A CRITICAL STUDY OF ERRORS IN ADDITION COMBINATIONS IN GRADES IV, V, and VI, IN THE ANTHONY PUBLIC SCHOOLS.
ANTHONY, KANSAS.
1925-1926

By

H. E. Unruh

A. B. Oberlin College
Oberlin, Ohio.
1920

Submitted to the Department of Education and the Faculty of the Graduate School of the University of Kansas in Partial fulfillment of the requirements for the degree of Master of Arts.

Approved:

J. W. Knott
Instructor in Charge

Raymond A. Schwope
Head of Department

July 1928
TABLE OF CONTENTS

Chapter | Page
-------|------
I      | Introduction   | 1
II     | Related Literature | 3
III    | Specific Problem and Method of Procedure | 10
IV     | Presentation of Data | 14
V      | Summary of Findings | 39

BIBLIOGRAPHY | 41

APPENDIX | 42
LIST OF TABLES

Number | Page
-------|-----
I | Number of Errors - Grade 4 | 15-17
II | Number of Errors - Grade 5 | 18-20
III | Number of Errors - Grade 6 | 21-23
IV | Number of Errors - Grade 4, 5 & 6 | 24-26
V | Frequency of Errors Grouped (Each grade separate) | 28
VI | Frequency of Errors Grouped (Three grades combined) | 29
VII | Mental Ages & Frequency of Errors Grade 4 | 32
VIII | Mental Ages & Frequency of Errors Grade 5 | 33
IX | Mental Ages & Frequency of Errors Grade 6 | 34
X | Distribution of Errors with Respect to Mental Age | 35
XI | Correlation Between Mental Age and Errors - Grade 4 | 36
XII | Correlation Between Mental Age and Errors - Grade 5 | 37
XIII | Correlation Between Mental Age and Errors - Grade 6 | 38

LIST OF DIAGRAMS

I | Frequency of combinations in Tests | 12
II | Frequency of combinations in Practice Pads | 30
ACKNOWLEDGMENT

To all who have had a part in making possible the preparation and completion of this study, the writer wishes to acknowledge his appreciation.

To M. C. Delmonzo, formerly of the school of Education, and R. A. Schwegler, Dean of the school of Education, Kansas University in the selection of the problem and the preparation of the tests.

To the pupils of the Anthony Public Schools who took the tests and to the teachers of these pupils who helped score the tests.

To J. W. Twente, Professor of Education, Kansas University for the direction in carrying out the work.

To my wife, Esther Margaret Unruh, who has assisted in scoring the tests and in tabulating the results, and whose implicit confidence has been an inspiration.

H.E.U.
CHAPTER I
INTRODUCTION

The chief aim of arithmetic is the mastery of the
world on the quantitative side through number concepts. Recent investigations have recorded that the product of
instruction in arithmetic is not a single ability but
consists of many abilities. S. A. Courtis\(^1\) in his
experimental work in arithmetic has come to recognize
seven different abilities in addition, three abilities
in subtraction, six in multiplication, and ten in division.

It is generally conceded by workers in the field
that perfection in these abilities can be attained only
through practice and drill, consequently, for the last
decade or so, administrators and teachers in the field
have availed themselves of various practice and drill
devices in an effort to reach perfection in the mastery
of these arithmetical abilities. In spite of all our
efforts however we have not as yet reached the stage of
perfection. The criticism that is frequently directed
against our public schools, that even high school graduates
do not have a mastery of the four fundamental operations
of arithmetic, is not entirely unfounded. In view of this
fact it occurred to the writer that it would be valuable

\(^1\) COURTIS, S.A. : Teacher's Manual for Courtis
Practice Pads.
both from an educational as well as a practical standpoint, to make an investigation in the field of arithmetic in an effort to definitely locate a few of the weak spots. The first intentions were to include in this study the four fundamental operations in arithmetic. However, after a thorough investigation into this matter it was realized that the field was too large in order to make an adequate study in the effort set forth here. Consequently the writer came to the conclusion that it would be better to make a detailed study of one phase rather than a general study of the larger field.

This thesis purposes to make a critical study of errors in addition combinations in grades IV, V, and VI in the Anthony Public Schools, Anthony, Kansas during the school year of 1925 - 1926.
CHAPTER II
RELATED LITERATURE

G. A. Gregory in his "Fundamentals of Educational Measurement" says, "If schools are inefficient for any one reason more than another, they are inefficient because of the ignorance of facts concerning their processes and products. Opinions are worthless in the face of facts and there is no excuse for opinions when facts are available. The public is asking for a ledger account of our business. The school principal who knows in advance where his school is weak and where it is strong is armed against criticism more than that he is guided in his efforts". (1)

Thorndike in his "Psychology of Arithmetic" says, "One of the arithmetical functions or abilities that the elementary school seeks to improve is: working knowledge of the meanings of addition, subtraction, multiplication, and division. Working ability to add, multiply, subtract, and divide. The elementary school should not prepare for the rare or difficult demands". (2)

Wilson and Mitchell in their investigation along the line of a "Sociology of Arithmetic", found that the greater

(1) Gregory, C.A., Fundamentals of Educational Measurement. PP 20 to 34.
(2) Thorndike, E.L., "Psychology of Arithmetic." P23
majority of people used mainly only very elementary arithmetical processes.

Carl T. Wise(1) in his survey of arithmetical problems arising in various occupations found that out of a total of 7345 actual problems classified from cities and from rural districts representing the problems that adults are called upon to solve, 85% may be classified under the four fundamental operations and their combinations.

Clifford Woody(2) made an investigation to determine the type of arithmetic needed in certain types of salesmanship. He analyzed a large number of sales bills and found that the distribution according to the number of places in any addend, out of 985 problems examined, 649 had only three places and less. With regard to the number of addends out of 1010 problems examined, 669 had four addends or less.

W.J.Osburn(3) in his study of the validity of the Courtis and Studebaker practice tests in the fundamentals of arithmetic states that if a pupil is to attain mastery of the fundamentals of arithmetic he must be able to respond

correctly to each one of the one hundred principal combinations in addition; one hundred combinations in subtraction; one hundred in multiplication; four hundred in short division; and seven hundred twenty higher decade additions.

Out of 21,000 errors that were analyzed in the above study he found that 25% of addition errors were due to the errors in combinations. As possible causes of the inaccuracies he states that possibly the amount of drill may not be proportioned according to difficulty of elements; or some elements may even be omitted from drill exercises.

"It is assumed that everybody will need the ability to add, subtract, multiply, and divide accurately, at least within certain limits. As to addition, every person should be able to add any number less than ten to any other number of the same sort. In other words, he should be able to add every possible combination of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, taken two at a time. This includes these combinations in both direct and reverse form. For example, the addition of 2 and 7 is to be taught just as carefully as 7 and 2. It is also necessary to teach carefully all combinations involving zero. Children do not inherit the ability to add zero and 6 or 8 and zero. The failure to teach the zero combinations is responsible for a large share of the
errors in the fundamentals of arithmetic even in high school classes. The total number of these addition facts is 166. A perfect knowledge of these 100 addition facts will enable a pupil to make every possible combination of any one number less than ten with any other number less than ten."

J. H. Smith made a study on the Relative Difficulty of the Addition Combinations. In this report he says, "One of the large problems confronting us in the scientific development of education is the preparation of material for corrective work and the development of new methods of instruction based upon experimentation. The following study was made with a view to carrying out this program in one field of elementary instruction. It was the writers opinion that many pupils made low scores in arithmetic tests because they are deficient in a few difficult combinations. If we can locate the difficult combinations and concentrate drill on them rather than spend time on combinations already fairly well mastered, we shall be able to make more rapid progress." (2)

In his experiment Smith used an apparatus consisting of a frame similar to a tachistoscope in which a dropping

(1) Osburn, W. J., "Corrective Arithmetic". PP 13-14
screen exposed a card on which one of the combinations had been printed. At the instant the screen was tripped by the latch the experimenter started a stop watch. The observer gave the sum as quickly as possible. As soon as the subject began to vocalize the sum the watch was stopped. The combination was then withdrawn and the time recorded on the back of the card. The screen was raised, another combination inserted and the experiment was continued.

It will be noted that the time required for the subject to give the sum of any combination involves several factors: (1) The time required for the screen to drop; (2) the time of recognition of the two digits on the card; (3) the time of recall of the association of these digits; (4) the reaction time for the vocalization of the sum.

After each subject had given the responses to the eighty one arrangements of the forty five combinations he was required to name a single figure exposed on a card in the same way. Nine cards containing the figures from 1 to 9 were exposed in a miscellaneous order. The time of one of these responses involves the dropping of the screen, the recognition of the digits and the reaction time of the vocalization. No appreciable variation was found in the time response of any individual to the different cards and
and very slight variations between responses of different individuals. It is clear, then, that the time required for the recall of the association of the sum and the digits is the variable factor in the time of responses to the various combinations. Those combinations for which this association is most easily recalled will have the shortest time response and the difficult ones will require the longest time.

Eighty six pupils from the third, fourth, fifth and seventh grades of the training school and one arithmetic methods class of the State Normal School at Whitewater Wisconsin were tested in this manner.

The median time response for the various combinations were then computed for each of the five groups. The combinations which proved difficult for the third and fourth grade groups also proved difficult for the upper grades groups and for the adult class.

In carrying out the experiment care was taken to determine the effect of the arrangement of any two digits on the time response. It was found that in nineteen of the combinations the time response was slightly greater when the larger digit was above. In fourteen combinations the time response was slightly greater when the smaller digit was above, and in three cases the time was the same for either arrangement. The range of time was from 1.07 seconds
to 1.81 seconds. On the basis of time requirements for the responses he divided the combinations in three groups; the easy group, the medium group, and the difficult group. After some emphasis placed on the combinations according to their difficulty excellent results were secured.

There is however one factor that J.H. Smith in his experiment failed to take into consideration, and that is the zero combinations. The general consensus of opinion is that the zero combinations are entirely too much neglected.

This brief review of the literature in the field indicates to us the kind and type of experimental work that has been done. It also indicates to us the type of arithmetical abilities that the world at large demands of us. This type of arithmetic is very largely of the simple kind.

In the light of the fact that pupils who are leaving our public schools apparently have not mastered fully the simple arithmetical abilities, the criticism that is frequently made in this regard has foundation. If our schools are to meet the issue it is up to us to analyze our present situation and to so remedy our efforts in the light of the errors revealed that we may reach a higher stage of efficiency. For this reason the writer feels justified in making this study.
CHAPTER III

SPECIFIC PROBLEM AND METHOD OF PROCEDURE

This study limits itself to a study of the following problem: "A Critical Study of Errors in Addition Combinations in Grades IV, V, and VI in the Anthony Public Schools, Anthony, Kansas, during the School Year 1925-1926 in an effort to answer the following questions:

1. What are the errors that occur most frequently?
2. How persistent are these errors?
   a. Within each grade?
   b. Within the three grades?
3. Relation of errors to the amount of practice in each combination.
4. How do the errors distribute themselves with respect to the Mental Age of the pupils tested?

In an effort to find a method of procedure in collecting the data for this study a search was made in the literature in this field. No definite prepared plan could be found. Standard tests can not be used as they do not measure precisely what is wanted in this case. In the light of these facts the writer set out to construct his own tests. (For sample of test see Appendix.)

A few factors had to be taken into consideration in the construction of these tests. It was of paramount
importance that the amount of practice afforded each combination must be equalized. Diagram I page 12 shows the technique employed in scoring the tests to make certain that the combinations all occurred the same number of times in the tests. The numbers in the squares indicate the number of times the combination occurred in the test. Since the combination 2 and 3, for example, occurred twice in the test, in that it occurred once as $\frac{2}{3}$ and once as $\frac{3}{2}$ and every other combination does the same thing, it was deemed advisable to include the doubles twice.

The tests consisted of two parts. The first part consisted of the combinations in single column and the second part in double column. Consequently it was necessary to eliminate the problem of "carrying" in the second part of the test as that would change the situation entirely. W. J. Osburn says that "the addition of the remainder of the tens' column requires the mastery of additional facts". (1)

These tests were given to one hundred sixty one pupils of the fourth, fifth, and sixth grades of the Anthony Public Schools during the school year 1925-1926. These one hundred sixty one pupils were distributed with respect to grade and buildings as follows: 28 pupils in the 4th grade Lincoln; 29 pupils in the 4th grade Washington; 29 pupils in the 5th grade Lincoln; 29 pupils in the 5th grade Washington;

(1) Osburn, W. J., Corrective Arithmetic, P.15.
**DIAGRAM I**

Frequency with which each combination occurs in the test used in this study

**Part I, Single Column**

<table>
<thead>
<tr>
<th>NUMBER ADDED TO</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Part II, Double Column**

<table>
<thead>
<tr>
<th>NUMBER ADDED TO</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
22 pupils in the 6th grade Lincoln; and 24 pupils in the 6th grade Washington.

These pupils took the tests four times during the school year 1925-1926. The first test was given four weeks after the opening of school in the fall. The second test was given nine weeks later; the third test nine weeks after the second test; and the fourth test nine weeks after the third test. Both part one and part two of the test was given each time.

Two weeks after the fourth test in addition combinations the National Intelligence test was given to these pupils in order to determine their mental ages. All tests were given under the personal direction of the writer. Papers were checked by the teachers in the respective grades and re-checked by the writer.

Each one of the tests in addition combinations were given in the forenoon. The pupils were instructed that the problems were all addition problems. They were further instructed to work accurately and as rapidly as possible. As soon as a pupil finished the test he was to raise his hand. As soon as seventy five per cent of the pupils in the room had finished the test, time was called.
CHAPTER IV

PRESENTATION OF THE DATA

The results revealed in the four tests in the simple addition combinations given the 161 pupils in the fourth, fifth, and sixth grades of the Anthony Public Schools are here presented in tabular form.

Table I page 15 indicates the number of errors and the per cent of errors in each combination. This information is given for each one of the four tests. The combinations are arranged in descending order with respect to the size of the totals of the four tests as indicated in the last column.

Table II page 18 indicates the same information for the fifth grade, and table III, page 21 for the sixth grade.

Table IV page 24 is a summary of Tables I, II, and III. It gives the total number of errors and the total per cent of errors in each combination made in the three respective grades. Again the combinations are arranged in descending order with respect to the total column. This column indicates the total number of errors committed by the 161 pupils in the three grades.

As indicated in Chapter II of this thesis, J.B. Smith, Superintendent of Schools, Belvidere, Illinois, as a result of his investigation in the "Relative Difficulty of the
## TABLE I

Number of errors and the per cent of errors with the totals in each addition combination in the four tests given the 57 fourth grade pupils.

<table>
<thead>
<tr>
<th>Combination</th>
<th>1st Test</th>
<th>2nd Test</th>
<th>3rd Test</th>
<th>4th Test</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
</tr>
<tr>
<td>0 &amp; 1</td>
<td>19</td>
<td>8.3</td>
<td>7</td>
<td>3.1</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 7</td>
<td>17</td>
<td>7.4</td>
<td>7</td>
<td>3.1</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 9</td>
<td>15</td>
<td>6.6</td>
<td>7</td>
<td>3.1</td>
<td>3</td>
</tr>
<tr>
<td>0 &amp; 3</td>
<td>17</td>
<td>7.4</td>
<td>7</td>
<td>3.1</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 5</td>
<td>17</td>
<td>7.4</td>
<td>5</td>
<td>2.1</td>
<td>3</td>
</tr>
<tr>
<td>0 &amp; 8</td>
<td>17</td>
<td>7.4</td>
<td>6</td>
<td>2.6</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 4</td>
<td>14</td>
<td>6.1</td>
<td>7</td>
<td>3.1</td>
<td>3</td>
</tr>
<tr>
<td>0 &amp; 6</td>
<td>15</td>
<td>6.6</td>
<td>7</td>
<td>3.1</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 2</td>
<td>13</td>
<td>5.7</td>
<td>8</td>
<td>3.5</td>
<td>2</td>
</tr>
<tr>
<td>7 &amp; 9</td>
<td>12</td>
<td>5.2</td>
<td>1</td>
<td>.4</td>
<td>4</td>
</tr>
<tr>
<td>8 &amp; 8</td>
<td>3</td>
<td>1.3</td>
<td>2</td>
<td>.8</td>
<td>4</td>
</tr>
<tr>
<td>1 &amp; 7</td>
<td>8</td>
<td>3.5</td>
<td>1</td>
<td>.4</td>
<td>1</td>
</tr>
<tr>
<td>4 &amp; 7</td>
<td>10</td>
<td>4.3</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>6 &amp; 7</td>
<td>5</td>
<td>2.1</td>
<td>2</td>
<td>.8</td>
<td>1</td>
</tr>
<tr>
<td>3 &amp; 7</td>
<td>6</td>
<td>2.6</td>
<td>2</td>
<td>.8</td>
<td>1</td>
</tr>
<tr>
<td>8 &amp; 6</td>
<td>8</td>
<td>3.5</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
</tr>
<tr>
<td>2 &amp; 4</td>
<td>6</td>
<td>2.6</td>
<td>1</td>
<td>.4</td>
<td>2</td>
</tr>
<tr>
<td>6 &amp; 9</td>
<td>9</td>
<td>3.9</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1 &amp; 6</td>
<td>4</td>
<td>1.7</td>
<td>1</td>
<td>.4</td>
<td>3</td>
</tr>
<tr>
<td>5 &amp; 9</td>
<td>5</td>
<td>2.1</td>
<td>4</td>
<td>1.7</td>
<td>0</td>
</tr>
<tr>
<td>Combination</td>
<td>1st. Test</td>
<td>2nd. Test</td>
<td>3rd. Test</td>
<td>4th. Test</td>
<td>TOTAL</td>
</tr>
<tr>
<td>-------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>No. of</td>
<td>% of</td>
<td>No. of</td>
<td>% of</td>
<td>No. of</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>5</td>
<td>2.1</td>
<td>1</td>
<td>.4</td>
<td>2</td>
</tr>
<tr>
<td>8 &amp; 9</td>
<td>4</td>
<td>1.7</td>
<td>1</td>
<td>.4</td>
<td>2</td>
</tr>
<tr>
<td>1 &amp; 8</td>
<td>3</td>
<td>1.3</td>
<td>1</td>
<td>.4</td>
<td>3</td>
</tr>
<tr>
<td>1 &amp; 9</td>
<td>2</td>
<td>.8</td>
<td>2</td>
<td>.8</td>
<td>3</td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>5</td>
<td>2.1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4 &amp; 6</td>
<td>5</td>
<td>2.1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4 &amp; 9</td>
<td>2</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>1 &amp; 1</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1 &amp; 3</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1 &amp; 5</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 &amp; 7</td>
<td>4</td>
<td>1.7</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4 &amp; 8</td>
<td>3</td>
<td>1.3</td>
<td>2</td>
<td>.8</td>
<td>0</td>
</tr>
<tr>
<td>5 &amp; 8</td>
<td>3</td>
<td>1.3</td>
<td>1</td>
<td>.4</td>
<td>1</td>
</tr>
<tr>
<td>2 &amp; 5</td>
<td>5</td>
<td>2.1</td>
<td>6</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>3 &amp; 3</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3 &amp; 6</td>
<td>3</td>
<td>1.3</td>
<td>1</td>
<td>.4</td>
<td>1</td>
</tr>
<tr>
<td>5 &amp; 6</td>
<td>3</td>
<td>1.3</td>
<td>2</td>
<td>.8</td>
<td>0</td>
</tr>
<tr>
<td>5 &amp; 7</td>
<td>4</td>
<td>1.7</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6 &amp; 6</td>
<td>3</td>
<td>1.3</td>
<td>1</td>
<td>.4</td>
<td>1</td>
</tr>
<tr>
<td>9 &amp; 9</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5 &amp; 5</td>
<td>4</td>
<td>1.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3 &amp; 8</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Combination</td>
<td>1st. Test</td>
<td>2nd. Test</td>
<td>3rd. Test</td>
<td>4th. Test</td>
<td>TOTAL</td>
</tr>
<tr>
<td>-------------</td>
<td>----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
</tr>
<tr>
<td>3 &amp; 5</td>
<td>2</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>2 &amp; 2</td>
<td>3</td>
<td>1.3</td>
<td>1</td>
<td>.4</td>
<td>0</td>
</tr>
<tr>
<td>2 &amp; 8</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1 &amp; 4</td>
<td>2</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1 &amp; 2</td>
<td>1</td>
<td>.4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 &amp; 6</td>
<td>1</td>
<td>.4</td>
<td>1</td>
<td>.4</td>
<td>0</td>
</tr>
<tr>
<td>4 &amp; 4</td>
<td>3</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4 &amp; 5</td>
<td>2</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0 &amp; 0</td>
<td>1</td>
<td>.4</td>
<td>1</td>
<td>.4</td>
<td>0</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>2</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2 &amp; 9</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>.4</td>
<td>0</td>
</tr>
<tr>
<td>3 &amp; 9</td>
<td>1</td>
<td>.4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7 &amp; 7</td>
<td>1</td>
<td>.4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE II

Number of errors and the per cent of errors with the totals in each addition combination in the four tests given the 58 fifth grade pupils.

<table>
<thead>
<tr>
<th>Combination</th>
<th>1st. Test</th>
<th>2nd. Test</th>
<th>3rd. Test</th>
<th>4th. Test</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of</td>
<td>% of</td>
<td>No. of</td>
<td>% of</td>
<td>No. of</td>
</tr>
<tr>
<td></td>
<td>Errors</td>
<td>Errors</td>
<td>Errors</td>
<td>Errors</td>
<td>Errors</td>
</tr>
<tr>
<td>1 &amp; 6</td>
<td>7</td>
<td>3.0</td>
<td>11</td>
<td>4.7</td>
<td>6</td>
</tr>
<tr>
<td>3 &amp; 3</td>
<td>3</td>
<td>1.2</td>
<td>7</td>
<td>3.0</td>
<td>12</td>
</tr>
<tr>
<td>2 &amp; 4</td>
<td>5</td>
<td>2.1</td>
<td>5</td>
<td>2.1</td>
<td>8</td>
</tr>
<tr>
<td>5 &amp; 8</td>
<td>5</td>
<td>2.1</td>
<td>7</td>
<td>3.0</td>
<td>3</td>
</tr>
<tr>
<td>1 &amp; 7</td>
<td>6</td>
<td>2.5</td>
<td>7</td>
<td>3.0</td>
<td>5</td>
</tr>
<tr>
<td>6 &amp; 7</td>
<td>2</td>
<td>.8</td>
<td>4</td>
<td>1.7</td>
<td>8</td>
</tr>
<tr>
<td>7 &amp; 9</td>
<td>3</td>
<td>3.4</td>
<td>4</td>
<td>1.7</td>
<td>3</td>
</tr>
<tr>
<td>1 &amp; 5</td>
<td>7</td>
<td>3.0</td>
<td>5</td>
<td>2.1</td>
<td>4</td>
</tr>
<tr>
<td>5 &amp; 7</td>
<td>4</td>
<td>1.7</td>
<td>5</td>
<td>2.1</td>
<td>2</td>
</tr>
<tr>
<td>6 &amp; 8</td>
<td>7</td>
<td>3.0</td>
<td>4</td>
<td>1.7</td>
<td>3</td>
</tr>
<tr>
<td>3 &amp; 9</td>
<td>3</td>
<td>1.2</td>
<td>4</td>
<td>1.7</td>
<td>3</td>
</tr>
<tr>
<td>2 &amp; 6</td>
<td>4</td>
<td>1.7</td>
<td>2</td>
<td>.8</td>
<td>5</td>
</tr>
<tr>
<td>2 &amp; 5</td>
<td>3</td>
<td>1.2</td>
<td>4</td>
<td>1.7</td>
<td>4</td>
</tr>
<tr>
<td>8 &amp; 8</td>
<td>3</td>
<td>1.2</td>
<td>2</td>
<td>.8</td>
<td>5</td>
</tr>
<tr>
<td>0 &amp; 2</td>
<td>4</td>
<td>1.7</td>
<td>1</td>
<td>.4</td>
<td>6</td>
</tr>
<tr>
<td>0 &amp; 3</td>
<td>7</td>
<td>3.0</td>
<td>1</td>
<td>.4</td>
<td>3</td>
</tr>
<tr>
<td>4 &amp; 9</td>
<td>3</td>
<td>1.2</td>
<td>3</td>
<td>1.2</td>
<td>6</td>
</tr>
<tr>
<td>6 &amp; 9</td>
<td>4</td>
<td>1.7</td>
<td>3</td>
<td>1.2</td>
<td>3</td>
</tr>
<tr>
<td>1 &amp; 4</td>
<td>5</td>
<td>2.1</td>
<td>3</td>
<td>1.2</td>
<td>3</td>
</tr>
<tr>
<td>Combination</td>
<td>1st Test</td>
<td>2nd Test</td>
<td>3rd Test</td>
<td>4th Test</td>
<td>TOTAL</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>6</td>
<td>2.5</td>
<td>3</td>
<td>1.2</td>
<td>3</td>
</tr>
<tr>
<td>5 &amp; 6</td>
<td>2</td>
<td>.8</td>
<td>2</td>
<td>.8</td>
<td>4</td>
</tr>
<tr>
<td>0 &amp; 1</td>
<td>3</td>
<td>1.2</td>
<td>2</td>
<td>.8</td>
<td>4</td>
</tr>
<tr>
<td>3 &amp; 5</td>
<td>3</td>
<td>1.2</td>
<td>3</td>
<td>1.2</td>
<td>2</td>
</tr>
<tr>
<td>5 &amp; 9</td>
<td>2</td>
<td>.8</td>
<td>4</td>
<td>1.7</td>
<td>3</td>
</tr>
<tr>
<td>1 &amp; 2</td>
<td>5</td>
<td>2.1</td>
<td>4</td>
<td>1.7</td>
<td>1</td>
</tr>
<tr>
<td>4 &amp; 7</td>
<td>3</td>
<td>1.2</td>
<td>4</td>
<td>1.7</td>
<td>2</td>
</tr>
<tr>
<td>4 &amp; 8</td>
<td>3</td>
<td>1.2</td>
<td>2</td>
<td>.8</td>
<td>1</td>
</tr>
<tr>
<td>0 &amp; 4</td>
<td>5</td>
<td>2.1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 7</td>
<td>3</td>
<td>1.2</td>
<td>1</td>
<td>.4</td>
<td>3</td>
</tr>
<tr>
<td>0 &amp; 9</td>
<td>3</td>
<td>1.2</td>
<td>1</td>
<td>.4</td>
<td>3</td>
</tr>
<tr>
<td>1 &amp; 8</td>
<td>1</td>
<td>.4</td>
<td>5</td>
<td>2.1</td>
<td>2</td>
</tr>
<tr>
<td>2 &amp; 7</td>
<td>5</td>
<td>2.1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>2 &amp; 8</td>
<td>3</td>
<td>1.2</td>
<td>3</td>
<td>1.2</td>
<td>0</td>
</tr>
<tr>
<td>3 &amp; 6</td>
<td>5</td>
<td>2.1</td>
<td>1</td>
<td>.4</td>
<td>3</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>3</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 6</td>
<td>1</td>
<td>.4</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1 &amp; 3</td>
<td>2</td>
<td>.8</td>
<td>3</td>
<td>1.2</td>
<td>3</td>
</tr>
<tr>
<td>3 &amp; 7</td>
<td>2</td>
<td>.8</td>
<td>3</td>
<td>1.2</td>
<td>2</td>
</tr>
<tr>
<td>7 &amp; 7</td>
<td>1</td>
<td>.4</td>
<td>3</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td>8 &amp; 9</td>
<td>3</td>
<td>1.2</td>
<td>1</td>
<td>.4</td>
<td>4</td>
</tr>
<tr>
<td>1 &amp; 9</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>2.1</td>
<td>0</td>
</tr>
<tr>
<td>Combination</td>
<td>1st. Test</td>
<td>2nd. Test</td>
<td>3rd. Test</td>
<td>4th. Test</td>
<td>TOTAL</td>
</tr>
<tr>
<td>-------------</td>
<td>----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
</tr>
<tr>
<td>2 &amp; 9</td>
<td>2</td>
<td>.8</td>
<td>3</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td>0 &amp; 5</td>
<td>3</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3 &amp; 8</td>
<td>1</td>
<td>.4</td>
<td>1</td>
<td>.4</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 8</td>
<td>2</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>5 &amp; 5</td>
<td>3</td>
<td>1.2</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1 &amp; 1</td>
<td>1</td>
<td>.4</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4 &amp; 6</td>
<td>1</td>
<td>.4</td>
<td>1</td>
<td>.4</td>
<td>0</td>
</tr>
<tr>
<td>0 &amp; 0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2 &amp; 2</td>
<td>2</td>
<td>.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>.8</td>
<td>0</td>
</tr>
<tr>
<td>4 &amp; 4</td>
<td>1</td>
<td>.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9 &amp; 9</td>
<td>1</td>
<td>.4</td>
<td>1</td>
<td>.4</td>
<td>0</td>
</tr>
<tr>
<td>4 &amp; 5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6 &amp; 6</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>.4</td>
<td>0</td>
</tr>
</tbody>
</table>
TABLE III

Number of errors and the per cent of errors with the totals in each addition combination in the four tests given the 46 sixth grade pupils.

<table>
<thead>
<tr>
<th>Combination</th>
<th>1st. Test</th>
<th>2nd. Test</th>
<th>3rd. Test</th>
<th>4th. Test</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of errors</td>
<td>No. of errors</td>
<td>No. of errors</td>
<td>No. of errors</td>
<td>No. of errors</td>
</tr>
<tr>
<td>1 &amp; 6</td>
<td>4 2.2</td>
<td>4 2.2</td>
<td>4 2.2</td>
<td>5 2.7</td>
<td>17 2.31</td>
</tr>
<tr>
<td>3 &amp; 3</td>
<td>3 1.6</td>
<td>5 2.7</td>
<td>4 2.2</td>
<td>4 2.2</td>
<td>16 2.17</td>
</tr>
<tr>
<td>8 &amp; 8</td>
<td>4 2.2</td>
<td>1 .54</td>
<td>1 .54</td>
<td>5 2.7</td>
<td>11 1.49</td>
</tr>
<tr>
<td>5 &amp; 8</td>
<td>3 1.6</td>
<td>3 1.6</td>
<td>5 2.7</td>
<td>0 0</td>
<td>11 1.49</td>
</tr>
<tr>
<td>4 &amp; 9</td>
<td>1 .54</td>
<td>3 1.6</td>
<td>5 2.7</td>
<td>1 .54</td>
<td>10 1.35</td>
</tr>
<tr>
<td>6 &amp; 8</td>
<td>1 .54</td>
<td>4 2.2</td>
<td>2 1.0</td>
<td>3 1.6</td>
<td>10 1.35</td>
</tr>
<tr>
<td>7 &amp; 9</td>
<td>3 1.6</td>
<td>1 .54</td>
<td>4 2.2</td>
<td>2 1.0</td>
<td>10 1.35</td>
</tr>
<tr>
<td>1 &amp; 7</td>
<td>2 1.0</td>
<td>3 1.6</td>
<td>4 2.2</td>
<td>0 0</td>
<td>9 1.22</td>
</tr>
<tr>
<td>1 &amp; 8</td>
<td>1 .54</td>
<td>1 .54</td>
<td>4 2.2</td>
<td>3 1.6</td>
<td>9 1.22</td>
</tr>
<tr>
<td>2 &amp; 5</td>
<td>2 1.0</td>
<td>2 1.0</td>
<td>2 1.0</td>
<td>3 1.6</td>
<td>9 1.22</td>
</tr>
<tr>
<td>2 &amp; 6</td>
<td>2 1.0</td>
<td>2 1.0</td>
<td>3 1.6</td>
<td>2 1.0</td>
<td>9 1.22</td>
</tr>
<tr>
<td>5 &amp; 7</td>
<td>2 1.0</td>
<td>4 2.2</td>
<td>2 1.0</td>
<td>1 .54</td>
<td>9 1.22</td>
</tr>
<tr>
<td>5 &amp; 9</td>
<td>2 1.0</td>
<td>2 1.0</td>
<td>4 2.2</td>
<td>1 .54</td>
<td>9 1.22</td>
</tr>
<tr>
<td>6 &amp; 9</td>
<td>3 1.6</td>
<td>2 1.0</td>
<td>1 .54</td>
<td>3 1.6</td>
<td>9 1.22</td>
</tr>
<tr>
<td>2 &amp; 8</td>
<td>3 1.6</td>
<td>2 1.0</td>
<td>1 .54</td>
<td>2 1.0</td>
<td>8 1.08</td>
</tr>
<tr>
<td>1 &amp; 1</td>
<td>3 1.6</td>
<td>1 .54</td>
<td>2 1.0</td>
<td>1 .54</td>
<td>7 .95</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>2 1.0</td>
<td>0 0</td>
<td>2 1.0</td>
<td>3 1.6</td>
<td>7 .95</td>
</tr>
<tr>
<td>3 &amp; 9</td>
<td>0 0</td>
<td>1 .54</td>
<td>4 2.2</td>
<td>2 1.0</td>
<td>7 .95</td>
</tr>
<tr>
<td>1 &amp; 5</td>
<td>0 0</td>
<td>1 .54</td>
<td>2 1.0</td>
<td>3 1.6</td>
<td>6 .81</td>
</tr>
</tbody>
</table>
### TABLE III, Continued

<table>
<thead>
<tr>
<th>Combination</th>
<th>1st. Test</th>
<th>2nd. Test</th>
<th>3rd. Test</th>
<th>4th. Test</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
</tr>
<tr>
<td>2 &amp; 9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>4 &amp; 7</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1.0</td>
<td>2</td>
</tr>
<tr>
<td>8 &amp; 9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1 &amp; 4</td>
<td>1</td>
<td>.54</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3 &amp; 7</td>
<td>2</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4 &amp; 8</td>
<td>1</td>
<td>.54</td>
<td>2</td>
<td>1.0</td>
<td>1</td>
</tr>
<tr>
<td>5 &amp; 6</td>
<td>3</td>
<td>1.6</td>
<td>1</td>
<td>.54</td>
<td>1</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>2</td>
<td>1.0</td>
<td>1</td>
<td>.54</td>
<td>1</td>
</tr>
<tr>
<td>1 &amp; 3</td>
<td>2</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3 &amp; 5</td>
<td>2</td>
<td>1.0</td>
<td>1</td>
<td>.54</td>
<td>1</td>
</tr>
<tr>
<td>3 &amp; 8</td>
<td>3</td>
<td>1.6</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4 &amp; 4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4 &amp; 5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>.54</td>
<td>3</td>
</tr>
<tr>
<td>9 &amp; 9</td>
<td>2</td>
<td>1.0</td>
<td>1</td>
<td>.54</td>
<td>1</td>
</tr>
<tr>
<td>6 &amp; 2</td>
<td>1</td>
<td>.54</td>
<td>1</td>
<td>.54</td>
<td>0</td>
</tr>
<tr>
<td>0 &amp; 3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>.54</td>
<td>2</td>
</tr>
<tr>
<td>1 &amp; 2</td>
<td>2</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1 &amp; 9</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>.54</td>
<td>0</td>
</tr>
<tr>
<td>2 &amp; 4</td>
<td>1</td>
<td>.54</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2 &amp; 7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 &amp; 2</td>
<td>1</td>
<td>.54</td>
<td>1</td>
<td>.54</td>
<td>0</td>
</tr>
</tbody>
</table>
### TABLE III, Continued.

<table>
<thead>
<tr>
<th>Combination</th>
<th>1st. Test</th>
<th>2nd. Test</th>
<th>3rd. Test</th>
<th>4th. Test</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
</tr>
<tr>
<td>5 &amp; 5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>.54</td>
<td>2</td>
</tr>
<tr>
<td>6 &amp; 6</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>.54</td>
<td>0</td>
</tr>
<tr>
<td>6 &amp; 7</td>
<td>1</td>
<td>.54</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0 &amp; 5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>0 &amp; 8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3 &amp; 6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4 &amp; 6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>7 &amp; 7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0 &amp; 4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0 &amp; 7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0 &amp; 6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0 &amp; 9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
## TABLE IV.

Number of errors by grades and the per cent of errors with the totals in each combination in the four addition tests given the 161 fourth, fifth & sixth grade pupils.

<table>
<thead>
<tr>
<th>Combination</th>
<th>FOURTH GRADE</th>
<th>FIFTH GRADE</th>
<th>SIXTH GRADE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
</tr>
<tr>
<td>1 &amp; 6</td>
<td>9</td>
<td>.89</td>
<td>28</td>
<td>3.01</td>
</tr>
<tr>
<td>7 &amp; 9</td>
<td>17</td>
<td>1.86</td>
<td>20</td>
<td>2.15</td>
</tr>
<tr>
<td>3 &amp; 3</td>
<td>5</td>
<td>.54</td>
<td>26</td>
<td>2.8</td>
</tr>
<tr>
<td>0 &amp; 1</td>
<td>50</td>
<td>3.29</td>
<td>11</td>
<td>1.8</td>
</tr>
<tr>
<td>0 &amp; 3</td>
<td>27</td>
<td>2.96</td>
<td>13</td>
<td>1.4</td>
</tr>
<tr>
<td>1 &amp; 7</td>
<td>13</td>
<td>1.42</td>
<td>20</td>
<td>2.15</td>
</tr>
<tr>
<td>0 &amp; 2</td>
<td>25</td>
<td>2.74</td>
<td>13</td>
<td>1.40</td>
</tr>
<tr>
<td>0 &amp; 7</td>
<td>28</td>
<td>3.07</td>
<td>9</td>
<td>.96</td>
</tr>
<tr>
<td>8 &amp; 8</td>
<td>13</td>
<td>1.42</td>
<td>14</td>
<td>1.50</td>
</tr>
<tr>
<td>8 &amp; 6</td>
<td>11</td>
<td>1.21</td>
<td>17</td>
<td>1.83</td>
</tr>
<tr>
<td>5 &amp; 8</td>
<td>6</td>
<td>.65</td>
<td>21</td>
<td>2.26</td>
</tr>
<tr>
<td>0 &amp; 9</td>
<td>28</td>
<td>3.07</td>
<td>9</td>
<td>.96</td>
</tr>
<tr>
<td>2 &amp; 4</td>
<td>10</td>
<td>1.09</td>
<td>24</td>
<td>2.58</td>
</tr>
<tr>
<td>0 &amp; 4</td>
<td>26</td>
<td>2.85</td>
<td>9</td>
<td>.96</td>
</tr>
<tr>
<td>0 &amp; 5</td>
<td>27</td>
<td>2.96</td>
<td>6</td>
<td>.64</td>
</tr>
<tr>
<td>6 &amp; 7</td>
<td>12</td>
<td>1.31</td>
<td>20</td>
<td>2.15</td>
</tr>
<tr>
<td>0 &amp; 8</td>
<td>27</td>
<td>2.96</td>
<td>5</td>
<td>.53</td>
</tr>
<tr>
<td>0 &amp; 6</td>
<td>26</td>
<td>2.85</td>
<td>8</td>
<td>.86</td>
</tr>
<tr>
<td>6 &amp; 9</td>
<td>10</td>
<td>1.09</td>
<td>13</td>
<td>1.40</td>
</tr>
<tr>
<td>Combination</td>
<td>FOURTH GRADE</td>
<td>FIFTH GRADE</td>
<td>SIXTH GRADE</td>
<td>TOTAL</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
</tr>
<tr>
<td>1 &amp; 5</td>
<td>6</td>
<td>.65</td>
<td>19</td>
<td>2.04</td>
</tr>
<tr>
<td>5 &amp; 7</td>
<td>5</td>
<td>.54</td>
<td>17</td>
<td>1.83</td>
</tr>
<tr>
<td>4 &amp; 9</td>
<td>7</td>
<td>.76</td>
<td>13</td>
<td>1.40</td>
</tr>
<tr>
<td>5 &amp; 9</td>
<td>9</td>
<td>.98</td>
<td>11</td>
<td>1.13</td>
</tr>
<tr>
<td>4 &amp; 7</td>
<td>12</td>
<td>1.51</td>
<td>10</td>
<td>1.07</td>
</tr>
<tr>
<td>2 &amp; 5</td>
<td>5</td>
<td>.54</td>
<td>14</td>
<td>1.50</td>
</tr>
<tr>
<td>2 &amp; 6</td>
<td>3</td>
<td>.32</td>
<td>15</td>
<td>1.61</td>
</tr>
<tr>
<td>1 &amp; 8</td>
<td>8</td>
<td>.87</td>
<td>9</td>
<td>.98</td>
</tr>
<tr>
<td>3 &amp; 9</td>
<td>2</td>
<td>.21</td>
<td>16</td>
<td>1.73</td>
</tr>
<tr>
<td>3 &amp; 7</td>
<td>11</td>
<td>1.21</td>
<td>8</td>
<td>.86</td>
</tr>
<tr>
<td>7 &amp; 8</td>
<td>9</td>
<td>.98</td>
<td>9</td>
<td>.98</td>
</tr>
<tr>
<td>8 &amp; 9</td>
<td>8</td>
<td>.87</td>
<td>8</td>
<td>.86</td>
</tr>
<tr>
<td>5 &amp; 6</td>
<td>5</td>
<td>.54</td>
<td>12</td>
<td>1.29</td>
</tr>
<tr>
<td>4 &amp; 3</td>
<td>6</td>
<td>.65</td>
<td>10</td>
<td>1.07</td>
</tr>
<tr>
<td>2 &amp; 8</td>
<td>4</td>
<td>.43</td>
<td>9</td>
<td>.96</td>
</tr>
<tr>
<td>1 &amp; 4</td>
<td>4</td>
<td>.43</td>
<td>12</td>
<td>1.29</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>2</td>
<td>.21</td>
<td>12</td>
<td>1.29</td>
</tr>
<tr>
<td>3 &amp; 5</td>
<td>4</td>
<td>.43</td>
<td>11</td>
<td>1.18</td>
</tr>
<tr>
<td>1 &amp; 3</td>
<td>6</td>
<td>.65</td>
<td>8</td>
<td>.86</td>
</tr>
<tr>
<td>2 &amp; 7</td>
<td>6</td>
<td>.65</td>
<td>9</td>
<td>.96</td>
</tr>
<tr>
<td>1 &amp; 9</td>
<td>7</td>
<td>.76</td>
<td>7</td>
<td>.75</td>
</tr>
<tr>
<td>1 &amp; 1</td>
<td>6</td>
<td>.65</td>
<td>4</td>
<td>.43</td>
</tr>
<tr>
<td>Combination</td>
<td>FOURTH GRADE</td>
<td>FIFTH GRADE</td>
<td>SIXTH GRADE</td>
<td>TOTAL</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
</tr>
<tr>
<td>3 &amp; 6</td>
<td>5</td>
<td>.54</td>
<td>9</td>
<td>.96</td>
</tr>
<tr>
<td>1 &amp; 2</td>
<td>3</td>
<td>.32</td>
<td>10</td>
<td>1.07</td>
</tr>
<tr>
<td>2 &amp; 9</td>
<td>2</td>
<td>.21</td>
<td>7</td>
<td>.75</td>
</tr>
<tr>
<td>5 &amp; 8</td>
<td>4</td>
<td>.43</td>
<td>6</td>
<td>.64</td>
</tr>
<tr>
<td>4 &amp; 6</td>
<td>7</td>
<td>.76</td>
<td>4</td>
<td>.43</td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>7</td>
<td>.76</td>
<td>3</td>
<td>.32</td>
</tr>
<tr>
<td>5 &amp; 5</td>
<td>4</td>
<td>.43</td>
<td>5</td>
<td>.53</td>
</tr>
<tr>
<td>7 &amp; 7</td>
<td>2</td>
<td>.21</td>
<td>8</td>
<td>.68</td>
</tr>
<tr>
<td>9 &amp; 9</td>
<td>4</td>
<td>.43</td>
<td>2</td>
<td>.21</td>
</tr>
<tr>
<td>2 &amp; 2</td>
<td>4</td>
<td>.43</td>
<td>3</td>
<td>.32</td>
</tr>
<tr>
<td>6 &amp; 6</td>
<td>5</td>
<td>.54</td>
<td>1</td>
<td>.10</td>
</tr>
<tr>
<td>4 &amp; 4</td>
<td>3</td>
<td>.32</td>
<td>2</td>
<td>.21</td>
</tr>
<tr>
<td>4 &amp; 5</td>
<td>3</td>
<td>.32</td>
<td>1</td>
<td>.10</td>
</tr>
<tr>
<td>0 &amp; 0</td>
<td>2</td>
<td>.21</td>
<td>3</td>
<td>.32</td>
</tr>
</tbody>
</table>
Addition Combinations" divided them into three groups. The groupings were made with respect to the difficulty of the various combinations as revealed in his study. These groups were the "Easy", "Medium" and the "Difficult". However, as indicated before, he did not include the zero combinations in his experiment. The writer of this thesis took the grouping as made by J.H. Smith and added the "Zero" group, which includes all those combinations involving zero - and found the errors made in each group. Table V page 28 gives this information for each of the three grades. The information here is given by tests as well as by grades.

Table VI page 29 combines the three parts of Table V and gives the results in summary form.

In an effort to determine the relation of the errors committed with respect to the amount of practice afforded in each combination in the Courtis practice pads used by these pupils, an analysis was made of this practice material. Only those combinations were taken into consideration that occurred in this material in exactly the same form as they appeared in the tests used in this study.

Diagram II page 30 is a diagram showing the frequency of occurrence of each combination in this material. It will readily be seen from this diagram that the element pf practice will be a negligible factor as the amount of
TABLE V

Number of problems solved and the distribution of errors with respect to the easy, medium, difficult, and zero groups in addition combinations.

<table>
<thead>
<tr>
<th>TEST</th>
<th>NO. PROBLEMS SOLVED IN EACH GROUP</th>
<th>EASY GROUP</th>
<th>MEDIUM GROUP</th>
<th>DIFFICULT GROUP</th>
<th>ZERO GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO. OF ERRORS</td>
<td>% OF ERRORS</td>
<td>NO. OF ERRORS</td>
<td>% OF ERRORS</td>
<td>NO. OF ERRORS</td>
</tr>
<tr>
<td>1st.</td>
<td>3420</td>
<td>48</td>
<td>1.40</td>
<td>61</td>
<td>1.49</td>
</tr>
<tr>
<td>2nd.</td>
<td>3420</td>
<td>6</td>
<td>.17</td>
<td>11</td>
<td>.32</td>
</tr>
<tr>
<td>3rd.</td>
<td>3420</td>
<td>18</td>
<td>.52</td>
<td>16</td>
<td>.46</td>
</tr>
<tr>
<td>4th.</td>
<td>3420</td>
<td>13</td>
<td>.38</td>
<td>12</td>
<td>.35</td>
</tr>
<tr>
<td>TOTAL</td>
<td>13680</td>
<td>85</td>
<td>.62</td>
<td>90</td>
<td>.65</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST</th>
<th>NO. PROBLEMS SOLVED IN EACH GROUP</th>
<th>EASY GROUP</th>
<th>MEDIUM GROUP</th>
<th>DIFFICULT GROUP</th>
<th>ZERO GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO. OF ERRORS</td>
<td>% OF ERRORS</td>
<td>NO. OF ERRORS</td>
<td>% OF ERRORS</td>
<td>NO. OF ERRORS</td>
</tr>
<tr>
<td>1st.</td>
<td>3480</td>
<td>46</td>
<td>1.32</td>
<td>39</td>
<td>1.12</td>
</tr>
<tr>
<td>2nd.</td>
<td>3480</td>
<td>48</td>
<td>1.33</td>
<td>39</td>
<td>1.12</td>
</tr>
<tr>
<td>3rd.</td>
<td>3480</td>
<td>32</td>
<td>.92</td>
<td>46</td>
<td>1.32</td>
</tr>
<tr>
<td>4th.</td>
<td>3480</td>
<td>17</td>
<td>.48</td>
<td>43</td>
<td>1.25</td>
</tr>
<tr>
<td>TOTAL</td>
<td>13920</td>
<td>143</td>
<td>1.03</td>
<td>167</td>
<td>1.19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST</th>
<th>NO. PROBLEMS SOLVED IN EACH GROUP</th>
<th>EASY GROUP</th>
<th>MEDIUM GROUP</th>
<th>DIFFICULT GROUP</th>
<th>ZERO GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO. OF ERRORS</td>
<td>% OF ERRORS</td>
<td>NO. OF ERRORS</td>
<td>% OF ERRORS</td>
<td>NO. OF ERRORS</td>
</tr>
<tr>
<td>1st.</td>
<td>2760</td>
<td>18</td>
<td>.65</td>
<td>25</td>
<td>.90</td>
</tr>
<tr>
<td>2nd.</td>
<td>2760</td>
<td>16</td>
<td>.58</td>
<td>18</td>
<td>.65</td>
</tr>
<tr>
<td>3rd.</td>
<td>2760</td>
<td>29</td>
<td>1.03</td>
<td>20</td>
<td>.72</td>
</tr>
<tr>
<td>4th.</td>
<td>2760</td>
<td>25</td>
<td>.90</td>
<td>26</td>
<td>.94</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11640</td>
<td>86</td>
<td>.77</td>
<td>89</td>
<td>.80</td>
</tr>
</tbody>
</table>
### TABLE VI

Distribution of errors with respect to the easy, medium, difficult, and zero groups when the fourth, fifth and sixth grades in Table V are combined.

<table>
<thead>
<tr>
<th>GRADE</th>
<th>NO. PROBLEMS SOLVED IN EACH GROUP</th>
<th>EASY GROUP</th>
<th>MEDIUM GROUP</th>
<th>DIFFICULT GROUP</th>
<th>ZERO GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
<td>% of Errors</td>
<td>No. of Errors</td>
</tr>
<tr>
<td>4th</td>
<td>13,680</td>
<td>85</td>
<td>62</td>
<td>90</td>
<td>65</td>
</tr>
<tr>
<td>5th</td>
<td>13,920</td>
<td>143</td>
<td>1.02</td>
<td>167</td>
<td>1.19</td>
</tr>
<tr>
<td>6th</td>
<td>11,040</td>
<td>86</td>
<td>.77</td>
<td>89</td>
<td>.80</td>
</tr>
<tr>
<td>TOTAL</td>
<td>38,640</td>
<td>314</td>
<td>.81</td>
<td>346</td>
<td>.89</td>
</tr>
</tbody>
</table>
DIAGRAM II

Frequency of occurrence of the respective addition combinations in the Courtis practice pads used by the fourth, fifth, and sixth grades.

<table>
<thead>
<tr>
<th>NUMBER ADDED</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>1</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>2</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>3</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>4</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>5</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>6</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>7</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>8</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>9</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
</tr>
</tbody>
</table>
practice afforded in each combination is the same.

Table VII page 32 gives for the fourth grade the
distribution of the number of pupils, number of problems
solved, number of errors, and the per cent of errors with
respect to the Mental Ages of the 57 pupils in this grade.

Table VIII page 33 gives the same information for the
58 pupils of the fifth grade, and Table IX page 34 for the
46 pupils of the sixth grade.

Table X page 35 shows the distribution of the per cents
of total errors committed in each grade with respect to
Q₁, Q₂, and Q₃.

Table XI page 36 is the correlation chart indicating
the relation between the frequency of errors committed and
the Mental Ages of the pupils in the fourth grade. Table XII
page 37 gives the same information for the fifth grade,
and Table XIII page 38 for the sixth grade.
TABLE VII

Distribution of the number of pupils, number of problems solved, number of errors, and per cent of errors with respect to the mental ages of the 57 pupils of the fourth grade.

<table>
<thead>
<tr>
<th>Mental Age</th>
<th>No. of Pupils</th>
<th>No. of Problems</th>
<th>No. of Errors</th>
<th>% of Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>186</td>
<td>1</td>
<td>880</td>
<td>5</td>
<td>.57</td>
</tr>
<tr>
<td>185</td>
<td>1</td>
<td>880</td>
<td>6</td>
<td>.68</td>
</tr>
<tr>
<td>187</td>
<td>1</td>
<td>880</td>
<td>4</td>
<td>.44</td>
</tr>
<tr>
<td>185</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>.22</td>
</tr>
<tr>
<td>164</td>
<td>1</td>
<td>860</td>
<td>0</td>
<td>.00</td>
</tr>
<tr>
<td>159</td>
<td>1</td>
<td>880</td>
<td>1</td>
<td>.11</td>
</tr>
<tr>
<td>158</td>
<td>1</td>
<td>880</td>
<td>0</td>
<td>.00</td>
</tr>
<tr>
<td>156</td>
<td>1</td>
<td>880</td>
<td>0</td>
<td>.00</td>
</tr>
<tr>
<td>154</td>
<td>1</td>
<td>872</td>
<td>18</td>
<td>2.06</td>
</tr>
<tr>
<td>153</td>
<td>2</td>
<td>1752</td>
<td>5</td>
<td>.28</td>
</tr>
<tr>
<td>150</td>
<td>1</td>
<td>880</td>
<td>4</td>
<td>.44</td>
</tr>
<tr>
<td>149</td>
<td>1</td>
<td>880</td>
<td>3</td>
<td>.34</td>
</tr>
<tr>
<td>147</td>
<td>2</td>
<td>1758</td>
<td>5</td>
<td>.28</td>
</tr>
<tr>
<td>Q₂</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>144</td>
<td>1</td>
<td>853</td>
<td>0</td>
<td>.00</td>
</tr>
<tr>
<td>143</td>
<td>1</td>
<td>880</td>
<td>10</td>
<td>1.13</td>
</tr>
<tr>
<td>142</td>
<td>1</td>
<td>821</td>
<td>7</td>
<td>.85</td>
</tr>
<tr>
<td>141</td>
<td>1</td>
<td>653</td>
<td>10</td>
<td>1.53</td>
</tr>
<tr>
<td>138</td>
<td>3</td>
<td>2627</td>
<td>6</td>
<td>.22</td>
</tr>
<tr>
<td>137</td>
<td>1</td>
<td>869</td>
<td>8</td>
<td>.92</td>
</tr>
<tr>
<td>136</td>
<td>2</td>
<td>1719</td>
<td>28</td>
<td>1.62</td>
</tr>
<tr>
<td>135</td>
<td>3</td>
<td>2228</td>
<td>4</td>
<td>.15</td>
</tr>
<tr>
<td>Median</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>6</td>
<td>5228</td>
<td>114</td>
<td>2.18</td>
</tr>
<tr>
<td>131</td>
<td>1</td>
<td>875</td>
<td>0</td>
<td>.00</td>
</tr>
<tr>
<td>130</td>
<td>1</td>
<td>880</td>
<td>8</td>
<td>.90</td>
</tr>
<tr>
<td>129</td>
<td>2</td>
<td>1648</td>
<td>83</td>
<td>5.34</td>
</tr>
<tr>
<td>128</td>
<td>2</td>
<td>1758</td>
<td>19</td>
<td>1.06</td>
</tr>
<tr>
<td>126</td>
<td>1</td>
<td>853</td>
<td>2</td>
<td>.23</td>
</tr>
<tr>
<td>124</td>
<td>1</td>
<td>868</td>
<td>10</td>
<td>1.45</td>
</tr>
<tr>
<td>Q₁</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>123</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>.22</td>
</tr>
<tr>
<td>122</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>.22</td>
</tr>
<tr>
<td>120</td>
<td>2</td>
<td>1729</td>
<td>16</td>
<td>.92</td>
</tr>
<tr>
<td>116</td>
<td>1</td>
<td>838</td>
<td>8</td>
<td>.95</td>
</tr>
<tr>
<td>115</td>
<td>1</td>
<td>785</td>
<td>5</td>
<td>.63</td>
</tr>
<tr>
<td>114</td>
<td>2</td>
<td>1697</td>
<td>21</td>
<td>1.23</td>
</tr>
<tr>
<td>113</td>
<td>1</td>
<td>880</td>
<td>0</td>
<td>.00</td>
</tr>
<tr>
<td>112</td>
<td>1</td>
<td>816</td>
<td>5</td>
<td>.61</td>
</tr>
<tr>
<td>110</td>
<td>1</td>
<td>873</td>
<td>3</td>
<td>.34</td>
</tr>
<tr>
<td>108</td>
<td>1</td>
<td>779</td>
<td>39</td>
<td>5.00</td>
</tr>
<tr>
<td>103</td>
<td>1</td>
<td>880</td>
<td>36</td>
<td>4.09</td>
</tr>
<tr>
<td>102</td>
<td>1</td>
<td>879</td>
<td>34</td>
<td>3.28</td>
</tr>
<tr>
<td>100</td>
<td>1</td>
<td>616</td>
<td>2</td>
<td>.32</td>
</tr>
</tbody>
</table>
TABLE VIII

Distribution of the number of pupils, number of problems solved, number of errors, and per cent of errors with respect to the mental ages of the 58 pupils of the fifth grade.

<table>
<thead>
<tr>
<th>Mental Age</th>
<th>No. of pupils</th>
<th>No. of Problems</th>
<th>No. of Errors</th>
<th>% of Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>198</td>
<td>1</td>
<td>880</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>197</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>1.67</td>
</tr>
<tr>
<td>191</td>
<td>1</td>
<td>880</td>
<td>5</td>
<td>1.56</td>
</tr>
<tr>
<td>188</td>
<td>1</td>
<td>880</td>
<td>9</td>
<td>1.78</td>
</tr>
<tr>
<td>182</td>
<td>1</td>
<td>853</td>
<td>7</td>
<td>1.44</td>
</tr>
<tr>
<td>179</td>
<td>1</td>
<td>880</td>
<td>4</td>
<td>1.02</td>
</tr>
<tr>
<td>178</td>
<td>3</td>
<td>2640</td>
<td>12</td>
<td>1.02</td>
</tr>
<tr>
<td>175</td>
<td>3</td>
<td>2635</td>
<td>25</td>
<td>1.02</td>
</tr>
<tr>
<td>173</td>
<td>2</td>
<td>1760</td>
<td>15</td>
<td>1.02</td>
</tr>
<tr>
<td>Q3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>163</td>
<td>1</td>
<td>880</td>
<td>9</td>
<td>1.02</td>
</tr>
<tr>
<td>164</td>
<td>1</td>
<td>880</td>
<td>4</td>
<td>1.02</td>
</tr>
<tr>
<td>165</td>
<td>1</td>
<td>842</td>
<td>4</td>
<td>1.02</td>
</tr>
<tr>
<td>166</td>
<td>2</td>
<td>1760</td>
<td>8</td>
<td>1.02</td>
</tr>
<tr>
<td>167</td>
<td>2</td>
<td>1756</td>
<td>6</td>
<td>1.02</td>
</tr>
<tr>
<td>160</td>
<td>2</td>
<td>1760</td>
<td>17</td>
<td>1.02</td>
</tr>
<tr>
<td>158</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>1.02</td>
</tr>
<tr>
<td>Median</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>1</td>
<td>880</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>154</td>
<td>1</td>
<td>880</td>
<td>1</td>
<td>0.00</td>
</tr>
<tr>
<td>153</td>
<td>3</td>
<td>2342</td>
<td>25</td>
<td>1.00</td>
</tr>
<tr>
<td>152</td>
<td>3</td>
<td>2613</td>
<td>35</td>
<td>1.00</td>
</tr>
<tr>
<td>150</td>
<td>1</td>
<td>880</td>
<td>3</td>
<td>1.00</td>
</tr>
<tr>
<td>149</td>
<td>3</td>
<td>2640</td>
<td>13</td>
<td>1.00</td>
</tr>
<tr>
<td>148</td>
<td>1</td>
<td>880</td>
<td>12</td>
<td>1.00</td>
</tr>
<tr>
<td>147</td>
<td>1</td>
<td>863</td>
<td>10</td>
<td>1.00</td>
</tr>
<tr>
<td>145</td>
<td>1</td>
<td>880</td>
<td>0</td>
<td>1.00</td>
</tr>
<tr>
<td>141</td>
<td>1</td>
<td>880</td>
<td>14</td>
<td>1.00</td>
</tr>
<tr>
<td>Q1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>139</td>
<td>2</td>
<td>1734</td>
<td>16</td>
<td>1.00</td>
</tr>
<tr>
<td>137</td>
<td>1</td>
<td>788</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>136</td>
<td>1</td>
<td>608</td>
<td>20</td>
<td>2.00</td>
</tr>
<tr>
<td>135</td>
<td>2</td>
<td>1588</td>
<td>43</td>
<td>2.00</td>
</tr>
<tr>
<td>132</td>
<td>1</td>
<td>880</td>
<td>9</td>
<td>2.00</td>
</tr>
<tr>
<td>131</td>
<td>2</td>
<td>1536</td>
<td>152</td>
<td>2.00</td>
</tr>
<tr>
<td>128</td>
<td>1</td>
<td>840</td>
<td>12</td>
<td>2.00</td>
</tr>
<tr>
<td>126</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>2.00</td>
</tr>
<tr>
<td>125</td>
<td>1</td>
<td>853</td>
<td>13</td>
<td>2.00</td>
</tr>
<tr>
<td>121</td>
<td>1</td>
<td>880</td>
<td>66</td>
<td>2.00</td>
</tr>
<tr>
<td>118</td>
<td>1</td>
<td>880</td>
<td>5</td>
<td>2.00</td>
</tr>
</tbody>
</table>
### TABLE IX

Distribution of the number of pupils, number of problems solved, number of errors, and per cent of errors with respect to the mental ages of the 46 pupils of the sixth grade.

<table>
<thead>
<tr>
<th>Mental Age</th>
<th>No. of pupils</th>
<th>No. of Problems</th>
<th>No. of Errors</th>
<th>% of Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>229</td>
<td>1</td>
<td>880</td>
<td>0</td>
<td>.00</td>
</tr>
<tr>
<td>217</td>
<td>1</td>
<td>880</td>
<td>1</td>
<td>.11</td>
</tr>
<tr>
<td>214</td>
<td>1</td>
<td>865</td>
<td>4</td>
<td>.46</td>
</tr>
<tr>
<td>212</td>
<td>2</td>
<td>1760</td>
<td>5</td>
<td>.28</td>
</tr>
<tr>
<td>211</td>
<td>1</td>
<td>880</td>
<td>4</td>
<td>.44</td>
</tr>
<tr>
<td>209</td>
<td>1</td>
<td>673</td>
<td>6</td>
<td>.89</td>
</tr>
<tr>
<td>207</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>.22</td>
</tr>
<tr>
<td>203</td>
<td>1</td>
<td>880</td>
<td>6</td>
<td>.68</td>
</tr>
<tr>
<td>201</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>.22</td>
</tr>
<tr>
<td>199</td>
<td>1</td>
<td>874</td>
<td>3</td>
<td>.34</td>
</tr>
<tr>
<td>197</td>
<td>2</td>
<td>1711</td>
<td>11</td>
<td>.64</td>
</tr>
<tr>
<td>196</td>
<td>2</td>
<td>1760</td>
<td>12</td>
<td>.68</td>
</tr>
<tr>
<td>195</td>
<td>1</td>
<td>868</td>
<td>2</td>
<td>.23</td>
</tr>
<tr>
<td>191</td>
<td>1</td>
<td>880</td>
<td>3</td>
<td>.34</td>
</tr>
<tr>
<td>186</td>
<td>1</td>
<td>880</td>
<td>4</td>
<td>.44</td>
</tr>
<tr>
<td>184</td>
<td>1</td>
<td>880</td>
<td>3</td>
<td>.34</td>
</tr>
<tr>
<td>182</td>
<td>2</td>
<td>1760</td>
<td>8</td>
<td>.45</td>
</tr>
<tr>
<td>175</td>
<td>1</td>
<td>878</td>
<td>6</td>
<td>.68</td>
</tr>
</tbody>
</table>

**Median**

<table>
<thead>
<tr>
<th>Mental Age</th>
<th>No. of pupils</th>
<th>No. of Problems</th>
<th>No. of Errors</th>
<th>% of Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>176</td>
<td>1</td>
<td>880</td>
<td>3</td>
<td>.34</td>
</tr>
<tr>
<td>175</td>
<td>1</td>
<td>887</td>
<td>1</td>
<td>.12</td>
</tr>
<tr>
<td>172</td>
<td>1</td>
<td>858</td>
<td>3</td>
<td>.35</td>
</tr>
<tr>
<td>171</td>
<td>2</td>
<td>1760</td>
<td>2</td>
<td>.11</td>
</tr>
<tr>
<td>168</td>
<td>1</td>
<td>880</td>
<td>4</td>
<td>.44</td>
</tr>
<tr>
<td>165</td>
<td>1</td>
<td>871</td>
<td>4</td>
<td>.45</td>
</tr>
<tr>
<td>162</td>
<td>4</td>
<td>3284</td>
<td>51</td>
<td>1.55</td>
</tr>
<tr>
<td>161</td>
<td>1</td>
<td>853</td>
<td>12</td>
<td>1.40</td>
</tr>
</tbody>
</table>

**Q1**

<table>
<thead>
<tr>
<th>Mental Age</th>
<th>No. of pupils</th>
<th>No. of Problems</th>
<th>No. of Errors</th>
<th>% of Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>3</td>
<td>2528</td>
<td>59</td>
<td>2.33</td>
</tr>
<tr>
<td>153</td>
<td>1</td>
<td>880</td>
<td>2</td>
<td>.22</td>
</tr>
<tr>
<td>151</td>
<td>1</td>
<td>880</td>
<td>17</td>
<td>1.94</td>
</tr>
<tr>
<td>150</td>
<td>1</td>
<td>880</td>
<td>3</td>
<td>.34</td>
</tr>
<tr>
<td>149</td>
<td>1</td>
<td>863</td>
<td>6</td>
<td>.69</td>
</tr>
<tr>
<td>142</td>
<td>1</td>
<td>830</td>
<td>4</td>
<td>.44</td>
</tr>
<tr>
<td>140</td>
<td>2</td>
<td>859</td>
<td>20</td>
<td>2.33</td>
</tr>
<tr>
<td>135</td>
<td>1</td>
<td>678</td>
<td>21</td>
<td>3.09</td>
</tr>
<tr>
<td>126</td>
<td>1</td>
<td>649</td>
<td>4</td>
<td>.61</td>
</tr>
</tbody>
</table>
TABLE X

Distribution of the per cent of total errors committed by the 161 pupils with respect to $Q_1$, $Q_2$, and $Q_3$ of their mental ages.

<table>
<thead>
<tr>
<th>GRADE</th>
<th>PER CENT OF TOTAL ERRORS COMMITTED</th>
<th>TOTAL NUMBER ERRORS COMMITTED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Above $Q_3$</td>
<td>Between $Q_2$ &amp; $Q_3$</td>
</tr>
<tr>
<td>4th.</td>
<td>9.81</td>
<td>13.52</td>
</tr>
<tr>
<td>5th.</td>
<td>13.32</td>
<td>9.78</td>
</tr>
<tr>
<td>6th.</td>
<td>11.07</td>
<td>16.43</td>
</tr>
<tr>
<td>4, 5, &amp; 6th</td>
<td>11.53</td>
<td>12.57</td>
</tr>
</tbody>
</table>
TABLE XI

Correlation between mental ages and frequency of errors in addition combinations by the 57 pupils of the fourth grade.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100 - 109</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110 - 119</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 - 129</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130 - 139</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140 - 149</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 - 159</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>160 - 169</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>170 - 179</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>180 - 189</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

45 6 1 3 0 0 0 0 1 1
-5 -4 -3 -2 -1 0 1 2 3 4

\[ r = -0.35 \pm 0.086 \]
TABLE XII

Correlation between mental ages and frequency of errors in addition combinations by the 58 pupils of the fifth grade.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>110 - 119</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 - 129</td>
<td>1 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130 - 139</td>
<td>5 1 1 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140 - 149</td>
<td>5 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 - 159</td>
<td>7 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>160 - 169</td>
<td>1 11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>170 - 179</td>
<td>8 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>180 - 189</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>190 - 199</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

43 11 1 1 0 0 1 0 0 0 0 0 0 0 0 1 58
-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

r = .155 ± .0944
TABLE XIII

Correlation between mental ages and frequency of errors in addition combinations by the 46 pupils of the sixth grade.

<table>
<thead>
<tr>
<th>Mental Age</th>
<th>0-9</th>
<th>10-19</th>
<th>20-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 - 129</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130 - 139</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140 - 149</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 - 159</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>160 - 169</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>170 - 179</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>180 - 189</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>190 - 199</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 - 209</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210 - 219</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>220 - 229</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Below</th>
<th>Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

46

\[ r = .245 \pm .024 \]
CHAPTER V

SUMMARY OF FINDINGS

1. What are the errors that occur most frequently?

In grade four all the zero combinations rank highest in the percentage of errors. The combination 1 and 0 ranked the highest.

In grades five and six the combination 1 and 6 ranks the highest in percentage of error. The combination 3 and 3 ranks second in both these grades.

In grade four the zero group ranks the highest, the difficult group ranks second, the medium group third, and the easy group fourth.

In the fifth grade the difficult group ranks highest, the medium group second, the easy group third, and the zero group fourth. In grade six the rankings are the same.

2. How persistent are the errors within each grade?

In grade four the zero group showed a decided decrease in the percentage of error in each succeeding test. However, in the other groups we do not find this consistent decrease.

In grades five and six there appears to be no consistent decrease in the per cent of error in the respective groups.

With regard to the individual combinations in the
majority cases there is a gradual and consistent decrease in the per cent of error in each succeeding test, however; in some few cases there is an increase.

3. How persistent are errors within the three grades?

Of the 1431 errors committed by the 161 pupils in these three grades 546 were committed by the fourth grade, 693 by the fifth grade, and 292 by the sixth grade.

The fourth grade averaged 0.47 errors per pupil; the fifth grade 10.22 errors per pupil; and the sixth grade 6.40 errors per pupil.

4. Relation of errors to the amount of practice in each combination.

Since the combinations all occurred the same number of times in the course of practice this factor is negligible.

5. How do the errors distribute themselves with respect to the mental ages of the pupils tested?

Combining the three grades we find that 11.53% of the total errors committed fell above \( Q_3 \); 12.57% between \( Q_2 \) and \( Q_3 \); 30.46% between \( Q_1 \) and \( Q_2 \); 45.42% below \( Q_1 \).

The correlation between mental age and frequency of errors in the fourth grade is \(-.35 \pm .066\); in the fifth grade it is \(.185 \pm .0944\); and in the sixth grade \(.265 \pm .1024\).
BIBLIOGRAPHY


MONROE, W.S. : Educational Tests and Measurements.


OSBURN, W.J. : Corrective Arithmetic. Houghton Mifflin Co. 1924


WOOLY, Clifford : Types of Arithmetic Needed in Certain Types of Salesmanship. Elementary School Journal, 22:505-20, Mr'22

PROBLEMS IN THE TEACHING OF ARITHMETIC: A Syllabus for Discussion on Important Aspects of Elementary School Arithmetic. Iowa Supply Co., Iowa City.
### APPENDIX

#### WORK SHEET

<table>
<thead>
<tr>
<th>NO.</th>
<th>C.A</th>
<th>M.A</th>
<th>I.Q</th>
<th>Grade</th>
<th>NUM. ERRORS</th>
<th>TOTAL</th>
<th>PROB. not finished</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4th</td>
<td>1st Test</td>
<td>2nd Test</td>
<td>3rd Test</td>
</tr>
<tr>
<td>1</td>
<td>123</td>
<td>136</td>
<td>110</td>
<td>4th</td>
<td>11</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>119</td>
<td>165</td>
<td>138</td>
<td>&quot;</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>118</td>
<td>143</td>
<td>121</td>
<td>&quot;</td>
<td>8</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>117</td>
<td>112</td>
<td>95</td>
<td>&quot;</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>114</td>
<td>167</td>
<td>146</td>
<td>&quot;</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>121</td>
<td>132</td>
<td>109</td>
<td>&quot;</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>145</td>
<td>115</td>
<td>79</td>
<td>&quot;</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>131</td>
<td>137</td>
<td>104</td>
<td>&quot;</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>117</td>
<td>156</td>
<td>133</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>113</td>
<td>150</td>
<td>132</td>
<td>&quot;</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>117</td>
<td>151</td>
<td>112</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>132</td>
<td>114</td>
<td>86</td>
<td>&quot;</td>
<td>7</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>13</td>
<td>113</td>
<td>144</td>
<td>122</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>122</td>
<td>135</td>
<td>110</td>
<td>&quot;</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>114</td>
<td>132</td>
<td>119</td>
<td>&quot;</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>113</td>
<td>132</td>
<td>117</td>
<td>&quot;</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>129</td>
<td>129</td>
<td>100</td>
<td>&quot;</td>
<td>22</td>
<td>8</td>
<td>37</td>
</tr>
<tr>
<td>18</td>
<td>116</td>
<td>153</td>
<td>132</td>
<td>&quot;</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>135</td>
<td>153</td>
<td>113</td>
<td>&quot;</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>151</td>
<td>135</td>
<td>89</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>149</td>
<td>129</td>
<td>86</td>
<td>&quot;</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>155</td>
<td>102</td>
<td>66</td>
<td>&quot;</td>
<td>24</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>23</td>
<td>120</td>
<td>149</td>
<td>124</td>
<td>&quot;</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>115</td>
<td>120</td>
<td>104</td>
<td>&quot;</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>No.</td>
<td>C.A</td>
<td>M.A</td>
<td>I.Q</td>
<td>Grade</td>
<td>Number of Errors</td>
<td>Total Problems Not Finished</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-------</td>
<td>-----------------</td>
<td>-----------------------------</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>123</td>
<td>120</td>
<td>94</td>
<td>4th</td>
<td>6 1 0 2 9</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>166</td>
<td>132</td>
<td>79</td>
<td></td>
<td>2 0 0 1 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>131</td>
<td>110</td>
<td>84</td>
<td></td>
<td>2 0 1 0 3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>123</td>
<td>164</td>
<td>133</td>
<td></td>
<td>0 0 0 0 0</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>143</td>
<td>141</td>
<td>95</td>
<td></td>
<td>8 1 0 1 10</td>
<td>227</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>119</td>
<td>185</td>
<td>155</td>
<td></td>
<td>6 0 0 0 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>120</td>
<td>108</td>
<td>90</td>
<td></td>
<td>23 15 0 1 39</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>157</td>
<td>138</td>
<td>100</td>
<td></td>
<td>0 1 0 0 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>120</td>
<td>128</td>
<td>106</td>
<td></td>
<td>18 0 1 1 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>112</td>
<td>126</td>
<td>112</td>
<td></td>
<td>0 1 0 1 2</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>117</td>
<td>130</td>
<td>111</td>
<td></td>
<td>8 0 0 0 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>114</td>
<td>135</td>
<td>118</td>
<td></td>
<td>0 1 0 0 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>138</td>
<td>132</td>
<td>94</td>
<td></td>
<td>74 23 0 0 97</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>101</td>
<td>142</td>
<td>140</td>
<td></td>
<td>5 1 1 0 7</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>148</td>
<td>113</td>
<td>76</td>
<td></td>
<td>0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>116</td>
<td>186</td>
<td>160</td>
<td></td>
<td>5 0 0 0 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>111</td>
<td>154</td>
<td>138</td>
<td></td>
<td>14 3 0 1 18</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>122</td>
<td>159</td>
<td>130</td>
<td></td>
<td>1 0 0 0 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>124</td>
<td>122</td>
<td>98</td>
<td></td>
<td>1 0 1 0 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>118</td>
<td>158</td>
<td>133</td>
<td></td>
<td>0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>118</td>
<td>138</td>
<td>117</td>
<td></td>
<td>2 1 1 0 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>140</td>
<td>136</td>
<td>.97</td>
<td></td>
<td>4 2 0 0 6</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>132</td>
<td>132</td>
<td>100</td>
<td></td>
<td>1 0 0 0 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>110</td>
<td>124</td>
<td>112</td>
<td></td>
<td>5 4 0 1 10</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>C.A</td>
<td>M.A</td>
<td>I.Q</td>
<td>Grade</td>
<td>1st.</td>
<td>2nd.</td>
<td>3rd.</td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>49</td>
<td>134</td>
<td>114</td>
<td>85</td>
<td>4th</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>140</td>
<td>116</td>
<td>82</td>
<td></td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>51</td>
<td>157</td>
<td>100</td>
<td>64</td>
<td></td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>52</td>
<td>152</td>
<td>103</td>
<td>78</td>
<td></td>
<td>18</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>53</td>
<td>124</td>
<td>138</td>
<td>111</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>54</td>
<td>157</td>
<td>128</td>
<td>93</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>55</td>
<td>119</td>
<td>147</td>
<td>123</td>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>56</td>
<td>119</td>
<td>147</td>
<td>123</td>
<td></td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>57</td>
<td>127</td>
<td>123</td>
<td>96</td>
<td></td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>58</td>
<td>129</td>
<td>150</td>
<td>116</td>
<td>5th</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>59</td>
<td>125</td>
<td>139</td>
<td>111</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>60</td>
<td>156</td>
<td>197</td>
<td>144</td>
<td></td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>61</td>
<td>156</td>
<td>169</td>
<td>116</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>62</td>
<td>124</td>
<td>173</td>
<td>139</td>
<td></td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>63</td>
<td>143</td>
<td>148</td>
<td>103</td>
<td></td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>64</td>
<td>123</td>
<td>160</td>
<td>130</td>
<td></td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>65</td>
<td>137</td>
<td>154</td>
<td>112</td>
<td></td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>66</td>
<td>159</td>
<td>162</td>
<td>105</td>
<td></td>
<td>1</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>67</td>
<td>132</td>
<td>178</td>
<td>134</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>68</td>
<td>129</td>
<td>163</td>
<td>126</td>
<td></td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>69</td>
<td>150</td>
<td>165</td>
<td>126</td>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>70</td>
<td>129</td>
<td>149</td>
<td>115</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>71</td>
<td>128</td>
<td>153</td>
<td>103</td>
<td></td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>72</td>
<td>133</td>
<td>178</td>
<td>133</td>
<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
## Work Sheet

<table>
<thead>
<tr>
<th>NO.</th>
<th>C.A</th>
<th>M.A</th>
<th>I.Q</th>
<th>GRADE</th>
<th>NUMBER OF ERRORS</th>
<th>Total Problems Not Finished</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1st. Test</td>
<td>2nd. Test</td>
</tr>
<tr>
<td>43.</td>
<td>133</td>
<td>132</td>
<td>136</td>
<td>5th</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>74.</td>
<td>160</td>
<td>139</td>
<td>87</td>
<td>&quot;</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>75.</td>
<td>129</td>
<td>155</td>
<td>120</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>76.</td>
<td>141</td>
<td>151</td>
<td>107</td>
<td>&quot;</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>77.</td>
<td>156</td>
<td>161</td>
<td>116</td>
<td>&quot;</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>78.</td>
<td>136</td>
<td>167</td>
<td>122</td>
<td>&quot;</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>79.</td>
<td>148</td>
<td>131</td>
<td>88</td>
<td>&quot;</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>80.</td>
<td>125</td>
<td>160</td>
<td>123</td>
<td>&quot;</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>81.</td>
<td>123</td>
<td>126</td>
<td>102</td>
<td>&quot;</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>82.</td>
<td>125</td>
<td>175</td>
<td>140</td>
<td>&quot;</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>83.</td>
<td>155</td>
<td>156</td>
<td>87</td>
<td>&quot;</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>84.</td>
<td>156</td>
<td>128</td>
<td>82</td>
<td>&quot;</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>85.</td>
<td>151</td>
<td>121</td>
<td>80</td>
<td>&quot;</td>
<td>6</td>
<td>47</td>
</tr>
<tr>
<td>86.</td>
<td>132</td>
<td>191</td>
<td>144</td>
<td>&quot;</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>87.</td>
<td>139</td>
<td>175</td>
<td>125</td>
<td>&quot;</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>88.</td>
<td>160</td>
<td>153</td>
<td>95</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>89.</td>
<td>136</td>
<td>141</td>
<td>103</td>
<td>&quot;</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>90.</td>
<td>132</td>
<td>161</td>
<td>121</td>
<td>&quot;</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>91.</td>
<td>130</td>
<td>161</td>
<td>116</td>
<td>&quot;</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>92.</td>
<td>138</td>
<td>188</td>
<td>136</td>
<td>&quot;</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>93.</td>
<td>145</td>
<td>149</td>
<td>102</td>
<td>&quot;</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>94.</td>
<td>137</td>
<td>118</td>
<td>92</td>
<td>&quot;</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>95.</td>
<td>129</td>
<td>179</td>
<td>138</td>
<td>&quot;</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>96.</td>
<td>165</td>
<td>151</td>
<td>95</td>
<td>&quot;</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>NO.</td>
<td>C.A</td>
<td>M.A</td>
<td>I.Q</td>
<td>GRADE</td>
<td>NUMBER OF ERRORS</td>
<td>Total No. Problems Solved</td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1st. Test</td>
<td>2nd. Test</td>
</tr>
<tr>
<td>97.</td>
<td>129</td>
<td>173</td>
<td>134</td>
<td>5th</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>98.</td>
<td>132</td>
<td>155</td>
<td>102</td>
<td>&quot;</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>99.</td>
<td>143</td>
<td>142</td>
<td>96</td>
<td>&quot;</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>100.</td>
<td>170</td>
<td>147</td>
<td>66</td>
<td>&quot;</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>101.</td>
<td>131</td>
<td>163</td>
<td>124</td>
<td>&quot;</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>102.</td>
<td>154</td>
<td>178</td>
<td>115</td>
<td>&quot;</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>103.</td>
<td>166</td>
<td>131</td>
<td>76</td>
<td>&quot;</td>
<td>58</td>
<td>13</td>
</tr>
<tr>
<td>104.</td>
<td>131</td>
<td>153</td>
<td>116</td>
<td>&quot;</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>105.</td>
<td>140</td>
<td>149</td>
<td>106</td>
<td>&quot;</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>106.</td>
<td>129</td>
<td>166</td>
<td>123</td>
<td>&quot;</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>107.</td>
<td>141</td>
<td>198</td>
<td>140</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>108.</td>
<td>178</td>
<td>125</td>
<td>70</td>
<td>&quot;</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>109.</td>
<td>151</td>
<td>167</td>
<td>127</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>110.</td>
<td>125</td>
<td>153</td>
<td>122</td>
<td>&quot;</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>111.</td>
<td>126</td>
<td>175</td>
<td>138</td>
<td>&quot;</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>112.</td>
<td>126</td>
<td>143</td>
<td>113</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>113.</td>
<td>145</td>
<td>167</td>
<td>109</td>
<td>&quot;</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>114.</td>
<td>156</td>
<td>155</td>
<td>85</td>
<td>&quot;</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>115.</td>
<td>129</td>
<td>137</td>
<td>106</td>
<td>&quot;</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>116.</td>
<td>143</td>
<td>162</td>
<td>109</td>
<td>6th</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>117.</td>
<td>133</td>
<td>163</td>
<td>126</td>
<td>&quot;</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>118.</td>
<td>155</td>
<td>182</td>
<td>117</td>
<td>&quot;</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>119.</td>
<td>172</td>
<td>161</td>
<td>94</td>
<td>&quot;</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>120.</td>
<td>157</td>
<td>229</td>
<td>146</td>
<td>&quot;</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
## Work Sheet

<table>
<thead>
<tr>
<th>No.</th>
<th>C.A</th>
<th>M.A</th>
<th>I.Q</th>
<th>Grade</th>
<th>Number of Errors</th>
<th>Total Problems Not Finished</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6th</td>
<td>9th</td>
<td>11th</td>
<td>13th</td>
<td>1st Test</td>
<td>2nd Test</td>
</tr>
<tr>
<td>121</td>
<td>143</td>
<td>214</td>
<td>149</td>
<td>6th</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>122</td>
<td>137</td>
<td>203</td>
<td>148</td>
<td>9th</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>123</td>
<td>142</td>
<td>207</td>
<td>138</td>
<td>11th</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>124</td>
<td>160</td>
<td>173</td>
<td>111</td>
<td>13th</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>125</td>
<td>145</td>
<td>173</td>
<td>119</td>
<td>11th</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>126</td>
<td>157</td>
<td>140</td>
<td>139</td>
<td>9th</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>127</td>
<td>172</td>
<td>133</td>
<td>77</td>
<td>13th</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>128</td>
<td>145</td>
<td>191</td>
<td>131</td>
<td>13th</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>129</td>
<td>146</td>
<td>199</td>
<td>136</td>
<td>11th</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>130</td>
<td>152</td>
<td>182</td>
<td>119</td>
<td>11th</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>131</td>
<td>140</td>
<td>217</td>
<td>115</td>
<td>9th</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>132</td>
<td>139</td>
<td>211</td>
<td>151</td>
<td>13th</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>133</td>
<td>173</td>
<td>126</td>
<td>72</td>
<td>13th</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>134</td>
<td>151</td>
<td>201</td>
<td>133</td>
<td>11th</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>135</td>
<td>189</td>
<td>151</td>
<td>79</td>
<td>11th</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>136</td>
<td>153</td>
<td>153</td>
<td>100</td>
<td>11th</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>137</td>
<td>159</td>
<td>197</td>
<td>141</td>
<td>11th</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>138</td>
<td>170</td>
<td>140</td>
<td>82</td>
<td>11th</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>139</td>
<td>159</td>
<td>172</td>
<td>108</td>
<td>11th</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>140</td>
<td>167</td>
<td>155</td>
<td>92</td>
<td>11th</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>141</td>
<td>152</td>
<td>195</td>
<td>128</td>
<td>6th</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>142</td>
<td>162</td>
<td>155</td>
<td>96</td>
<td>6th</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>143</td>
<td>139</td>
<td>212</td>
<td>152</td>
<td>6th</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>144</td>
<td>140</td>
<td>162</td>
<td>115</td>
<td>6th</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>NO.</td>
<td>C.A</td>
<td>M.A</td>
<td>I.Q</td>
<td>GRADE</td>
<td>NUMBER OF ERRORS</td>
<td>TOTAL PROBLEMS NOT FINISHED</td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-------</td>
<td>------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1st. Test 2nd. Test 3rd. Test 4th. Test TOTAL</td>
<td></td>
</tr>
<tr>
<td>145</td>
<td>140</td>
<td>184</td>
<td>131</td>
<td>6th</td>
<td>0 0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>146</td>
<td>143</td>
<td>155</td>
<td>108</td>
<td>&quot;</td>
<td>1 1 6 4 12</td>
<td>4</td>
</tr>
<tr>
<td>147</td>
<td>161</td>
<td>149</td>
<td>92</td>
<td>&quot;</td>
<td>0 2 3 1 6</td>
<td>17</td>
</tr>
<tr>
<td>148</td>
<td>193</td>
<td>162</td>
<td>85</td>
<td>&quot;</td>
<td>9 9 15 6 39</td>
<td>102</td>
</tr>
<tr>
<td>149</td>
<td>137</td>
<td>186</td>
<td>135</td>
<td>&quot;</td>
<td>0 0 4 0 4</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>134</td>
<td>171</td>
<td>127</td>
<td>&quot;</td>
<td>0 1 1 0 2</td>
<td></td>
</tr>
<tr>
<td>151</td>
<td>146</td>
<td>209</td>
<td>143</td>
<td>&quot;</td>
<td>1 3 2 0 6</td>
<td>107</td>
</tr>
<tr>
<td>152</td>
<td>149</td>
<td>196</td>
<td>131</td>
<td>&quot;</td>
<td>0 1 5 4 10</td>
<td></td>
</tr>
<tr>
<td>153</td>
<td>165</td>
<td>162</td>
<td>98</td>
<td>&quot;</td>
<td>2 2 1 0 5</td>
<td>111</td>
</tr>
<tr>
<td>154</td>
<td>147</td>
<td>171</td>
<td>115</td>
<td>&quot;</td>
<td>0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>143</td>
<td>212</td>
<td>143</td>
<td>&quot;</td>
<td>1 0 0 2 3</td>
<td></td>
</tr>
<tr>
<td>156</td>
<td>156</td>
<td>196</td>
<td>144</td>
<td>&quot;</td>
<td>1 1 0 0 2</td>
<td></td>
</tr>
<tr>
<td>157</td>
<td>144</td>
<td>197</td>
<td>136</td>
<td>&quot;</td>
<td>2 2 1 1 6</td>
<td>8</td>
</tr>
<tr>
<td>158</td>
<td>135</td>
<td>142</td>
<td>76</td>
<td>&quot;</td>
<td>0 0 3 1 4</td>
<td></td>
</tr>
<tr>
<td>159</td>
<td>166</td>
<td>150</td>
<td>90</td>
<td>&quot;</td>
<td>0 1 1 1 3</td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>158</td>
<td>176</td>
<td>111</td>
<td>&quot;</td>
<td>0 0 3 0 3</td>
<td></td>
</tr>
<tr>
<td>161</td>
<td>139</td>
<td>163</td>
<td>117</td>
<td>&quot;</td>
<td>0 2 2 0 4</td>
<td>9</td>
</tr>
</tbody>
</table>
Score sheet for scoring errors in the fourth grade

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1</td>
<td>16</td>
<td>10</td>
<td>15</td>
<td>13</td>
<td>16</td>
<td>12</td>
<td>14</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>3</td>
<td>3</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td>1</td>
<td></td>
<td>2</td>
<td>1</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4th</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Score sheet for scoring errors in the fifth grade

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Score sheet for scoring errors in the sixth grade

<table>
<thead>
<tr>
<th></th>
<th>-0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1st</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 1st</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 1st</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>2</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 1st</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td>1</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TEST, PART I

<table>
<thead>
<tr>
<th>Name</th>
<th>Grade</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADD:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | | | | | | | | | | | | | | | | | | |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4 | 0 | 1 | 1 | 2 | 3 | 5 | 0 | 1 | 1 | 2 | 7 | 5 | 5 | 2 | 5 |
| 3 | 4 | 7 | 1 | 9 | 5 | 0 | 1 | 2 | 4 | 2 |   |   |   |   |   |   |   |   |   |   |
| 4 | 0 | 1 | 1 | 6 | 3 | 0 | 7 | 8 | 6 | 7 |   |   |   |   |   |   |   |   |   |   |
| 1 | 4 | 6 | 1 | 4 | 3 | 0 | 3 | 8 | 2 | 7 |   |   |   |   |   |   |   |   |   |   |
| 4 | 0 | 9 | 8 | 6 | 2 | 4 | 4 | 2 | 6 | 3 |   |   |   |   |   |   |   |   |   |   |
| 9 | 9 | 2 | 6 | 6 | 0 | 8 | 4 | 5 |   |   |   |   |   |   |   |   |   |   |   |   |
| 3 | 2 | 1 | 5 | 9 | 5 | 7 | 2 | 6 | 3 | 8 |   |   |   |   |   |   |   |   |   |   |
| 7 | 5 | 0 | 3 | 9 | 6 | 2 | 8 | 6 | 5 | 4 |   |   |   |   |   |   |   |   |   |   |
| 0 | 2 | 5 | 7 | 8 | 3 | 4 | 3 | 3 | 7 | 5 |   |   |   |   |   |   |   |   |   |   |
| 8 | 7 | 2 | 7 | 8 | 0 | 6 | 6 | 9 | 8 | 0 |   |   |   |   |   |   |   |   |   |   |
| 6 | 2 | 5 | 3 | 4 | 5 | 0 | 9 | 6 | 5 | 6 |   |   |   |   |   |   |   |   |   |   |
| 7 | 9 | 3 | 9 | 7 | 7 | 9 | 8 | 3 | 8 |   |   |   |   |   |   |   |   |   |   |
| 0 | 6 | 4 | 9 | 7 | 8 | 8 | 8 | 7 | 7 | 0 |   |   |   |   |   |   |   |   |   |
| 0 | 3 | 7 | 8 | 6 | 9 | 0 | 5 | 9 | 5 | 6 |   |   |   |   |   |   |   |   |   |
| 9 | 8 | 9 | 0 | 9 | 3 | 9 | 8 | 9 | 9 | 7 |   |   |   |   |   |   |   |   |   |
| 2 | 6 | 4 | 5 | 5 | 3 | 0 | 7 | 3 | 6 | 4 |   |   |   |   |   |   |   |   |   |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Grade</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>19</td>
<td>28</td>
<td>97</td>
</tr>
<tr>
<td>65</td>
<td>74</td>
<td>88</td>
</tr>
<tr>
<td>66</td>
<td>22</td>
<td>81</td>
</tr>
<tr>
<td>66</td>
<td>97</td>
<td>08</td>
</tr>
<tr>
<td>71</td>
<td>71</td>
<td>00</td>
</tr>
<tr>
<td>60</td>
<td>31</td>
<td>73</td>
</tr>
<tr>
<td>61</td>
<td>95</td>
<td>50</td>
</tr>
<tr>
<td>45</td>
<td>90</td>
<td>40</td>
</tr>
<tr>
<td>44</td>
<td>41</td>
<td>43</td>
</tr>
<tr>
<td>32</td>
<td>65</td>
<td>84</td>
</tr>
<tr>
<td>74</td>
<td>95</td>
<td>21</td>
</tr>
</tbody>
</table>

20
66