

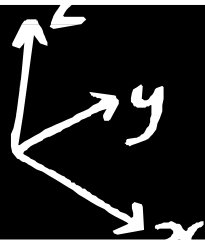
MATH FIELD DAY

MAY 22, 2010

COACH'S INFORMATION PACKET

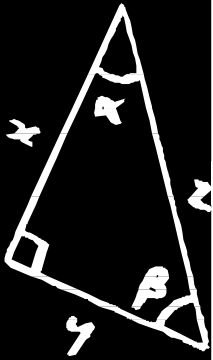
ELEMENTARY/MIDDLE
SCHOOLS
6th Grade

quadratic $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$



$$f(a) = \left(a - \frac{7}{b^2} + \sqrt{a(b)} \right)^3$$

Theorem



$\sin \alpha$

$\sin a$

24×4

$3z$

$\sqrt{49} = 7$

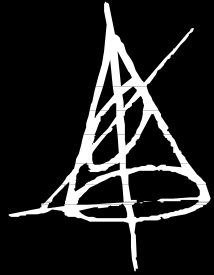
equation

$\frac{dx}{dy}$

calculus

x	y
6	7
7	2
9	10
3	3
9	7
12	11

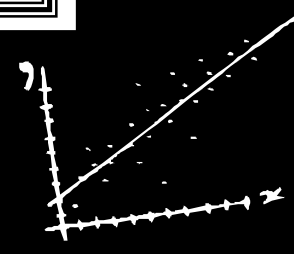
$x = -6$



$\frac{\sin \beta}{\sin \alpha}$

Pythagoras

$2y - 3y = x$



Math Field Day 6th Grade Events Schedule

Saturday, May 22, 2010

The tentative schedule is as follows:

12:00 p.m. – 12:15 p.m. Passing Period – Students Will Move to the Designated Test Rooms

12:15 p.m. – 12:45 p.m. Session One (30 minutes)

Grade Six Tests

6th Grade General Knowledge – Multiple Choice
(6th Grade General Knowledge Test for Alternates will be 60 minutes)

12:50 p.m. – 1:20 p.m. Session Two (30 minutes)

Grade Six Tests

Terminology
Calculator Challenge
Problem Solving
Mental Gymnastics

1:20 p.m. – 1:30 p.m. Passing Period – Students Will Move to the Designated Game Rooms

1:30 p.m. – 2:30 p.m. Session Two (60 Minutes)

Grade Six Games

Hex
Sudoku
Mancala
Capture
(6th Grade Game for Alternates – Hex)

2:30 p.m. – 2:45 p.m. Break / Snacks

2:45 p.m. Return to the Gymnasium

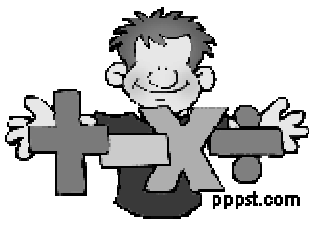
2:50 p.m. – 3:30 p.m. Awards Assembly – A. B. Miller Gymnasium

General Event Information

1. Coaches will receive student name badges during the week before Math Field Day. 6th, 7th and 8th grade students will report directly to the testing rooms between 12:00 pm and 12:15 pm. Attendance will be taken during this time and late students will not be admitted to the testing room once the tests have begun.
2. Students and proctors are to report to assigned rooms in the Math building based on grade level and event. Signs will be posted on all classroom doors.
 - a) All 6th grade students will report to their assigned testing rooms (Cal. Challenge, Mental Gym., Prob. Solving, or Round Robin). All 6th grade students will compete in the General Knowledge Exam (30 min test) prior to competing in the 6th grade subject tests.
3. **Two students** from the 6th grade team from each school should complete the Team Tie-Breaker question located in the quad area in front of the math building by **12:10 pm**. All teams should select the students who will complete the Team Tie-Breaker question prior to arrival at Math Field Day.
4. For the tests, scantrons will show five (5) choices. Some sample tests and actual test items may have 4 or 5 choices. If no choice “e” is given, there is no option to mark “e” as an answer.
5. **ALL** test events will include a math question as a tiebreaker.
6. Calculators will be provided on the day of the event for those events requiring their use.
7. Discuss with your team the ethics of cheating. If a student feels the game or event was not fair, this student needs to bring the matter to the attention of the proctor **before leaving the room.**
8. Two to three proctors will be trained and assigned to each event.

Grade 6

**MATH FIELD DAY
TESTS**



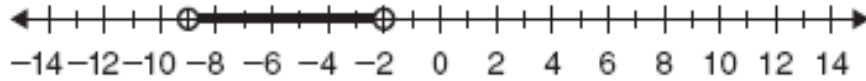
Fontana Unified School District
Math Field Day
General Knowledge
Grade 6

Directions: Choose the most appropriate answer. If no answer is correct, choose none.

1. How many ounces are in 26 pounds?

- a) 1.625 oz b) 208 oz c) 26 oz d) 416 oz e) none

2. Which compound inequality is represented by the graph?

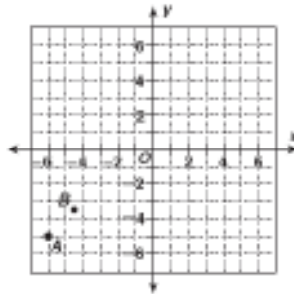


- a) $9 > x > 2$ b) $-9 < x < -2$ c) $-2 < x < -9$ d) $-2 \leq x \leq 9$ e) none

3. Which expression simplifies to 6?

- a) $18 - (15 \div 3 + 7)$ b) $25 - 10 \div 5 + 3$ c) $28 \div (7 \times 2) - 2$ d) $6 + 12 \times 2 - 18$ e) none

4. In which quadrant is point A located?



- a) I b) II c) III d) IV e) none

5. Find the ratio equivalent to 14 to 3.

- a) 52 to 12 b) 7 to 2 c) 42 to 12 d) 28 to 7 e) none

6. Solve for x. Round your answer to the nearest hundredth.

$$\frac{18.1}{3.2} = \frac{137.6}{x}$$

- a) $x = 0.9$ b) $x = 10$ c) $x = 24.32$ d) $x = 24.33$ e) none

7. Which is the missing number in the pattern 1, 5, 21, __, 341?

- a) 43 b) 84 c) 85 d) 105 e) none

8. Which is the prime factorization of 255?

- a) $3 \times 5^2 \times 17$ b) $5^2 \times 17$ c) $3 \times 5 \times 17$ d) 3×85 e) none

**Fontana Unified School District
Math Field Day
Calculator Challenge
Grade 6**



Use your calculator to solve the following problems and then fill in the correct answer on your scantron sheet. Do not write on the test or scratch paper.

1. Which of the following fractions is closest to 0?

- a) $\frac{5}{9}$ b) $\frac{1}{3}$ c) $-\frac{1}{5}$ d) $-\frac{6}{13}$ e) none

2. When 75% of a number is 30, then 20% of the number is:

- a) 16 b) 8 c) 20 d) 10 e) none

3. Find the product of $2\frac{5}{9}$ and $\sqrt{441}$.

- a) $36\frac{4}{9}$ b) 18 c) $53\frac{6}{9}$ d) $84\frac{1}{9}$ e) none

4. Find $225 \div -5^2$.

- a) -9 b) 9 c) 1,125 d) 2,025 e) none

5. $(-31 + -12) - 16 + 35 - 2 \times (14 - 9) =$

- a) -108 b) -130 c) 102 d) 108 e) none

6. Find $7\frac{1}{3} + 9\frac{4}{7} + 2\frac{3}{4} - 7 =$

- a) $4\frac{212}{325}$ b) $12\frac{55}{84}$ c) $12\frac{223}{315}$ d) $12\frac{84}{55}$ e) none

7. Find $2.94 \div 7\frac{3}{11}$.

- a) 0.40425 b) 0.44025 c) 0.24450 d) 0.40452 e) none

8. Find the greatest amount below:

- | | | | | | | |
|-------------------|------------------|---------------|-----------|---------|--------|---------------|
| $\frac{3}{15}$ | 78.5% | $\frac{2}{3}$ | 0.7858 | 77.999% | 0.7799 | $\frac{4}{7}$ |
| a) $\frac{3}{15}$ | b) $\frac{3}{4}$ | c) 78.5% | d) 0.7858 | e) none | | |



Fontana Unified School District
Math Field Day
Problem Solving
Grade 6

Directions: Choose the most appropriate term. If no answer is correct choose none. Scratch paper and calculators may be used during this test.

1. Which number is prime?

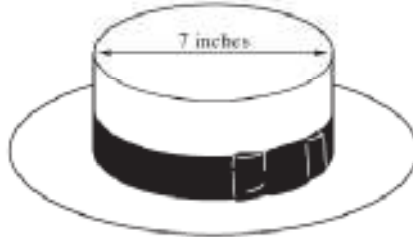
- a) 243
- b) 117
- c) 104
- d) 89
- e) none

5.4 inches

5.4 inches

2. The top part of this hat has a diameter of 7 inches. If the length of the top is exactly half the length across the bottom, what is the circumference of the bottom part of the hat rounded to the nearest tenth?

- a) 43.96 in.
- b) 34 in.
- c) 14 in.
- d) 43.96 in.²
- e) none



3. If Wendy received scores of 68% , 93% , 85% , and 96% on her first four math tests, what would she need to score on her next test to raise her overall average to 86%?

- a) 92%
- b) 90%
- c) 88%
- d) 87%
- e) none

4. Johnny has 16 black, 18 white, 12 gray, and 9 pairs of brown socks in one drawer. What is the probability that, without looking, Johnny will pull out a pair of gray socks from the drawer?

- a) 22%
- b) 23%
- c) .22%
- d) 22. $\bar{2}$ %
- e) none

5. A group of hikers climbs from Salt Flats (elevation -127 ft.) to Pike's Peak (elevation 5,896 ft.) What is the difference in elevation from Salt Flats and Pike's Peak?

- a) 5,796 ft.
- b) 5,976 ft.
- c) 6,023 ft.
- d) 6,032 ft.
- e) none



Fontana Unified School District Math Field Day Terminology Grade 6

Directions: Choose the most appropriate term. If no answer is correct, choose none.

1. A solid with two congruent parallel circular bases is a _____.

- a) cone
- b) prism
- c) pyramid
- d) cube
- e) none

2. A segment, other than a side, that connects two vertices of a polygon is a(n) _____.

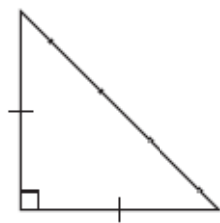
- a) edge
- b) diagonal
- c) corner
- d) face
- e) none

3. If one event has m possible outcomes and a second event has n possible outcomes after the first event has occurred, then there are $m \cdot n$ total possible outcomes for the two events. This is referred to as the:

- a) multiplicative property
- b) theoretical probability
- c) fundamental counting principle
- d) experimental probability
- e) none

4. Which of the following best describes the triangle?

- a) scalene right
- b) isosceles acute
- c) equilateral right
- d) isosceles obtuse
- e) none



5. The set of values that make a statement true is called the:

- a) coordinate set
- b) solution set
- c) inequalities
- d) positive set
- e) none

Fontana Unified School District
Math Field Day
Mental Gymnastics
Grade 6



Listen to the CD to solve the following problems, and then fill in the correct answer on your scantron sheet when you hear the word "Equals". You must compute all problems mentally without writing on the test or scratch paper.

1. A) 22 B) 15 C) 21 D) 16 E) None
2. A) 13 B) 48 C) 18 D) 12 E) None
3. A) 22 B) 10 C) 30 D) 35 E) None
4. A) 0 B) -6 C) 21 D) -9 E) None
5. A) $\frac{7}{10}$ B) $\frac{3}{5}$ C) $\frac{3}{10}$ D) $1\frac{3}{10}$ E) None

The students will listen to math problems played on a CD. The students will have an answer sheet that looks similar to the answer shown above. Below are sample problems for 6th grade Mental Gymnastics that will be read aloud at Math Field Day:

1. $21 + 18 + 3 - 12 \div 2 =$
2. 22 less than the product of 5 and 7 =
3. $20 \times 5 - 30 - 6 - 8 - 6 \div 5 \times 2 =$
4. Subtract 15 from the difference of 7 and 1 =
5. $\frac{3}{5} + \frac{2}{5} - \frac{3}{10} =$

MATH FIELD DAY GAMES

MATH FIELD DAY GAME PACKET

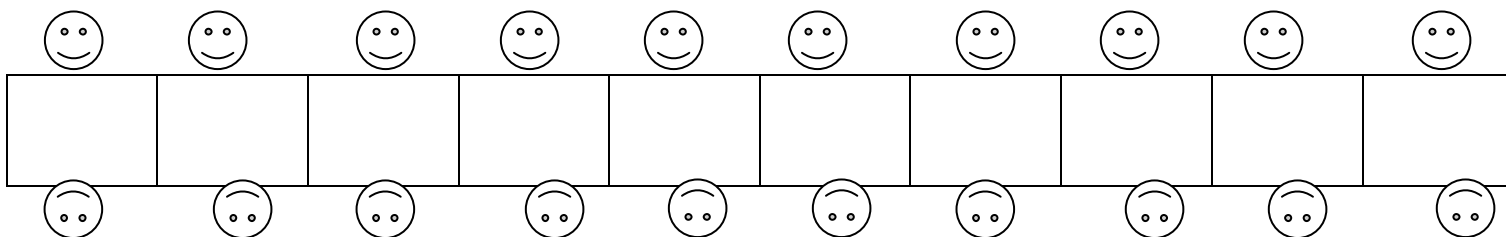
The games are played during the second hour of the competition. The games provide students with another opportunity to earn an individual medal and points for their school.

The games that will be played by 6th grade this year are:

1. Hex
2. Sudoku
3. Mancala
4. Capture

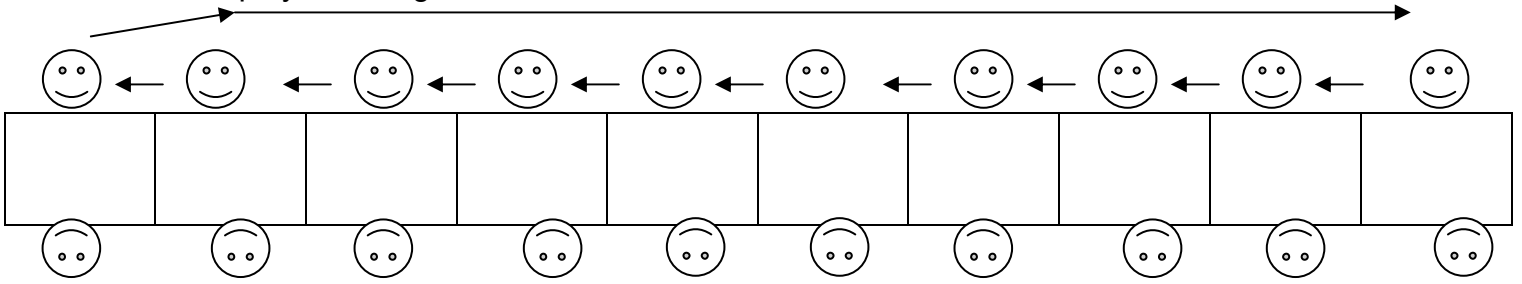
GENERAL RULES FOR GAMES (EXCEPT SUDOKU -SEE ADDITIONAL INFO BELOW)

1. Students report to assigned rooms based on grade level and event.
2. Students are to be seated while games are in progress, and only move/rotate at the end of the round (with proctor direction).
3. Individual games will have a total limit of 5-6 minutes, depending on the number of students present in each room.
4. There will be a 20-second limit for an individual to make his/her move in any game.
5. **Once a player's pencil touches the paper (game sheet), the play (the move) must be made. The player cannot change his/her mind.**
6. The desks will be setup in one long row. Students will be seated on opposite sides of the table, facing each other.
7. If students cannot agree who will go first, then "rock, paper, scissors" determines who goes first.

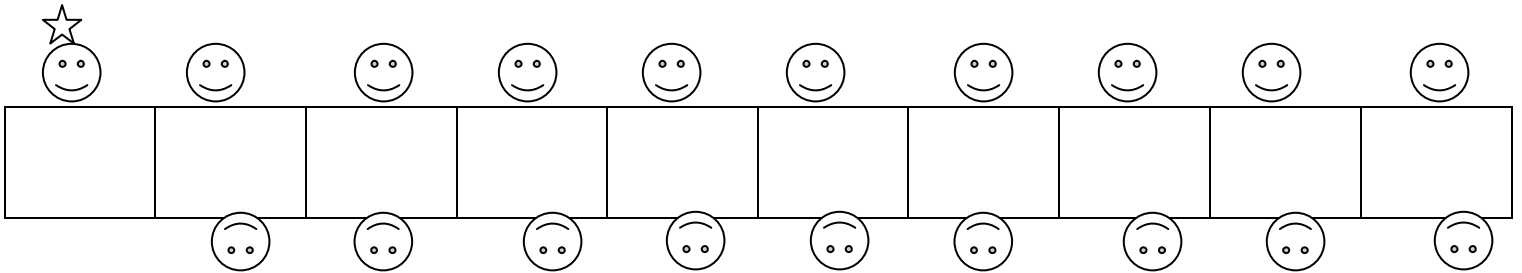


8. Once the first game is played, the players will let the table proctor know they have finished. The proctor will circle if it is a win, lose or tie.

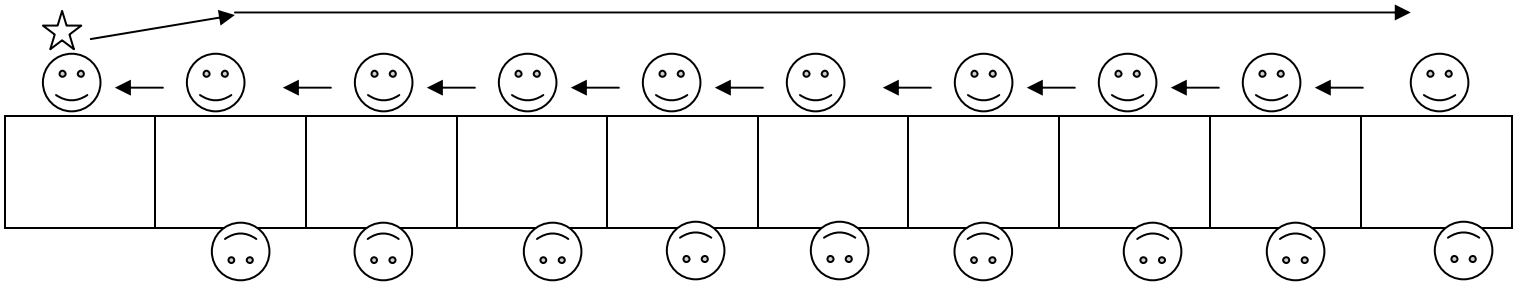
9. One side of the row will rotate after the completion of each round. The side that rotates after the first round, will be the same side that rotates after each additional round. At least seven rounds should be played during the event.



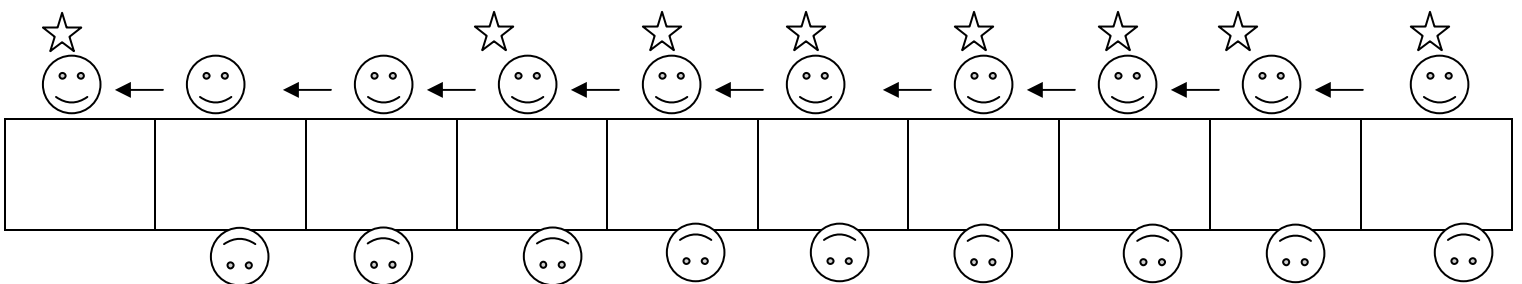
10. If there are an odd number of students in the room, the last student will sit out during the first game.



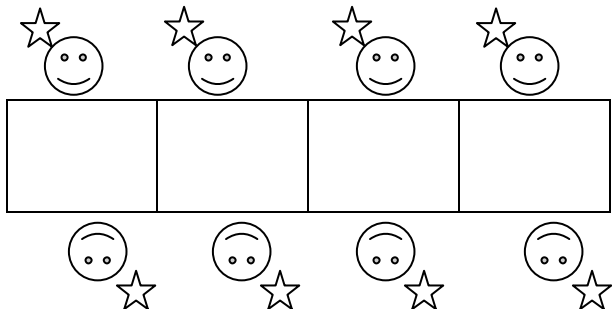
11. When there are an odd number of students, an even number of rounds should be played (either 6 or 8 depending on time.)



12. At the end of Round 8 (or 6 depending on time) . . .



The students who sat out each round should play each other for their final round. Every student in the room should have played the same number of rounds.



13. Scoring Sheet: The following scores need to be used: 2 points for a win, 1 point for a tie, 0 points for a loss. The proctor will circle 2 or 1 or 0 on the score sheet. The proctor will collect the score sheets and complete the total column at the end of the final round.

Example:

Game	Round	Win	Tie	Loss	Proctor Initials
Game 1	Round 1	2	1	0	
Game 2	Round 2	2	1	0	
Game 3	Round 3	2	1	0	
Game 4	Round 4	2	1	0	
Game 5	Round 5	2	1	0	
Game 6	Round 6	2	1	0	
Game 7	Round 7	2	1	0	
Game 8	Round 8	2	1	0	
Tie Breaker Games	Tie Breaker Round	Win	Tie	Loss	Proctor Initials
Game 1	Round 1	2	1	0	
Game 2	Round 2	2	1	0	
Game 3	Round 3	2	1	0	

14. At the end of the final round, the scores are tallied. The students with the highest matching scores are placed from 1st through 5th place. If there is a tie for any place, those students who are tied will compete against each other in a bonus round.

GENERAL RULES FOR SUDOKU

1. Students report to the assigned room based on grade level and event.
2. Students are to be seated in rows while the game is in progress. They will not be facing an opponent and will not move/rotate at the end of each round.
3. Individual games will have a total limit of 4 minutes. The students will be competing during each round as a whole group.
4. The students will play between 7-8 rounds of Sudoku (depending on the number of students and time.)
5. The games will vary in difficulty each round.
6. Score Sheet: The students will earn between 0 and 5 points per round depending on the number of correct responses per score sheet.

Game	Round	Number Shaded Boxes Correct					Total	Proctor Initials
Game 1	Round 1	5	4	3	2	1		
Game 2	Round 2	5	4	3	2	1		
Game 3	Round 3	5	4	3	2	1		
Game 4	Round 4	5	4	3	2	1		
Game 5	Round 5	5	4	3	2	1		
Game 6	Round 6	5	4	3	2	1		
Game 7	Round 7	5	4	3	2	1		
Game 8	Round 8	5	4	3	2	1		
Tie Breaker Games	Tie Breaker Round	Number Shaded Boxes Correct					Total	Proctor Initials
Game 1	Round 1	5	4	3	2	1		
Game 2	Round 2	5	4	3	2	1		
Game 3	Round 3	5	4	3	2	1		

GAMES

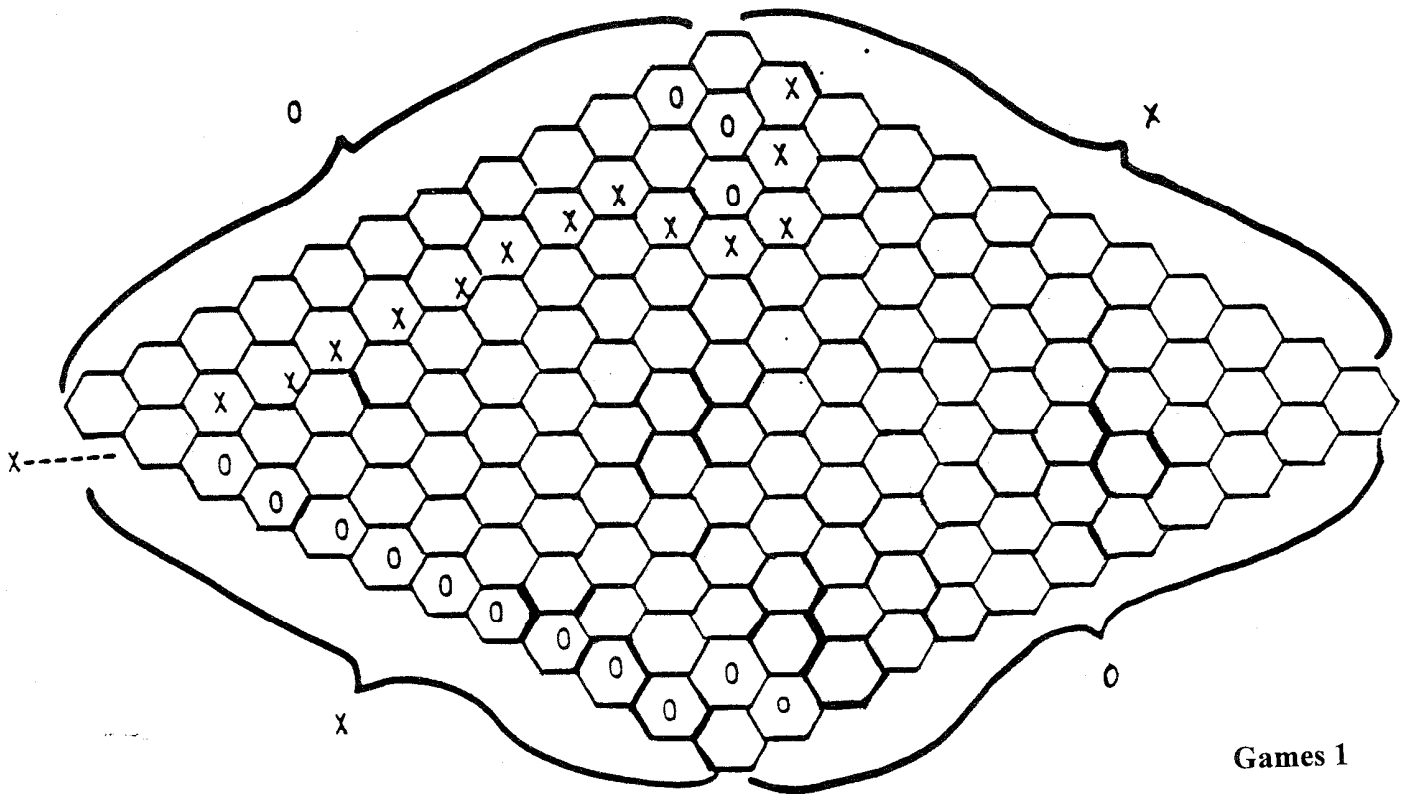
HEX

Description:

This game is similar to the commercially available game of Bridge-It. The game helps students develop the idea of finding patterns in a maze. The winner must form a continuous path from his or her starting side to the opposite side of the rhombus by connecting the hexagons on their edges.

Players take turns placing their marks (either X or O) in the hexagons of their choosing. Each consecutive turn does not have to be adjacent to the parallel sides. Note that the four corner hexagons can actually be considered to be part of either of the sides that they face.

In the sample below, X can win by placing a mark in the hexagon indicated.

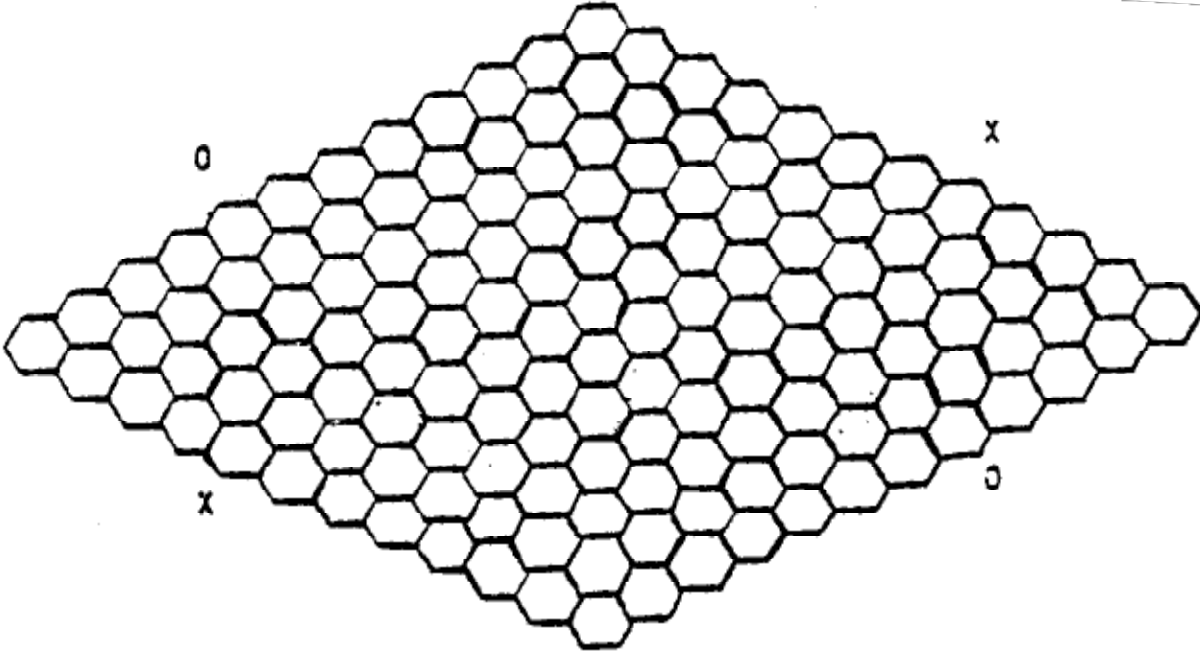


Math Field Day

Student 1: _____

Student 2: _____

HEX

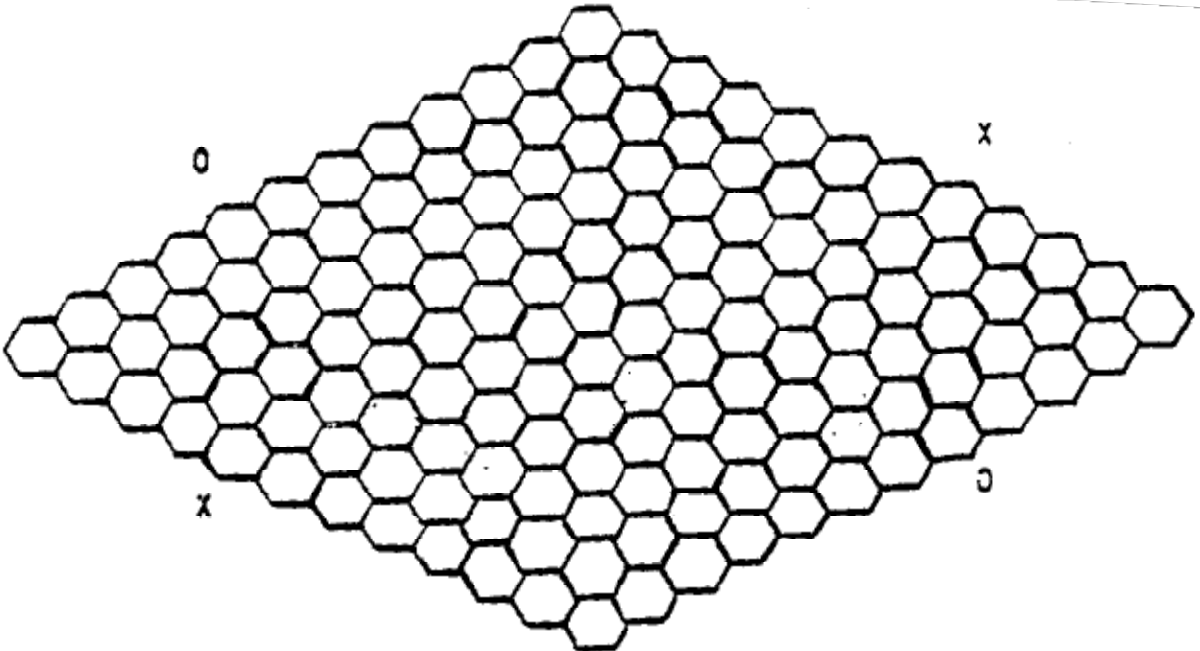


Math Field Day

Student 1: _____

Student 2: _____

HEX



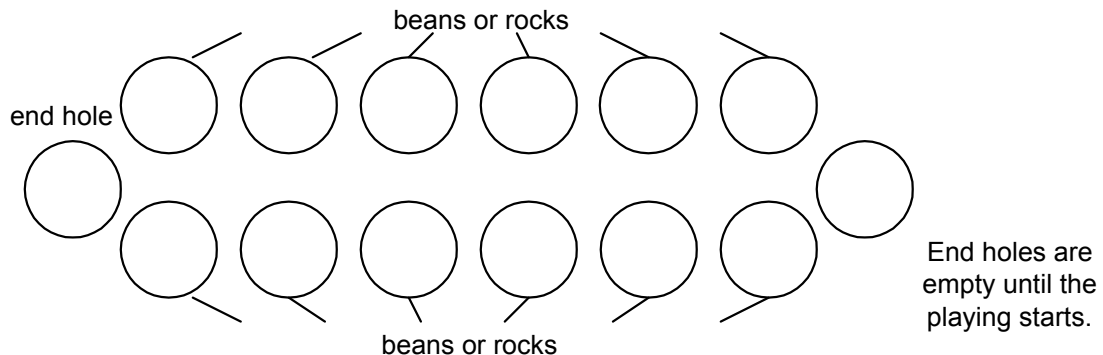
Mancala

Description:

There are many versions of Mancala. It originated in ancient Egypt, and is one of the oldest games in the world. You can play it on a special Mancala board, if you have one, or by using any small containers you have at hand. (If you are outdoors, you can play it simply by scooping out little holes in the earth.)

This is one of the easiest versions, but it is as fascinating as the more complex versions, and just as good today as it was thousands of years ago.

Set out your “board” like this.



Put two beans in each “hole” except for the ones on the ends. Those end holes are common property, and belong to both players.

One player starts, scooping up all the beans from one of the holes on his or her side of the board, **places the beans in one hand, and distributes them with the other hand – one bean to a hole – in each of the next holes moving toward the right, including the holes on the end.** Once a bean lands in the end holes, it is out of play.

The object of the game is to be the first player to get rid of all the beans on your side of the board.

If a player’s last bean falls into the end hole, he or she **must** go again, and can choose any hole on his or her side of the board, scoop out the beans, place them in one hand, and distribute them one by one in the holes to the right.

If the **last bean** lands in a hole which is on the other player’s side of the board, and there are no beans at all in that player’s hole, player A has the option to **scoop out the opposite hole (on his side of the board) and distribute the beans one per hole as in regular play.** The player may choose not to do this. If he or she has no beans there, the turn is over.

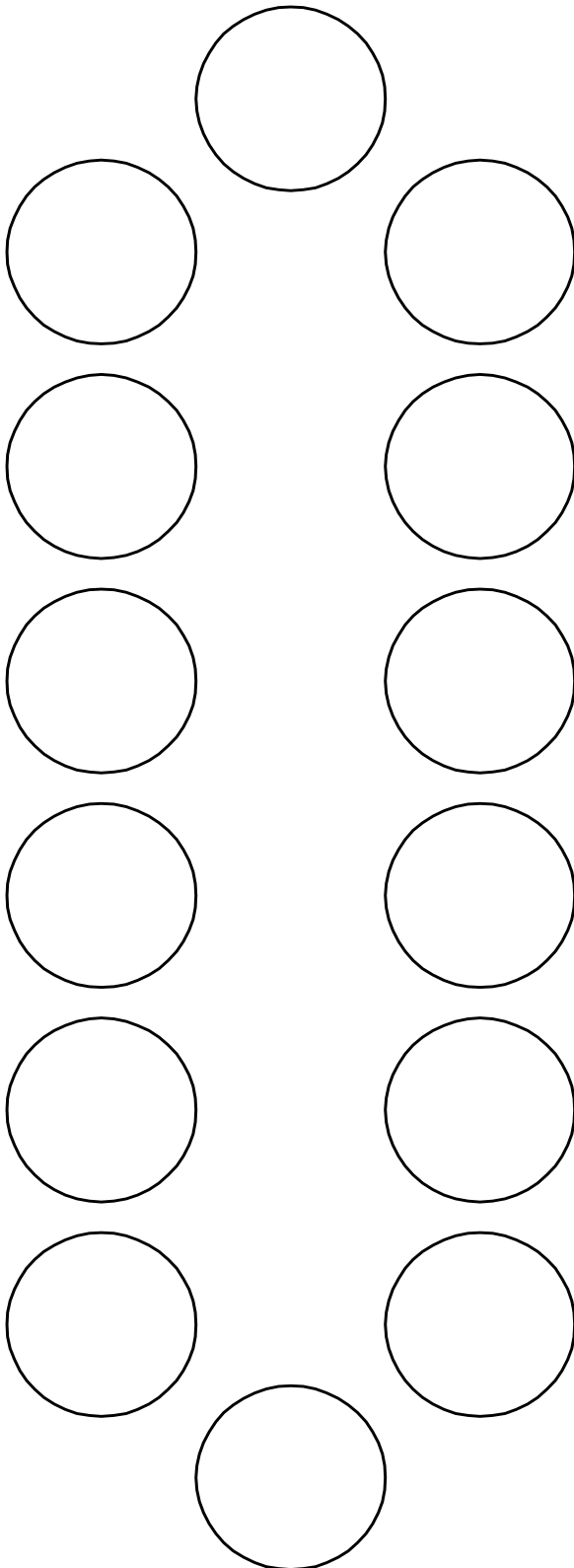
Student 1: _____

Student 2: _____

School: _____

School: _____

MANCALA



Winner of Competition Game

CAPTURE

Description:

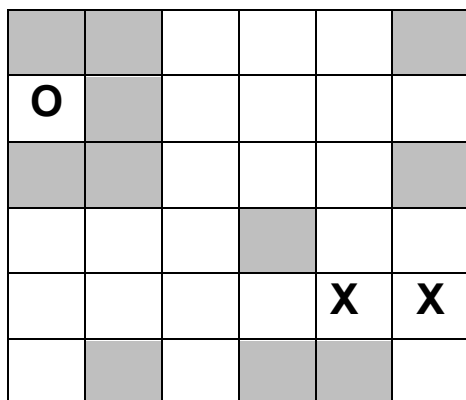
The game of Capture is a simple paper/pencil game played with two players on a 6 x 6 grid. Each player chooses a symbol; these could be an X or a 0. The objective of the game is to avoid placing your symbol in a straight or a diagonal course from the opponent. The players use logic along with the following rules to corner or capture the opponent.

The starting player marks his/her symbol in any square on the grid to begin the game. Player b then places his/her symbol in any square on the grid, avoiding a "direct hit". Competition begins when the first player moves from his/her mark, any number of squares in a straight line--horizontally, vertically or diagonally--to an unused space, and makes his/her mark on it. He/she crosses out the old mark. The opponent plays similarly observing the rule that a player may never move through a space previously played on and crossed out or through a space occupied by the opponent. The play continues until there is a winner. The winner either forces the opponent into a position from which he/she cannot play (figure A) OR "CAPTURES" the opponent by moving in the straight or diagonal line into the opponent's occupied square (figure B). **If both players are trapped, then the player who must move next loses.**

In example (figure A) the 0 player cannot move. The player with the X is the winner.

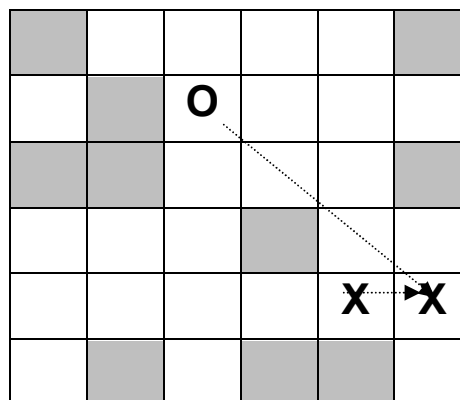
In example (figure B) 0 can move into the X's occupied square. Player O is the winner.

(A)



"X" is the winner because "O" cannot move.

(B)



"O" is the winner because "X" moved into "O's" diagonal. "O" can now move to make a "direct hit" in the "X" square.

Math Field Day grids for Capture are 6 x 6 boxes.

Math Field Day

Student 1: _____

Student 2: _____

Capture

Math Field Day

Student 1: _____

Student 2: _____

Capture

SUDOKU

Description:

Sudoku is a logic-based, combinatorial number-placement puzzle. The objective of the game is to fill all the blank squares in a game with the correct numbers. There are three very simple constraints to follow. In a 9 by 9 square Sudoku game:

- Every row of 9 numbers must include all digits 1 through 9 in any order
- Every column of 9 numbers must include all digits 1 through 9 in any order
- Every 3 by 3 subsection of the 9 by 9 square must include all digits 1 through 9

Every Sudoku game begins with a number of squares already filled in, and the difficulty of each game is largely a function of how many squares are filled in. The more squares that are known, the easier it is to figure out which numbers go in the open squares. As you fill in squares correctly, options for the remaining squares are narrowed and it becomes easier to fill them in.

7	8		1	9				
9		2		3		6		8
					2	9		
				4	5		2	
2		7					5	6
5	6			2	7	1		
	7	3						
6			4	5				
8		1	3			2		

7	8	5	1	9	6	3	4	2
9	1	2	5	3	4	6	7	8
3	4	6	7	8	2	9	1	5
1	3	8	6	4	5	7	2	9
2	9	7	8	1	3	4	5	6
5	6	4	9	2	7	1	8	3
4	7	3	2	6	8	5	9	1
6	2	9	4	5	1	8	3	7
8	5	1	3	7	9	2	6	4