

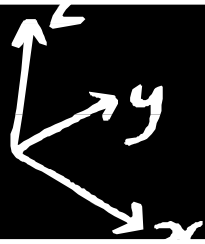
MATH FIELD DAY

MAY 14, 2011

COACH'S INFORMATION PACKET

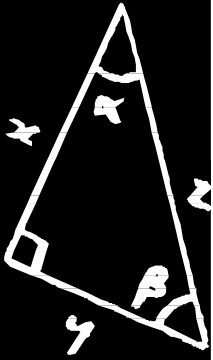
MIDDLE SCHOOL
7th & 8th Grades

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



$\frac{1}{a} = \left(\frac{a-7}{b^2} + \sqrt{a(b)} \right)^3$

Theorem



$\sin \alpha$

$\sin a$

24×4

$3z$

$\sqrt{49} = 7$

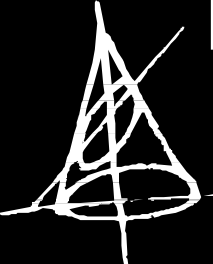
equation

$\frac{dx}{dy}$

calculus

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

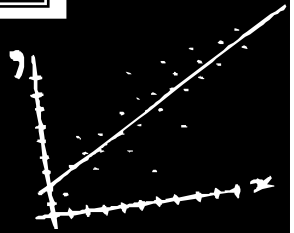
$x = -6$



$\frac{\sin \beta}{\sin b}$

Pythagoras

$2y - 3y = x$



Math Field Day 7th & 8th Grades Events Schedule

Saturday, May 14, 2011

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

Basic Skills Tests (Free Response)

7th Grade

8th Grade

12:30 p.m. – 12:35 p.m. Passing Period – Students Will Move to the Designated Test Rooms

12:35 p.m. – 1:25 p.m. Session Two (50 minutes)

Core Mathematics Tests (Multiple Choice)

Pre-Algebra

Algebra I

Geometry

1:25 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)

Grades 7 & 8 Games

Hex

Five-in-a-Row

Mancala

Capture

(7th & 8th Grade Game for Alternates – Capture)

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 7th grade and 8th grade students will report to the Basic Skills testing rooms first. After completion of the 15 minute period, all 7th and 8th grade students will report to their core subject test rooms.
3. **Two students** from the 7th/8th 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.

Grades 7 & 8

**MATH FIELD DAY
TESTS**

7th Grade Basic Skills – 15 Minutes

This test consists of 110 free response questions that can be completed in any order. The test involves basic mathematical computations. Calculators are not used on this event. No talking is allowed.

Sample 7th Grade Basic Skills Problems.

*** The problems below can be completed in any order. The winner will be determined by the number of correct answers out of 110 problems during the 15 minute testing block.

| Answer | Problem |
|--------|---|
| 1. | 1. $5\frac{2}{3} - 3\frac{4}{5} =$ |
| 2. | 2. Find the prime factorization of 72. |
| 3. | 3. Find the difference of 438.09 and 235.675 |
| 4. | 4. Find the LCM of 25 and 55. |
| 5. | 5. $\sqrt{144} \times \sqrt{100} =$ |
| 6. | 6. Find 8^3 in standard form. |
| 7. | 7. $8 + 12 \div (-2) - 3 =$ |
| 8. | 8. If $\frac{20}{100} = \frac{x}{45}$, then $x =$ |
| 9. | 9. If two angles of a triangle measure 29° and 72° , what does the third angle measure? |
| 10. | 10. What is the largest number out of: $\frac{3}{5}, \frac{4}{9}, \frac{6}{11}, \frac{2}{3}, \frac{5}{8}$ and $\frac{4}{7}$? |
| 11. | 11. $\frac{4}{25} = \underline{\hspace{1cm}} \%$ |
| 12. | 12. $-143 + 529 =$ |
| 13. | 13. Use $>$, $<$, or $=$ to complete $4\frac{7}{24} \underline{\hspace{1cm}} 4.24$ |
| 14. | 14. Robert paid \$43.08 including tax for 3 CDs. All three were the same price. How much did each CD cost? |

8th Grade Basic Skills – 15 Minutes

This test consists of 110 free response questions that can be completed in any order. The test involves basic mathematical computations. Calculators are not used on this event. No talking is allowed.

Sample 8th Grade Basic Skills Problems.

*** The problems below can be completed in any order. The winner will be determined by the number of correct answers out of 110 problems during the 15 minute testing block.

| Answer | Problem |
|--------|---|
| 1. | 1. $\sqrt{256} \times \sqrt{225} =$ |
| 2. | 2. $1.898 \times 1.8 =$ |
| 3. | 3. $4.2 \overline{)1260}$ |
| 4. | 4. Find the median of the data set: 73, 21, 54, 21, 86, 42, 38. |
| 5. | 5. What is the remainder when you divided 124 by 5? |
| 6. | 6. $3,000,000 - 5,329 =$ |
| 7. | 7. $8.6 + 2.34 + 8 + .097 =$ |
| 8. | 8. Find $\frac{18}{x} - 5$, if $x = 4$ |
| 9. | 9. A box of pencils costs \$4.29. Each box contains 50 pencils. How many pencils are in 12 boxes? |
| 10. | 10. $7 + 3 \times 8 + 6 \div 3 =$ |
| 11. | 11. 45 is what percent of 180? |
| 12. | 12. $(\sqrt{144} + \sqrt{36}) - 14.5 =$ |
| 13. | 13. How many inches are in $8\frac{2}{3}$ feet? |
| 14. | 14. What is the width of a rectangle that has a length of 18 inches and a perimeter of 76 inches? |



Fontana Unified School District Math Field Day Pre-Algebra

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

1. Nancy earns \$7.00 per hour working at a gift shop. She earned \$42.00 on Saturday and \$35.00 on Sunday. Which equation can be used to find x, the total numbers of hours that she worked on Saturday and Sunday?

- a) $7 + x = 42 + 35$ b) $7x - 35 = 42$
c) $7 + x = 42 - 35$ d) $7x + 42 = 35$
e) none

2. Order these numbers from greatest to least:

$$\frac{17}{20}, \quad 0.82, \quad 86\%, \quad 9\%$$

- a) $\frac{17}{20}$, 0.82, 86%, 9%
b) 86%, $\frac{17}{20}$, 0.82, 9%
c) 9%, 0.82, $\frac{17}{20}$, 86%
d) 0.82, $\frac{17}{20}$, 86%, 9%
e) none

3. \$48 is 64% of what amount?

- a) \$30.72 b) \$68.00
c) \$75.00 d) \$112.00
e) none

4. Evaluate

$$(1 + 3)^0 + (2 - 4)^{-2} + 2^{-1}$$

- a) $1\frac{3}{4}$ b) $-\frac{1}{2}$
c) $1\frac{1}{4}$ d) $6\frac{1}{2}$
e) none

5. $-42 + \frac{x}{2} = 3 - 17$

- a) -112 b) 14
c) 56 d) 112
e) none

Fontana Unified School District
Math Field Day
Algebra I



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

1. Simplify $(-2xy^2)^4(2x^3y^4)^2$.

- a) $4x^{24}y^{32}$
- b) $-8x^9y^6$
- c) $64x^{10}y^{16}$
- d) $-4x^{10}y^{16}$
- e) none

2. What is the inverse of the relation below?

$\{(-2, -1), (2, 1), (-2, 4), (-4, 0)\}$

- a) $\{(-4, 0), (-2, 4), (2, 1), (-2, -1)\}$
- b) $\{(1, 2), (-1, -2), (-4, 2), (0, 4)\}$
- c) $\{(2, 1), (-2, -1), (2, -4), (4, 0)\}$
- d) $\{(-1, -2), (1, 2), (4, -2), (0, -4)\}$
- e) none

3. Nancy and Rachel are 420 miles apart. They start toward each other with Nancy driving 16 miles per hour faster than Rachel. They meet in 5 hours. Find Rachel's speed.

- a) 34 mph
- b) 50 mph
- c) 40.4 mph
- d) 68 mph
- e) none

4. The solution to which system of equations has an y value of -2 ?

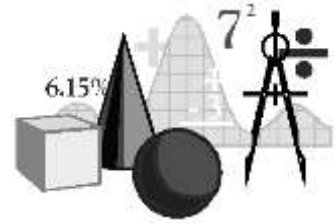
- a) $x + y = 0$
 $3x - y = 2$
- b) $3x - y = 2$
 $y = -x - 2$
- c) $x + y = 0$
 $3x - 3y = -6$
- d) $y = -x - 2$
 $x + y = 0$

e) none

5. Find the solution of $3n - 13 = 38$ if the replacement set is $\{12, 14, 15, 17, 18\}$

- a) 12
- b) 15
- c) 17
- d) 18
- e) none

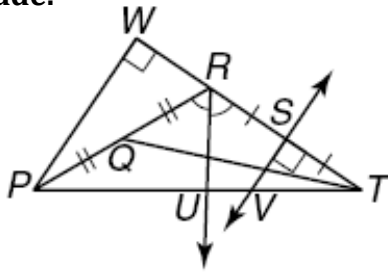
Fontana Unified School District Math Field Day Geometry



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

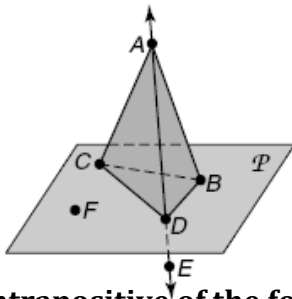
1. Name an altitude.

- a) \overline{RW}
- b) \overline{RP}
- c) \overline{QT}
- d) \overline{RU}
- e) none



2. Which three points in the figure are collinear?

- a) C, D, F
- b) B, C, D
- c) A, E, F
- d) A, D, E
- e) none



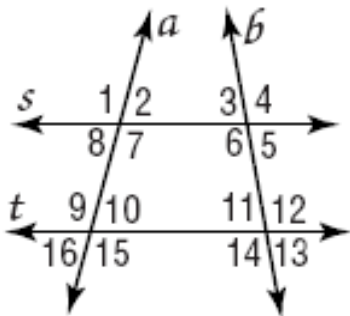
3. Identify the contrapositive of the following statement.

If $x = 5$, then $x + 8 = 13$.

- a) If $x + 8 = 13$, then $x = 5$
- b) $x = 5$ and $x + 8 = 13$
- c) If $x + 8 \neq 13$, then $x \neq 5$
- d) If $x \neq 5$, then $x + 8 \neq 13$
- e) none

4. Given $s \parallel t$ and $m\angle 1 = 8x - 4$ and $m\angle 15 = 6x + 24$, find x .

- a) -10
- b) 14
- c) 20
- d) 28
- e) none



MATH FIELD DAY GAMES

MATH FIELD DAY GAME PACKET

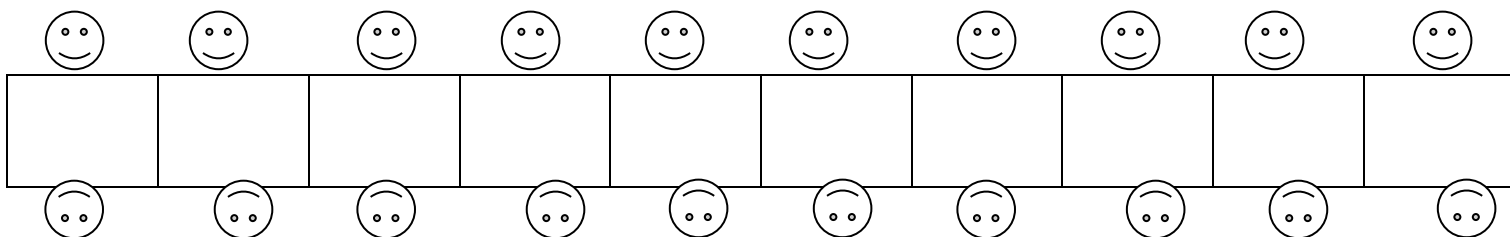
The games are played during the second hour of the competition. The games provide students with another opportunity to earn an individual medal and points for their school.

The games that will be played by 7th & 8th grades this year are:

1. Hex
2. Five-in-a-Row
3. Mancala
4. Capture
5. Sudoku (Alternates Only)

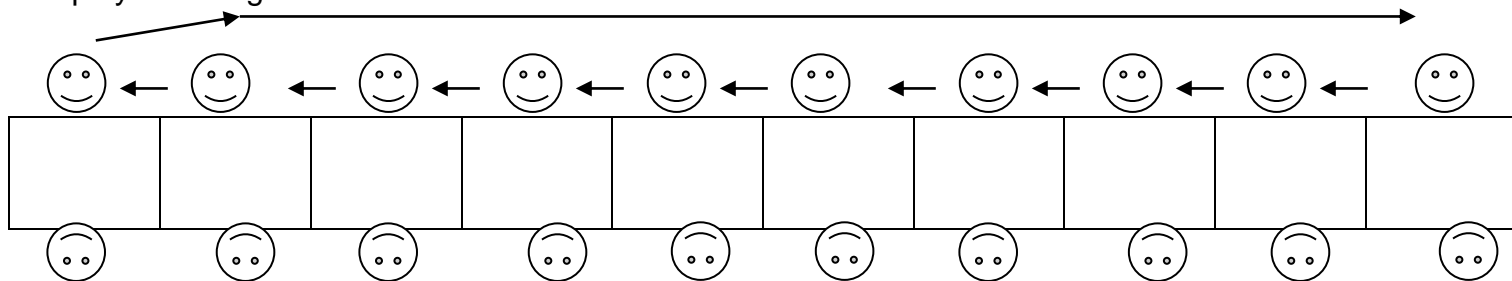
GENERAL RULES FOR GAMES (EXCEPT SUDOKO-SEE ADDITIONAL INFO BELOW)

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.

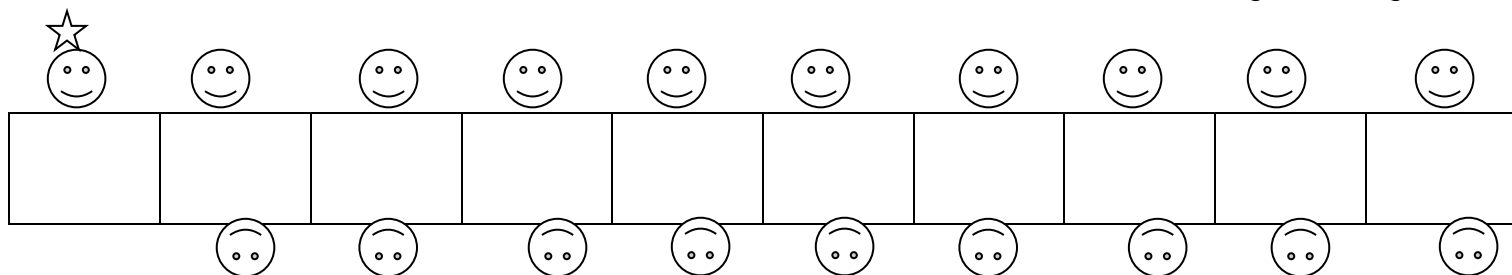


8. Once the first game is played, the players will let the table proctor know they have finished. The proctor will circle if it is a win, lose or tie.

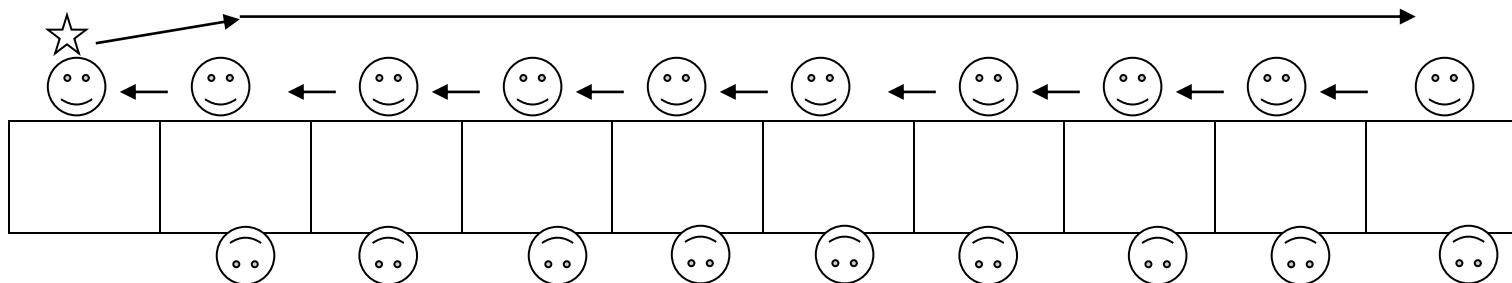
9. One side of the row will rotate after the completion of each round. The side that rotates after the first round, will be the same side that rotates after each additional round. At least seven rounds should be played during the event.



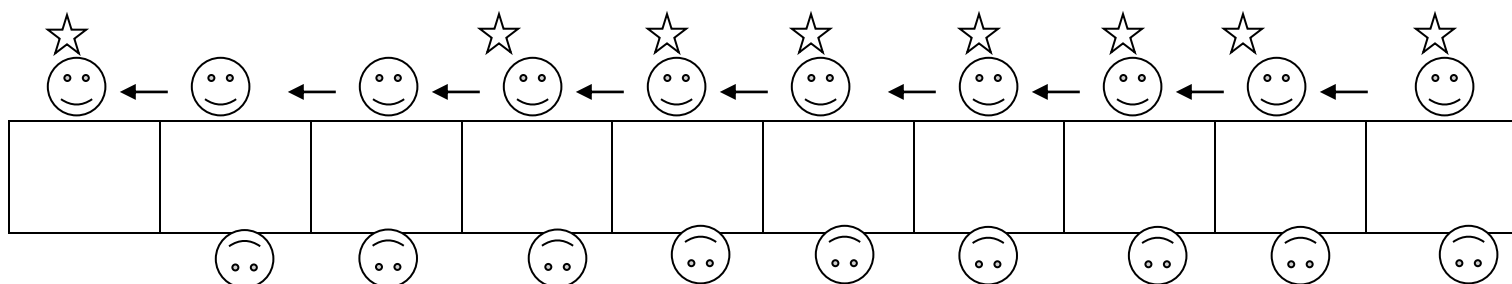
10. If there are an odd number of students in the room, the last student will sit out during the first game.



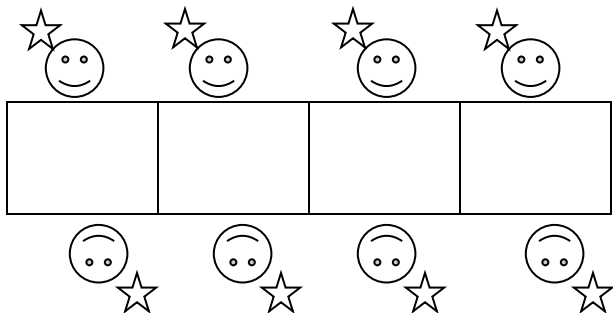
11. When there are an odd number of students, an even number of rounds should be played (either 6 or 8 depending on time.)



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.

GAMES

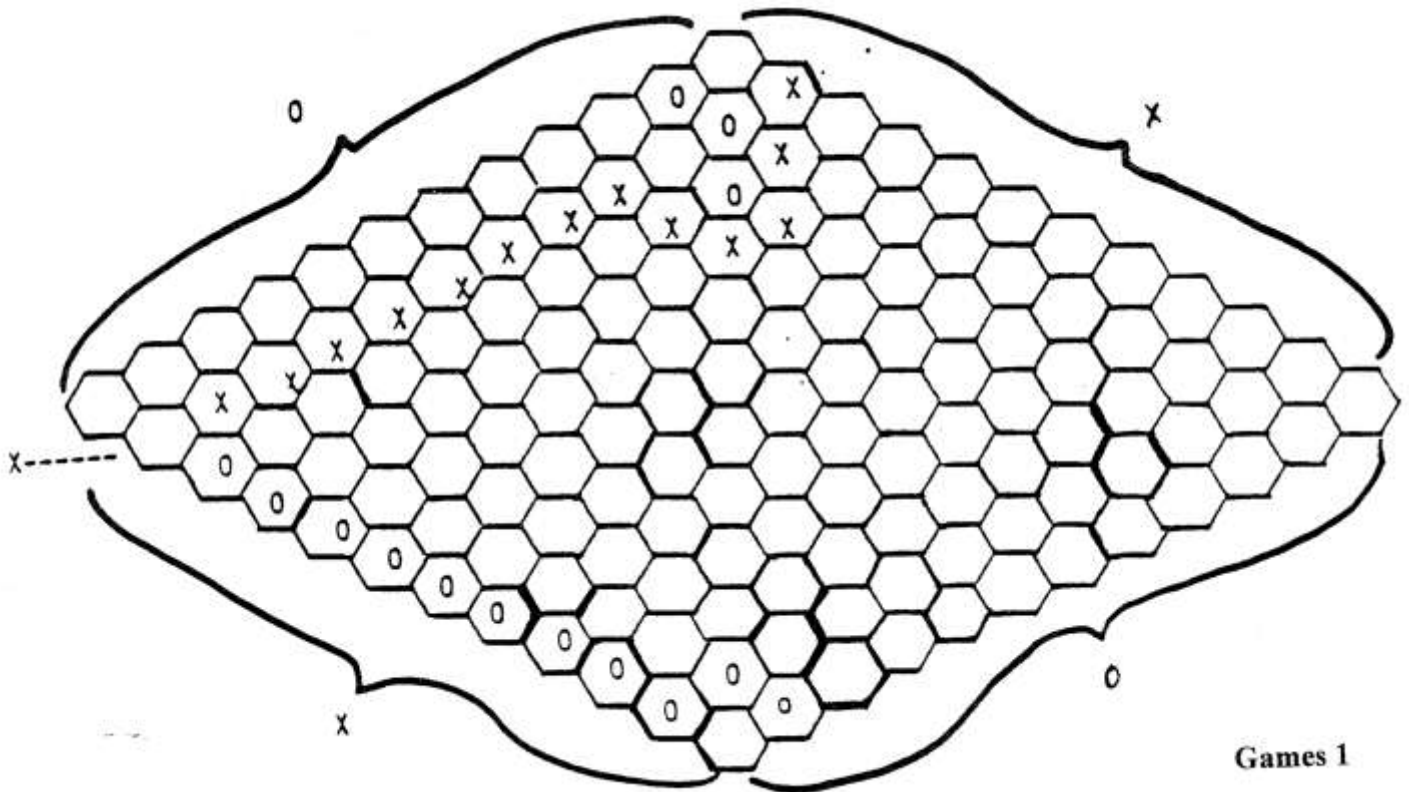
HEX

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.

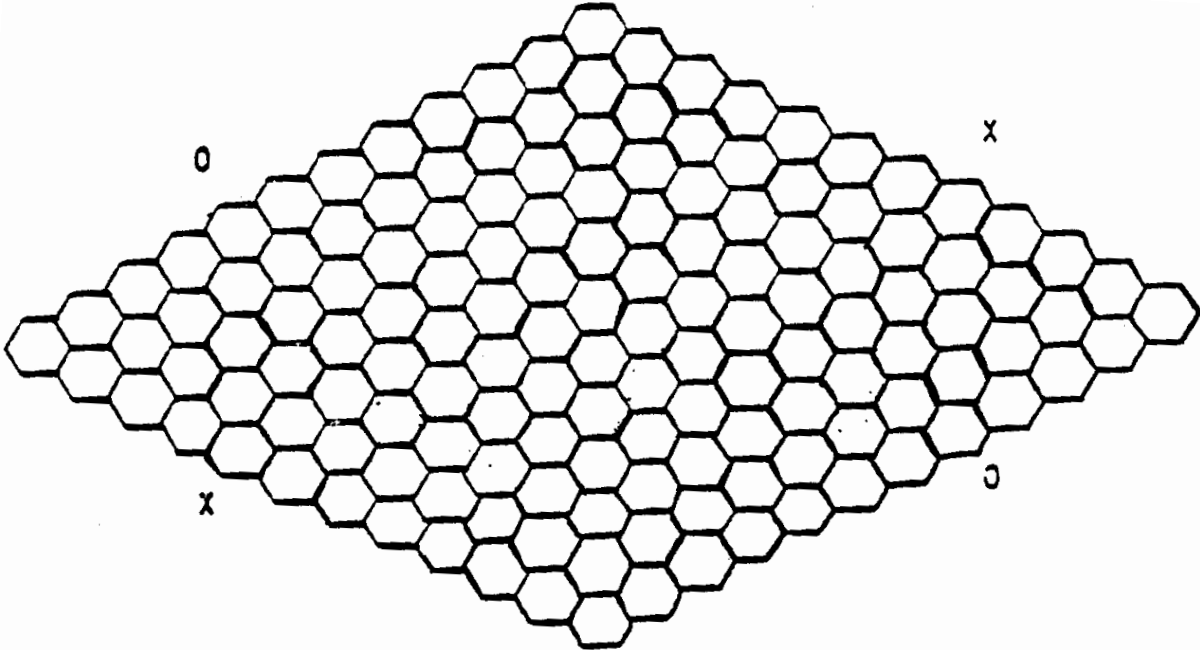


Math Field Day

Student 1: _____

Student 2: _____

HEX

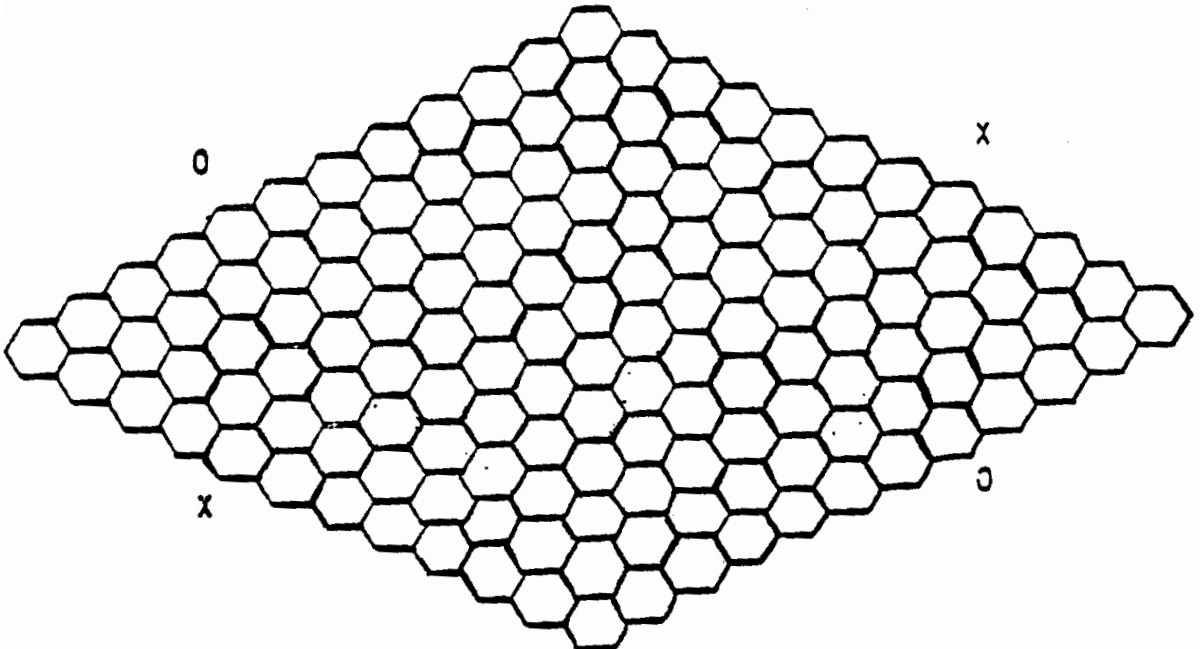


Math Field Day

Student 1: _____

Student 2: _____

HEX



FIVE-IN-A-ROW

Description:

This game is similar to two-dimensional tic-tac-toe. It is played on graph paper and the number of squares to be used is limited only by the size of the paper. Players alternately mark "X" and "O" in the squares. The first player to get five-in-a-row horizontally, vertically, or diagonally – is the winner.

In the example below, "X" wins.

| | | | | | | | | | | | |
|--|--|--|---|---|---|---|---|---|---|---|--|
| | | | O | | | | | | | | |
| | | | O | X | | O | | | | O | |
| | | | O | X | X | X | O | | X | | |
| | | | | | X | X | X | O | | X | |
| | | | | | O | X | X | X | O | X | |
| | | | | | | O | X | O | O | | |
| | | | | | | | | X | | | |
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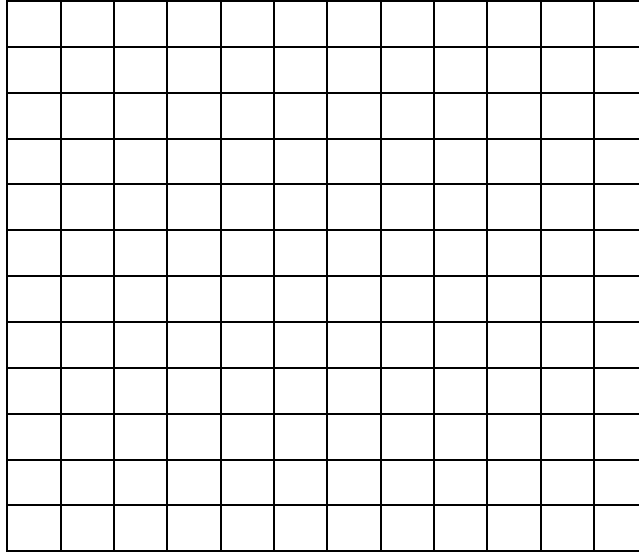
Math Field Day grids for Five-In-A-Row are 12 x 12 boxes.

Math Field Day

Student 1: _____

Student 2: _____

FIVE-IN-A-ROW

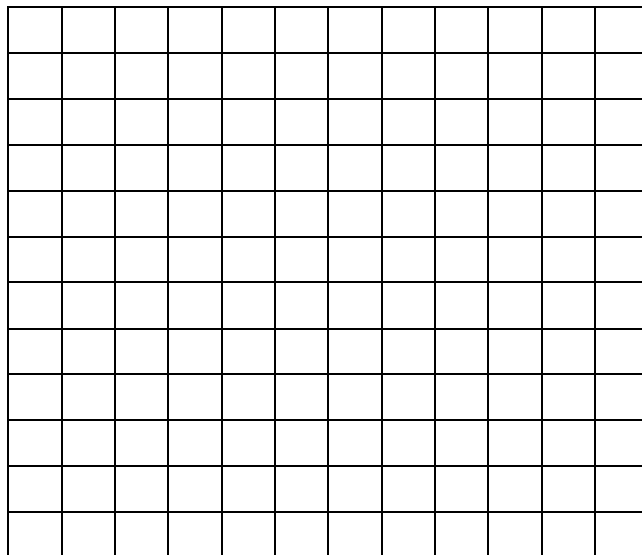


Math Field Day

Student 1: _____

Student 2: _____

FIVE-IN-A-ROW



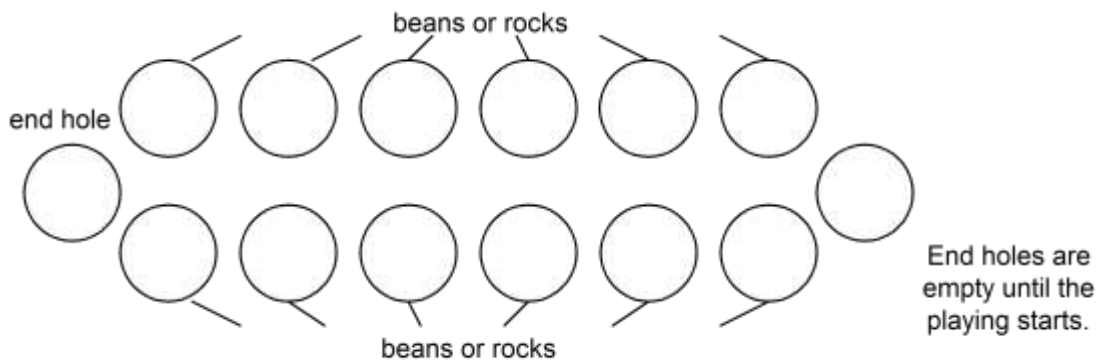
Mancala

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.

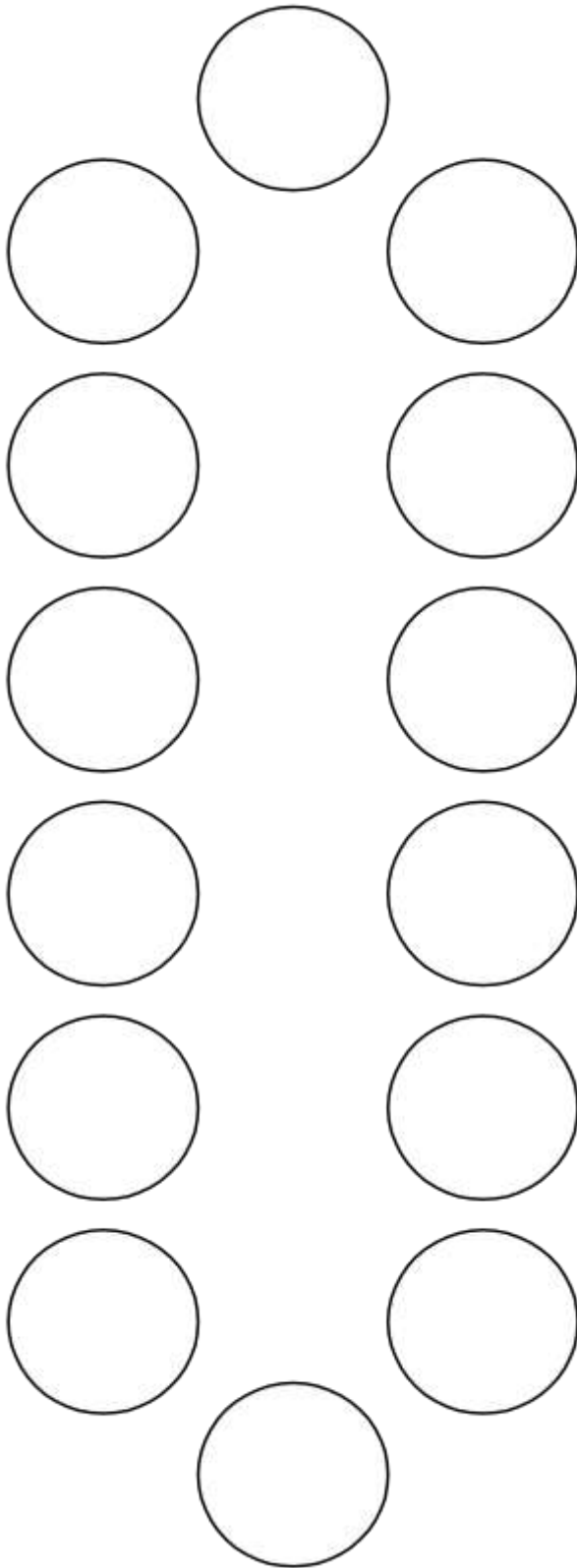
Student 1: _____

Student 2: _____

School: _____

School: _____

MANCALA



Winner of Competition Game

CAPTURE

Description:

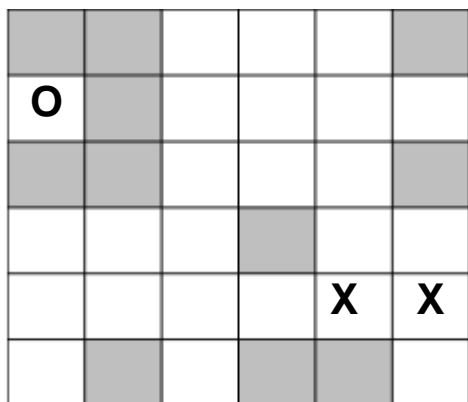
The game of Capture is a simple paper/pencil game played with two players on a 6 x 6 grid. Each player chooses a symbol; these could be an X or a 0. The objective of the game is to avoid placing your symbol in a straight or a diagonal course from the opponent. The players use logic along with the following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

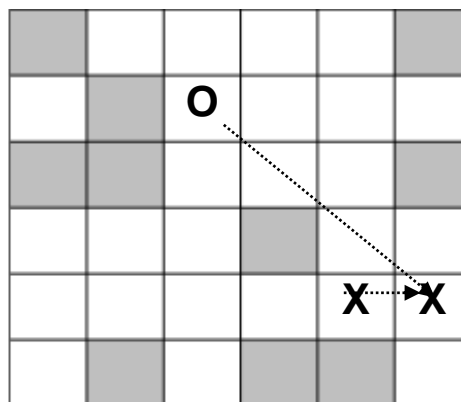
In example (figure B) 0 can move into the X's occupied square. Player O is the winner.

(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

| | | | | | |
|--|--|--|--|--|--|
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Math Field Day

Student 1: _____

Student 2: _____

Capture

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