1984

A handbook of mathematic games for secondary teachers

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A HANDBOOK OF MATHEMATIC GAMES FOR SECONDARY TEACHERS

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This project is dedicated to my wife Kathy A. Zdilor whose support and inspiration is deeply appreciated.

SUMMARY

The mathematics program in most secondary classrooms is textbook oriented, primarily concerned with the manipulation of symbols as opposed to dealing with concrete objects. Manipulative materials, when properly chosen, promote thorough understanding of mathematical concepts and provide substantial motivation for the student.

The names of Dienes and Bruner are included in numerous articles on the use of games and manipulative material in teaching mathematics. They all strongly agree that students need physical involvement in a learning situation. I concur adamantly with their thoughts on the physical involvement of the child in the mathematics program in the classroom.

I personally feel the involvement of the teacher is primarily the responsibility of the classroom teacher. Without total involvement, few students discover the true excitement of mathematics.

In order to encourage the involvement of the learning of mathematics in the classroom, I have compiled a handbook of card games that can be easily made by the classroom teacher. I have placed emphasis on games that will strengthen the concepts I have found to be particularly difficult for junior high students to grasp.

The simplicity of the games and the low cost of materials are especially beneficial to any teacher and district.

This handbook will be useful to the classroom teacher who wishes to provide an environment in which all students are motivated to feel successful and enjoy learning mathematics.

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INTRODUCTION

The mathematics curriculum being taught in most secondary classrooms is textbook dominated. The emphasis is mainly concerned with manipulation of symbols rather than concrete objects. The state-adopted text has a place in the secondary classroom, but should be supplemented with games and activities that motivate students. The games should offer choice and variety to accommodate differences in abilities and interests. The "Purple Plague" of endless repetition of dittos can generate a lack of interest as well as failing to develop understanding in most students. Any type of manipulative material, when properly chosen, promotes thorough understanding of the concepts and provide motivation for the student.

Discarding the state-adopted textbook and emphasizing all instruction around games is not the correct solution either. There would probably be little or no consistency from one teacher to another, placing the burden on the student who tranfers between schools. It is possible to develop games in such a way that they could be implemented in the regular instruction without any problems arising.

This project focuses around using math games and activities that are useful to secondary teachers who wish to provide an environment in which all students are motivated to feel successful and enjoy learning mathematics.

REVIEW OF THE LITERATURE

The mathematics program in most secondary classrooms is textbook dominated, concerned with manipulation of symbols rather than concrete objects. The state-adopted workbook has a place in the secondary classroom but should be supplemented with games and activity that are fun for children and offer choice and variety, to accommodate differences in abilities, learning styles and interest. A never-ending series of worksheets can generate a lack of interest as well as failing to develop understanding in most children. Manipulative materials, when properly chosen, promote thorough understanding of concepts and provide motivation for the students. The following content is a review of literature which supports the idea of manipulative material, games and labs which indicate positive reinforcement when used in the classroom.

Klein and Schnell[18] are concerned with concept formation in the teaching of mathematics rather than memorization of fact. They feel that this can be accomplished of many experiences of manipulative materials, Schwebel[19] believes that learning is dependent on the development of the student since only certain things can be learned at a specific stage of development.

Flener[5] states in his article, "Are Concrete Activities the 'Most Basic' Elements in a Mathematics Program?",

states that "new math is out" and "basic math is in." He also states that among many mathematics educators, a balanced approach to conceptual understanding and symbolic manipulation has gained support.

In the book, Let's Play Math, Holt and Dienes[11] assert that the open-minded attitude encouraged by games, develops a student's potential for clear thinking.

Post[17] calls for a meaningful and vibrant mathematics program. He refers to the work of Dienes in stressing the importance of learning mathematics by direct interaction with the environment. He recommends that students have many experiences at the concrete-manipulative level before they work with symbols exclusively. Sowell[21] agrees that a wide range of concrete experiences should come first and believes that students will then move more easily toward abstractions. According to Sowell, they should participate in concrete, concrete-abstract, and pictorial-abstract experiences prior to purely abstract experiences.

Humphrey[12] generalizes that students tend to learn certain academic skills and concepts better through manipulative materials. He refers to such subjects as reading, language, science and mathematics.

In his article, "The Relative Effectiveness of Concrete Aids in Discovery Learning", Kuhfittig[14] suggests combining the two teaching processes that are currently

receiving attention: that of discovery learning and the use of instructional materials. He states that manipulative devices are an appropriate vehicle for students who are making discoveries on their own. Kuhfittig concludes that the low ability student benefits even more from aids in mastering abstract skills.

In Drill and Practice at the Problem Solving Level, Wirtz[22] expresses a desire to help stimulate a movement toward change in the curriculum. He would like to have students develop a better understanding to problem solving. His prime concern is the development of a positive attitude toward mathematics. May[16] believes that the textbook is the primary teaching tool in mathematics, but agrees that it is necessary to enhance the program. She describes many tools that can be used to make learning more exciting. She feels that students will not be "turned off" to mathematics if the teacher creates some action in the classroom.

Giambrone[8] sees games as a nice way for students to get much needed practice, and a more pleasant way to learn.

Kerr[13] tells us that it is important to have fun and that games can be used to make mathematics more enjoyable. He emphasizes that care must be used in selecting aids so that the game actually complements the regular lesson and justifies the time. Hoffman[10] concurs with Kerr, stating that games used to reinforce math skills should be chosen

very carefully. She suggests that the game be keyed to the objectives and that they be introduced with as much care as any other component of the lesson.

Gellis[7] is a very enthusiastic supporter of the idea that mathematics can be fun. In her article, she discusses one of the activities she utilizes to relieve the boredom of drill. Many other articles by this author have proved helpful. Chilcote, Blaine, and Nason[2] also emphasize mathematics as a fun as well as practical skill, and believe teachers should relate math skills to the student's world. They state that a wide variety of interesting activities will really make mathematics a pleasant time.

Bitter and Mikesell[1] report how one school district established a mathematics laboratory to make concrete math materials available to their teachers. The math lab houses commercial materials that can be borrowed by the teachers as well as a workshop where teachers can come to develop their own instructional aids. All materials are available at no charge.

Denman[3] discusses accountability in the use of mathematics games. She asserts that after teachers obtain the materials and learn how to use them, they must also know why the games are being used. Ensminger[4] feels that there is a potential problem when games are used as appraisal tools. While commercial and teacher-made games can motivate,

teach, reinforce, and appraise if designed and used carefully, "the quickest way to take away from the fun is to let it be known that, by any other name, a test is still a test." She recommends using games as informal self-appraisals, but does not recommend that a teacher use them for appraisal, as it is self-defeating.

Frehmeyer[6] discusses the fact that many teachers found the "new math" very frustrating and are just now beginning to relax and enjoy mathematics again. She states that almost every math consultant that she shared ideas with stressed the importance of a positive attitude on the part of the teacher and that this could be improved by the increased use of games, puzzles, and manipulatives.

Frederick L. Goodman and Layman E. Allen[15] share similar viewpoints about the importance of games in the classroom. Through games, a child assumes an active role, and discovers for himself. They feel games also have a useful role in mathematics in that they develop positive attitudes toward subject matter, and they build a learner's self-esteem by encouraging an "I can do it" attitude. Raymond Glazier[9] feels that although there is quite a bit of impressionistic, anecdotal study, there is virtually no organized systematic study. In research that he conducted, Glazier found that significant learning had occurred through the use of games, even though basic material had been

covered using traditional methods. Research on educational games seem to be at a loss. Very little information on educational gaming was found in a perusal of ERIC from 1971-1980. Roger Smith[20] states that "Less material has been written on the subject of game evaluation than any other aspect of gaming. The success of individual game to date has been of an erratic nature. This is partially due to a lack of concrete evaluation criteria. There are several questions which should be asked about a game which might provide some measure of its success. First, how does the game represent the subject portrayed? Second, does the game represent the subject portrayed? Are students able to comprehend the game operation? Is the game playable? What is the extent of competition and participation?" Although evaluation of education games is meager, interest in the classroom seems to be high. Allen and Main, in their studies, found that the mean absentee rate in classes employing instructional gaming in a tournament structure was significantly less than the corresponding rate in control classes.[15]

It appears evident that researchers and studies have concluded that utilization of games in classrooms enhances the total mathematics program. It provides students with a chance to participate, compete and the end results are remarkably successful. By employing instructional math

games in classrooms, studies indicate that absentees are marginally lower than without.

STATEMENT OF OBJECTIVES AND PROCEDURE

The purpose of this project is to provide a handbook of math card games which are an alternate activity from textbooks and worksheets that are designed to help secondary students master computational skills in math. A further purpose is to encourage teachers to supplement their teaching strategies with mathematic games. Thirdly, the materials for this math card games are simple to use and very inexpensive.

The games provided will reinforce many skills recommended by the Math Foundations Skills Program developed by teachers in the Rialto Unified School District. Detailed instructions on how to play the games, concepts and examples will be provided. Each game will be coded with the appropriate unit in the Math Foundation Skills Program. Math skills reinforced in game format include:

1. Introduction to whole numbers
2. Addition of whole numbers
3. Subtraction of whole numbers
4. Multiplication of whole numbers
5. Division of whole numbers
6. Introduction of fractions
7. Multiplication and division of fractions
8. Addition and subtraction of fractions
9. Working with fractions

10. Introduction to decimals

11. Addition and subtraction of decimals

12. Multiplication and division of decimals

13. Percents

14. Integers

15. Square Root

The above games will provide alternative approaches to encourage mastery of math concepts, problem solving and enjoyment.

Below is a sample of the format used for each of the games. The directions are designed for both teacher and secondary student to easily follow.

Name of Game

Math Skill Unit _____

Topic:

Set Up:

Players:

How to Play:

Scoring:

Winner:

Example:

LIMITATIONS

The limitations that are immediately apparent are those of grade level and time. In the secondary classroom, these games may be used the first ten to twenty minutes of a fifty-minute period.

This project is primarily designed to meet the needs of the Math Foundations Skills Program developed in the Rialto Unified School District, its usefulness will be primarily for junior high teachers with similar mathematical goals. However, teachers at the elementary and senior high school level can use these games to reinforce basic math skills.

Another limitation is the reading level of the studdents. The students using these games must be able to read directions, however they can be taught by the teacher.

STATEMENT TO THE TEACHER

All of the games are recommended for 3 to 5 players. The dealer is determined by drawing a card. The player with the highest card goes first. In case of a tie for the highest number, those two players draw again. If you run out of cards before the game ends, reshuffle and continue playing.

Two games, Round It Whole Numbers and Round It Decimals, need a pair of dice in order to play the game.

A HANDBOOK OF MATHEMATIC GAMES FOR SECONDARY TEACHERS

READ IT

Math Skill Unit I-H-3

Topic: Read large whole numbers

Set Up: Face cards and tens are zero.
Aces are one.

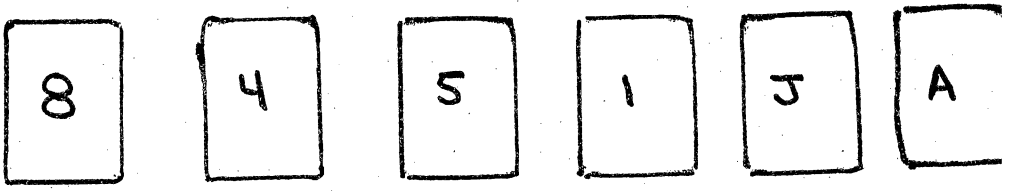
Players 3 to 5 per group

How to Play: First player tells dealer how many cards to deal (3 to 10). Cards are laid face up and the students read the number.

Scoring: If a student reads the number correctly, points are earned for each card used. (4 cards dealt, if read correctly, equals 4 points.) Total the points from each round.

Winner: Highest score after 10-20 minutes.

Example:



845,101

Would be read as eight hundred forty-five thousand one hundred one.

WRITE IT

Math Skill Unit I-H-3

Topic: Write large whole numbers

Set up: Face cards and tens are zero.

Aces are one.

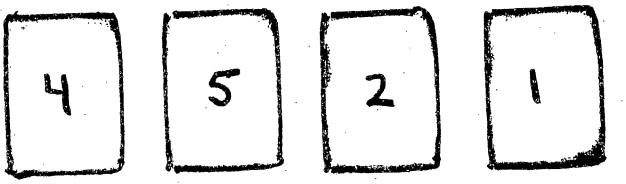
Players: 3 to 5 per group

How to Play: First player tells dealer how many cards to deal (3 to 10). Cards are laid face up and the students write the number on paper.

Scoring: If a student writes the number correctly, points are earned for each card used. (4 cards dealt, if correctly equals 4 points.) Total the points from each round.

Winner: Highest score after 10-20 minutes.

Example:



Would be written four thousand five hundred twenty-one.

PLACE IT

Math Skill Unit I-H-3

Topic: Identify place value

Set up: Face cards like all other cards are place holders.

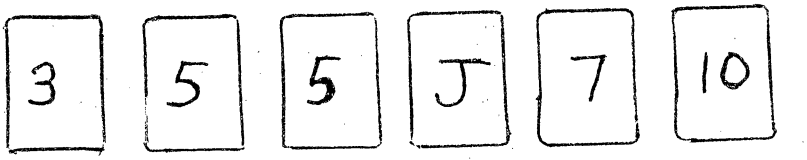
Players: 3 to 5 per group

How to Play: First player is dealt seven cards face up. From left to right locate the first face card (10's included) or highest card if no face cards. Identify this place.

Scoring: If student identifies the place value correctly, points are earned for that place. (4th place is thousands, so 1000 points earned.) Total the parts from each round.

Winner: Highest score after 10-20 minutes.

Example:



First face card from left to right is the jack. It is in the hundred's place so one hundred points earned.

EXPAND IT

Math Skill Unit I-H-3

Topic: Write numbers in expanded notation

Set up: Face cards and tens are zero.

Aces are one.

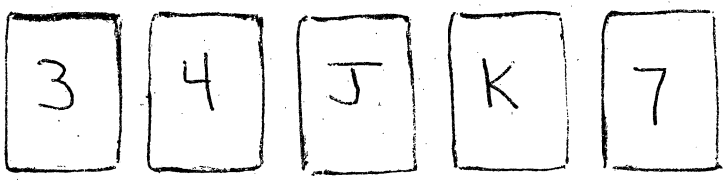
Players: 3 to 5 per group

How to Play: First player tells dealer how many cards to deal (3 to 10). Cards are laid face up and the player writes the expanded notation of the number represented by the cards.

Scoring: If a student writes the number in expanded form correctly, points are earned for each card used. (4 cards dealt, if expanded correctly, equals 4 points.) Total the points from each round.

Winner: Highest score after 10-20 minutes.

Example:



(3 x 10,000) + (4 x 1,000) + (7 x 1)

5 cards = 5 points

ROUND IT

Math Skill Unit I-H-3

Topic: Rounding whole numbers to nearest selected place

Set up: Face cards and tens are zero. Aces are one. One pair of dice.

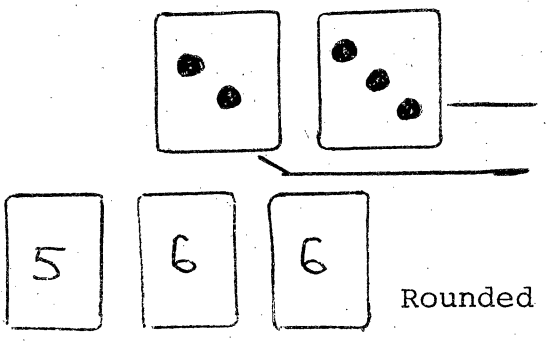
Players: 3 to 5 per group

How to Play: First player rolls dice. The larger number is the amount of cards dealt and the smaller number is the number of places from the right to round off. Cards are dealt face up.

Scoring: If a student rounds correctly, the rounded number is the amount of points earned. Total the points from each round.

Winner: Highest score after 10-20 minutes.

Example



Rounded to 570

570 points earned.

ADD IT

Math Skill Unit III-H-8

Topic: Add whole numbers

Set up: Face cards and tens are zero.

Aces are one.

Players: 3 to 5 per group

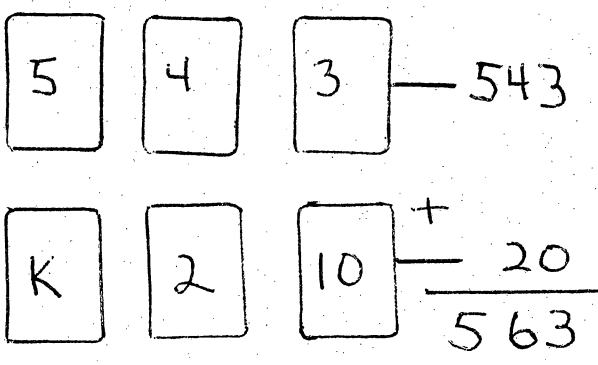
How to Play: Deal six cards to each player in two groups of three. Each student then adds their two three digit number together. Cards are then set aside and six more cards are dealt in two groups of three and totaled.

Scoring: The total of the first hand is added to the total of the second hand.

The total is the amount of points earned.

Winner: Highest score after 10-20 minutes.

Example:



SUBTRACT IT

Math Skill Unit III-H-10

Topic: Subtract whole numbers

Set up: Face cards and tens are zero.

Aces are one.

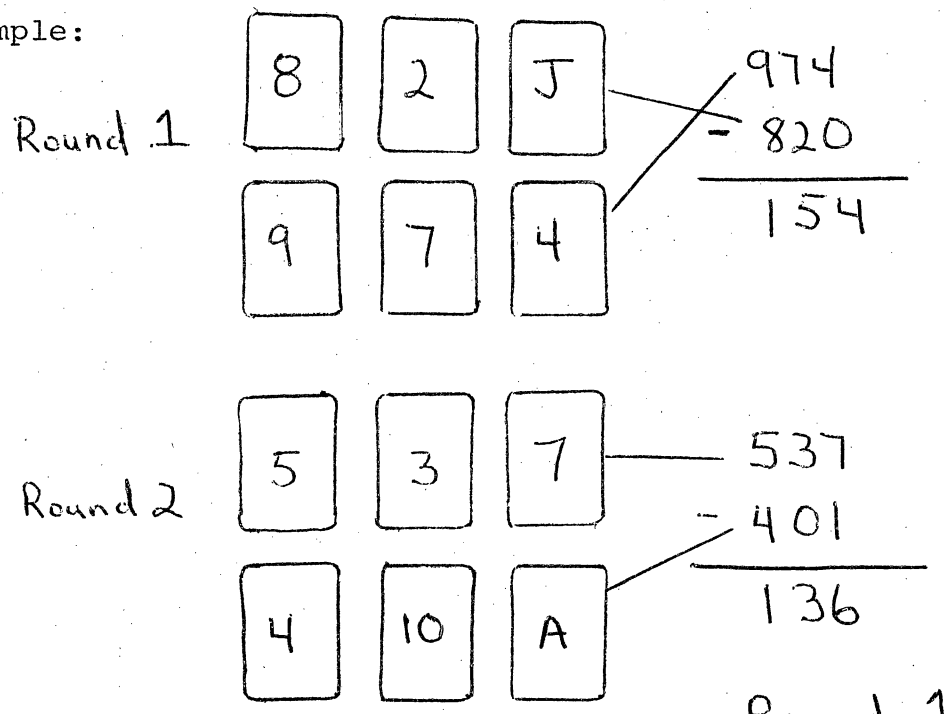
Players: 3 to 5 per group

How to Play: Same as add it but subtract the smaller three digit number from the larger.

Scoring: Subtract the differences from each round of play. This difference is your points.

Winner: After 10-20 minutes, the person with the lowest score wins.

Example:



MULTIPLY IT

Math Skills Unit III-H-12

Topic: Multiply Whole Numbers

Set up: Face cards and tens are zero.

Aces are one.

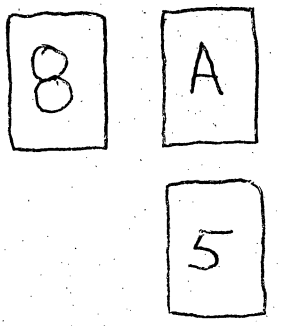
Players: 3 to 5 per group

How to Play: Deal out two digit multiplicand and a one digit multiplier. Find the product. Set cards aside and deal a second round and so on.

Scoring: Total the products together from each round. The total is points earned.

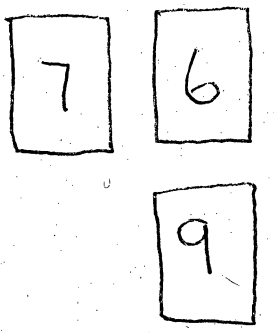
Winner: Highest score after 10-20 minutes.

Example:



Round 1

$$\begin{array}{r} 81 \\ \times\ 5 \\ \hline 405 \end{array}$$



Round 2

$$\begin{array}{r} 76 \\ \times\ 9 \\ \hline 684 \end{array}$$

Round 1 405
Round 2 + 684
1,089 Total

DIVIDE IT

Math Skills Unit III-H-14

Topic:	Divide whole numbers
Set up:	Remove face cards and tens. Aces are one.
Players:	3 to 5 per group
How to Play:	First player is dealt two cards for the dividend and one card for the divisor. The quotient is found and is rounded to nearest one.
Scoring:	The rounded quotient is equivalent to the points earned. Continue adding the quotient from each round.
Winner:	Highest score after 10-20 minutes.

Examples:

Round 1 [7] [2] [4]

$$7\overline{)24} \quad 3\,3/7 = 3 \text{ pts.}$$
$$21$$
$$3$$

Round 2 [3] [5] [6]

$$3\overline{)56} \quad 18\,2/3 = 19 \text{ pts.}$$
$$3$$
$$26$$
$$24$$
$$2$$

Round 1 3 pts.
Round 2 19 pts.
22 total

CHANGE IT

Math Skills Unit IV-H-24

Topic: Change improper fractions to mixed or whole numbers

Set up: Remove face cards and aces.

Tens are ten.

Players: 3 to 5 per group

How to Play: Deal two cards to each player. The larger card is the numerator and the smaller card is the denominator. Each player changes their improper fraction to a mixed or whole number and simplify if possible. Those cards are set aside and two more cards are dealt.

Scoring: After each round, players earn points equal to the whole number of their mixed or whole number obtained.

Winner: Highest score after 10-20 minutes.

Example:

$\frac{7}{5} = 1\frac{2}{5}$ 1 point

Player 1

$\frac{9}{3} = 3$ 3 points

Player 2

CHANGE IT X

Math Skills Unit IV-H-19

Topic: Change improper fractions and multiplication of fractions

Set-up: Remove face cards, aces and seven are optional. Tens are ten.

Players: 3 to 5 per group

How to Play: Same as CHANGE IT. Scoring is different.

Scoring: After the first two rounds, players earn point for the product of their two changed fraction.

Winner: Highest score after 10-20 minutes.

Example:

	Player 1	Player 2
Round 1	$\frac{6}{3} = \frac{6}{3} = 2$	$\frac{8}{5} = \frac{8}{5} = 1\frac{3}{5}$
Round 2	$\frac{8}{6} = \frac{8}{6} = 1\frac{1}{3}$	$\frac{10}{3} = \frac{10}{3} = 3\frac{1}{3}$

Scoring

$2 \times 1\frac{1}{3}$

$2 \times \frac{4}{3} = \frac{8}{3} = 2\frac{2}{3}$ pts.

$1\frac{3}{5} \times 3\frac{1}{3}$

$\frac{8}{5} \times \frac{16}{3} = \frac{16}{3} = 5\frac{1}{3}$ pts.

CHANGE IT $\frac{\circ}{\circ}$

Math Skills Unit IV-H-20

Topic:	Change Improper Fractions and Division of Fractions
Set up:	Same as CHANGE IT X but scoring is different.
Players:	3 to 5 per group
How to Play:	Same as CHANGE IT X but scoring is different.
Scoring:	After the first two rounds, players earn points for Quotient of the two changed fractions.
Winner:	Highest score after 10-20 minutes
Example:	Player 1

Round 1 $\frac{6}{3} = 2$

Round 2 $\frac{8}{6} = 1\frac{1}{3}$

Score $2 \div 1\frac{1}{3}$

$2 \div \frac{4}{3}$

$\frac{2}{1} \times \frac{3}{4} = \frac{6}{4} = 1\frac{1}{2}$

CHANGE IT +

Math Skills Unit IV-H-17

Topic: Change Improper Fractions and Addition of Fractions

Set up: Same as CHANGE IT X

Players: 3 to 5 per group

How to Play: Same as CHANGE IT X but scoring is different.

Scoring: After the first two rounds, players earn points for the sum of their two changed fractions.

Winner: Highest score after 10-20 minutes.

Example: Player 1

Round 1 $\frac{6}{3} = 2$

Round 2 $\frac{8}{6} = 1\frac{1}{3}$

Score $2 + 1\frac{1}{3} = 3\frac{1}{3}$

CHANGE IT -

Math Skills Unit IV-H-18

Topic: Change Improper Fractions and Subtraction of Fractions

Set up: Same as CHANGE IT X

Players: 3 to 5 per group

How to Play: Same as CHANGE IT X but scoring is different.

Scoring: After the first two rounds, players earn points for the difference of their two changed fractions.

Winner: Lowest score after 10-20 minutes.

Example: Player 1

Round 1 $\frac{6}{3} = \frac{6}{3} = 2$

Round 2 $\frac{8}{6} = \frac{8}{6} = 1\frac{1}{3}$

Score $2 - 1\frac{1}{3} = \frac{2}{3}$

READ IT DECIMALS

Math Skills Unit IV-H-25

Topic: Read Decimals

Set up: Face cards and tens are zero.

Aces are one.

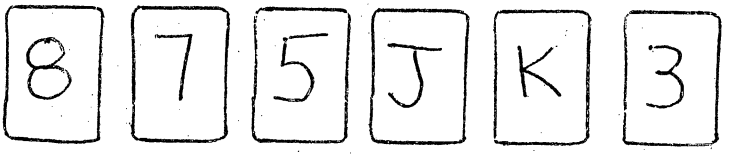
Players: 3 to 5 per group

How to Play: Same as READ IT WHOLE NUMBERS except from left to right first face card or ten is a decimal point.

Scoring: Same as READ IT WHOLE NUMBERS.

Winner: Highest score after 10-20 minutes

Example:



875.03

Would be read as eight hundred seventy-five and three hundreths.

WRITE IT DECIMALS

Math Skills Unit IV-H-25

Topic: Write Decimals

Set up: Face cards and tens are zero.

Aces are one.

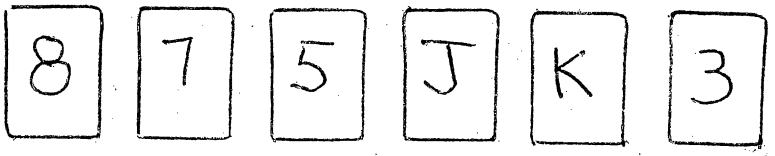
Players: 3 to 5 per group

How to Play: Same as WRITE IT WHOLE NUMBERS except left to right first face card or ten is a decimal point.

Scoring: Same as WRITE IT WHOLE NUMBERS

Winner: Highest score after 10-20 minutes.

Example:



875.03

Would be written eight hundred seventy-five and three hundredths.

PLACE IT DECIMAL

Math Skills Unit IV-H-25

Topic: Identify Place Value

Set up: Face cards like all other cards are place holders.

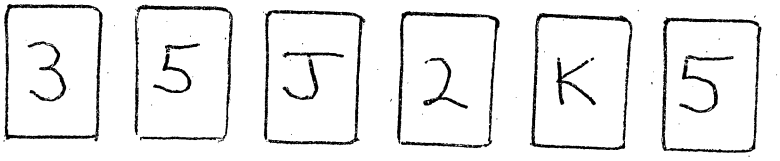
Players: 3 to 5 per group

How to Play: Same as PLACE IT WHOLE NUMBERS except from left to right first face card is a decimal point. Second face card must identify this place.

Scoring: Same as PLACE IT WHOLE NUMBERS.

Winner: Highest score after 10-20 minutes.

Example:



Second face card is in hundredth's place so one hundred points earned.

ROUND IT DECIMALS

Math Skills Unit IV-H-25

Topic: Round Decimals to nearest selected place

Set up: Face cards and tens are zero.

Aces are one.

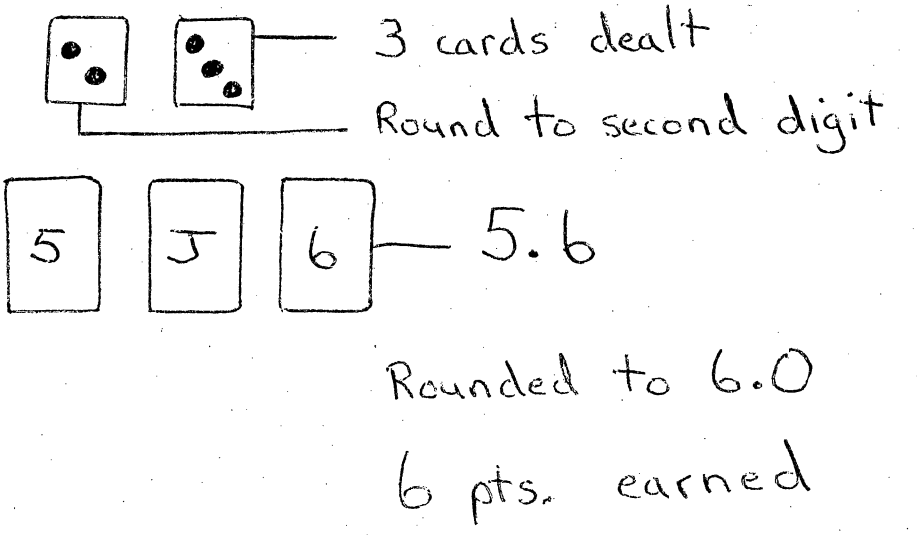
Players: 3 to 5 per group

How to Play: Same as ROUND IT WHOLE NUMBERS except from left to right first face card is a decimal point.

Scoring: Same as ROUND IT WHOLE NUMBERS.

Winner: Highest score after 10-20 minutes.

Example:

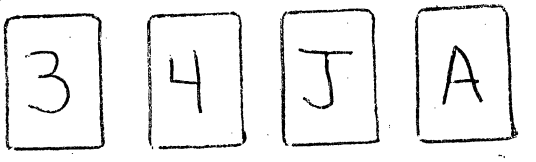


EXPAND IT DECIMALS

Math Skill Unit IV-H-25

Topic:	Write Decimal Numbers in expanded notation
Set up:	Face cards and tens are zero. Aces are one.
Players:	3 to 5 per group
How to Play:	Same as EXPAND IT WHOLE NUMBER, except from left to right first face card is a decimal point.
Scoring:	Same as EXPAND IT WHOLE NUMBERS.
Winner:	Highest score after 10-20 minutes.

Example



$(3 \times 10) + (3 \times 1) + (1 \times .1)$

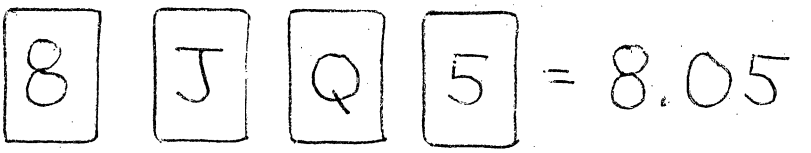
4 cards = 4 pts.

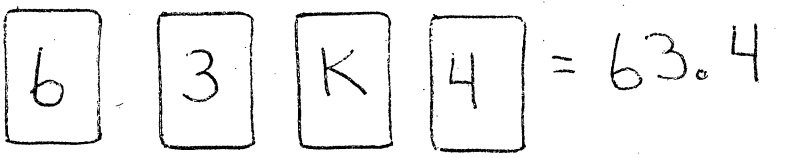
ADD IT DECIMALS

Math Skills Unit IV-H-26

Topic:	Add decimals
Set up:	Face cards and tens are zero. Aces are one.
Players:	3 to 5 per group
How to Play:	Deal two groups of four cards to each player. From left to right first face card is decimal point. Players write down both numbers and add them together. Cards are set aside and another two groups of four cards is dealt.
Scoring:	The sum on the two groups is the points earned. Continue adding the sums of each round together.
Winner:	Highest score after 10-20 minutes.

Example:





8.05
+ 63.4
71.45 points

SUBTRACT IT DECIMALS

Math Skills Unit IV-H-27

Topic: Subtract decimals

Set up: Face cards and tens are zero.

Aces are one.

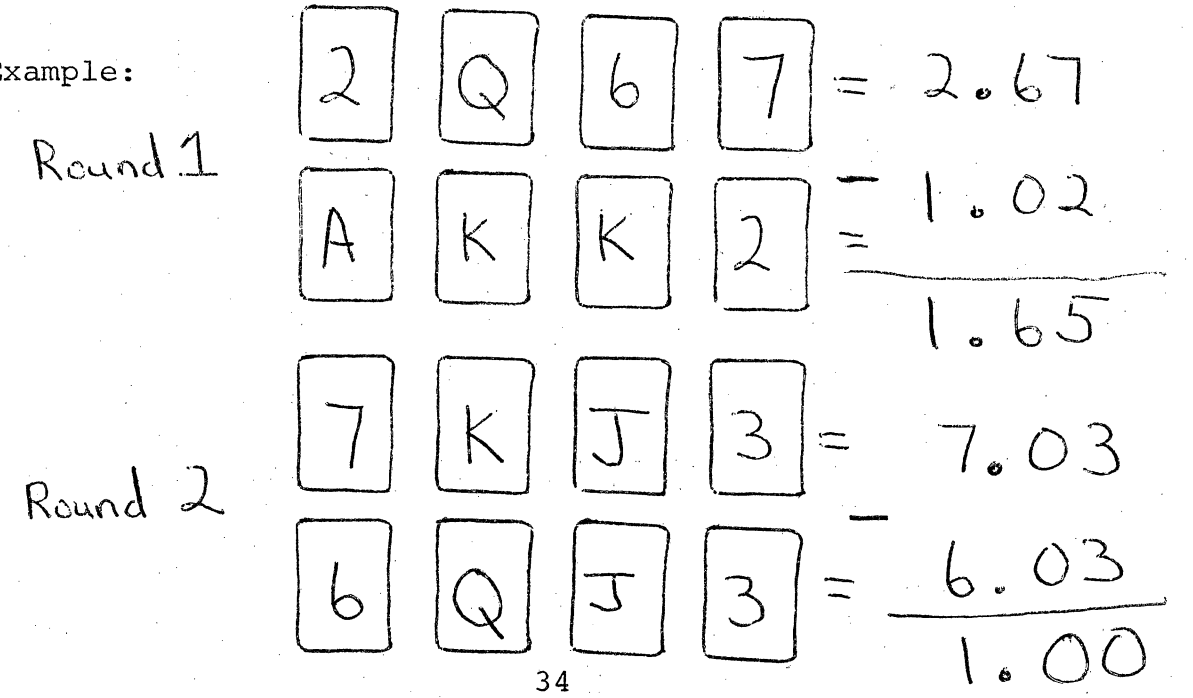
Players: 3 to 5 per group

How to Play: Deal two groups of four cards to each player. The larger number is the minuend (top number) and smaller number is the subtrahend (bottom number). From left to right first face card is decimal point.

Scoring: Subtract the difference from each round of play. This difference is your points.

Winner: After 10-20 minutes, the person with the lowest score wins.

Example:



Score 1.65
- 1.00

MULTIPLY IT DECIMALS

Math Skills Unit IV-H-28

Topic: Multiplication of decimals

Set up: Face cards and tens are zero.

Aces are one.

Players: 3 to 5 per group

How to Play: Deal two groups of three cards to each player. From left to right, the first face card is a decimal point. Players write down both numbers and multiply these together.

Scoring: After each round, total the score together.

Winner: Highest score after 10-20 minutes.

Example:

Round 1

5 K A = 5.1

7 2 J = × 72.

367.2

Round 2

9 J 3 = 9.3

10 5 7 = × .57

5.301

Score 367.2

+ 5.301

372.501 pts.

DIVIDE IT DECIMALS

Math Skills Unit IV-H-29

Topic: Division of decimals

Set up: Face cards and tens are zero.

Aces are one.

Players: 3 to 5 per group

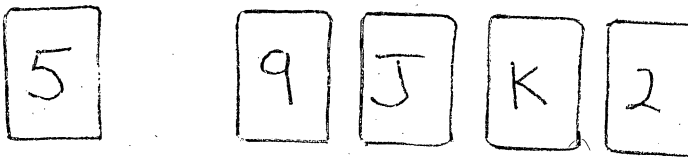
How to Play: Each player is dealt one card, the divisor. (If it is a face card or ten, put it back and deal another card), and four cards for the dividend. From left to right, the first face card is the decimal. Divide. Round quotients to hundredths place. Keep quotients.

Scoring: The sum of the quotients for each round is the points earned.

Winner: Highest score after 10-20 minutes.

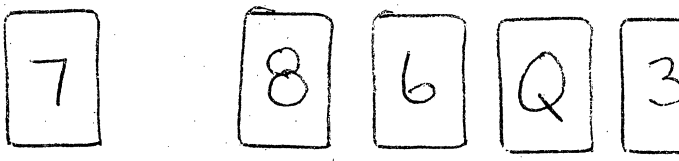
Example:

Round 1



$5\overline{)9.02} = 1.804$

5
40
40
20
20
0



$7\overline{)86.3} = 12.328$

7
16
14
23
21
20
14
60

Score 1.80
+ 12.33
14.13 pts.

PERCENT IT

Math Skills Unit V-H-31

Topic: Change Fraction to Percent

Set up: Remove face cards and aces. Tens are tens.

Players: 3 to 5 per group

How to Play: Deal two cards to each player. First card is numerator, second card is denominator. Change fraction to percent. Round off to the nearest percent.

Scoring: Points are earned based on the percent obtained. Total percents after each round.

Winner: Highest score after 10-20 minutes.

Example:

$$\frac{5}{8} = \frac{5}{8}$$

$$8\overline{)5.00} \quad .62\tfrac{4}{8} \text{ OR } .63$$

48

20

16

4

63%

Score 63 pts.

CHANGE IT %

Math Skill Unit V-H-31

Topic: Change Percents to Fraction

Set up: Face cards and tens are zero.

Aces are one.

Players: 3 to 5 per group

How to Play: Deal two cards to each player. This is their percent. Now change percent to a fraction. Reduce the fraction. End of Round 1. Set cards aside and deal two more cards.

Scoring: The numerator of the reduced fraction is your points earned. Total points after each round.

Winner: Highest score after 10-20 minutes.

Examples:

Round 1 [2] [3] = 23% = $\frac{23}{100}$ 23 pts.

Round 2 [A] [8] = 18% = $\frac{18}{100} = \frac{9}{50}$ 9 pts.

Score $\begin{array}{r} 23 \\ +\ 9 \\ \hline 32 \text{ pts.} \end{array}$

ADD-IN

Math Skills Unit IX-H-46

Topic: Addition of Integers

Set up: Remove face cards. Aces are one. Tens are ten. Black cards are positive. Red cards are negative.

Players: 3 to 5 per group

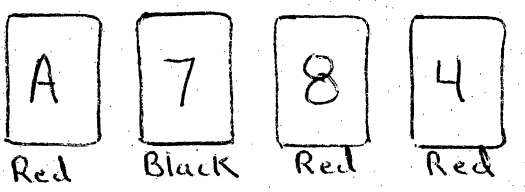
How to Play Deal 4 cards to each player, then they add the cards together. After each round, set cards aside and deal 4 more cards to each player. Add sums together after each round.

Scoring: You score points based on the sum of the integers.

Winner: Highest score after 10-20 minutes.

Example:

Round 1

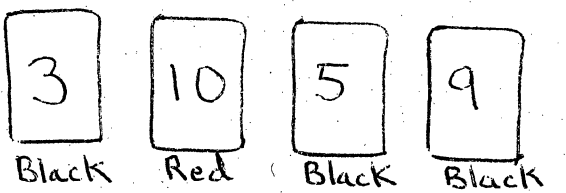


$-1 + 7 + -8 + -4$

$-13 + 7 = -6$

-6 pts.

Round 2



$3 + -10 + 5 + 9$

$17 + -10 = 7$

7 pts.

Score $-6 + 7 = 1$ pt.

SUB-IN

Math Skills Unit IX-H-46

Topic: Subtraction of Integers

Set up: Same as ADD-IN

Players: 3 to 5 per group

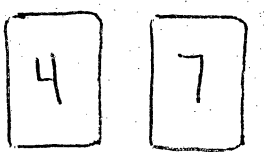
How to Play: Deal 2 cards to each player, first card is minuend. Second card is subtrahend. Find the difference of the two cards. Then set cards aside and deal two more cards to each player.

Scoring: You earn points based on the difference of the integers. Each round is totaled.

Winner: Highest score after 10 to 20 minutes.

Example:

Round 1

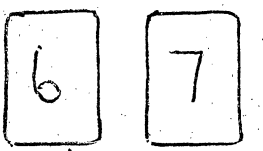


Black Red

$4 - -7$

$4 + 7 = 11$ 11 pts.

Round 2



Red Black

$-6 - 7$

$-6 + -7 = -13$ -13 pts.

Score $11 - -13$

$11 + 13 = 24$

24 pts.

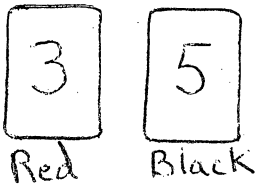
MULT-IN

Math Skills Unit IX-H-46

Topic:	Multiplication of Integers
Set up:	Same as ADD-IN
Players:	3 to 5 per group
How to Play:	Deal 2 cards to each player, then they multiply the cards together. After each round set cards aside and deal 2 more cards to each player.
Scoring:	You earn points based on the product of the integers. Each round is totaled.
Winner:	Highest score after 10 to 20 minutes.

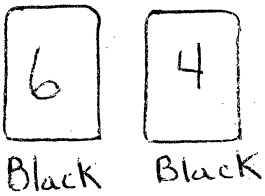
Example:

Round 1



$-3 \times 5 = -15$ -15 pts.

Round 2



$6 \times 4 = 24$ 24 pts.

Score $-15 + 24 = 9$

9 pts.

DIV-IN

Math Skills Unit IX-H-46

Topic: Division of Integers

Set up: Same as ADD-IN

Players: 3 to 5 per group

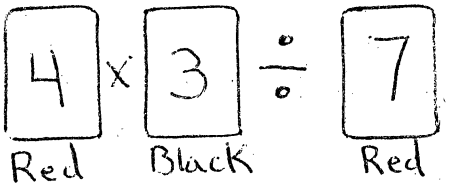
How to Play: Deal two cards to each player. They find the product of the two cards (same as Mult-In). This product becomes the dividend, deal one more card to each player. This card is the divisor. Now find the quotient. Round off to nearest integer. After each round, set cards aside and deal two more cards and then one card to each player.

Scoring: You earn points for the quotient of the integers. Total each round.

Winner: Highest score after 10 to 20 minutes.

Example:

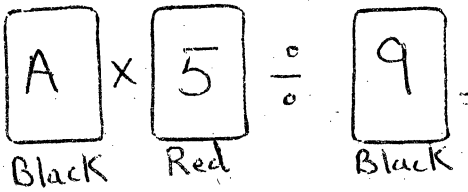
Round 1



-4×3

$-12 \div 7 = 1\frac{5}{7} = 2$ 2 pts.

Round 2



1×-5

$-5 \div 9 = \frac{-5}{9} = -1$

-1 pt.

Score 2

$+ -1$

$1 +$

SQUARE ROOT

Math Skills Unit XI-H-54

Topic: Recognize Perfect Squares

Set up: Remove face cards, tens are tens, aces are ones.

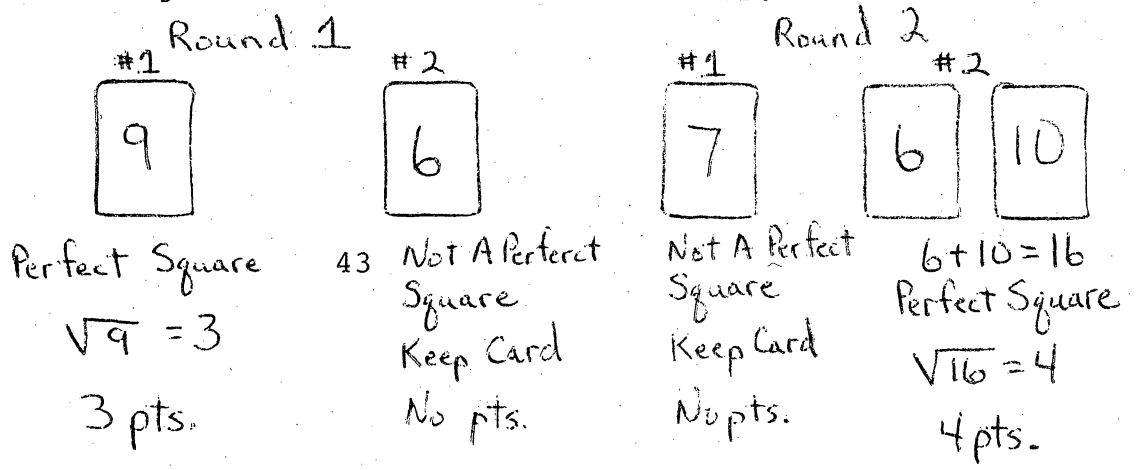
Players: 3 to 5 per group

How to Play: Deal one card to each player. Players decide if they have a perfect square. If yes, they take the square root, then set their cards aside. Players that do not have a perfect square, just keep their card. Another card is dealt to each player and they total their cards. If they now have a perfect square, they set their cards aside after taking the square root. Some players may not get a pefect square, so after their point total is over 100, they set their cards aside and start over.

Scoring: When you have a perfect square, the square root is the amount of points earned. Add square roots together.

Winner: Highest score after 10-20 minutes.

Example:



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