

Eric's Puzzle Party – 2004

<http://www.ericmarshbarger.org/epp/>

DO NOT READ PAST THIS PAGE UNTIL TOLD TO DO SO BY THE REFEREE!

Introduction

By now you should have already formed a team of players and designated a captain of the team. While you are waiting for the contest to begin you may want to think of a spiffy team name. In the *very unlikely* event of tie scores, the winning team will be the one the referee thinks has the coolest name.

In addition to this booklet of puzzles your team should have received a box of certain property which will be of use. Scratch paper, pens, pencils, calculators, and graph paper are also available to use (just ask the referee).

Also provided on site are a number of dictionaries. Certain puzzles may ask you to find words satisfying various conditions. To be valid, a word must appear in one of those dictionaries, in which it must be either listed in boldface or be an inflected form of a boldface entry. Comparative and superlative forms of adjectives are acceptable only if specified after a boldface entry, but noun plurals and verb forms are acceptable if clearly implied by the inflectional patterns of related words. Words may contain accent marks. A word is unacceptable if it:

1. is composed of two or more component words separated by a space, or appears only as a component part;
2. contains an apostrophe, hyphen, or period;
3. is designated as capitalized or usually capitalized;
4. is listed only as an abbreviation or symbol.

Besides the above items, you should use nothing else to help solve the problems (computers, cell phones, internet etc).

The contest is scheduled to start at 1:00 PM. It will last 4 hours. It is not necessary to complete all of the puzzles.

Most problems will have a space to write answers down. Be sure to write your answers clearly and in the appropriate places. Scoring of ambiguous answers will be left to the referee's discretion. Some problems may require you to demonstrate an answer to the referee without writing it down. Unless otherwise noted, you may do this at any time during the contest (the referee will write down any earned points in your booklet). For this type of problem, if you have submitted an answer and then later improve upon your solution, you may submit the better answer to the referee for more points.

When time expires the referee will collect all of the Puzzle Booklets (be sure you have recorded all of your answers). Grading will occur as quickly as possible, and prizes awarded immediately thereafter.

I would advise you to read all of the problems first, before starting any of them. If anything is unclear, do not hesitate to ask the referee for clarification.

Acknowledgements

Most of the puzzles in this booklet were created by Eric Harshbarger. While some play upon common puzzle themes, only two are taken directly from other sources: Puzzle #11 is from the book *Solve It!* by James F. Fixx (Doubleday, 1978) and Puzzle #13 from the webpage *Beginning Pentomino Problems* (<http://www.rit.edu/~mecsm/Professional/Puzzles/Pentominoes/P-A.html>). I'd like to thank my parents, Fred and Linda Harshbarger for encouraging me to hold this puzzle party and for proofreading the booklet of puzzles.

Finally, thanks to all of you, the players, who showed up for this first Puzzle Party.

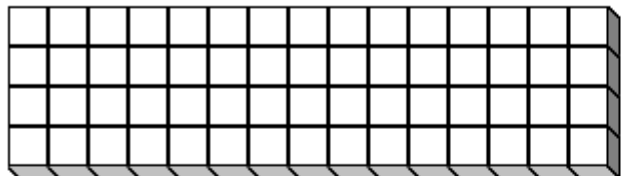
Have fun!

3. PENTOMINO BUILDING: Using the set of 12 red Pentominoes provided to your team, try to create as many of the configurations pictured below as possible. Points for each configuration are awarded individually (i.e. you need not create them all to get credit for solved ones). When you have a solution for a particular arrangement, show it to the referee (who will designate that configuration as having been solved by your team).

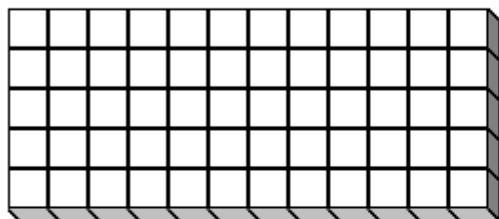
SCORING: Each configuration has a number of points awarded for its completion.



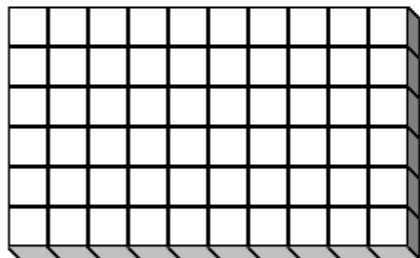
3x20 Rectangle
500 POINTS



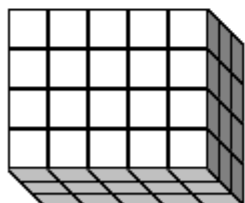
4x15 Rectangle
400 POINTS



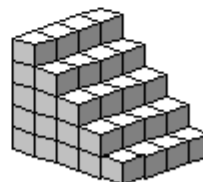
5x12 Rectangle
400 POINTS



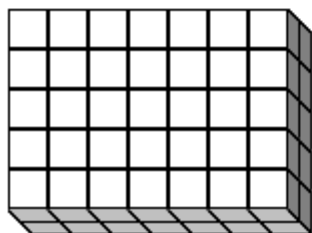
6x10 Rectangle
300 POINTS



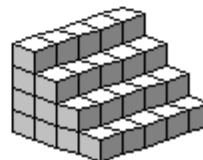
4x5x3 Box
750 POINTS



5 Steps
1000 POINTS



5x6x2 Box
500 POINTS



4 Steps
1000 POINTS

4. INCREASING ALPHABET: Create a list of words such that the first word begins with 'A' and is one letter long (that one is obvious), the second word begins with 'B' and is two letters long, the third starts with 'C' and is three letters long, and so on. Progress through the alphabet as far as you can. You need not find answers for previous letters to get credit for a particular entry (for example, you will earn points for an 11 letter K-word even if you do not find a 10 letter J-word).

SCORING: Each word awards a number of points equal to 10 * (word length).

ANSWERS:

- 1 A
- 2 B _
- 3 C _ _
- 4 D _ _ _
- 5 E _ _ _ _
- 6 F _ _ _ _ _
- 7 G _ _ _ _ _ _
- 8 H _ _ _ _ _ _ _
- 9 I _ _ _ _ _ _ _ _
- 10 J _ _ _ _ _ _ _ _ _
- 11 K _ _ _ _ _ _ _ _ _ _
- 12 L _ _ _ _ _ _ _ _ _ _ _
- 13 M _ _ _ _ _ _ _ _ _ _ _ _
- 14 N _ _ _ _ _ _ _ _ _ _ _ _ _
- 15 O _ _ _ _ _ _ _ _ _ _ _ _ _ _
- 16 P _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
- 17 Q _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
- 18 R _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
- 19 S _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
- 20 T _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
- 21 U _
- 22 V _
- 23 W _
- 24 X _
- 25 Y _
- 26 Z _

5. LEGO DESCRIBING: This puzzle will require two team members (a Describer and a Builder) to sit at the long table on the screened in porch. The two members will sit back-to-back (facing away from one another). The Describer will be given an abstract model (glued together) built from 12 LEGO pieces. The Builder will be given the same 12 LEGO pieces, loose. The goal is for the Describer to verbally instruct the Builder as to how to create a duplicate of the model without the Builder ever seeing the glued model. A Start Time and a Finish Time will be recorded for the puzzle. A team may only attempt this in one sitting (choose your Describer and Builder carefully; they may not be changed, and they may not call 'time out'). If the two team members give up after any amount of time, this puzzle will be forfeited. The duplicated model must match exactly. If, at anytime, the two participants believe the model is completed, they may call the referee over to check (still without the Describer showing the original model to the Builder). If the model is duplicated correctly, the completion time will be recorded. If the model is incorrect, the referee will simply say so and the Describer and Builder may resume the challenge. Each team's model is unique.

SCORING: Faster times win more points (teams may not be building at the same time, but each team will have a duration recorded if they complete the puzzle).

- 1st Place: 2000 points
- 2nd Place: 1500 points
- 3rd Place 1000 points
- 4th Place 500 points
- 5th Place 250 points

Teams that forfeit the puzzle are awarded 0 points, of course.

7. SCRABBLE STATES: Using some or all of the set of 100 Scrabble tiles provided, create the longest list of names of U.S. states that you can. No crossing words or sharing tiles between words, just spell out as many of the state names as you can (do not repeat any of the states). The two blank tiles may be designated as whatever letters you wish. Spaces in state names should be ignored.

SCORING: Points awarded for given list lengths:

Length	Points
1	5
2	10
3	15
4	25
5	40
6	65
7	105
8	170
9	275
10	445
11	720
12	1165
13	1885
14	3050
...	(sum of previous two scores)

ANSWER: Show your constructed list to the referee to receive points.

REFERENCE:

ALABAMA	MONTANA
ALASKA	NEBRASKA
ARIZONA	NEVADA
ARKANSAS	NEW HAMPSHIRE
CALIFORNIA	NEW JERSEY
COLORADO	NEW MEXICO
CONNECTICUT	NEW YORK
DELAWARE	NORTH CAROLINA
FLORIDA	NORTH DAKOTA
GEORGIA	OHIO
HAWAII	OKLAHOMA
IDAHO	OREGON
ILLINOIS	PENNSYLVANIA
INDIANA	RHODE ISLAND
IOWA	SOUTH CAROLINA
KANSAS	SOUTH DAKOTA
KENTUCKY	TENNESSEE
LOUISIANA	TEXAS
MAINE	UTAH
MARYLAND	VERMONT
MASSACHUSETTS	VIRGINIA
MICHIGAN	WASHINGTON
MINNESOTA	WEST VIRGINIA
MISSISSIPPI	WISCONSIN
MISSOURI	WYOMING

9. COLORBLIND WORDSEARCH: Provided (next page) is a chart showing the Braille representation of the alphabet and a Wordsearch puzzle in which a list words has been Braille-encoded then hidden in the grid of large and small dots. Find (and circle) as many of the words as possible (two examples have been indicated for you). Words will only appear horizontally or vertically, reading either left-to-right or top-to-bottom (i.e. no diagonal or reversed words).

SCORING: 50 points for each word circled (other than the examples given).

ANSWER: Circle the words as you find them in the wordsearch.

10. LETTER FREQUENCY: For each letter of the alphabet think of a word that contains as many of that letter as possible (for example, STEEPLE contains 3 E's; can you think of a word that contains more than that?).

SCORING: For each letter you will receive a score of: 5 * (instances of the letter in your corresponding word). STEEPLE would be worth 15 points for the letter 'E'.

ANSWERS:

- A. _____
- B. _____
- C. _____
- D. _____
- E. _____
- F. _____
- G. _____
- H. _____
- I. _____
- J. _____
- K. _____
- L. _____
- M. _____
- N. _____
- O. _____
- P. _____
- Q. _____
- R. _____
- S. _____
- T. _____
- U. _____
- V. _____
- W. _____
- X. _____
- Y. _____
- Z. _____

11. SELF-DESCRIBING NUMBER: Write a ten digit number so that the first (leftmost) digit tells how many zeroes there are in the number, the second how many ones, the third how many twos, and so forth.

SCORING: 300 points for a correct answer.

ANSWER:

12. WORD RECTANGLE: Below is an example of a 3x3 word square. Each row and column spells a word. Your goal is create a word rectangle of similar style. Each row and column must spell a word, but the grid can be a rectangle not just a square. No word may be used more than once. Each dimension of your rectangle must be at least 2.

SCORING: Your team will receive 50 points multiplied by the area of your rectangle (e.g. a 3x4 word rectangle will be worth 600 points; $3 * 4 * 50 = 600$)

EXAMPLE:

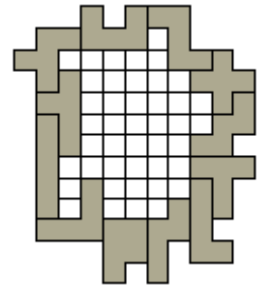
B	A	T
I	R	E
D	E	N

ANSWER:

13. PENTOMINO FARM: Using the 12 Pentomino pieces provided, enclose as large an area as possible on the grid provided (next page). Surrounding pieces must touch along at least one edge (simple corner-to-corner touching will not suffice). Placed pieces must follow the grid lines (i.e. don't place the pieces diagonally or such).

SCORING: Your team will receive 5 points for each square of the enclosed area.

ANSWER: Show the referee your construction to receive points.



14. STACK THE DECK: Provided to your team is a standard deck of cards (the Jokers will not be used). Imagine a game of cards that starts with 10 players. The dealer deals out 5 cards to each player (player to the left of dealer receives the first card). The person dealt the best poker hand wins the round. The deal then shifts to the left one player, and the previous dealer drops out of the game (so there are only 9 players in the second round). Again, 5 cards are dealt to each player; and the best poker hand wins the round. Round 3: deal moves left and the previous dealer drops out (8 players now). This continues for 9 rounds. In the last round there will be two players, each dealt five cards. The best poker hand wins the round.

Here's the challenge: imagine that the deck is 'stacked' each round in exactly the same way (i.e. the arrangement of cards when the dealing starts is identical each of the nine rounds). You have to decide how to stack the deck. Your goal is twofold: 1) make the dealer win as many times as possible, and 2) make the dealer have as many of the nine types of hands as possible (which rounds he gets which hands does not matter).

What arrangement of 52 cards do you use?

SCORING: Let 'W' be the number of times the dealer wins over the course of the nine rounds of play, and let 'H' be the number of different types of hands the dealer gets over the course of the nine rounds of play. Your score for this puzzle will be $(W + 1) * (H + 1) * 20$.

ANSWER: List the order of the stacked deck in the 52 spaces below (read left to right, row by row). Below that, circle which rounds the dealer wins, and circle each type of hand the dealer gets. Also, physically stack your actual deck of cards according to your written arrangement and give that to the referee.

Stacked deck (Examples of notation: '10 of Hearts' = 10H, 'Queen of Diamonds' = QD, 'Ace of Spades' == AS):

___	___	___	___	___	___	___	___	___	___	___	___	___
___	___	___	___	___	___	___	___	___	___	___	___	___
___	___	___	___	___	___	___	___	___	___	___	___	___
___	___	___	___	___	___	___	___	___	___	___	___	___

Rounds won by dealer: 1st 2nd 3rd 4th 5th 6th 7th 8th 9th

Hands obtained by dealer:

Str. Flush 4-Kind Full House Flush Straight 3-Kind 2-Pair 1-Pair High card

REFERENCE:

Here are the nine types of poker hands (from best to worst):

- **Straight flush:** five cards in sequence in the same suit (Ace may be high or low). Between two straight flushes, the one headed by the highest-ranking card wins.
- **Four of a kind:** any four cards of the same rank.
- **Full house:** three of a kind and a pair. Between two full houses, the one wins whose three of a kind are composed of higher ranking cards.
- **Flush:** any hand of five cards all of the same suit. Between two flushes, the one containing the highest-ranking card wins. If these two cards tie, the next-highest-ranking card decides, and so forth.
- **Straight:** any five cards in sequence but not all of the same suit. Between two straights, the one headed by the highest ranking card wins.
- **Three of a kind:** such as three 6's, with two unmatched cards. Between to hands of three of a kind, the higher ranking set wins.
- **Two pairs:** two cards of any one rank and two cards of any other rank, with an unmatched fifth card in hand. Between two such hands, the one with the higher pair wins. If both hands contain the same high pair, the lower pair is compared. If still tied, the higher unmatched card determines the winner.
- **One pair:** any two cards of the same rank. Between two such hands, the higher pair wins. If tied, then highest extra cards are compared.
- **High card:** five unmatched cards. Compared highest cards (or second highest, etc) for winner.

15. CUBIC MAZE: On the surface of the cubic maze given to your team trace a path from the Start position ('S') to the Finish position ('F') using the washable marker. Trace the path as cleanly as possible and have no extraneous branches in the final solution (i.e. the answer should be a single line from Start to Finish – you may erase the marker ink with a damp towel).

SCORING: 500 points will be awarded to your team when a solution to the maze is found.

ANSWER: Show the referee your solved maze.

16. RHOMBIC DODECAHEDRON: Provided to your team is a rhombic dodecahedron (12 sided shape) made of cardboard. It can be taken apart into seven pieces: a cube and six pyramids. Note that each pyramid has numbers written on its triangular faces (all of the numbers 0 through 23 are represented). Your goal is to reassemble the dodecahedron to obtain the highest 'score'.

Your score is calculated in the following way: when the dodecahedron is built, it will have 12 sides shaped like diamonds (rhombi). Each diamond will have two numbers on it (since each diamond is formed from two of the pyramidal triangles). For each of the twelve diamonds, multiply its two numbers together. Then, add the twelve products together to get a single sum. That sum is your score.

SCORING: Your team will be awarded a number of points equal to the score you achieve in the above manner.

ANSWER: Record your products and sum, circle your total calculated points, and show the assembled dodecahedron to the referee.

17. LATITUDE AND LONGITUDE: Below is a list of 12 cities. To the nearest degree guess the position coordinates in latitude and longitude of each city. Be sure to include direction designation with each (N or S for latitude, E or W for longitude). Here are the cities:

SCORING: This puzzle will likely result in points being subtracted from your score; the goal is to 'minimize the damage' by guessing as accurately as possible. For each degree of inaccuracy in your answers (in both the latitude and longitude) 1 point will be subtracted from your team's overall score. **BE SURE TO TRY A GUESS FOR EACH CITY! If you leave any blanks empty, it will be assumed you entered coordinates 0 Latitude and 0 Longitude and the penalty will be calculated accordingly!**

ANSWERS:

	<u>LATITUDE (N/S)</u>	<u>LONGITUDE (E/W)</u>
•Paris, France	_____	_____
•Sydney, Australia	_____	_____
•Buenos Aires, Argentina	_____	_____
•Moscow, Russia	_____	_____
•New York City, USA	_____	_____
•Cairo, Egypt	_____	_____
•Tokyo, Japan	_____	_____
•Mexico City, Mexico	_____	_____
•Bangkok, Thailand	_____	_____
•Vancouver, Canada	_____	_____
•Cape Town, South Africa	_____	_____
•Auburn, Alabama, USA	_____	_____