is the child's natural medium of self-expression (Axline, 1947).

8. Self Concept is an individual's assessment of the degree to which he or she

possess cognitive, affective, artistic, creative, and physical characteristics or skills (Cook, 1959)

9. Traditional is a system of educating in which the teacher is the focus of attention. The teacher decides what is taught, when it is taught and determines the evaluation of the child. The child has the passive role of doing assignments and listening to the teacher. The majority of the students do the same thing, at the same time, and in the same place.

10. Zero Sum Game is a game in which the players have no common interests. Both players want to avoid getting zero as a score and want to accumulate as many points as possible.

Hypotheses for the Main Study

Hypotheses 1 After working in an atmosphere that varies from Traditional structure to an atmosphere that is full of choices in learning activities, the students will indicate a desire to continue in an atmosphere that is full of choices in learning activities.

Hypotheses 2 Students will indicate a more positive attitude toward their teacher when varied "learning activities" are used.

Hypotheses 3 The individual students will be able to choose their most effective learning style after they are given varied and choice types of learning experiences.

Hypotheses 4 The students will demonstrate significantly higher scores in math than the expected years growth as shown on the Standford Achievement Test (1973 Edition).

Limitations of the Study

For the purpose of this study, the following were assumed to be limitations:

1. The study was conducted in two eighth grade classes in suburban St. Louis, Missouri. Therefore, randomization was not able to occur. Results can only apply to these two classes of students.

2. The subjects were from a middle-income predominately white community. Therefore, randomization was not able to occur. Results can only apply to the socio-economic and racial status of these particular students.

3. The study was conducted in the eighth grade of a private school.

4. The researcher was personally involved in the research situation.

Experimental Setting

The study was conducted in an elementary parochial school in Florissant, Missouri. The estimated population of this church is 624 families, of which 350 families send their children to the school. The residents were mainly Caucasian, middle class, skilled and semi-skilled suburban families. Many of the parents work at McDonnell Douglas Corporation in St. Louis County.

The elementary school has a total enrollment of 654 school children in grades first through eighth. Seventy-one (71) are in the eighth grade.

Subjects

The subjects for this study were those in the eighth grade classes of the researcher. Of these 69 students, there are 40 girls and 29 boys. There are 49 thirteen year olds and 20 fourteen year olds. The scores from the 1975 Stanford Achievement Test were used to find grade level achievement.

In October of 1975 when the Stanford Achievement Test was completed, the actual grade placement of these subjects was 8.6 (eighth grade, sixth month).

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The review of literature was divided into three main parts: (1) the mathematical method and limitations in examining games; (2) educational and psychological criterion for the use of learning activities in the classroom; and, (3) structural elements of games.

Mathematical Method

The foundation for the mathematical method used in this study is based on the theories of Van Neuman and Oskar Morganstern (1944), Anatol Rapoport (1966), Morton D. Davis (1970), and Martin Shubik (1975).

John Van Neuman and Oskar Morganstern were the first to advance anything on game theory, in their book Theory Of Games And Economic Behavior (1944).

> First, one must distinguish between the abstract concept of a game and the individual plays of that game. The game is simply the totality of the rules which describe it. Every particular instance at which the game is played, in a particular way, from beginning to end, is a play.

> Second, the corresponding distinction should be made for the moves, which are the component elements of the game. A move is the occasion of a choice between various alternatives, to be made either by one of the players, or by some device subject to chance, under conditions precisely prescribed by the rules of the game. The specific alternative chosen in a concrete instance, i.e. in a concrete play is the choice. Thus the moves are related to the choices in the same way as the game is to the play. The game consists of a sequence of moves, and the play of a sequence of choices.
>
> Finally, the rules of the game should not be confused with the strategies of the players. Exact definitions will be given subsequently, but the distinction which we stress must be clear from the start. Each player selects his strategy, i.e., the general priciples governing his choices freely. While any particular strategy may be good or bad, provided that these concepts can be interpreted in an exact sense, it is within the player's discretion to use or to reject it. The rules of the game, however, are absolute commons. If they are ever infringed, then the whole transaction by definition ceases to be the game described by those rules. In many cases it is even physically impossible to violate them.

Van Neuman and Morganstern's theory is very exacting, especially in the areas of rules. In the area of strategy, they become too complex mathematically to be discussed in this study in educational research.

Anatol Rapoport (1966 & 1970) advances a more readable and understandable theory of games in the area of strategy.

> The importance of the idea of strategy stems not from the possibility of analyzing a game but rather from the resulting conceptualization of a game. In common parlance, we speak of flexible and or rigid plans of action. We call a plan of action rigid if it contains few contingent decisions. Plans made long in advance of the action, we associate with rigidity, implying that to be flexible, one must be willing to wait and see, to defer decisions until one has taken into account the way a situation develops. This conception of flexibility may be valid in real life, but it is irrelevant to the notion of strategy, as the term is defined in game theory. One might think that making a commitment to a definite strategy before the play of the game starts is tantamount to abandoning flexibility, but this is by no means the case.
>
> A strategy, as we have defined it here, already contains in it all the contingencies which can possibly arise. Deferring decisions until the corresponding choice must be made does not increase flexibility. Any feeling ✓to the contrary which we may have stems from the well-known circumstance that in real life unforeseen developments.

> Everything that can possibly occur in the course of a play of a game is known; what is not known is the way the opposing players will actually choose each of their moves. But all the choices open to him are known. A strategy is a plan which provides for every possible choice on the part of the other player.

Morton D. Davis (1970) states clearly what is the "most important single contribution" to game theory in his book Game Theory.

> Most knowledgeable game theorists when asked to select the most important single contribution to game theory, would probably choose the minimax theorem . . .
>
> As a consequence of the minimax theorem, the general, zero-sum, two-person game has a good theoretical foundation. But, like the game of perfect information, it rarely exists in practice. The difficulty is the requirement that the game be zero-sum.
>
> The essential assumption upon which the theory is based is the opposition of the two-✓player interests. To the extent that the assumption is not valid, the theory is irrelevant and misleading. Often the assumption seems to be satisfied but in reality is not. In a price war, for example, it may be to the advantage of both parties that prices be maintained.

Lastly, Martin Shubik (1975) discusses game theory.

but goes further in his examination of games, and applies game theory to other activities than just board or card games. He has an excellent chart in his book <u>Gaming</u> that is worth examining for this sort of study.

Summary of Mathematical Method

I teach math, and I use games of all types. I thought by studying mathematical game theory I could learn to conceptualize the games I use and then I would be able to explain the games to the students. Conceptualization did not take place for many reasons. Forinstance, the number which is sufficient to encompass all the first player's strategies in the game of Tic-Tac-Toe is "9 x 7 x 5 3 = 65, 664, 686, 390, 625" (Rapoport, 1966)! I found this alarming to say the least. How could I ever find anything practical that I could relay to my students through game theory if Tic-Tac-Toe is so complicated?

As an educator, the prospects became more and more bleak that I would find anything practical that I could use in the classroom.

TABLE 2.1 Purpose for Gaming

TEACHING	EXPERIMENTATION	ENTERTAINMENT	THERAPY AND DIAGNOSIS	OPERATIONS	TRAINING
Motivational aid to learning	Validation of hypotheses	Theater	Group therapy and t-groups	Cross check and validation for other methods	Teaching skills to individuals
Reinforcement for other methods of training	Artificial intelligence	Gambling	Individual therapy	Extra-organizational communication	Teaching bureaucratic organizational behavior
Device for teaching facts	Exploration and generation of hypothese	Spectator games	Diagnosis	Exploration and testing	Dress rehersals and "shakedown" exercises
Device for teaching theory		Participant games		Planning	
Device for studying dynamic cases		Solitary games		Group Opinion Formation "Delphi"	
Device for teaching personal relations				Brainstorming	
Enculturation of the child				Forecasting	
				Advocacy	
				"Shakedown	

In all game theory one is assuming that the players are rational, not allowing for the fact that you may be playing with an irrational player who could completely destroy your strategy and win the game. So, then, the study of game theory does not help you to become a better player in any of the games because there are too many human variables, which cannot be controlled by the game theorists.

So at first glance, what appears to be culling of knowledge, is soon seen to be the most useful information I could find after lengthy investigation.

Eventually, I had to go to the psychologist and educators to be able to conceptualize what I had learned from mathematical game theory.

Educational and Psychological Theories

The foundation of this study in the preliminary and main study are based on the theories of Erving Goffman (1961, 1967, and 1969), Jean Piaget (Rosskopf, Steffe and Taback, 1971), B.F. Skinner (1974), James S. Coleman (1967), Mary Reily (1974), Carl Rogers (1961), and Virginia Mae Axline (1947).

Erving Goffman has established one of the most influential models in the area of gaming and interaction. Goffman(1969) says,

> I begin with the most simple case. We play games such as chess or bridge. They have rules the players agree to observe. These rules are not the rules of the "real" world or of "ordinary" life. Chess has its king and queen, knights and pawns, its space, its geometry, its laws of motion, its demands, and its goal. The queen is not a real queen, nor is she a piece of wood or ivory. She is an entity in the game defined by the movements the game allows her. The game is the context within which the queen is what she is. This context is not the context of the real world or ordinary life. The game is a little cosmos of its own. This is obviously true as any educator knows since in almost any game in the classroom the students loose contact with the 'real world.'
>
> In the process of the interaction of the games, many things take place which must be considered by the teacher (or facilitator). Goffman (1969) says this about the other variables to be considered. In the analysis of strategic interaction, moves are central, but these constitute a class that is broader than the one derived from moves in expression games. During occasions of strategic interaction, a move consists of a structured course of action available to a player which, when taken, objectively, alters the situation of the participants. Some of these moves are concealed, some visible; when visible, the question will always arise as to the reading that the op-

> ponent places on the event, namely the assessment he makes in terms of it. But this reading will be merely a contingency of the interaction, certainly not the whole thing. What is effected by strategic moves is not merely a state of information, but rather courses of action taken. Thus we can expect to find situations where Harry elects a course of action knowing that he, thereby, provides the other side with information they can use against him; but in spite of this cost finds that the other gains outweigh the price in information.

Finally, Goffman (1967) has this to say about the individual who can make these moves and keep self-command. He says,

> The ability to maintain self-command under trying circumstances is important, as is therefore, the coolness and moral resoluteness needed if this is to be done. If society is to make use of this individual, he must be intelligent enough to appreciate the serious chances he is taking and yet not become disorganized or demoralized by this appreciation. Only then will he bring to moments of society's activity the stability and continuity they require if social organization is to be maintained.

Jean Piaget is obviously one of the strongest advocates in the use of learning activities. However, there is a major drawback in trying to apply his method in the classroom; no one knows exactly how to do it. Rosskope (1971) asserts,

> More important is a required recognition of the state of present-day education. Education everywhere in the world, except for a very privileged minority, is group education. It is becoming increasingly

> organized in terms of a mass technology, with more children per teacher, more materials and more instrumentation per class. The time spent by a teacher with an individual child is constantly diminishing. Individualizing instruction is increasingly a myth, and instrumented individualization is also a myth, as has been pointed out by Piagetians themselves. The Piagetian method, on the other hand, places its primary emphasis on one-to-one "clinical method."

How is it possible for the teacher to meet the ever increasing demands with expected diminishing return of help from administrators and other educators? Then, it appears that the teacher can use individualized activities at a minimum in the classroom when it requires individual attention.

The teacher then must depend more on activities in which the whole class or half the class can participate. What is the value of these and what must the teacher do to assure these activities are effective? James S. Coleman suggests,

> Learning through games has a number of intrinsic virtues. One of these is its attention-focus quality. Games tend to focus attention more affectively than other teaching devices, partly because they involve the students actively rather than passively. The depth of involvement in a game, whether it is basketball, Life, Career, or bridge, is often so great that the players are totally absorbed in this artificial world.

> Another virtue of academic games as a learning device is that using them diminishes the teacher role as judge and jury. Such a role often elicits students' fear, resentment, or anger and gives rose to discipline problems. It may also generate equally pleasant servility and apple polishing. Games enable the student to see the consequences of his actions in winning or loosing. He cannot blame the teacher for his grades; instead he is able to understand the way in which his own activity is related to the outcome. The teacher's role reverts to a more natural one of helper and coach.

When using games in the classroom, the teacher introduces to the students what B.F. Skinner (1974) calls 'problematic contingencies.' Skinner expounds,

> We learn some of these strategies from the problematic contingencies to which we are exposed, but not much can be learned in a single lifetime, and an important function of a culture is to transmit what others have learned. Whether problem solving arises from raw contingencies or from instruction by others, it is acquired in overt form (with the possible exception of a strategy learned at the covert level from private consequences) and can always be carried out at the overt level. The covert case, to which the term 'thinking' is most likely to be applied, enjoys no special advantage beyond that of speed or confidentiality.

✓Therefore, it is to the students' advantage to be introduced to as much overt behavior as possible in the classroom. But how much depends on the individual teacher's skill. Martin Shubik (1975) asserts,

> The learning experience is by no means confined to the players. In gaming used for teaching purposes, especially at or below the high school level, the worth of a game is frequently no more than that of the teacher. An inspired teacher can direct a mediocore game with good results, and the best of teaching games can be ineffective if directed by an inadequate teacher. This break-down of roles applies also to gaming used for purposes other than teaching.

Mary Reilly (1974) affirms,

> Only the naive could believe from reviewing the evidence of the literature, that play is a behavior having an identifiable nature. While common sense may confidently assert that there is such a thing as play, the literature assumes a rather weak position about what this phenomenon is. Play is as concealed in theories of human behavior as it is in the actual behavior of man. The conceptualizing lenses of the mind require painstaking adjustment to detect the presence of this elusive transient behavioral form. For it does exist in both man and his society but in a concealed fashion. Beneath the sophisticated surfaces of some discipline, their conceptual apparatus occasionally permits a fragmented view of play.

Finally, Reilly affirms one of the most elusive statements about play I have ever read. Play as historical evidence clearly shows, is a phenomenon stretching across a knowledge spectrum which includes biology, psychology, sociology and anthropology. Because it is multidimensional, it requires interdisciplinary explanation.

It is obvious to any educator that play stretches across all subject areas in the classroom. It eludes us entirely. The students enjoy it <u>because</u> the teacher cannot find a criterion to judge him; he feels safe and can learn more freely.

How can you use play in the classroom if there is no criterion for evaluation. Carl Roger (1961) had an answer to this.

> Now another personal learning, <u>I enjoy the discovering of order in experience</u>. It seems inevitable that I seek for the meaning or orderliness or lawfulness in any large body of experience. It is this kind of curiosity, which I find very satisfying to pursue. This has led me to each of the major formulations I have made. It led me to search for the orderliness in all the conglomeration of things that clinicians did for children, and out of that came my book on <u>The Clinical Treatment of the Problem Child</u>. It led me to formulate the general principles which seem to be operative in psychotherapy, and that led to several books and many articles. It has led me into research to test the various types of lawfulness which I feel I have encountered in my experience. It has enticed me to construct theories to bring together the orderliness of that which has already been experienced and to project this order forward into new and unexplored realms where it may be further tested.

It is this justification which should lead each teacher to find "orderliness" in the use of learning activities in his/her own classroom.

Most important, what is the result of using learning activities and play in the classroom on the students? Virginia

Mae Axline (1947) says this best.

> It is a unique experience for a child suddenly to find adult suggestions, mandates, rebukes, restraints, criticisms, disapprovals, support, intrusions gone. They are all replaced by complete acceptance and permissiveness to be himself. No wonder the child, during his first play contact, often expresses bewilderment. What is this all about? He is suspicious. He is curious. All his life there has been someone who helps him live his life. There may even be someone who has determined to live his life for him. Suddenly this interference is gone and he is no longer living in the shadow of someone who looms larger than he on his horizon. He is out in the sun and the only shadows are the ones which he himself wishes to cast. It is a challenge. And something deep within the child responds to this clearly felt challenges to <u>be</u>, to exercise this power of life within himself, to give direction, to become more purposeful and decisive and individual.

I agree intently with one of the major authorities on play, Virginia Mae Axline. As Saint Paul in scripture says, "All the power lies within." I believe the power lies within each child to bring his being to an organismic whole to function as a child of God.

Summary of Education and Psychological Theories

I have moved from the stringent mathematical method to what I find the more redeeming educational and psychological theories.

Even in this section, I moved in a linear order, which I am sure is obvious to the reader. I started with the authorities who insist on putting a logical order to explain activity. Eventually, I moved to the authorities who less and less put a logical demand on play.

I concluded with Virginia Mae Axline who simply supports the positive effect of play on the child and connected her with a quote from Saint Paul. I did this because in the two quotes, both demanded the internal control of the person to take over so he can become organismic whole in the process.

Structural Elements of Games

In this section, I am going to include the Seven Elements of Games as asserted by Elliot M. Avedon (1971).

> By combining the work of the mathematicians and the behaviorists, we are able to identify seven elements of games. These are:
>
> 1. Purpose of reison d'entre.
> 2. Procedures for action.
> 3. Rules for governed action.
> 4. Number of required participants.
> 5. Role of participant.
> 6. Participant interaction patterns.
> 7. Results of pay-off.
>
> In addition to these, personnel in the field of recreation have called attention to additional game elements which must be considered. A major element which recreational personnel have long been concerned with are the <u>abilities and skills required for participation</u>. Other elements which they have considered to be of importance are the <u>environmental requirements</u> and necessary <u>physical setting</u> along with the <u>required equipment</u> needed for participation in a game.

From a syntactical point of view then, games are composed of ten elements; possibly, additional elements will be identified at some future date. Presently, the ten elements to consider are as follows:

1. Purpose of the game; aim or goal, intent the reison d'entre.
2. Procedure for action; specific operations, trquired courses of action, method of play.
3. Rules governing action; fixed principles that determine conduct and standards for behavior.

   N.B. Some games have very few rules, others have such elaborate sets of rules as to require a non-participant to keep track of infringement of the rules or to enforce the rules.
4. Number of required participants; stated minimum or maximum number of persons needed for action to take place.

   N.B. Sometimes minimum and maximum are identical.
5. Roles of pay-off; values assigned to the outcome of the action.
6. Results or pay-off; values assigned to the outcome of the action.
7. Abilities and skills required for action; aspects of the three behavioral domains utilized in a given activity.

(a) Cognitive domain includes, figural, symbolic, semantic, and behavioral informational content; and operational processes, such as cognition, memory, divergent and convergent production, and evaluation.

(b) Sensory-motor domain includes, bodily movement, manipulative motor skills, coordination, sequences and patterns of movement, endurance factors, sight, hearing, etc.

(c) Affective domain includes, semiotic factors which stimulate emotions, i.e., anger, joy, affection, disgust, hate, etc. Offers opportunities for object-ties, transference, identification.

8. Interaction patterns;

(a) Intra-Individual-action taking place within the mind of a person or action involving the mind and a part of the body, but requiring no contact with another person or external object.

(b) Extra-Individual-action directed by a person toward an object in the environment, requiring no contact with another person.

(c) Aggregate-action directed by a person toward an object in the environment while in the company of other persons who are also directing action toward objects in the environment. Action is not directed toward each other, no interaction between participants is required or necessary.

(d) Inter-Individual-action of a competitive nature directed by one person toward another.

(e) Unilateral-action of a competitive nature among three or more persons, one of whom is an antagonist or "it". Interaction is in simultaneous competitive dyadic relationships.

(f) Multi-lateral-action of a competitive nature among three or more persons, no one person is an antagonist.

(g) Intra-group-action of a cooperative nature by two or more persons intent upon reaching a mutual goal. Action requires positive verbal and non-verbal interaction.

(h) Inter-group-action of a competitive nature between two or more intra-groups.

✓ 9. <u>Physical setting and environmental requirements;</u>

(a) Physical setting man-made or natural facility in which action takes place.

(b) Environmental requirements; natural circumstances which are indispensable or obligatory.

N.B. This element may not always be present.

10. Required Equipment; man-made or natural artifacts employed in the course of action.

    N.B. This element may not always be present.

Summary of the Structural Elements of Games

I put this list in for obvious reasons since it combines both the mathematical theories and behaviorist theories into one list.

This list applies to all games in an interdisciplinary approach and does it much better than any other list I found in my study.

In particular, element seven (7) is fascinating. For example, seven can be used in the following manner to examine the three behavioral domains of soccer.

The cognitive domain in soccer includes understanding the basic objectives of the game. The basic objective of soccer is to advance the ball forward through the opponent's goal primarily by the use of the feet. Players do not merely kick the ball downfield indiscriminately. It is often relayed to other teammates with a better chance to advance.

The sensory-motor nerve domain in soccer includes specific bodily movements that are peculiar to this game. A skilled player knows how to "dribble", to give the ball short, repeated kicks in any direction so that he maintains control of it. Experts are able to stop the ball by placing their foot over it and to accomplish other baffling maneuvers which prevent opponents getting it away from them.

The affective-domain of soccer includes factors which stimulate emotion of anger and joy. Anger can be aroused because of the penalties called during the game.

Penalties vary for rule infractions. However, the major ones are types of free-kicks at the goal. If the game is close, this kind of penalty causes a great deal of anxiety, or even anger by both teams. It is usually the team that gets the free-kicks that has the odds in favor of them getting the goal.

A goal, scoring of one point, is made against the goalkeeper's team when the ball has passed over the goal line drawn on the ground between the goal posts and under the crossbar. This again induces anxiety for both teams, anger for the team scored against and joy for the scoring team.

In my opinion, the above list of the ten structural elements of games is an invaluable tool for the teacher to use. By breaking down a game into all its individual elements, the teacher would better understand the fundamental process of any activity better. After breaking the game down into its elements, a teacher would be able to synthesis the information so he could more efficiently handle the game for the students and for himself.

CHAPTER III

PRACTICAL APPLICATION
IN
AN EDUCATIONAL SETTING

> Let no man deceive himself. If any man among you seeimth to be wise in this world, let him become a fool, that he may be wise.
>
> For the wisdom of this world is foolishness with God. For it is written, He taketh the wise in their own craftiness.
>
> And again, The Lord knoweth the thoughts of the wise, that they are vain.
>
> Therefore, let no man glory in men, for all things are yours.
>
> I Corinthians 4: 18-21

Introduction

This section will be approached differently. In the first two sections, I used an inductive method of approach. I first stated what the authorities say; then I stated what I believed was true. In this section, I will use a deductive method of approach. I will advance what I believe; then I will advance what the authorities say.

My experience in teaching varied; and in all the places I have taught, I have used activities extensively. I taught in Central America as a missionary. I taught in Los Angelos on a private ranch for juvenile delinquents. I taught in a ghetto area of the city of St. Louis in a catholic school. The last three years of my teaching has been at a catholic school in Florissant, Missouri.

In all these places, there were no activities for the students when I arrived; and I initiated several activities in all of these places. The school where I am presently employed was no different when I arrived. I am going to discuss how I plan the activities around a school year for the eighth grade.

I am with hope that this will give other teachers the incentive to use activities, and give some personal insights to the value of each. In my summary, then, I will use the authorities to validate the activities approach to education.

Practical Application

Camping Trip - I believe activities are necessary in a non-educational setting for many reasons. First of all, it is good to be with the students outside the educational setting. For the most part, junior high students can not believe you are human until they see you outside of school.

This is why each year I plan a weekend camp-out near the beginning of the year with the students and their parents. It gives the other junior high teachers and myself a chance to get to know the parents as well as the children on a personal level.

I do not believe real learning can take place until you get to know the students personally.. It pays dividends in the area of discipline. The students have a natural inclination to cooperate with you if you know their parents; especially, if you have met their parents in an informal situation like camping. This is true because one tends to become more relaxed and more themselves away from the pressures of the city. Throughout the school year, there is a "closeness" that continues to exist no matter what happens in the school situation. This is true for the parents, the teachers, and the students.

I mean, how can one possibly hate someone who has gone horseback riding, canoing, hiking, singing, swinging on a rope swing, pitched tents with, ate with, and laughed and joked with for a whole weekend? It is impossible; and it helps to make the school year a really warm experience for everyone.

Math - I teach math to the eighth grade. In the area of math, I use many activities in the classroom. I do this almost daily because I find that the students can work quietly all period if they have busy work; but, it also tends to make them belligerent if you do busy work every day. So within a 45 minute framework, I vary the activities as much as possible.

Usually, I begin class by grading the previous day's assignment. Then, we discuss tomorrow's homework; and about fifteen or twenty minutes is given for the homework to be completed. We then usually play a math game like peco fume (a game similar to the commercial game Mastermind). Sometimes we play a game we call mental mathematics; which is simply adding, subtracting, multiplying and dividing a chain of numbers in your head. So, daily I vary the activity in the classroom so the students are not confined to one type of academic discipline the whole period. I believe it is unhealthy for them mentally, emotionally, and physically to confine them to only one type of academic discipline all period.

One of the unique things I allow my students to do is to decorate their homework papers. They draw cartoons about me, about their classmates, and about the math figures in our math book (Silver Burdett). Many of these papers have turned out to be works of art. I have compiled a notebook of these papers (Appendix D). I find that when math becomes a creative experience for them, the students enjoy what they are doing and learn math better.

The most outstanding thing the students do in math is their culminating project. When we have the Science and Art Fair at our school, I have the eighth grade choose from many numbers of things to do. The students can do synography, make polyhedra , design their own home, car, boat, etc. I in no way limit them from what they can do. One of the students made a mobile out of car parts one year. I found this particularly astounding. It was an amazing piece of work, balanced and beautiful to the eye. I have the students do this so they will integrate math in themselves through practical application.

I have made twenty (20) board games which I have found to be an invaluable tool in the classroom.(Appendix F). I sometimes use them on Fridays during the last twenty minutes of class to give them a break from the oridinary routine of school. The games are also excellent to use when giving a test. It is inevitable that some students will complete their test before the other students.

If they finish the test, then they are allowed to play one of the games quietly. This can also be done with homework. The students never tire of these games; so it always gives life to the otherwise lifeless academic situation for them.

Lastly, I would like to say that I enjoy the thrill of logic of math. I always try to instill its order in them. Then, hopefully, it will bring a logical ordering to their own minds.

Physical Education - When I first arrived at the school there had never been a physical education program initiated in the school's thirteen-year history. I was asked to develop a physical education program that would suit the school's needs.

The first thing I did was to design a physical fitness check list so as to record the improvement from the beginning of the year (Appendix E). The students seem to enjoy this testing because almost everyone wants to see improvement in themselves. The program is relaxed so they do not have to contend with an overwhelmingly competitive atmosphere.

During the early fall and spring, the students play soccer, volleyball, basketball and baseball. There are three fields which I have access to use for the program. All of the activities require minimal equipment which the school cannot afford.

In the winter, I have access to the church hall to use for the physical education program, which was originally designed to be a cafeteria.

I divide the hall in half. The girls play crab soccer, dodge ball or have gymnastics. The boys will play crab soccer or wrestling. Wrestling is one of the activities all the boys seem to enjoy.

In the winter, I alternate with square dancing every other week. Everyone enjoys this. At first, the students thought it was "silly and dumb"; however, once they found out how strenuous and how much fun square dancing is, they all began looking forward to it.

In the fall, the students have a special sports activity between the seventh and eighth graders. The seventh and eighth grade girls play each other for a trophy in volleyball. The seventh and eighth grade boys play each other in soccer for a trophy. They are travelling trophies. A plate is added each year about the results of the games. It is done primarily for fun and no hard feelings have resulted from the games so far.

In the spring, the students have another special sports activity. It is a track and field day between the seventh and eighth graders. This is a beautiful event because the ribbons and trophies are divided almost evenly between the seventh and eighth graders each year. Plus, it takes no real skill to participate in these events. Usually, it is always a surprise who wins each event.

The whole physical education program is relaxed and done primarily with the intent of having fun. It also gives the students a chance to be challenged physically in school as they are challenged academically, which they enjoy.

Drama and Music - Each year I plan a special activity in music and drama.

In February, the students have a "rock concert," which is an astounding event for all. The music is all done by the eighth grade students. There is always special lighting effects; the lighting effects are done similar to those of the contemporary rock groups. There is black lights, strobe lights, blue lights, red lights, green lights, and no lights at all. It all works together to make an environment which is wild and beautiful.

One year we even made two large bubbles out of plastic you get from the lumber yard (Appendix F). One bubble was made in the shape of a "big pillow" and the other in the shape of a "big heart." The bubbles were filled with balloons and were lighted with many different colored lights from the back.

In May, the students presented a play which is always done in a thoroughly professional manner. Each year the play is presented, the audience is amazed that eighth grade students can do such an excellent production.

It is demanded that the students understand what the role of an artist "is." The artist is creating a situation on stage, and it is their responsibility to give the audience the very best they have to give. It is always amazing what the students do when they are challenged in a positive manner.

All the students "for the first time" become totally involved as a class. Never in their eight years together have they become so totally dedicated to a common cause. There are the actors, the set builders, the make-up artist, the costume committee, the ticket committee, the advertisement committee, the clean-up committee, the refreshment committee, the sound-effects committee, etc. All students realize that <u>all</u> are equally important from the beginning. The last night all the students come out, all get their turn to take a bow; and when the curtain closes, the girls sob for a half hour. Because they realize that they have worked together. They have learned to love and respect one another and in two short weeks school will be over. It won't ever be the same again.

This is why I initiate the activities in music and drama each year.

Workshop Involvement - I also involve students in my own education whenever possible. I find they always add another dimension to whatever I do. The students always bring freshness and diversity to whatever I do that I couldn't possibly do by myself.

I did a workshop at Webster College on Math Activities in the classroom. I brought many of the activities that I used and explained their practical application in the classroom. It went very well, and I heard many good comments from the teachers who were there.

Most of the comments centered around the practical application of math activities in the classroom. Most of the teachers had seen and heard about the various activities I presented. However, they did not know how to apply them in the classroom before the workshop.

I also did a workshop in cooperation with Lindenwood 4.

This was an unusually inspired workshop in which an environment was created by the students around Madaline E'ngle's book a Wrinkle In Time.

In each of the "wrinkles in time," a particular subject area was stressed. In each of the "wrinkles in time," students were located. The students gave instructions to the visitors about their particular subject area. The students again added a vitality to the workshop that teacher alone could not do.

Also in the workshop, was a 20 foot by 13 foot "space ship" made out of plastic (Appendix F). In the rocket ship the students send the visitors to outer space so they could travel to another wrinkle in time. Many of the songs were of the students own creations. All of this helped to create an even more effective environment for the visitors.

The environment was worth the visit alone since the students created it themselves. It was an exciting day that was both practical and enjoyable for the students and the visitors.

Homeroom/Religion - Homeroom is my favorite subject. It is here that everyone gets to know one another better. Everyone works together, prays together, argues together, and has fun together. It is the only place in school that the students and I have a home base to work from.

Money is earned for the missions through an auction and a car wash. It is always fun to do these activities; it gets everyone working together.

Most important, is the cause the students work towards at Christmas. They get food, clothes, toys, and love all together to give to a needy family. Four students' names are pulled out of a hat; these students go with the two eighth grade homeroom teachers to deliver to the needy at Christmas. The four students then relate the trip to the other students after Christmas. It is always rewarding. The students have never been in a situation where poverty is so severe. It helps them to begin to realize what they have in their own homes.

Another activity which the students enjoy is Christmas carrolling at a convalescent home for the elderly at Christmas. It gives the whole class the opportunity to participate in something which jolts them into the realization of what it means to be old and lonely. To follow through with this after Christmas, the movie "Peege" is shown to remind them about their experience over Christmas. "Peege" is a movie about a senile, lonely, old woman in a convalescent home at Christmas. It follows through with what they have done; and all activities should be followed through with in some way.

So, it reinforces what the students have experienced to learning.

Visitors are invited to come to the homeroom. People who play music are invited. People who are involved with Special Olympics are invited. Lawyers are invited. Jewish people are invited to explain their faith. Other teachers are invited. Anyone and everyone is invited who can introduce the students to another important facet of life. So, the students can assimilate the experiences the guests share with them.

The students also plan church services together. They plan the liturgy, the songs, and the petitions. Although it 's unusual to a church school, it still is effective because it is created around a central theme from the gospels. Each student is given the opportunity to perform. All enjoy this. Not only the girls sing, but the boys sing also with guitars, drums, banjoes, and harmonicas. It makes for a really joyous occasion, which helps to prepare them to live what they believe.

In the homeroom, the students do a newspaper. A newspaper is sent home at Christmas and at the end of the year.

This newspaper is done so the students can tell their parents what they have done each semester. It is sent home as a gift to the parents. Each student has at least one article in the newspaper. The newspaper is usually between 30-50 pages of delightful news for the parents. In sum, the newspaper synthesizes the year for the students so they "know" what they have done, what they have enjoyed with one another.

Finally, homeroom is a place where each student is valued. Everyone is given the opportunity to gain recognition from the rest of the class. Homeroom then is a place where I build the individual self-concept of each student. Until the students know that they have self-worth, they cannot and will not achieve in school.

Central America - Each summer, I take some of the graduating eighth grade students camping to Central America. The intent is to introduce them to another culture and it's people. The students learn that the people they neet on their journey are a truly valuable gift. Of course, they also learn to appreciate the wealth and beauty of their own country and are always glad to come back to the United States again to be spoiled.

Travelling is done in my van. I take the students camping through the center of Mexico, through the mountains and Mexico City and down to the Yucantan Peninsula to Belize, Central America.

In Belize, the students stay with my friends which I have there. Friends that I made when I was a missionary there. They are introduced to the President of the Senate and to the caretaker of the catholic church. The students are introduced to all those people I admire; to those who have something to share, to those they have something to gain from. When leaving, they are saddened that they must leave their new-found friends; but, they are anxious to get home.

On the way back, I take them camping on the eastern sea coast along the Gulf of Mexico. It is a great experience that has no end in its value to them. I do it because they learn what no one could teach them. They come home with a new vision in their life and see the world through different eyes.

Summary

The foundation for the validity of the activities that I use in the classroom, is based on the educational theories of Carl Rogers (1961), Dr. Thomas Gordon (1974), John S. Dacey (1976), George Isaac Brown (1971), William Glasser

M.D. (1969), Louis E. Rath (Merril Harmin and Sidney, 1969), and Robert Rosenthal (Lenore Jacobson, 1968).

One of the most powerful authorities today is Carl Rogers (1961). He asserts, "What is most personal is most general." I believe this is true in education because it is what a teacher has to go on at times. You don't know what is right, and you can't find a situation like yours in any of the text books. So, you are forced to move on what you feel or know is right in your classroom. Perhaps some would call this "common sense" but you need to operate on this to develop you and your students' fullest potential.

Dr. Thomas Gordon (1974) affirms that you must do whatever you can to build the students maturity level. I always address the students as "ladies and gentlemen;" I do this because they enjoy being treated with respect in the classroom. It also helps them to realize that respect is what they are working toward. "No other person in the school organization has as much potentiality for influencing students towards good or bad than the teacher." Teachers must accept this responsibility fully before they can become effective teachers and begin a process of positive change in their students' lives.

> George Isaac Brown (1971) asserts, When confronted with the basic questions, Why introduce affective experiences into the classroom? and Why is it important to integrate the effective and cognitive domain; and accordingly modify the curriculum? We became aware that something besides our own prejudices was involved; especially if we were to answer these questions reasonably when they were put to us by people not in the project. Brown answers, A goal we were striving for in our work was to help the students become <u>more free</u> and <u>more responsible</u>. We believed this could be done by increasing the student's sense of his own power to take responsibility for his behavior.

Then all these activities enhance the student's maturity level by helping him to be free by giving him responsibility...

> Dewey wrote (1916), Knowledge is humanistic in quality not because it is <u>about</u> human products in the past, but because of what it does in liberating human intelligence and human sympathy. Any subject matter which accomplishes this result is humane, and any subject matter which does not accomplish it, is not even educational.

I believe that all of the activities which I initiate, liberates the students' minds so they can become free to learn much of the drudgery that seems inevitable in an academic situation.

> William Glasser, M.D., (1969), affirms, Love and self-worth are so intertwined that they may properly be related through the use of the term identity. Thus, we may say that the single basic need that people have is the requirement for an identity; the belief that we are someone in distinction to others, and that the someone is important and worthwhile. Then <u>love and self-worth may be considered the two pathways</u> that mankind has discovered lead to a successful identity.

Then, in the homeroom, it is valid that we build each others self-worth so all can perform at maximum potential.

> Louis R. Raths advances the view (Merril Harmin and Sidney B. Simon, 1966). The point has been made that our values tend to be a product of our experiences. They are not just a matter of true or false. One can not to to an encyclopedia or to a textbook for values. The definition that has been given makes this clear. One has to prize himself, choose for himself, integrate choices into the pattern of his own life. Information as such doesn't convey this quality of values. Values come out of the flux of life itself. This means that we are dealing with an area that isn't a matter of proof or consensus. It is a matter of experience.

Then it is possible that through the "cosmos" that each activity creates for itself, the students become in contact with the flux of life through activities. The activities done in Homeroom/Religion are valid and help the student begin the on-going process of developing personal values to defend and live by all their lives. In doing this, gaining again,identity and self-worth out of necessity through the experiences they participate in the classroom.

> Robert Rosenthal (Lenore Jacobson, 1968) exponds on the theme which is very integral to my own philosophy. The central idea of this book has been that one person's expectation of another's behavior could come to serve as a self-fulfilling prophecy. This is not a new idea, and anecdotes and theories can be found

that support its tenability.

I believe in demanding the best from my students in all the activities we do. It becomes a "self-fulfilling prophecy" in the classroom. Their achievements astound them; they become happier and happier with themselves as the year progresses. They are introduced to many different activities which stretch them; and they begin to demand of themselves their very best. Then I begin to only "share" with them in class and no longer have to "teach."

CHAPTER IV

PRESENTATION AND DISCUSSION OF DATA AND RESULTS

Introduction

The descriptive research method of study employing a descriptive design or survey study method is used in this part of the study. The literature was surveyed to acquire facts. The facts were used to develop approaches with direct application to the classroom. The questionnaires were used to primarily determine attitudes. From the students' attitudes were determined the results.

Data Collection

During the experimental stages of the study, the researcher used the data that he had collected from previous experiences.

During the first week of December, the students were given the four questionnaires (Appendix B).

Instruments

The instruments used were evidences obtained through observation, records, and questionnaires.

Four questionnaires were used in this study. They were:

1. General Questionnaire
2. Reading Questionnaire
3. Math Questionnaire
4. Activity Questionnaire

Treatment of the Data

The data gained from the questionnaires is recorded on the following pages. The discrepancy as to the number in the class is due to absences on the day the questionnaire was completed.

Included in this data also are two lists of the eighth grade homerooms which were surveyed for attitude (Appendix A).

A. Hypothesis

1. After working in an atmosphere that varies from traditional structure to an atmosphere that is full of choices in learning activities, the students will indicate a desire to continue in an atmosphere that is full of choices in learning activities.

93% indicate that for Reading, they would like to have Reading choices.

72% indicate that to help me with Reading, the teacher should let me choose.

82% indicate they would like to continue the varied activities in Reading.

57% indicate they would prefer to continue to learn math through activities.

83% indicate the thing I like about my teacher is that he is fair to everyone.

72% indicate there is nothing they like least about their teacher.

2. Students will indicate a more positive attitude toward their teacher when varied "learning activities" are used.

B. Questionnaires

As the result of the questionnaires, certain pertinent information might be presented.

67% choose math as favorable subject.

72% range from average to most of the time.

63% range from average to very often having choices.

67% indicate they do math best.

60% indicate class is different because it is fun.

70% think teaching is fun.

43% think learning is fun.

87% for reading choices.

C. Activity Questionnaires

As a result of the questionnaire, certain pertinent information might be presented.

100% enjoy the campouts.

70% enjoy preparing for masses.

80% enjoy the car wash.

90% enjoy the auction for the missions.

87% enjoy Physical Education. (sports)

93% enjoy math board games.

100% enjoy the eighth grade play.

78% enjoy the eighth grade concert.

67% enjoy visitors coming.

77% enjoy mental mathematics.

63% enjoy pico fume.

91% enjoy getting food and clothes for the needy at Christmas.

60% enjoy Christmas carolling at convalescent home.

87% enjoy field day between seventh and eighth grade.

73% enjoy math activities.

84% enjoy math culminating project.

77% activities make school more enjoyable.

77% enjoy the camping trips the most.

68% felt activities bring the class closer together.

D. Results

The results are not conclusive. A big weakness in the questionnaire approach is the validity. It is impossible to know the results that might have occurred had these same children never experienced varied learning activities,

Considering the limitations, there is descriptive type information that may prove valuable. On this basis, the following results are apparent.

The students prefer reading choices over the teacher dictating what they should read in class.

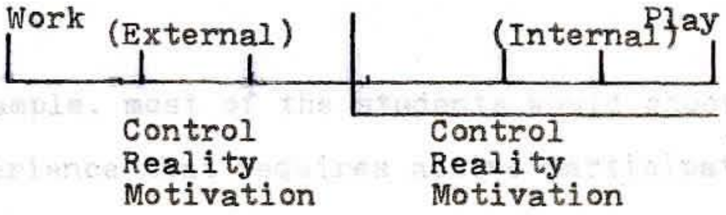
The math games were successful. A large majority would choose to continue learning math through the activity approach.

The most successful questionnaire as far as getting positive results was the "activity questionnaire." I suggest that this was true because when involved in activities, the students feel free, and don't feel the burden of being judged by someone larger on their horizon than themselves.

The most amazing result is that the majority of the students said that activities make school more enjoyable and bring the class closer together. These are reasons enough to continue to use the activities. Because by bringing them closer together, they find each other's self-worth.

Camping was the most successful of all the activities. Perhaps, this has to do that this research was involved with children who live in the suburbs and do not often go to a place where they can run free, be loud, and no one scold them for it. Because they were away from the suburbs, they could do what any healthy, happy, child could do under the circumstances (they were loud and active.)

Finally, I believe this can be validated by using Eva Neuman's continuum from Chapter I. I am sure this is where it lies on the continuum for the students.



This is where all learning should be. Teachers should be aware of this even though it is impossible to do entirely in the classroom. As concerned educators, teachers should work toward this goal so that the students can be free to learn.

3. The individual students will be able to choose their most effective learning style after they are given varied choices of types of learning experiences.

   33% usually like to work alone.
   60% usually like to work with a group.
   6% usually like to work with the whole class.
   70% like to talk about the subject.
   20% like to talk and write about a subject.
   10% like to write about a subject.
   81% like to choose what they want to do in Reading.
   57% think the teacher should "let me read orally."

Results

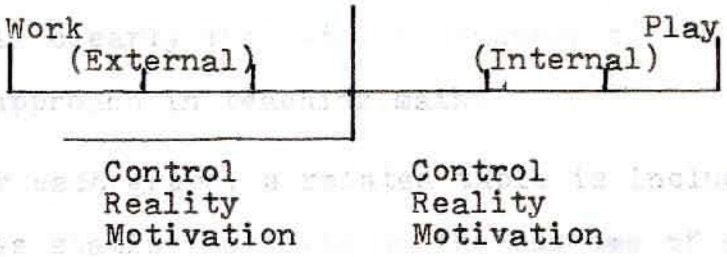
✓The results are not conclusive, but the data does give a definite indication of the types of choices the students prefer.

For example, most of the students would choose a learning experience that requires active participation of themselves in a group. Amazingly, the students also indicate they would rather talk about a subject than write about a subject. Discussion requires more of an active participation of everyone in the class. It is evident from the above results that they normally prefer not to work with the whole class.

Few students would choose to write about a subject. In my opinion this is true because they feel the burden of the teacher's authority when writing. It is much harder for the student to defend a concept on the "written page". However, if the same subject were discussed, it does not present as much of a burden to defend the same concept orally.

On the written page there is always too much to present, too much to defend and too much to be answered for by the teacher. Because of this overwhelming aspect of writing, I try to accept the student's as much as possible. He will then become more self-confident and more openly express what he believes.

Finally, I believe this can be validated by using Eva Neuman's continuum from Chapter I. I am sure this is where writing lies on the continuum for most of the students.

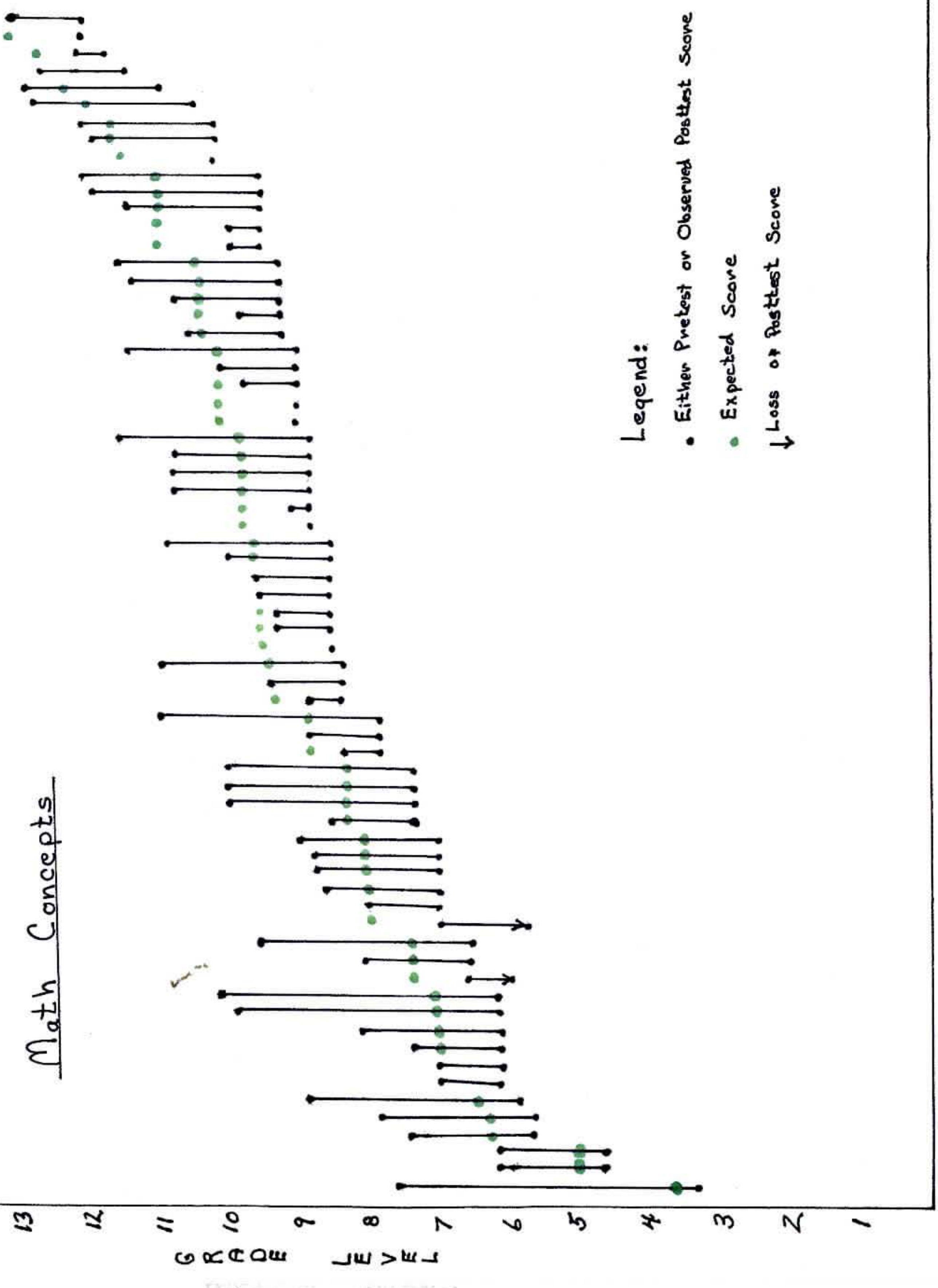


Since this is the student's attitude toward writing, teachers should do as much as possible to eliminate this overwhelming burden for the student. Admittedly, it is not entirely possible in the classroom to eliminate this burden. There is always the "almighty grade" which the teacher and the student must contend with.

4. The students will demonstrate significantly higher scores in math than the expected years growth as shown on the Stanford Achievement (1973 Edition).

The following pages contain graphs on the three areas of math included in the Stanford Achievement Test. The three areas in math included are: (1) math concepts, (2) math computation and (3) math application. The graphs give the results over a two-year period. A control group was not available for this study so graphs had to be used which would show the expected one-year's growth of each student and the actual growth of each student. Thus the graphs will clearly indicate the success of the researcher's activity approach in teaching math.

After each graph, a related table is included. Each table gives statistical data on the outcome of each area tested in math. Only sixty-seven of the sixty-nine students could be used in this section. The researcher did not have any contact with two of the subjects since they attended different schools in seventh grade.



Math Concepts

TABLE 1

EXPECTED AND OBSERVED GAINS IN MATH CONCEPTS

MONTHS GAINED	EXPECTED	OBSERVED
1	0	5
1-5	1	5
6-10	26	14
11-15	40	9
16-20	0	9
21-25	0	18
26-30	0	4
31-35	0	1
36-40	0	2
41-45	0	0
46-50	0	0
51-55	0	0
56-60	0	0

IT IS AN ARTIFACT OF THE PROCESS FOR ESTIMATING EXPECTED GAIN THAT NO LOSSES CAN BE PREDICTED.

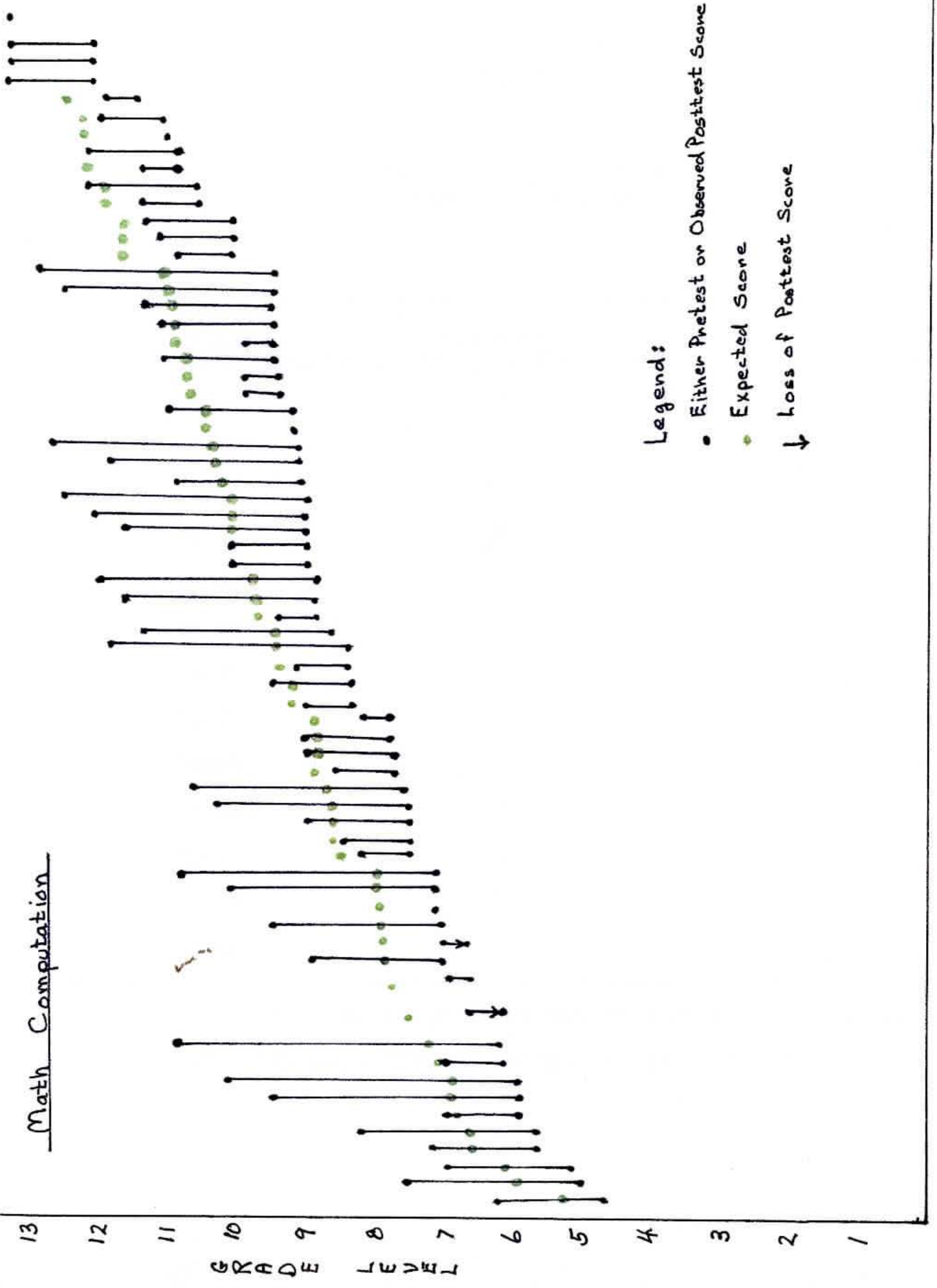

Math Computation
GRADE LEVEL
13
12
11
10
9
8
7
6
5
4
3
2
1
INDIVIDUAL STUDENTS
Legend:
● Either Pretest or Observed Posttest Score
● Expected Score
↓ Loss of Posttest Score

TABLE 2

EXPECTED OBSERVED GAIN IN MATH COMPUTATION

MONTHS GAINED	EXPECTED	OBSERVED
1	0	5
1-5	0	6
6-10	31	14
11-15	35	9
16-20	1	6
21-25	0	5
26-30	0	9
31-35	0	4
36-40	0	5
41-45	0	3
46-50	0	0
51-55	0	0
56-60	0	0

IT IS AN ARTIFACT OF THE PROCESS FOR ESTIMATING EXPECTED GAIN THAT NO LOSSES CAN BE PREDICTED.

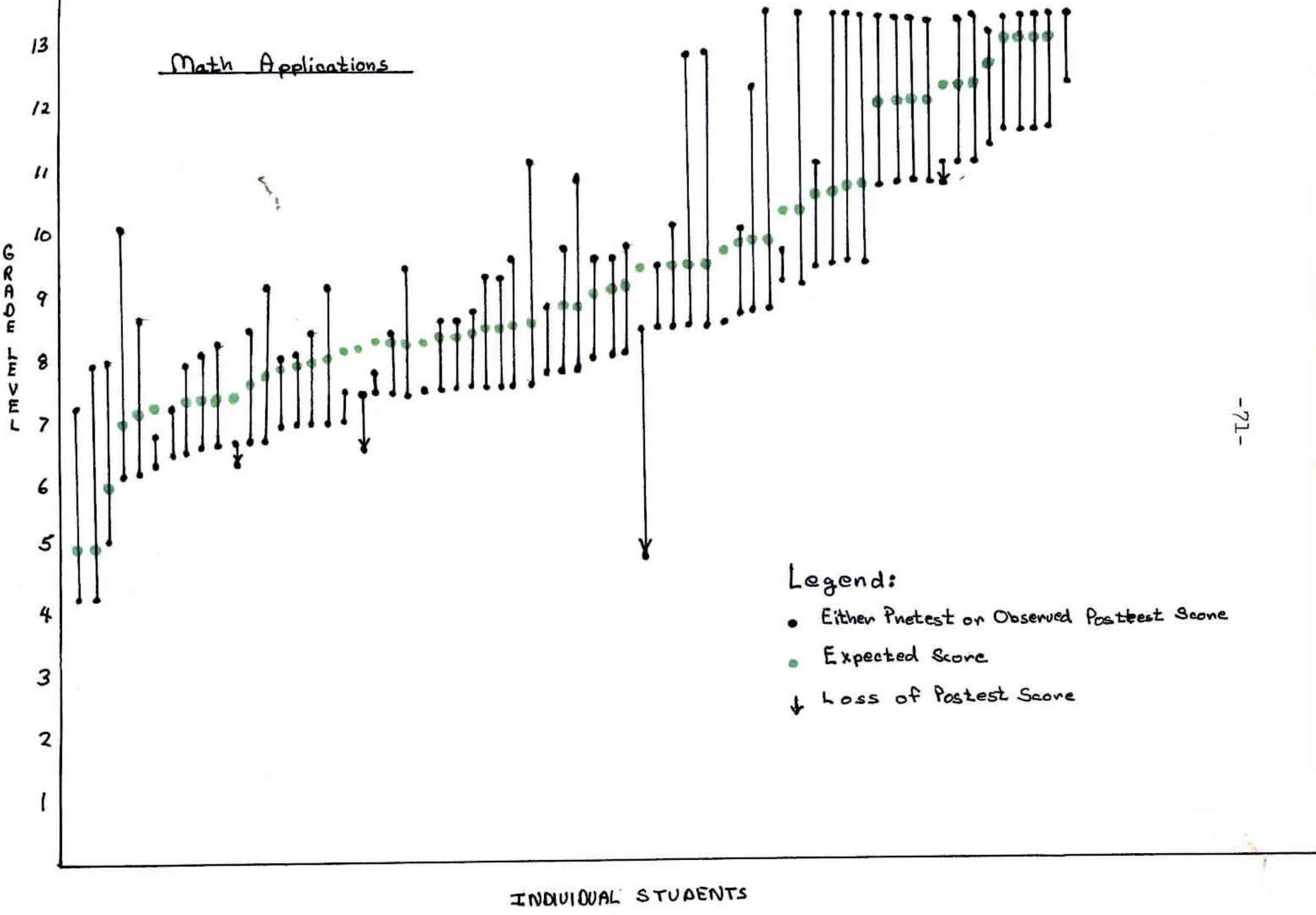

Math Applications
GRADE LEVEL
13
12
11
10
9
8
7
6
5
4
3
2
1
INDIVIDUAL STUDENTS
Legend:
● Either Pretest or Observed Posttest Score
● Expected Score
↓ Loss of Posttest Score

TABLE 3

EXPECTED AND OBSERVED GAIN IN MATH APPLICATIONS

MONTHS GAINED	EXPECTED	OBSERVED
1	0	5
1-5	3	1
6-10	30	8
11-15	34	15
16-20	0	12
21-25	0	8
26-30	0	3
31-35	0	7
36-40	0	8
41-45	0	0
46-50	0	0
51-55	0	0
56-60	0	0

IT IS AN ARTIFACT OF THE PROCESS FOR ESTIMATING EXPECTED GAIN THAT NO LOSSES CAN BE PREDICTED.

Results

After studying the graphs, it is immediately evident that the subjects tested exceeded farther than the expected one-year's growth in math. Since the Stanford Achievement Test is one of the most widely used and accepted achievement test presently in use, it is an excellent criterion to base the academic success of this study respectively.

In math concepts, thirty-four(34) of the sixty-seven (67) subjects achieved beyond the expected one-year's growth and five(5) showed no noticable improvement. While in math computation, thirty-two (32) of the sixty-seven (67) subjects tested progressed beyond the expected one-year's growth and five (5) showed no noticable improvement. Finally, in math application, thirty-eight (38) of the sixty-seven (67) subjects tested beyond the expected one-year's growth and five (5) showed no noticable improvement.

The interpretation of the data from the graphs is endless. However, in the above brief discussion, the data reinforces the use of an activities approach in an educational setting. The data indicates that on the average fifty percent (50%) of the subjects tested, they progressed beyond their predictable potential as indicated on the Stanford Achievement Test.

The math application graph is the most astounding . . . I could hardly believe the results when I first put the graph together. Carl Rogers (1961) was correct when he said that the "facts are friendly." In my opinion, I believe that so many of the subjects scored beyond their predictable potential because of their involvement in learning activities in math. In the "doing" of the activities, the subjects have learned how to "apply" math. It it this reason I believe that the subjects manifest their fullest potential in math application as indicated on the Stanford Achievement Test.

In defense of the above statement, it must be emphasized here that the subject that dropped from a 7.8 to a 4.7 was ill the day the test was given! Therefore, the subject's test score is invalid and cannot be considered when validating the study, as a whole.

The data then supports the use of an activities approach to education. The burden of guilt no longer has to be felt by the teacher because activities are not only "fun", but the use of activities results in noticable achievement in the students' academic growth.

(The following paragraph has been corrected according to the suggestions made the board on the day of my oral examination.)

The math application graph is the most astounding... I could hardly believe the results when I first put the graph together. Carl Rogers (1961) was correct when he said that the "facts are friendly." In my opinion, I believe that so many of the subjects scored beyond their predictable potential because of their involvement in learning activities in math. (Since the study was a descriptive document, without further statistical data, the study will have to be validated at a later date.) In the "doing" of the activities, the subjects have learned how to "apply" math. It is this reason I believe that the subjects manifests their fullest potential in math application as indicated on the Standford Achievement Test.

Refining Present Study

In many ways the teaching philosophy and I espouse to achieve wholistic education and succeed in helping my students to enjoy math and achieve in it far beyond their predictable potentials. I touched on this earlier when I discussed the organismic whole of the student at work in the educational setting through the use of learning activities.

The reason I avoided this issue in the study is because I wanted to avoid creating "math anxiety" in the classroom. At the junior-high level, the students are just beginning to see the relationships that exists in math. Introducing them to the destructive uses of math seemed pointless.

However, I have investigated resources that are available to introduce the students to the destructive and inhumane uses of math. Simulation games would be effective in helping the students understand the moral dilemma facing mathematicians today. For example, the simulation games would help them confront the struggles between nations or industries. The simulation games could also deal with ecological problems. In these simulation games, one could win through a combination of diplomacy and successful manipulation of mathematics.

This type of learning activity could then be introduced to challenge the student without increasing the anxiety level in the classroom. Hence, math will not be divorced from value-questioning and value-encountering activities. This in particular would prove valuable to the students in this study since many of their parents work for McDonnell Douglas Corporation, which manufactures destructive weapons relying on sophisticated mathematics.

Finally, the above discussion would improve the present study. It would integrate math more realistically into the students' lives. The necessity for the addition of this type of activity in math cannot be understated. Freire (1970), advances that eventually, it may mean that the students can avoid the inhumane control math may have on their lives in the future. Then both the "internal" and "external" control of math will be more uniformally synthesized in the present classroom situation.

Recommendations For Future Research

There seem to be a great many studies done in this area. Not so much has been done in research in the practical application of activities in the traditional setting.

New questions that might be set forth for possible investigation are:

1. Do students achieve more academically when learning activities are provided in the traditional setting?
2. Do students respond more favorably or positively in their attitude toward the teacher when learning activities are provided in the traditional setting?
3. Do students when given the opportunity for choices, choose learning styles that meet their individual needs?
4. Is there improvement in self-concept when learning activities are provided in a traditional setting?
5. Is there an improvement in attitude toward school when learning activities are provided in the traditional setting.
6. Do students demonstrate improvement in the cognitive domain and the sensory mortar domain as indicated in the "structural elements of games" as listed on pages 31-35 in this study.

APPENDIX

APPENDIX A

Girls 20
Boys 14
34

MR. LANE
GRADE 8 ROOM 18

BECKMAN, DAN

BEQUETTE, SUE

BRETZLER, MARK

BOCKLAGE, TODD

BUELTMANN, MARK (NEW)

BUFE, MARIE

DIETZ, EILEEN

DOHERTY, MICHELE

FARRELL, EILEEN

FRANEY, PAT

FRANK, KAREN

FRITZ, CONNIE

GALLAGER, RON (NEW)

GRIFFIN, CHRIS

HEITERT, MARK

HORAT, VICKIE

HUSMANN, JOYCE

KNOBBE, JENNY

LAMI, SALLY

LAROSE, MARK

MASKOW, BOB

PAYNE, KELLEY

POLITTE, DIANE

RENNER, ED

ROCKLAGE, JOE

RYAN, LISA

SCHNEIDER, KIM

SKRIVAN, CRAIG

STEINIGER, DOLORES

STORLMAN, MARY KAY

TERBROCK, NINO

WANKO, MIKE

WIENER, KAREN

ZANG, BETH

Girls 20
Boys 14
34

Oldest 34

MRS. MOELLERING
GRADE 8 ROOM 1

BENSING, MARK
BIXBY, MARTY
CALCATERRA, MICHELLE
CAGLE, PATTI
CIARAVINO, ANGELA
DALTON, LOUIE
ENGELHARD, CINDY
FARMER, MARIA
FERNAU, LORI
FIELDS, RICH
FITZGERALD, CHRISTOPHER
GERST, LAURA
GIBSON, LESLIE
HAYNES, LISA
HERCULES, TOM
HIGGINBOTHAM, CATHERINE
LANG, TOM
LOFTUS, JIM
LOUGHMAN, TIM
LUZYNSKI, LAURA
MARTY, PATTY
ODERMAN, ARLENE
PORTERFIELD, MIKE
QUINLISK, TOM
REED, BETSY
SANDT, TIM
SCHWETZ, NANCY
STELZER, STACY
STIENS, GARY
STRAUSS, DEBBIE
STROOT, KAREN
TOBIN, KELLY
WIENER, SHARON
WILLARD, KATHY

APPENDIX B

QUESTIONNAIRE

1. My favorite subject is ...

2. My least favorite subject is ...

3. I usually like to work

_____by myself.

_____with a group.

_____with the whole class.

4. I like to

_____talk about a subject.

_____write about a subject.

_____both.

5. My teacher talks

_____very little.

_____a lot of the time.

6. My teacher lets me talk

_____almost never.

_____a lot of the time.

QUESTIONNAIRE
(continued)

7. I have choices in my class

_____almost never.

_____a lot of the time.

8. I have fun at school

_____almost never.

_____most of the time.

9. The thing I like most about my class this year is ...

10. The thing I do best is ...

11. The thing that I like least about my class this year is ...

12. How is your class different from other classes you've had before?

13. The thing I like best about my teacher is ...

14. The thing I like least about my teacher is ...

15. Rate this classroom

_____high

_____low

16. Teaching is ...

17. Learning is ...

READING QUESTIONNAIRE

1. The thing I like best about reading activities is ...

2. The thing I like least about reading is ...

3. For reading, I would like to

_____have more reading activities.

_____have regular reading.

_____both.

4. To help me with reading, the teacher should ...

MATH QUESTIONNAIRE

1. I like the activities

    ____that the teacher made.

    ____that we do orally in class.

    ____that we do on our math activity sheets.

2. The thing I learned from doing the activities were...

3. The things I learned from teaching activities were...(if applies)

4. I want to continue to learn math through activities because...

5. How do you feel the atmosphere is different because we use activities?

6. I like math more

    ____the regular

    ____with the math activities

    ____other ways.

ACTIVITY QUESTIONNAIRE

1. Check the following activities you enjoy doing.

_____camping trips
_____preparing for the masses (singing)
_____car wash
_____raffle for missions
_____auction for missions
_____Student Service Committee
_____homeroom newspapers
_____Physical Education (Sports)
_____Physical Education (Square Dancing)
_____decorating bulletin boards
_____math board games
_____math activity sheet games
_____8th grade play
_____8th grade concert
_____assemblies
_____visitors coming
_____role playing
_____mental mathematics
_____pico fume
_____plays in reading
_____role playing in religion
_____getting food and clothes for the poor at Christmas
_____Christmas carrolling at convelescant home
_____competition games in sports between 7th & 8th graders
_____field day between 7th & 8th graders
_____singing on Wednesday
_____art on Wednesday
_____math activities
✓ _____math culminating project
_____Spanish (activity reading)
_____Lindenwood 4 Workshop
_____Webster College Workshop

ACTIVITY QUESTIONNAIRE
(continued)

2. Do the activities make school more enjoyable for you? Explain.

3. Do the activities make school less enjoyable for you? or, make no difference?

4. Which activities do you enjoy the most?

5. Do you have suggestions of further activities that we could do in school?

6. Do you think the activities bring the 8th grade ✓closer together?

APPENDIX C

+5

105%

Mark Bensing Math 9-29-76

HERE WE GO!

pg39
2 -9
4 +15
6 +25
8 -31
10 +31
12 -43
14 +325
16 -325
18 +28
20 -39
22 +68
24 +123
26 +1815
28 +20195
30 +35873
32 -27
34 -177
36 -201
38 -137
40 +655

EXTRACREDIT

He's seeing his own reflection in that ~~m~~ mirror..

Pg 46

2 +4
4 +3
6 -4
8 -11
10 0
12 -5
14 -1
16 +107
X 18 -12
20 260
22 +79
X 24 -158
26 0
28 +2495
30 +16
32 +1
34 -2
36 +20
38 -4
40 +12
X 42 +39

WATCH OUT

1.

			+3
-2	+13	-8	+3
-5	+1	+7	+3
+10	-11	+4	+3
+3	+3	+3	+3

2.

-3	+10	-1	-8	-2
-12	+6	+14	~~+14~~	-2 X
+8	-13	-9	-12	-2
+5	-5	-6	+4	-2
-2 -2	-2	-2	-2	-2

Hiss Boo

MATH

Boo Hiss

94

Marie Bufe
St. Sabina

gr 8
Dec 2 '76

Math -2

p. 94
even

2 $^{24}/_{5} \times (^{5}/_{6} + ^{15}/_{8}) =$
$^{24}/_{15} \times (^{20}/_{24} + ^{45}/_{24}) =$
$^{24}/_{5} \times ^{65}/_{24} = ^{13}/_{1} = 13$

4 $36 \cdot (^{5}/_{9} + ^{-7}/_{12}) =$
$36 \cdot (^{20}/_{36} + ^{-21}/_{36}) =$
$^{36}/_{1} \cdot ^{1}/_{36} = ^{-1}/_{1} = -1$

6 $^{3}/_{4} \cdot (^{8}/_{7} - ^{8}/_{15}) =$
$^{3}/_{4} \cdot (^{120}/_{105} + ^{-56}/_{105}) =$
$^{3}/_{4} \cdot ^{64}/_{105} = ^{16}/_{35}$
35

× $(7 \cdot ^{-35}/_{12}) + (5 \cdot ^{35}/_{12}) =$
$^{245}/_{12} + ^{175}/_{12} = ^{420}/_{12} =$
35

10. $^{9}/_{25} \cdot (^{13}/_{32} + ^{19}/_{32}) =$
$^{9}/_{25} \cdot ^{32}/_{32} = ^{288}/_{800}$

Hola, amigos
Me llamo María

Hello friends
My name is Marie

p. 95
even

2 $^{-11}/_{4}$
4 $4\,^{13}/_{16}$
6. $1\,^{3}/_{4}$
8. $4\,^{5}/_{16}$
10. $6\,^{15}/_{16}$

p. 96
even

12 $^{25}/_{8} \cdot ^{3}/_{2} = ^{75}/_{16} = 4\,^{11}/_{16}$
14 $^{6}/_{1} \cdot ^{4}/_{3} = ^{24}/_{3} = 8$
16 $^{17}/_{4} \cdot ^{-5}/_{2} = ^{-85}/_{8} = 10\,^{5}/_{8}$
18. $^{13}/_{8} \cdot ^{-13}/_{4} = ^{169}/_{32} = 5\,^{9}/_{32}$
20 $^{7}/_{2} \cdot ^{9}/_{4} = ^{63}/_{8} = 7\,^{7}/_{8}$
22. $^{8}/_{1} \cdot ^{-11}/_{4} = ^{-88}/_{4} = -22$
× 24 $^{13}/_{3} \cdot ^{9}/_{24} = ^{1}/_{12}$

26 yes, Because they dived, multiplied & added integers
28 $^{21}/_{4} \cdot ^{44}/_{5} = ^{924}/_{20} = 46\,^{1}/_{5}$
30. $^{37}/_{7} \cdot ^{35}/_{8} = ^{295}/_{56} = 28\,^{7}/_{56}$
32. $^{-38}/_{9} \cdot ^{75}/_{4} = ^{2850}/_{36} = 79\,^{1}/_{6}$

100%

Shelley Calcaterra
St. Sabina

* watch out

Grade 8
Nov. 29, '7

Math

p. 90

1. $7\frac{5}{12} = 7\frac{5}{12}$
$+2\frac{3}{4} = 2\frac{9}{12}$
$9\frac{14}{12} = \boxed{10\frac{1}{6}}$

2. $6\frac{5}{8} = 6\frac{5}{8}$
$-3\frac{1}{4} \quad -3\frac{2}{8}$
$\boxed{3\frac{3}{8}}$

3. $2\frac{3}{5} = 2\frac{6}{10}$
$-4\frac{7}{10} \quad -4\frac{7}{10}$
$\boxed{-2\frac{1}{10}}$

4. $-5\frac{1}{2} = -5\frac{4}{8}$
$-1\frac{7}{8} = -1\frac{7}{8}$
$-6\frac{11}{8} = \boxed{-7\frac{3}{8}}$

5. $10\frac{1}{3} = 10\frac{2}{6}$
$-6\frac{1}{2} = +6\frac{3}{6}$
$\boxed{16\frac{5}{6}}$

6. $-8\frac{5}{6} = -8\frac{5}{6} = -8\frac{30}{24}$
$3\frac{3}{8} = +-3\frac{3}{8} = -3\frac{9}{24}$
$-11\frac{39}{24} = -12\frac{15}{24}$
$\boxed{-12\frac{5}{8}}$

7. $-11\frac{1}{5} = -11\frac{2}{10} = -11\frac{2}{10}$
$-4\frac{1}{2} = +4\frac{5}{10} \quad 3\frac{15}{10}$
$= \boxed{-6\frac{7}{10}}$

8. $14\frac{2}{3} = 14\frac{16}{24} = 14\frac{16}{24}$
$-17\frac{5}{8} = -17\frac{15}{24} \quad -16\frac{39}{24}$
$\boxed{-2\frac{23}{24}}$

9. $5\frac{4}{9}$
$-3\frac{1}{9}$
$2\frac{3}{9} = \boxed{2\frac{1}{3}}$

10. $-7\frac{2}{3}$
$-8\frac{2}{3}$
$-15\frac{4}{3} = \boxed{-16\frac{1}{3}}$

11. 4 3/11 = 4 3/11
-6 5/11 -6 5/11
-2 2/11

12. -11 3/5 = -11 3/5
- 4 4/5 -4 4/5
-15 7/5 = -16 2/5

13. 12 1/2 = 12 3/6
- 5 1/3 = -5 2/6
7 1/6

14. 4 3/8 = 4 3/8 = 4 9/24
- 9 2/3 = -9 2/3 = -9 16/24
-5 7/24

15. 11 3/5 = 11 9/15
+ -5 1/3 = -5 5/15
6 4/15

16. -24 5/8 = -24 5/8 = -24 25/40 = -23 65/40
+ 13 4/5 = 13 32/40 = 13 32/40 = 13 32/40
-10 33/40

17. -16 5/16 = -16 5/16 = -16 15/48
- -29 2/3 = + 29 2/3 = 29 32/48
13 17/48

18. 5 3/4 = 11 2/4 = 10 6/4
11 1/2 - 5 3/4 5 3/4
6 5 3/4

+5

Watch Out

???

1. 9 5/8
+ 9 5/8
18 10/8 = 19 2/8

19 2/8
4 4/8
23 6/8

23 6/8
4 4/8
27 10/8 = 28 2/8

28 1/4
↑
28 2/8

2. 12 3/4 = 12 9/12
- 2 2/3 + -2 8/12
10 1/12

94

Laura Gerst
St. Sabina

Oct 25
Grade 8

Math -2

~~100%~~

1) A $\frac{+6}{+11}$ b $\frac{-8}{5}$ c $\frac{+13}{+10}$

2) A -1 $\frac{-1}{1}$ $\frac{-1}{2}$ $\frac{-1}{3}$ $\frac{-1}{4}$ 0 $\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$ $\frac{7}{8}$

$\frac{1}{2}$ $\frac{2}{4}$ $\frac{4}{8}$ $\frac{6}{16}$ $\frac{12}{32}$

B $\left(\frac{-2}{4}=\frac{4}{8}\right)\left(\frac{-2}{8}=\frac{4}{16}\right)\left(\frac{4}{8}=\frac{2}{16}\right)\left(\frac{3}{4}=\frac{6}{8}\right)\left(\frac{6}{8}=\frac{12}{16}\right)$

3. A -1 $\frac{-1}{3}$ $\frac{-1}{4}$ 0 $\frac{-1}{6}$ $\frac{1}{12}$

$\frac{-1}{2}$ $\frac{-2}{4}$ $\frac{-4}{8}$ $\frac{-16}{16}$

$\frac{-2}{6}$ $\frac{-4}{12}$ $\frac{-8}{24}$ $\frac{16}{48}$

$\frac{-2}{8}$ $\frac{-4}{16}$ $\frac{-8}{38}$

$\frac{2}{12}$ $4/24$ $8/48$

$\frac{2}{24}$ $\frac{4}{36}$ $\frac{8}{48}$ $\frac{16}{60}$

("he turns into the were wolf"

Eileen Dietz
St. Sabina

96%

11-15-76
Grade 8

Math -1

Page 81

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
a	16	12	9	10	12	51	90	72	16	38	180
b	24	18	8	6	4	85	75	90	52	19	252
g.c.f	8	6	1	2	4	17	15	18	4	1	36
l.cm	48	36	72	30	12	255	450	360	208	722	1260

12.) $54 = 2 \times 3^3$ g.c.f. $= 2 \times 3^2 = \underline{18}$
$90 = 2 \times 3^2 \times 5$ l.c.m. $= \underline{270}$

13.) $36 = 2^2 \times 3^2$ g.c.f. $= 2^2 = \underline{4}$
$32 = 2^5$ l.c.m. $= \underline{288}$

14) $60 = 2^2 \times 3 \times 5$ g.c.f. $= 2 \times 3 = \underline{6}$
$126 = 2 \times 3^2 \times 7$ l.c.m. $= \underline{1260}$

(95)

90
+10
100

Mark Heitert
St. Sabina

Math

+/ 62

10-19-76
8

1. -2 < +1
2. -4 < -3
3. +4 > +3
4. +12 > +9
5. -8 < -6
6. +7 < +10
7. -5 > -9
8. -1 < 0
9. {-4, -3, -1, +2, +5}
10. {-6, -5, -4, -2, 0}
11. {-2, 0, +2, +4, +7}
12. {-8, -6, +5, +7, +9}
13. {-9, -8, -6, -5, -4, -3, 0, +1, +2, +6, +7}
14. {-71, -60, -55, -39, -11, +14, +42, +64}

1. +11
2. -10
3. -14
4. -33
5. +19
6. -12
7. +12
8. -35
9. +1
10. +2
11. -1
12. +3
13. +3
14. -8
15. -7
16. -1
17. -14, -8, -5, -3, +2
18. 0, +6, +9, +11, +14, +17
19. -17, -11, -8, -6, -3, 0
20. +2
21. +8
22. -8
23. -16
24. +20

-21

13. +3
14. +3
15. -8
16. -6
17. -6
18. -15
19. +6
x20. +8
21. -15
22. +12
23. -12
24. +15

1. +4, commu. for multi.
2. -3, commu. for add.
3. -9, identity for add.
4. 0, identity for add.
5. +1, comm. for add.
6. 0, property of zero for mult.
7. +1, identity for multi.
8. +6 identity for multi.
9. -14, identity for add.
10. -1, associative for add.
11. +6, additive inverse for add.
12. 0, distributive for multi.
13. -6, comm. for multi.
14. +3 associative for multi.

(show) 15. +7 + +4 + -9 + +8 + -11 + +1 + +2 = ?
solve +7 + +4 + -9 + +8 + -11 + +1 + +2 = +2
answer East High scored more

show 16. +2 + -3 + -1 + +1 + +2 + +2 + -1 = N
solve +2 + -3 + -1 + +1 + +2 + +2 + +1 = +2
answer the net change is 2

show 17. $4000 + $12000 + $3000 + $1000 – Y $15000 + $16000 = B Y-B = K
solve $11000 $16000 + $ 5000 + $1000 = $10,000 $5000 + $1000 = $11,000 $11000 - 10,000 = 1,000
answer net loss is $1,000

15. 3000.00
3000,00
3000.00
3000.00

16. 800.99
800,99
800.99
800.00

17. 0.35
0.35
0.35
0.4

18. 576.
19. 6,000
20.001789
21. 81,000
22. .2685
23.00008015

24. 245_{ten}
25. 117_{ten}
26. 241_{ten}
27. 2827_{ten}
28. 80_{eight}
29. 616_{eight}
30. 11573_{eight}
31. 7205_{eight}

32. 64
33. 4096
34. 256
35. 1024

36. $(5+5)-5+5=10$
37. 3^3-3

The "Blue" Pages

196

99
+10
109

pg 62
63
65
Mark La Rose 12/
St. Sabina
Math

10-19-76
18

62 ① -2 < +1
② -4 < -3
③ +4 > +3
④ +12 > +9

⑤ -8 < -6
⑥ +7 < +10
⑦ -5 > -9
⑧ -1 < 0

⑨ {-4, -3, +2, +5}
⑩ {-6, -5, -4, -2, 0}
⑪ {-2, 0, +2, +4, +7}
⑫ {-8, -6, +5, +7, +9}
⑬ {-9, -8, -6, -5, -4, -3, 0, +1, +2, +6, +7}
⑭ {-71, -60, -55, -39, -11, +14, +42, +64}

① +11 ② -10 ③ -14 ④ -33
⑤ +19 ⑥ -12 ⑦ +12 ⑧ -35
⑨ +1 ⑩ +2 ⑪ -1 ⑫ +3
⑬ +3 ⑭ -8 ⑮ -7 ⑯ -1

⑰ -14, -8, -5, -3, 0, +3

⑱ 0, +6, +9, +11, +14, +17

⑲ -17, -11, -8, -6, -3, 0

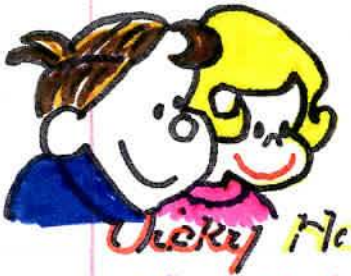
⑳ +2 ㉑ +8 ㉒ -8 ㉓ -16
㉔ +20 ㉕ +36 ㉖ -2 ㉗ +7
㉘ -5 ㉙ -3 ㉚ +1 +10 ㉛ +11

① +6 ⑦ +64 63 ⑬ +3 ⑲ +6
② -20 ⑧ -15 ⑭ +3 ⑳ +7
③ +24 ⑨ -54 ⑮ -8 ㉑ -15
④ -18 ⑩ -48 ⑯ -6 ㉒ +12
⑤ -44 ⑪ -36 ⑰ -4 ㉓ -12
⑥ +49 ⑫ -25 ⑱ -15 ㉔ +15

pg 65
① 250,050.049
② 4,000,310.406
③ $(3\times10^5)+(4\times10^4)+(9\times10^3)+(2\times10^2)+(5\times10)+(3\times\frac{1}{10^3})+(6\times\frac{1}{10^4})$
④ $(2\times10^6)+(3\times10^5)+(3\times10^4)+(9\times10^3)+(3\times\frac{1}{10^2})+(9\times\frac{1}{10^3})$
⑤ $1+(2\times\frac{1}{10})+(3\times\frac{1}{10^2})+(5\times\frac{1}{10^3})+(9\times\frac{1}{10^4})+(7\times\frac{1}{10^5})+(6\times\frac{1}{10^7})$
⑥ 5.486×10^6
⑦ $7.89\times\frac{1}{10^4}$
⑧ 5.645×10
⑨ 4.5×10^4
⑩ 3.0175×10^2
⑪ $5.6\times\frac{1}{10^3}$

⑫ 4500, 4510, 4508, 4507.6
⑬ 700, 660, 656, 655.7
⑭ 1000, 980, 975, 975.1
⑮ 3000, 3000, 3000, 3000.0
⑯ 800, 800, 800, 800.0
⑰ 000, 00, 0, 0.4
⑱ 576
⑲ 60,000
⑳ .001759
㉑ 81000
㉒ 76.25
㉓ .8015
㉔ 245 ten
㉕ 117 ten
㉖ 22 ten
㉗ 2827 ten
㉘ 100 eight ✓
㉙ 216 eight
㉚ 11573 eight
㉛ 7305 eight
㉜ 64
㉝ 4096
㉞ 256
㉟ 1024
㊱ $\frac{5+5}{5}\times5$
㊲ 3^3-3

(97)



100

Vicky Horvath
St. Sabina

november 8, 1976
pg. 76   8-18

MATH

-0

1. $F_{15}=\{1,2,3,5,15\}$
2. $F\text{-}24=\{1,2,3,4,6,8,12,24\}$
3. $F18=\{1,2,3,6,9,18\}$
4. $F60\{1,2,3,4,5,6,10,12,15,20,30,60\}$
5. $F\text{-}36=\{1,2,3,4,6,9,12,18,36\}$
6. $F13=\{1,13\}$
7. $F25=\{1,5,25\}$
8. $F37=\{1,37\}$

9. $F_{12} \cap F8=\{1,2,4\}$
10. $F_{16} \cap F24=\{1,2,4,8\}$
11. $F\text{-}18 \cap F_{12} \cap F_{32}=\{1,2\}$
12. $F32 \cap F_{16}=\{1,2,4,8,16\}$
13. $F36 \cap F60=\{1,2,3\}$
14. $F15 \cap F\text{-}60 \cap F45=\{1,3,5,15\}$
15. $F\text{-}7 \cap F6=\{1\}$
16. $F26 \cap F39=\{1,13\}$
17. $F25 \cap F\text{-}9 \cap F\text{-}30=\{1\}$

18. gcf$=\{2\}$
19. gcf$=\{6\}$
20. gcf$=\{8\}$
21. gcf$=\{1\}$
22. gcf$=\{4\}$
23. gcf$=\{12\}$
24. gcf$=\{6\}$
25. gcf$=\{15\}$
26. gcf$=\{14\}$

Gary Stiens
St Sabina

94
+ 10
104

Oct. 19 1976
Rm. 1 Gr. 8th

Math ([illegible]) -12

Pg. 62
1. <
2 <
3 >
4. >
5. <
6 <
7 >
8. <

9. {-4, -3, -1, +2, +5}
10. {-6, -5, -4, -2, 0}
11. {-2, 0, +2, +4, +7}
12. {-8, -6, +5, +7, +9}
13 {-9, -8, -6, -5, -4, -3, 0, +1, +2, +6, +7}
14 {-71, -60, -55, -39, -11, +14, +42, +64}

1 +11
2. +10
3 +14
4. +33
5 +19
6 +12
7 +12
8. +35

9 +1
10. +2
11 -1
12. +3
13. +3
14 -8
15. -7
16. -1

17 -14, -8, -5, -3, 0, +3
18. 0, +6, +9, +11, +14, +17
19 -17, -11, -8, -6, -3, 0

11 0, Identity for add.
12. -6, distributive property for add. & mult
13 -6, commutative property for mult
14 +3, Assoc. property for mult.

15. Tell: won 7 points, won 4, lost 9, won 8, lost 11, won 1, and won 2. Who scored more points East High or its opponent?

Show: $^{+}7 + {}^{+}4 - {}^{-}9 + {}^{+}8 - {}^{-}11 + {}^{+}1 + {}^{+}2 = n$

Solve: $^{+}7 + {}^{+}4 - {}^{-}9 + {}^{+}8 - {}^{-}11 + {}^{+}1 + {}^{+}2 = {}^{+}2$

Answer: East High $(^{+}2)$ 2

16. Tell: stock, up 2, down 3, down 1, up 1, up 2, up 2, and down 1. What was the net change in price?

Show: $^{+}2 - {}^{-}3 - {}^{-}1 + {}^{+}1 + {}^{+}2 + {}^{+}2 - {}^{-}1 = n$

Solve: $^{+}2 - {}^{-}3 - {}^{-}1 + {}^{+}1 + {}^{+}2 + {}^{+}2 - {}^{-}1 = +2$

Answer: Net change was $(+2)$ 2

17. Tell: reported: Jan. \$4000 pr., Feb. \$2000 pr., March \$5000 loss, Apr. \$3000 pr., May \$6000 loss, June \$1000 pr. What is the net profit or loss for the six months

TURN PAGE over

17. 0,0,0,0.4

18. 576.

19. 6,000

20. .001789

21. 81,000.

22. .7685

23. .0008015

24.
$(3\times 8^2)+(6\times 8^1)+5$
$192 + 48 + 5$
$365_{\text{eight}} = 245_{\text{ten}}$

25. $(4\times 5^2)+(3\times 5)+2$
$100 + 15 + 2$
$432_{\text{five}} = 117_{\text{ten}}$

26. $(1\times 2^4)+(1\times 2^2)+(1\times 2)$
$16 + 4 + 2$
$10,110_{\text{two}} = 24_{\text{ten}}$

27 $(3\times 9^3)+(7\times 9^2)+(8\times 9)+1$
$2187 + 567 + 72 + 1$
$3781_{\text{nine}} = 2827_{\text{ten}}$

ANSWER: 100 eight

28. $8\overline{)64}$ = 8 r. 0, 64, 0 $\quad 8\overline{)8}$ = 1 r., 8, 0 $\quad 8\overline{)1}$

$(1\times 8^2)+0 = 64$
$64 + 0$

96

MaryKay Stuhlman
St Sabina

gr.8 rm18
11/8/76

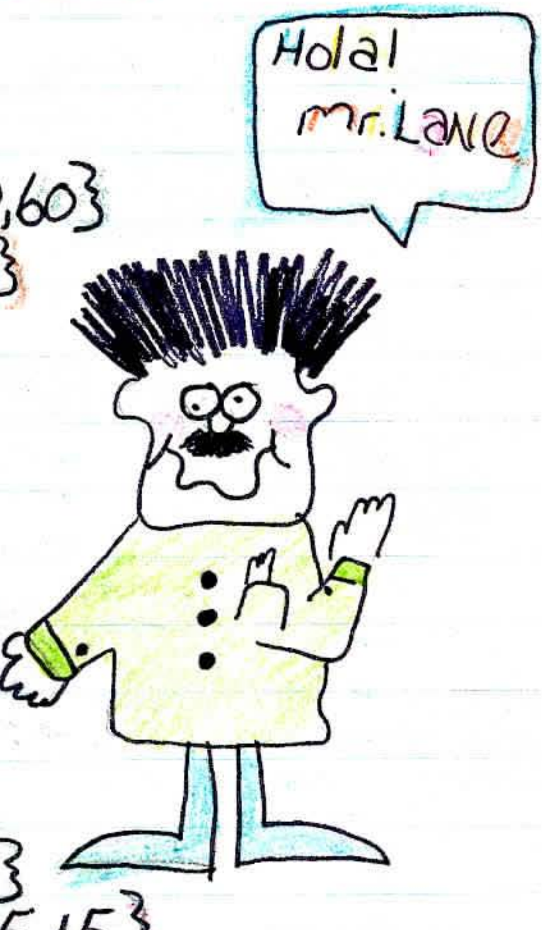
Math -1 MINUS ONE

.76

1) $F\ 15\ \{1,3,5,15\}$
2) $F{-24}\ \{1,2,3,4,6,8,12,24\}$
3) $F_{18}\ \{1,2,6,9,18\}$
4) $F60\ \{1,2,3,4,5,6,10,12,20,60\}$
5) $F{-36}\ \{1,2,3,6,9,12,18,36\}$
6) $F_{13}\ \{1,13\}$
7) $F{-25}\ \{1,5,25\}$
8) $F{-37}\ \{1,37\}$

9) $F_{12} \cap F_8 = \{1,2,4\}$
10) $F_{24} \cap F_{16} = \{1,2,4,8\}$
11) $F_{18} \cap F_{12} \cap F_{32} = \{1,2,\}$
12) $F_{32} \cap F_{16} = \{1,2,4,8,16\}$
13) $F{-36} \cap F_{60} = \{1,2,3,4,6,12\}$
14) $F_{15} \cap F{-60} \cap F_{45}\ \{1,3,5,15\}$
15) $F_7 \cap F{-6} = \{1\}$
16) $F_{26} \cap F_{39} = \{1\}$
17) $F_{25} \cap F{\cdot 9} \cap F{-30} = \{1\}$

18) 4
19) 6
20) 4
21) 1
22) 4
23) 12
24) 60
25) 15
26) 1



100

Stacy Stelzer
St. Sabrina

-0

Nov. 29, 19[illegible]6
Grade 8

Math

Page #90

1) $7\frac{5}{12} = 7\frac{5}{12}$
$+2\frac{3}{4} = 2\frac{9}{12}$
$9\frac{14}{12} = 10\frac{2}{12} = 10\frac{1}{6}$

2) $6\frac{5}{8} = 6\frac{5}{8}$
$+\,^-3\frac{1}{4} = -3\frac{2}{8}$
$3\frac{3}{8}$

3) $2\frac{3}{5} = 2\frac{6}{10}$
$+\,^-4\frac{7}{10} = ^-4\frac{7}{10}$
$^-2\frac{1}{10}$

4) $-5\frac{1}{2} = -5\frac{4}{8}$
!?!??! $= -1\frac{7}{8}$
$-6\frac{11}{8} = ^-7\frac{3}{8}$

5) $10\frac{1}{3} = 10\frac{1}{3} = 10\frac{2}{6}$
$-\,^-6\frac{1}{2} = +6\frac{1}{2} = +6\frac{3}{6}$
$16\frac{5}{6}$

6) $-8\frac{5}{6} = -8\frac{5}{6} = -8\frac{20}{24}$
$-3\frac{3}{8} = +\,^-3\frac{3}{8} = ^-3\frac{9}{24}$
$-11\frac{29}{24} = ^-12\frac{5}{24}$

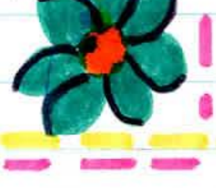
7) $^-11\frac{1}{5} = -11\frac{1}{5} = -11\frac{2}{10} = ^-10\frac{12}{10}$
$-\,^-4\frac{1}{2} = +4\frac{1}{2} = 4\frac{5}{10} = +4\frac{5}{10}$
X
$^-6\frac{7}{10}$

8) $14\frac{2}{3} = 14\frac{2}{3} =$
$-17\frac{5}{8} = +\,^-17\frac{5}{8} =$

$14\frac{16}{24} = 14\frac{16}{24}$
$^-17\frac{15}{24} = ^-16\frac{39}{24}$
X
$^-2\frac{23}{24}$

9) $5\frac{4}{9}$ + (
$+\,^-3\frac{1}{9}$
$2\frac{3}{9} = 2\frac{1}{3}$

10) $-7\frac{2}{3}$
$+\,^-8\frac{2}{3}$
$^-15\frac{4}{3} = ^-16\frac{1}{3}$



Stacy Stelzer

#

11) $4\frac{3}{11} = 4\frac{3}{11}$
$-6\frac{5}{11} = +{}^{-}6\frac{5}{11}$
${}^{-}2\frac{2}{11}$

12) ${}^{-}11\frac{3}{5} = {}^{-}11\frac{3}{5}$
$-4\frac{4}{5} = +{}^{-}4\frac{4}{5}$
$-15\frac{7}{5} = {}^{-}16\frac{2}{5}$

13) $12\frac{1}{2} = 12\frac{1}{2} = 12\frac{3}{6}$
$-5\frac{1}{3} = +{}^{-}5\frac{1}{3} = {}^{-}5\frac{2}{6}$
$7\frac{1}{6}$

14) $4\frac{3}{8} = 4\frac{3}{8} = 4\frac{9}{24}$
$-9\frac{2}{3} = +{}^{-}9\frac{2}{3} = -9\frac{16}{24}$
${}^{-}5\frac{7}{24}$

15) $11\frac{3}{5} = 11\frac{9}{15}$
$+{}^{-}5\frac{1}{3} = -5\frac{5}{15}$
$6\frac{4}{15}$

16) ${}^{-}24\frac{5}{8} = {}^{-}24\frac{25}{40} = {}^{-}23\frac{65}{40}$
$+13\frac{4}{5} = 13\frac{32}{40} = 13\frac{32}{40}$
X ${}^{-}10\frac{33}{40}$

17) ${}^{-}16\frac{5}{16} = {}^{-}16\frac{5}{16} = {}^{-}16\frac{15}{48}$
$-{}^{-}29\frac{2}{3} = +29\frac{2}{3} = 29\frac{32}{48}$
$13\frac{17}{48}$

18) $11\frac{1}{2}'' = 11\frac{1}{2}'' = 11\frac{2}{4}'' = 10\frac{6}{4}''$
$-5\frac{3}{4}'' = +{}^{-}5\frac{3}{4}'' = {}^{-}5\frac{3}{4}'' = +{}^{-}5\frac{3}{4}''$
$5\frac{3}{4}''$

Watch Out!!

(Extra Credit)

1.) $9\frac{5}{8}'' = 9\frac{5}{8}''$
$+4\frac{1}{2}'' = 4\frac{4}{8}$
$12\frac{9}{8} = 13\frac{1}{8}''$

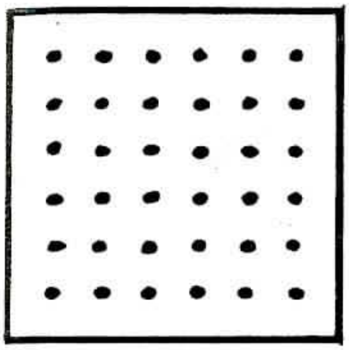
+5
$\frac{105}{84}'' \times \frac{8}{1} = \frac{105}{4} = 26\frac{1}{4}''$

2.) $\frac{8}{3} \times \frac{2}{1} = \frac{16}{3} = 5\frac{1}{3}''$

APPENDIX D

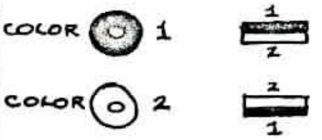
MATH Grades 5-9

SUBMITTED BY JOEL ZIEGLER, 6TH GRADE TEACHER,
HAZELWOOD SCHOOL DISTRICT



REVERSI -or- FLIPS

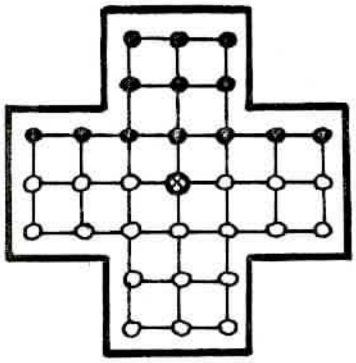
FOR 2 PLAYERS



EACH PLAYER BEGINS WITH 18 CHIPS, WITH HIS COLOR ON THE TOPS AND OPPONENT'S COLOR ON THE BOTTOMS. CHIPS NEED HOLES IN CENTERS TO FIT ONTO PEGS.*

OBJECT: TO FINISH WITH MORE OF YOUR COLOR SHOWING ON THE BOARD THAN OPPONENT'S...

RULES: PLAYS ARE ALTERNATE. THE 4 CENTER SQUARES MUST BE FILLED FIRST, BY EACH PLAYER PLACING A CHIP ON A PEG. THEN, CHIPS MUST BE PLACED ADJACENT TO ANY OPPONENT CHIP - VERTICALLY, HORIZONTALLY, OR DIAGONALLY. A PLAYER MUST PLACE HIS CHIP SO THAT ONE OR MORE OPPONENT CHIPS BECOME FLANKED (ON ANY TWO SIDES) BY THE CHIP HE IS PLACING & ANOTHER OF HIS CHIPS. THE OPPONENT PIECE OR PIECES IN BETWEEN ARE THEN **FLIPPED** & BECOME "FRIENDLY" (CHANGE TO OTHER COLOR). A PLAYER MUST ALWAYS PLACE A CHIP SO THAT HE CAN FLIP AS A RESULT OF HIS PLAY. OTHERWISE, HE LOSES HIS TURN. PIECES MAY NOT BE MOVED FROM ORIGINAL PLACEMENT. THEY MAY BE FLIPPED ANY NUMBER OF TIMES. MORE THAN ONE LINE OF OPPONENT PIECES MAY BE CAPTURED & FLIPPED IN ONE TURN, BEFORE &/OR AFTER CHIP PLACEMENT, - VERTICALLY, HORIZONTALLY, OR DIAGONALLY. GAME ENDS WHEN ALL 36 CHIPS ARE PLACED.



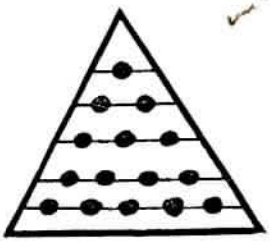
FOX & GEESE

FOR 2 PLAYERS

BEGIN WITH 14 PEGS; 13 GEESE & 1 FOX; SET UP AS SHOWN. (⊗ = FOX; ●● = GEESE; O = EMPTY)

OBJECT: FOR GEESE TO "CORNER" (MAKE UNABLE TO MOVE) THE FOX - OR - FOR FOX TO CAPTURE ENOUGH GEESE SO THAT HE CANNOT BE CORNERED.

RULES: PLAYS ARE ALTERNATE. GEESE MAY MOVE ONE SPACE PER PLAY ALONG ANY LINE; GEESE MAY NOT MOVE BACKWARDS. FOX MAY MOVE IN ANY DIRECTION ALONG ANY LINE. ONLY FOX MAY JUMP. HE MAY JUMP AS MANY TIMES AS POSSIBLE IN ONE PLAY. JUMPED GEESE ARE CAPTURED AND REMOVED.



DR. NIM

FOR 2 PLAYERS

BEGIN WITH 15 PEGS; SET UP AS SHOWN.

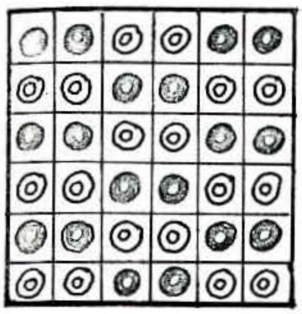
OBJECT: TO FORCE OPPONENT INTO BEING THE PLAYER WHO MOVES THE LAST PEG.

RULES: PLAYS ARE ALTERNATE. YOU MAY REMOVE AS MANY PEGS AS YOU WISH FROM ANY ONE ROW IN ANY ONE TURN.

* **REVERSI** MAY BE PLAYED WITH COINS ON OUTLINED SQUARES, TOO.

MATH Grades 5-9

SUBMITTED BY JOEL ZIEGLER, 6TH GRADE TEACHER,
HAZELWOOD SCHOOL DISTRICT



FOCUS

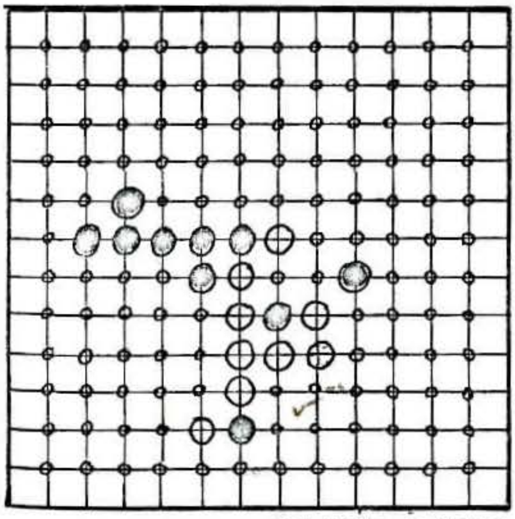
FOR 2 PLAYERS

COLOR 1 ●
COLOR 2 ◎

EACH PLAYER BEGINS WITH 18 CHIPS, DISTRIBUTED ON PEG BOARD AS SHOWN. PEGS SHOULD BE TALL ENOUGH TO HOLD AT LEAST 5 CHIPS. CHIPS NEED HOLES IN CENTERS TO FIT ONTO PEGS.

OBJECT: TO CONTROL ALL CHIP STACKS.

RULES: PLAYS ALTERNATE. A PLAY IS MADE BY MOVING A STACK OF CHIPS AS MANY SPACES UP, DOWN, RIGHT OR LEFT (NEVER DIAGONALLY) AS THERE ARE CHIPS IN THE STACK (I.E. A STACK OF 4 CHIPS IS MOVED 4 SPACES). A MOVE MAY END ON ANOTHER STACK OR AN EMPTY SPACE. A PLAYER MAY MOVE ONLY THE STACKS WITH HIS COLOR ON TOP. HE MAY MOVE PART OF A STACK BY TAKING PIECES OFF THE TOP & THEN MOVING THE SAME NUMBER OF SPACES AS PIECES. STACKS MAY NOT CONTAIN MORE THAN 5 CHIPS. PIECES IN EXCESS OF 5 ARE MOVED FROM THE BOTTOM OF THE STACK: OPPONENT PIECES THUS REMOVED ARE CAPTURED & OUT OF THE GAME. PLAYER PIECES ARE KEPT AS RESERVES & MAY BE PLAYED ON ANY SUBSEQUENT TURN INSTEAD OF MOVING STACKS, & MAY BE PLAYED ANYWHERE ON THE BOARD.



BLACK WINS!

GO-MOKU

FOR 2 PLAYERS

THE ORIENTAL BOARD GAME

COLOR 1 ⊕
COLOR 2 ●

EACH PLAYER HAS UNLIMITED PLAYING PIECES, & EACH USES A DIFFERENT COLOR.

A BOARD MAY BE MADE OF 1" PARTICAL BOARD WITH HOLES DRILLED FOR GOLF TEES. GO-MOKU MAY ALSO BE PLAYED WITH CHIPS OR COINS ON OUTLINED SQUARES. A LARGER BOARD MAY BE USED WITH, SAY, 15 X 15 OR 18 X 18 SQUARES.

OBJECT: TO GET 5 ADJOINING PIECES IN A ROW, EITHER HORIZONTALLY, VERTICALLY, OR DIAGONALLY.

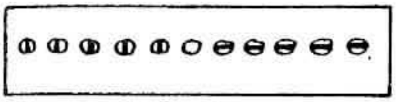
RULES: TURNS ALTERNATE. PIECES ARE PLAYED AT THE INTERSECTIONS OF THE LINES. NO PLAYING PIECE IS MOVED ONCE IT HAS BEEN PLAYED.

[illegible] GAMES [illegible]

YOU MAY FIND THESE GAMES TO BE ADVANTAGEOUS AS SUPPLEMENTARY MATH MATERIAL. SOME, SUCH AS "10 MEN IN A BOAT", CAN BE USED TO STUDY FUNCTIONS & RELATIONS. BOARDS MAY BE MADE OF FIBERBOARD. (PLYWOOD TENDS TO SPLIT.) PEGS MAY BE MADE OF GOLF TEES WITH THE SHARP POINTS CUT OFF & SANDED. IT IS SUGGESTED THAT DIRECTIONS FOR EACH GAME BE WRITTEN ON A 4x5 CARD, LABELLED & PLACED WITH CORRESPONDING GAME IN A SHOEBOX.

10 MEN in a BOAT

⦶ = 1ST COLOR ⊖ = 2ND COLOR



BEGIN WITH 10 PEGS, 5 EACH OF 2 DIFFERENT COLORS. LEAVE CENTER SPACE EMPTY.

OBJECT: TO REVERSE PEG POSITIONS IN AS FEW MOVES AS POSSIBLE.

RULES: YOU MAY JUMP A PLAYER OF A DIFFERENT COLOR OR MOVE TO AN ADJACENT EMPTY SPACE. YOU MAY NOT JUMP A PLAYER OF THE SAME COLOR.

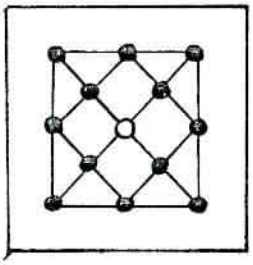
ELIMINATION PLUS

BEGIN WITH 32 PEGS. LEAVE CENTER SPACE EMPTY.

OBJECT: TO LEAVE 1 PEG IN ORIGINAL EMPTY SPACE.

RULES: YOU MAY ELIMINATE PEGS BY JUMPING OVER THEM.

ELIMINATION SQUARE

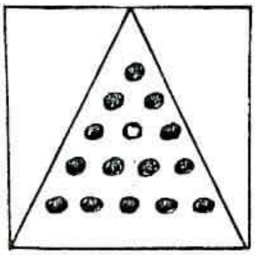


BEGIN WITH 12 PEGS. LEAVE CENTER SPACE EMPTY.

OBJECT: TO LEAVE 1 PEG IN CENTER SPACE.

RULES: YOU MAY ELIMINATE PEGS ONLY BY JUMPING OVER THEM WHILE FOLLOWING THE LINES.

ELIMINATION TRIANGLE



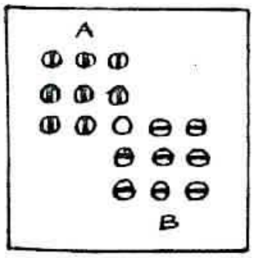
BEGIN WITH 14 PEGS. LEAVE 1 SPACE EMPTY.

OBJECT: TO LEAVE 1 PEG IN ORIGINAL EMPTY SPACE.

RULES: YOU MAY ELIMINATE PEGS ONLY BY JUMPING OVER THEM.

REVERSAL

⦶ = 1ST COLOR ⊖ = 2ND COLOR



BEGIN WITH 8 PEGS OF 1 COLOR IN SECTION A & 8 PEGS OF ANOTHER COLOR IN SECTION B. LEAVE CENTER SPACE EMPTY.

OBJECT: TO REVERSE POSITION OF PEGS.

RULES: YOU MAY JUMP A PEG OF A DIFFERENT COLOR OR MOVE TO AN ADJACENT EMPTY SPACE. YOU MAY NOT JUMP A PEG OF THE SAME COLOR.

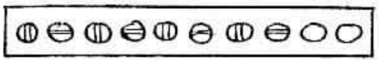
PEG GAMES · K-ADULT

SUBMITTED BY BEV DOUGHERTY, MATH TEACHER

YOU MAY FIND THESE GAMES TO BE ADVANTAGEOUS AS SUPPLEMENTARY MATH MATERIAL. SOME, SUCH AS "GARAGE SHUFFLE," CAN BE USED TO STUDY FUNCTIONS & RELATIONS. BOARDS MAY BE MADE OF FIBERBOARD. (PLYWOOD TENDS TO SPLIT.) PEGS MAY BE MADE OF GOLF TEES WITH THE SHARP POINTS CUT OFF & SANDED. IT IS SUGGESTED THAT DIRECTIONS FOR EACH GAME BE WRITTEN ON A 4x5 CARD, LABELLED & PLACED WITH CORRESPONDING GAME IN A SHOEBOX.

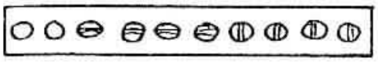
QUADRIX

⦶ = 1ST COLOR ⊖ = 2ND COLOR



(A)

BEGIN WITH 8 PEGS, 4 EACH OF 2 DIFFERENT COLORS, SET UP AS IN FIG. (A)



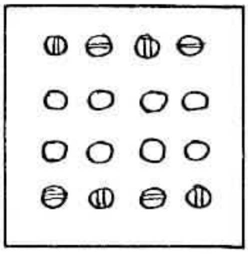
(B)

OBJECT: TO LEAVE PEGS IN ORDER SHOWN IN FIG. (B) IN FOUR MOVES.

RULES: YOU MAY MOVE ONLY PAIRS OF ADJACENT PEGS, REGARDLESS OF COLORS, TO ANY PAIR OF EMPTY SPACES. YOU MAY PASS ANY NUMBER OF PEGS AND MOVE IN EITHER DIRECTION. YOU MAY NOT REVERSE THE ORDER OF A PAIR OR SEPARATE A PAIR.

TAC-TICKLE

(FOR 2 PLAYERS) ⦶ = 1ST COLOR ⊖ - 2ND COLOR



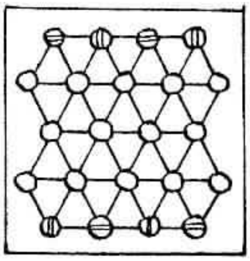
BEGIN WITH 8 PEGS, 4 EACH OF 2 DIFFERENT COLORS, SET UP AS SHOWN.

OBJECT: TO GET 3 OF YOUR PEGS IN THE SAME LINE, (VERTICAL, HORIZONTAL, OR DIAGONAL) WITHOUT ANY SPACES BETWEEN THEM, BEFORE THE OTHER PLAYER.

RULES: YOU MAY MOVE YOUR PEGS INTO ADJACENT EMPTY SPACES VERTICALLY, HORIZONTALLY, OR DIAGONALLY. YOU MAY NOT JUMP OR TAKE ANOTHER PEG.

VARIATIONS: ① 1 PLAYER CHOOSES PLACEMENT OF ALL 8 PEGS. THE OTHER PLAYER CHOOSES HIS COLOR AND WHETHER OR NOT TO MOVE FIRST.
② YOU MAY JUMP BUT YOU MAY NOT TAKE. JUMPS MAY BE MADE VERTICALLY OR HORIZONTALLY, NOT DIAGONALLY, INTO AN EMPTY SPACE. YOU MAY JUMP EITHER COLOR PEG. JUMPS MAY BE COMBINED IN A SINGLE MOVE WHENEVER POSSIBLE.
③ COMBINE ① & ②

CHINESE TAC-TICKLE



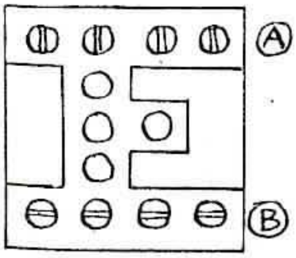
⦶ = 1ST COLOR ⊖ = 2ND COLOR

BEGIN WITH 8 PEGS, 4 EACH OF 2 DIFFERENT COLORS, SET UP AS SHOWN.

OBJECT: TO GET 3 OF YOUR PEGS IN THE SAME LINE (VERTICAL, HORIZONTAL, OR DIAGONAL) WITHOUT ANY EMPTY SPACES BETWEEN THEM, BEFORE THE OTHER PLAYER.

RULES: YOU MAY MOVE YOUR PEGS INTO ADJACENT EMPTY SPACES WHILE FOLLOWING THE LINES. YOU MAY NOT JUMP OR TAKE ANOTHER PEG.

GARAGE SHUFFLE



BEGIN WITH 8 PEGS ("CARS"), 4 EACH OF 2 DIFFERENT COLORS, SET UP AS SHOWN.

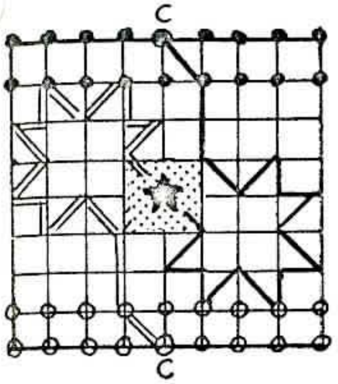
OBJECT: TO MOVE THE CARS IN LINE (A) TO LINE (B) IN AS FEW MOVES AS POSSIBLE.

RULES: YOU MAY MOVE A CAR TO AN ADJACENT EMPTY SPACE. YOU MAY NOT JUMP CARS. EACH CAR MAY BE MOVED SEVERAL TIMES BEFORE REACHING ITS FINAL PARKING PLACE.

GRAPHICS, CANDY MERTON

MATH Grades 5-9

SUBMITTED BY JOEL ZIEGLER, 6TH GRADE TEACHER,
HAZELWOOD SCHOOL DISTRICT



BLUE & GREY

FOR 2 PLAYERS

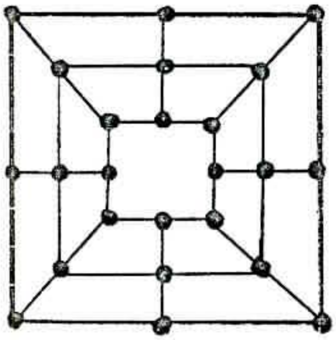
COLOR 1 ○
COLOR 2 ⊕
CAPTAIN ©

EACH PLAYER BEGINS WITH 18 MEN: 17 GUARDS & 1 CAPTAIN

A GOOD BOARD MAY BE MADE OF 1" PARTICAL BOARD WITH HOLES DRILLED FOR GOLF TEE MEN. LINES MAY BE MADE WITH FELT MARKERS, THE TOPS OF THE GOLF TEES DIPPED IN BLUE OR GREY PAINT, THE CAPTAINS DISTINGUISHED BY A DAB OF RED ON TOP.

OBJECT: TO MOVE YOUR CAPTAIN ALONG THE LINE MARKED FOR HIM INTO THE STAR IN THE CENTER OF THE BOARD.

RULES: ARRANGE GUARDS AND CAPTAINS AS SHOWN. EACH PLAYER IN TURN MOVES EITHER A GUARD OR A CAPTAIN I POSITION. THE CAPTAIN MAY NOT MOVE IF HIS PATH IS BLOCKED. GUARDS MAY MOVE IN ANY DIRECTION, INCLUDING DIAGONALLY, BUT MAY NOT ENTER THE AREA IN THE CENTER OF THE BOARD. A GUARD MAY & MUST CAPTURE BY JUMPING AN ADJACENT OPPOSING GUARD IF THE SPACE BEYOND IT IN A STRAIGHT LINE IS VACANT. MULTIPLE JUMPS ARE POSSIBLE. IF MORE THAN ONE GUARD IS ABLE TO JUMP, THE PLAYER MAY CHOOSE WHICH ONE TO USE. CAPTAINS MAY NOT JUMP OR BE JUMPED. IF BOTH CAPTAINS ARE BLOCKED BY OPPOSING GUARDS AND NEITHER PLAYER CAN BREAK THE IMPASS, THE GAME IS WON BY THE PLAYER WHOSE CAPTAIN IS FARTHER ADVANCED ALONG THE LINE.



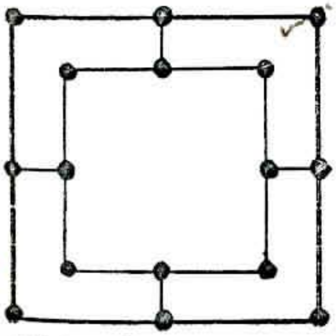
11 MAN MORRIS

FOR 2 PLAYERS

EACH PLAYER BEGINS WITH 11 PIECES*

OBJECT: TO REDUCE THE OPPONENT TO TWO PLAYING PIECES OR TO PREVENT OPPONENT FROM MOVING.

RULES: PLAYERS ALTERNATELY ADD PEGS ONE AT A TIME UNTIL ALL 22 PEGS HAVE BEEN PLAYED. THREE PEGS OF THE SAME COLOR IN A STRAIGHT ROW (HORIZONTALLY, VERTICALLY, OR DIAGONALLY) FORM A "MILL." THE PLAYER MAKING A MILL REMOVES ONE OF THE OPPONENT'S PLAYING PIECES NOT PART OF A MILL. WHEN ALL PEGS HAVE BEEN PLAYED, PLAYERS CONTINUE BY MOVING PIECES TO ADJACENT VACANT HOLES. NO JUMPS ARE PERMITTED.


5 MAN MORRIS

VARIATIONS

9 MAN MORRIS

EACH PLAYER BEGINS WITH 9 PEGS & BOARD & RULES AS ABOVE.

5 MAN MORRIS

EACH PLAYER BEGINS WITH 5 PEGS & BOARD AS SHOWN. MILLS ARE MADE ONLY HORIZONTALLY AND VERTICALLY.

---

* MORRIS MAY BE PLAYED WITH COINS ON OUTLINED SQUARES

APPENDIX E

PHYSICAL EDUCATION CHECK LIST - ST. SABINA

NAME ______________________________ GRADE __________

EVENT	1st. SEMESTER	2nd. SEMESTER
SIT-UPS (THREE MINUTES)		
PUSH-UPS (THREE MINUTES)		
SOFTBALL THROW		
50 YARD DASH		
1 MILE RELAY		
$\frac{1}{4}$ MILE RUN		
RUNNING BROAD JUMP		
STANDING BROAD JUMP		

LIST OF FIELD DAY EVENTS

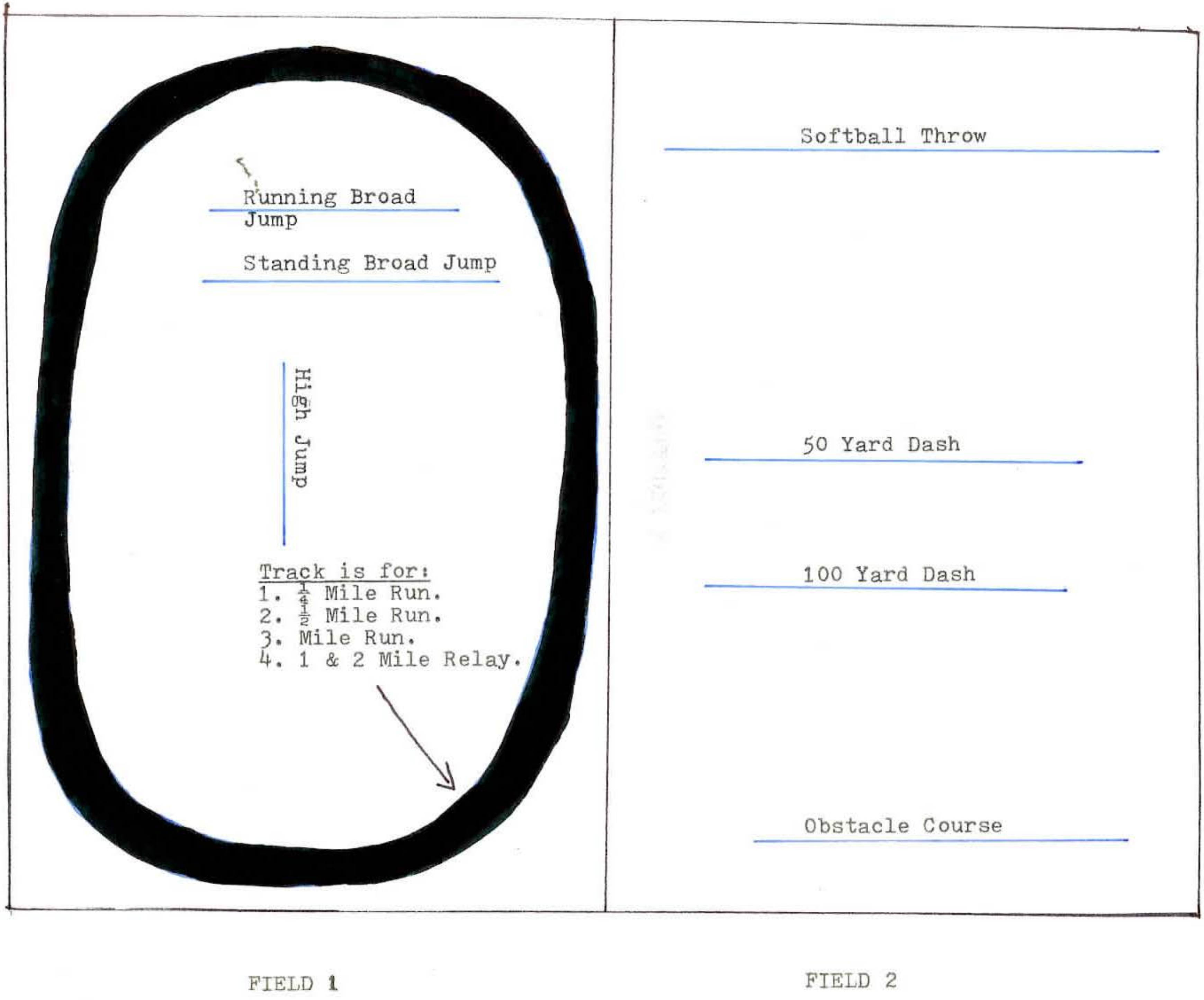
BOYS' EVENTS	GIRLS' EVENTS
1. SOFTBALL THROW	1. SOFTBALL THROW
2. 50 YARD DASH	2. 50 YARD DASH
3. HIGH JUMP	3. HIGH JUMP
4. RUNNING BROAD JUMP	4. RUNNING BROAD JUMP
5. STANDING BROAD JUMP	5. STANDING BROAD JUMP
6. $\frac{1}{4}$ MILE RUN	6. $\frac{1}{4}$ MILE RUN
7. $\frac{1}{2}$ MILE RUN	7. $\frac{1}{2}$ MILE RUN
8. MILE RELAY	8. MILE RELAY
9. 2 MILE RELAY	9. OBSTACLE COURSE
10. OBSTACLE COURSE	10. 100 YARD DASH

****

EACH STUDENT SIGNS-UP FOR TWO EVENTS OF THEIR CHOICE.

ON THE FOLLOWING PAGE IS A MAP OF THE LAY-OUT OF THE EVENTS.

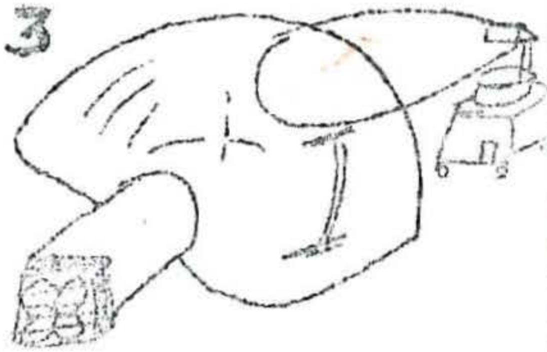
Lay-Out Of Field Day Events



APPENDIX F

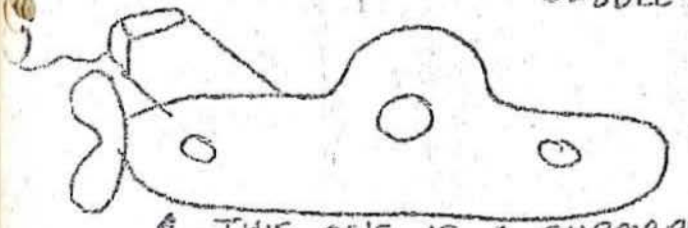
Build A BUBBLE

3



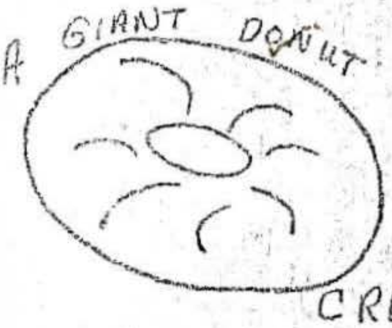
MATERIALS: 4 mil Polyurethane Plastic (VISQUEENE) FROM A LUMBER YARD. TWO inch 'DUCT' TAPE OR CLEAR PLASTIC TAPE FROM SPORTING GOODS STORE. ONE PORTABLE WINDOW FAN.

CONSTRUCTION: TO BUILD A SIMPLE BUBBLE SHAPE # 3 CUT A SHEET OF PLASTIC 12' X 24'. FOLD IT IN HALF TO FORM A SQUARE 12' X 12'. USE TAPE TO SEAL THE THREE OPEN SIDES. MAKE A TUBE TO FIT AROUND YOUR FAN. CUT SLIT IN BUBBLE & ATTACH FAN + TUBE — NOW INFLATE. CUT VERTICAL SLIT FOR DOOR AND REINFORCE WITH TAPE. YOUR BUBBLE IS BUILT — QUICK & EASY!



1 THIS ONE IS A SUBMARINE— MAKE IT OUT OF BLACK PLASTIC, PUT CLEAR PORTHOLES IN IT; AND CREATE THE SEA AROUND IT.

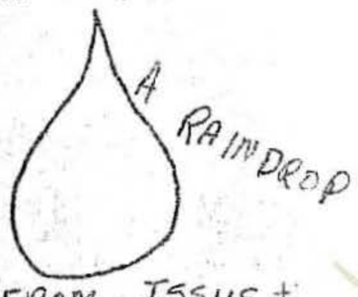
BUILD IT IN ANY SHAPE! ANY SIZE! CREATE ANY PLACE ON EARTH OR BEYOND BY PROJECTING IMAGES ON ITS SURFACE — INSIDE YOU WILL BE COMPLETELY SURROUNDED BY COLOR, MOTION, VISUAL IMAGES AND SOUND!



2. This BUBBLE IS A BIG FLOPPY AIRPLANE, IMAGINE TRAVELING IN IT TO ANY PLACE IN THE WORLD.

CREATIVE MOVEMENT AND DANCE

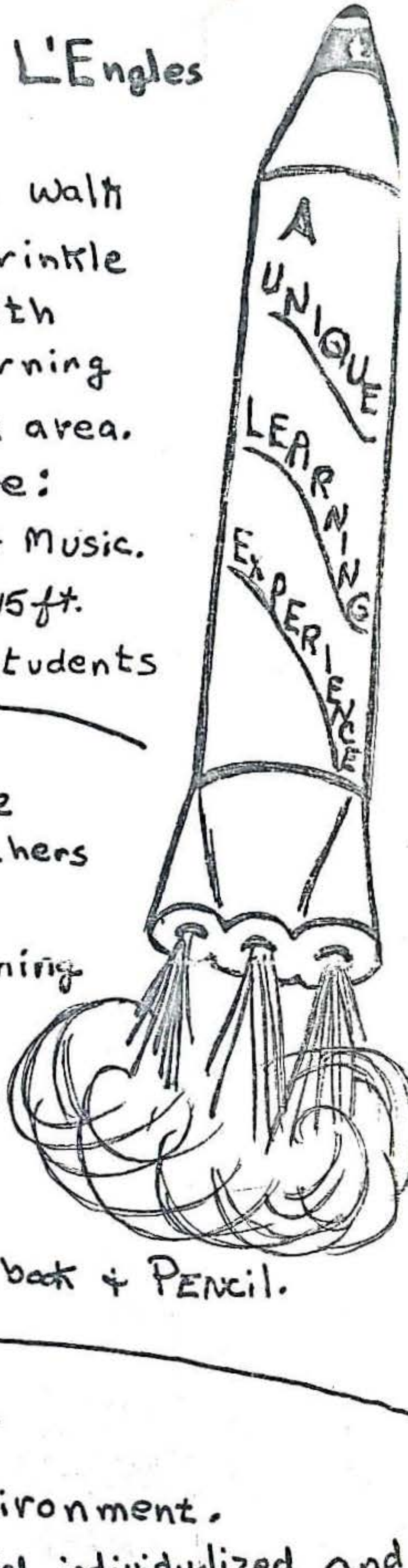
BUILD A LONG SAUSAGE LIKE BUBBLE TALL ENOUGH SO STUDENTS CAN'T TOUCH THE CEILING INSIDE. 3



TAKEN FROM ISSUE # GOOD APPLE

The Experience

You will be visiting Madeleine L'Engles book "A Wrinkle In Time". You will walk through a labyrinth and visit each "wrinkle in time". You will be able to visit with students\teachers who will show you learning activities involving a particular subject area. The subject areas you will be visiting are: English, Science, Math, Reading, Spelling + Music. For music you will travel in our - 20 ft. by 15 ft. spaceship listening to some songs the students have written and put to music.



Sponsored by: Lindenwood 4. 8th grade students in cooperation with their teachers Linda Brakensiek and Dennis C. Lane.

lace: St. Charles Presbytarian Church, adjoining Lindenwood College Campus. On Gamble and Sibley Streets.

ime: 9:00 am — 3:00pm. Date: Dec. 18

OST: Your time and Your gas.

hat To Bring: You. Your Friends. Notebook + Pencil.

Intent of Workshop

① Come and experience a learning environment.

② Come and see a vast display of tested individualized and group activities. (All activities are geared for grades 7th + 8th)

③ Come and be taught by students who enjoy learning.

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