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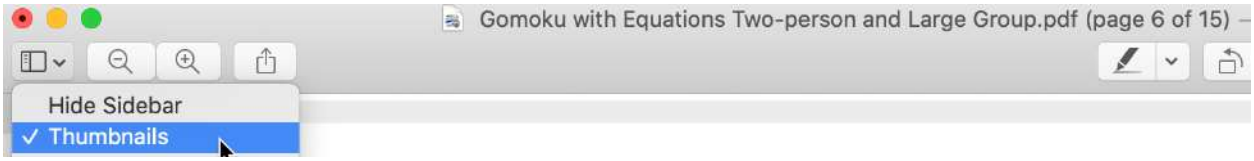
Gomoku with Equations

The game of Gomoku is based on the much more complex game of Go. In Gomoku, players take turns with X's and O's (or chips of different colors) until one of them has **5 in a row (horizontally, vertically, or diagonally) on a 9x9 board**. Going first is a big advantage—take turns or let the younger player go first. There is quite a lot of strategy that helps to win the game.
Before playing "**Gomoku with Equations**," please make sure that you have learned some strategies by playing:
Gomoku— the 6th of 15 pages in the pdf. If you turn on "Thumbnails," you will be able to select a small image of the page you are seeking and see the (page # of 15)



This page contains a blank-grid 8 ½ x 11-inch page for X's and O's **or** 2 colors of chips.

You can also play Gomoku on page 9 of 15 with contains 6 grids on one sheet of paper, this version is designed to use X's and O's.

To prepare a deck of playing cards for **Gomoku with Equations**, remove all the face cards (12 of them) leaving 4 Aces (each counts as a "1"), and four of each of the 2 – 10 cards for a total of 40 cards. You can use two decks to get 80 cards or you can print page 7 of 15 to get 8 of each number from 1 to 10. If you want the same number on the back of each card, you can to print page 8 of 15 on the back of page 7 of 15. Printing on card stock is preferable because the pieces will last longer than those printed on paper. Depending on the age and knowledge of the players, you can insist on the Hierarchical Order of Operations or you can relax that and just have them tell you what they want to do with the cards to make the target number.

Play is begun by dealing out 6 cards face up to each of the two players.

Gomoku with Equations —1 to 20
A two-person version example on page 10 of 15

This version of the game is designed for grades 1 and 2 and is designed for the operations of addition and subtraction.

Players who want the middle spot on the board (a good strategy) will see if they can make an equation equal to the number on the middle of the board. The equation must use **two or more** cards and ***exactly equal*** the number where the chip (or X or O) is to be placed.

You may use up to all six of your cards. If the desirable middle number is **18** and the player has the following cards:

2 4 4 5 7 10

they could use the 4+4+10 or

they could use (7–4) x (2+4) or

they could use (2x10) – 7 + 5 or

if known, they could use 10 + 7 + (4/4)

Each card can only be used one time in each equation, and once the turn is over the cards used are placed in the discard pile and the same number of cards are given to the player so that they always have 6 cards when it is their turn. The second player chooses a location and uses their cards to make the number. Play alternates until someone has 5 in a row (horizontally, vertically, or diagonally).

Winning is determined when one player has 5 in a row (horizontally, vertically, or diagonally). Some people allow the person going second to have a chance to tie, the official rules say that whoever gets 5 in a row first is the winner. Once both players are well versed in the strategies of the game, you can make it harder to win by insisting that only the second player can count wins (e.g., if you go first and win—that is the expected outcome). Going second and winning counts as a win because it much harder to win going second. If you play these rules, take turns going first until a player wins from going second. If someone wins going second, he or she must go first the next game to give the opponent a chance to win going second. This would **not** be a good rule at the beginning and if the person who goes first wins, just celebrate!

Gomoku with Equations —1 to 50
A two-person version example on page 11 of 15

This version of the game is designed for **grades 3 and 4** and is designed for the operations of addition, subtraction, and multiplication.

Players who want the middle spot on the board (a good strategy) will see if they can make an equation equal to the number on the middle of the board. The equation must use **two or more** cards and exactly equal the number where the chip (or X or O) is to be placed. You may use up to all six of your cards.

If the desirable middle number is **34** and the player has the following cards:

2 4 4 5 7 10

they could use the 4x10 – 4 – 2 or

they could use the (7–4) x 10 + 4 or

they could use the 7 x 4 + 2 + 4 or

they could use the (7 x 10) ÷ 2 + 4 – 5

Each card can only be used one time in each equation, and once the turn is over the cards used are placed in the discard pile and the same number of cards are given to the player so that they always have 6 cards when it is their turn. The second player chooses a location and uses their cards to make the number. Play alternates until someone has 5 in a row (horizontally, vertically, or diagonally).

Winning is determined when one player has 5 in a row (horizontally, vertically, or diagonally). Some people allow the person going second to have a chance to tie, the official rules say that whoever gets 5 in a row first is the winner. Once both players are well versed in the strategies of the game, you can make it harder to win by insisting that only the second player can count wins (e.g., if you go first and win—that is the expected outcome). Going second and winning counts as a win because it much harder to win going second. If you play these rules, take turns going first until a player wins from going second. If someone wins going second, he or she must go first the next game to give the opponent a chance to win going second. This would **not** be a good rule at the beginning and if the person who goes first wins, just celebrate!

Gomoku with Equations —1 to 100
A two-person version example on page 12 of 15

This version of the game is designed for **grades 5 through adult** and is designed for the operations of addition, subtraction, multiplication, and division.

Players who want the middle spot on the board (a good strategy) will see if they can make an equation equal to the number on the middle of the board. The equation must use **two or more** cards and exactly equal the number where the chip (or X or O) is to be placed. You may use up to all six of your cards. If the desirable middle number is **87** and the player has the following cards:

2 4 4 5 7 10

they could use the (4+4) x 10 + 7 or

they could use the 10 x 7 + (2 x 4) + 4 + 5 (using all six cards!) Note: it took me longer to find this example!

Each card can only be used one time in each equation, and once the turn is over the cards used are placed in the discard pile and the same number of cards are given to the player so that they always have 6 cards when it is their turn. The second player chooses a location and uses their cards to make the number. Play alternates until someone has 5 in a row (horizontally, vertically, or diagonally).

Winning is determined when one player has 5 in a row (horizontally, vertically, or diagonally). Some people allow the person going second to have a chance to tie, the official rules say that whoever gets 5 in a row first is the winner. Once both players are well versed in the strategies of the game, you can make it harder to win by insisting that only the second player can count wins (e.g., if you go first and win—that is the expected outcome). Going second and winning counts as a win because it much harder to win going second. If you play these rules, take turns going first until a player wins from going second. If someone wins going second, he or she must go first the next game to give the opponent a chance to win going second. This would **not** be a good rule at the beginning and if the person who goes first wins, just celebrate!

Gomoku with Equations—1 to 20, 1 to 50, and 1 to 100 can all be generated on Excel with the file "Gomoku with equations 2-person game.xlsx"

Gomoku with Equations for Groups—1 to 20, 1 to 50, and 1 to 100 can all be generated on Excel with the file "Gomoku with equations for large groups.xlsx"

Gomoku with Equations for Groups Instructions

Gomoku with Equations for Groups allows distance playing with a teacher and a group. The group can be small or an entire class, with everyone on Zoom at the same time.

Ideally, the teacher creates (Gomoku with equations for large groups.xlsx) or uses one of the examples (pages 13, 14, or 15 of 15) from the pdf. The teacher can send out the game board via email to all of the students ahead of the time that they are on Zoom, or the teacher can use the camera to show it during the game.

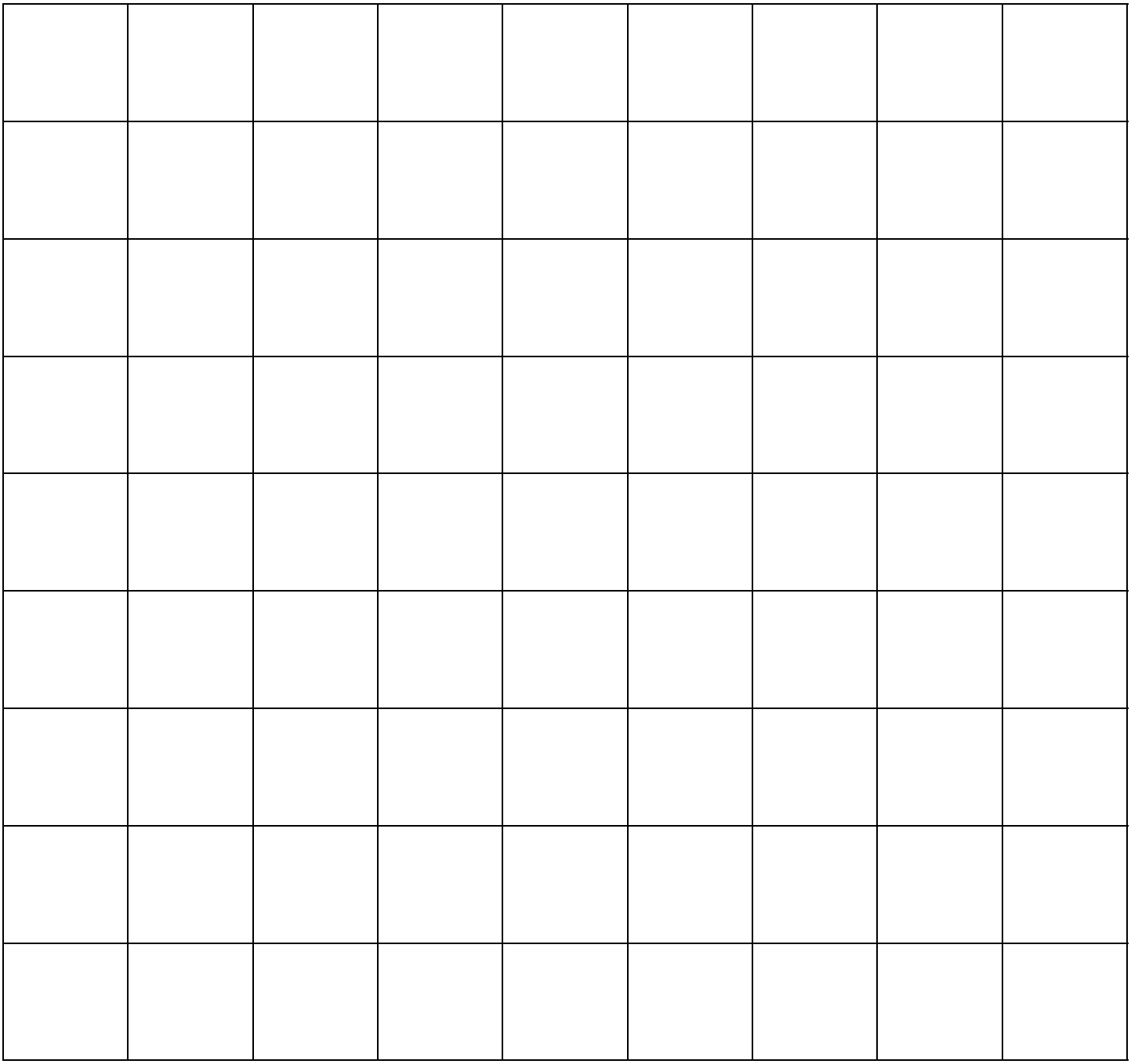
The teacher would deal six cards for each player (the teacher and the class) and tell the class their six numbers (e.g., 3, 5, 8, 10, 4, 6)

A student selected using the teacher's method for selection choose the first location using the Letter Number of the location. Students who wish to choose the middle location would say E5 and then must be able to make an equation (using **2 to 6** cards) that has the same value. For example, if the middle number was 9, the student could say 10+4−5=9. The student cards 5, 10 and 4 would be put on the discard pile and the teacher would give them three new cards (e.g., 10, 1, 3) Now the students would have 3, 8, 6 (from before) and 10, 1, 3 (new cards). The six cards that students would use their next turn are 3, 8, 6, 10, 1, 3.

It is now the teacher's turn and play continues until one player has five in a row vertically, horizontally, or diagonally.

Gomoku

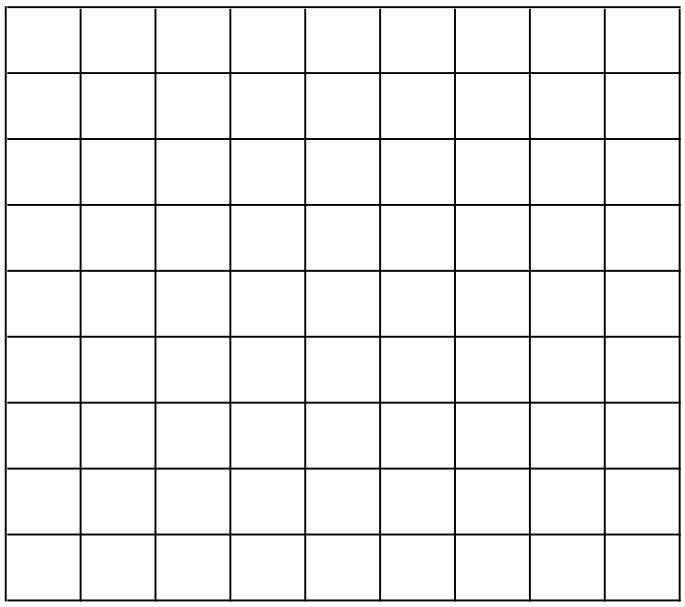
The game of Gomoku is based on the much more complex game of Go. In Gomoku, players take turns with X's and O's (or chips of different colors) until one of them has 5 in a row (horizontally, vertically, or diagonally). Going first is a big advantage—take turns or let the younger player go first. There is quite a lot of strategy that helps to win the game. Before playing "Gomoku with Equations," please make sure that you have learned some strategies.

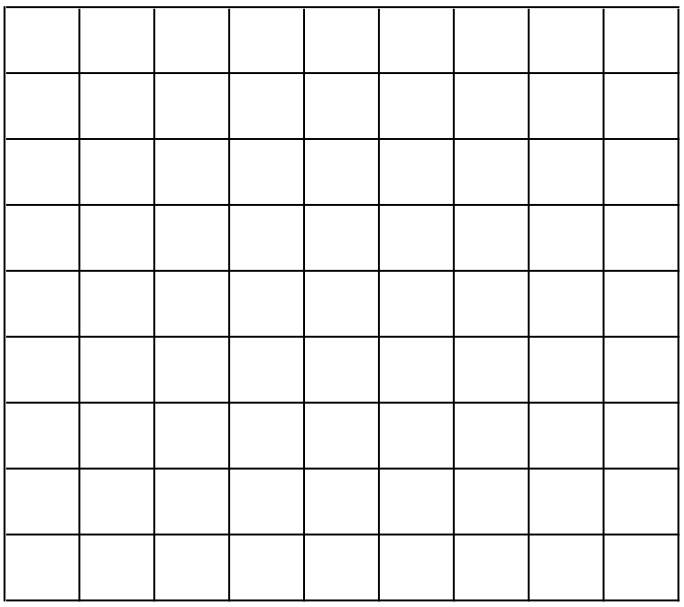


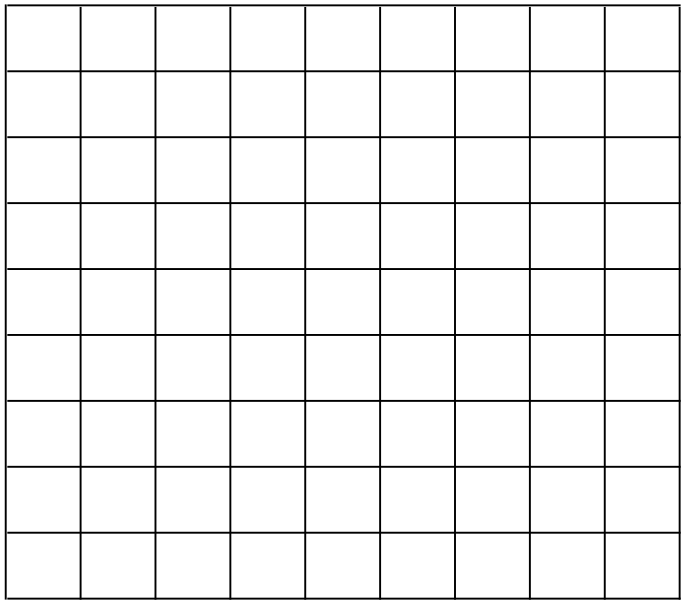
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10

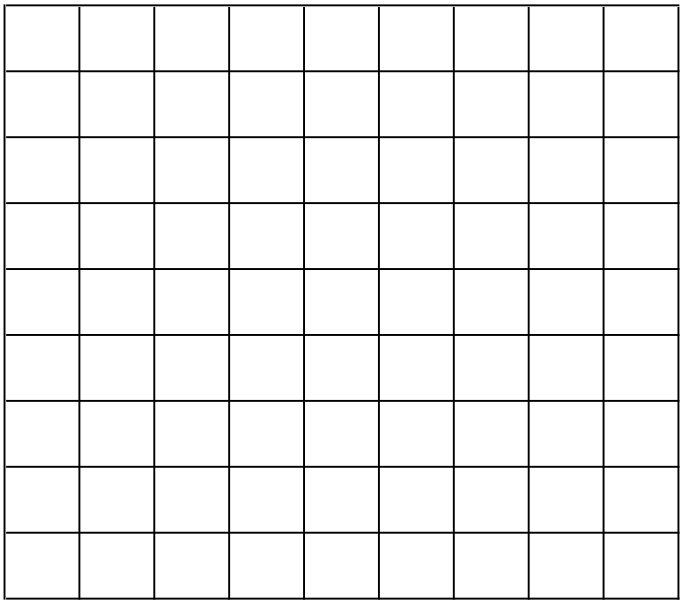
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10

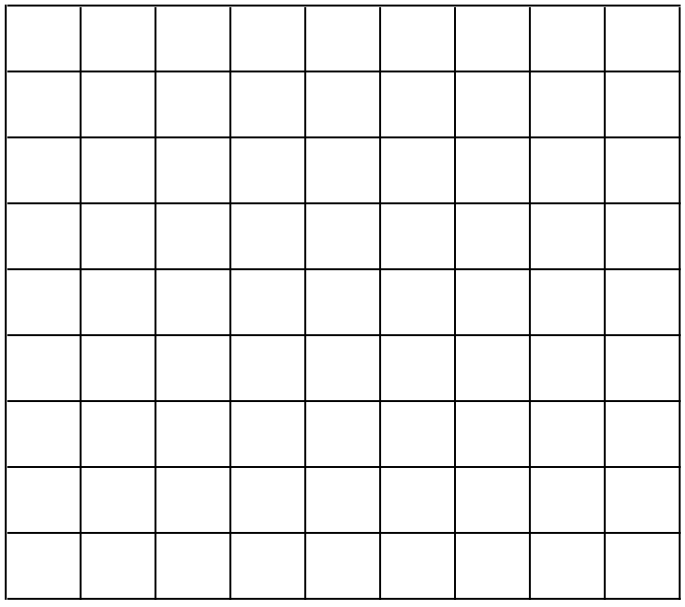
Gomoku: Two players take turns placing an **X** or an **O** onto the game board.
The first player to get five in a row (vertically, horizontally, or diagonally) wins.

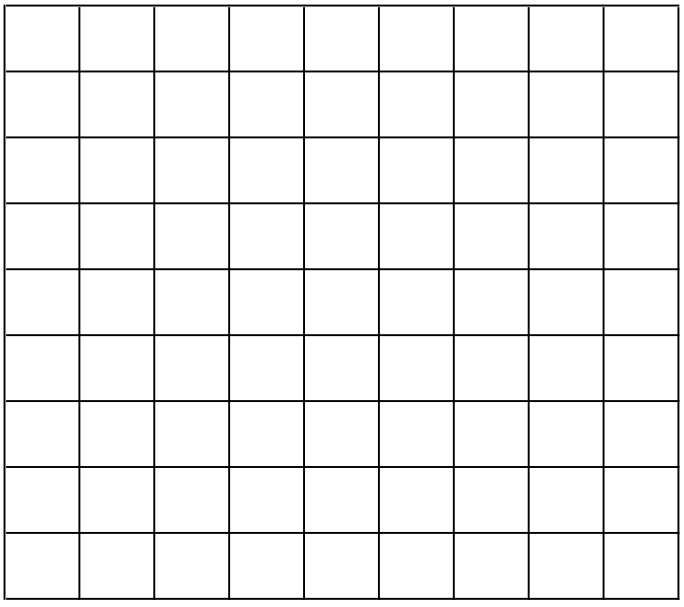












Gomoku

1 to 20

4	9	6	13	19	1	5	20	14
1	16	12	6	11	11	2	20	8
10	15	18	16	13	19	17	7	17
8	8	9	17	18	19	13	4	9
1	5	13	8	6	3	12	16	14
3	9	19	4	10	9	12	7	9
5	11	7	19	20	10	2	11	6
14	1	16	14	1	7	20	16	20
11	5	16	2	5	19	15	20	6

Gomoku

1 to 50

2	39	21	39	7	40	2	42	8
42	34	10	5	46	26	46	7	9
19	5	41	35	20	33	2	10	50
27	17	32	3	9	40	15	14	23
30	4	27	45	35	6	28	38	42
7	27	44	34	35	10	21	17	25
25	42	36	31	34	8	30	44	1
24	10	12	44	8	48	45	7	48
39	26	18	9	6	1	40	17	27

Gomoku

1 to 100

90	30	90	2	63	73	30	14	59
57	20	86	49	65	39	54	81	32
90	87	52	37	53	26	82	77	80
75	98	78	46	79	62	2	37	80
30	69	89	71	87	95	71	89	61
81	95	69	42	84	44	18	35	21
10	78	86	51	67	68	74	3	61
50	1	2	31	25	67	29	96	34
42	78	85	73	7	78	20	35	6

Gomoku for Groups

1 to 20

9	9	12	13	18	20	17	11	12	8
8	1	6	4	18	4	10	3	5	4
7	19	6	17	15	1	3	13	2	1
6	12	12	8	15	4	15	18	6	5
5	14	15	4	3	14	5	10	14	20
4	18	14	14	5	4	7	4	6	9
3	3	8	17	7	2	17	14	3	19
2	3	15	13	2	1	1	12	14	17
1	6	11	20	9	10	12	12	6	4
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**

To choose a location, say the letter and then the number. For example, D2 or G7.

Gomoku for Groups

1 to 50

9	42	40	2	32	45	34	4	22	46
8	8	44	31	5	14	17	14	14	33
7	45	13	38	47	37	45	12	7	34
6	26	38	10	26	43	12	4	24	50
5	19	18	45	16	2	39	48	17	42
4	6	15	36	39	40	49	27	8	22
3	14	18	34	26	8	20	25	24	12
2	6	41	2	25	47	45	48	44	10
1	21	33	30	14	35	6	21	1	5
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**

To choose a location, say the letter and then the number. For example, D2 or G7.

Gomoku for Groups

1 to 100

9	90	42	90	22	26	51	90	1	50
8	19	60	81	11	50	88	40	24	87
7	8	75	76	5	33	21	6	17	46
6	69	18	36	10	63	7	80	32	83
5	39	17	63	10	89	8	6	30	12
4	73	94	38	58	8	22	55	52	74
3	100	99	57	47	39	12	98	90	66
2	79	60	61	51	81	4	12	54	16
1	33	17	3	4	92	1	97	97	18

A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**

To choose a location, say the letter and then the number. For example, D2 or G7.