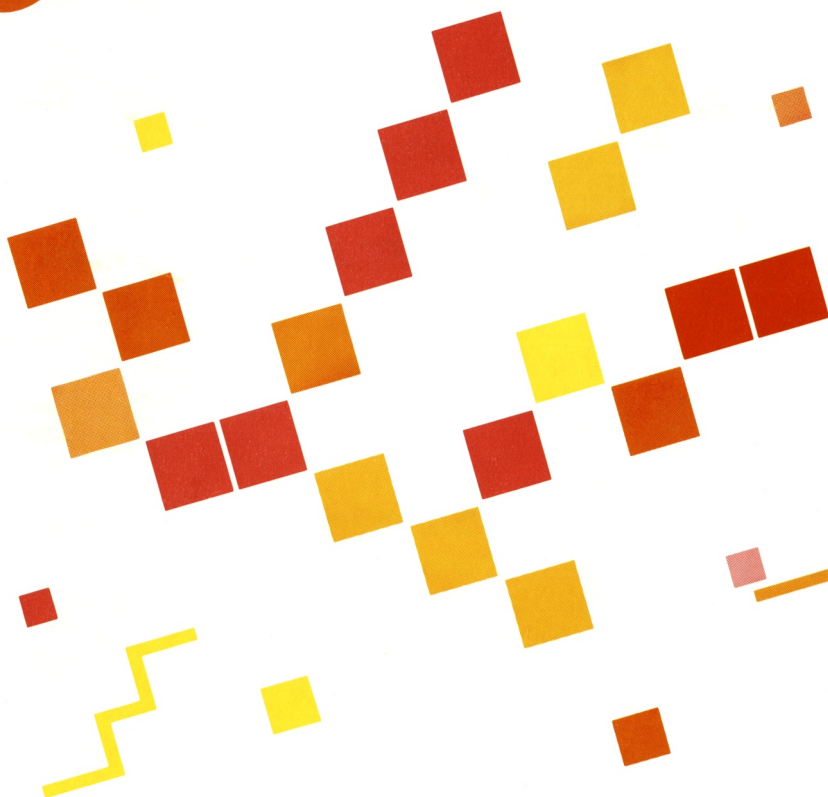




# WORD CHALLENGE™



**Better Than Boggle™!**

Based On PROXIMITY Linguistic Technology



**HAYDEN**  
SOFTWARE



# WORD CHALLENGE™

The Ultimate Word Game

Macintosh  
User's Manual

Based on PROXIMITY Linguistic Technology

Macintosh conversion by  
John Rhoads, Ph.D

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600 Suffolk Street  
Lowell, MA 01854  
1-800-343-1218  
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# INTRODUCTION

WORD CHALLENGE is a sophisticated new word game designed especially for your Macintosh. Word games are a long-standing tradition in Western culture and now WORD CHALLENGE presents you with LEX, an electronic opponent of uncanny skill and intelligence. Test and improve your vocabulary skills by playing against LEX either alone or with your friends.

WORD CHALLENGE is easy to operate and fun to play. A variety of unique options allows you to construct a game suitable to your own competitive level. This user's manual provides step-by-step instructions and a detailed explanation of the special features in WORD CHALLENGE. Special sections at the end of the manual describe the inner mechanisms of the game and suggest tips for the beginner.

## The Word Challenge Cast of Characters

- **LEX**                      The expert and your opponent. LEX plays at 26 different difficulty levels and is a match for anyone from beginner to pro.
- **YOU**                      The challenger.
- **Timer**                    Set it to the amount of time YOU need.
- **Scorekeeper**            Keeps track of games and match totals. Choose among five scoring methods for the Scorekeeper to use.
- **Dictionary of 90,000 Words**    The Scorekeeper's reference for checking all the words YOU and LEX discover.

# PLAYING WORD CHALLENGE

## OBJECT

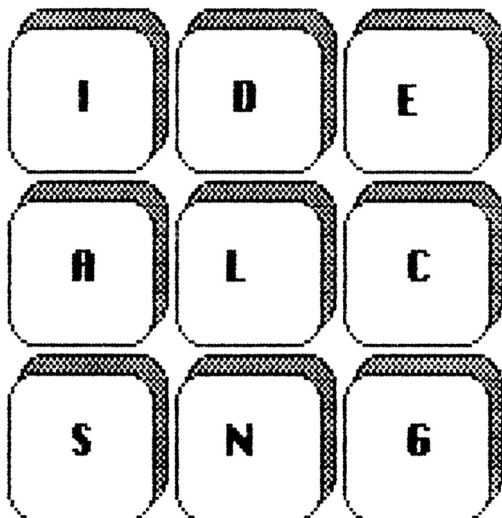
The object of **WORD CHALLENGE** is to compete against **LEX**, the dreaded Word Master, to find hidden words in a grid of letters. The player who accumulates the most points is the winner.

## FORMING WORDS

It's easy to find words in the **WORD CHALLENGE** grid. Look at the sample square on the next page and connect the letters to form words using the following rules:

1. Letters may only be connected if they touch each other on any side or on any corner. For example, in the sample square, the letter **I** adjoins **A**, **L** and **D**.
2. Words are legal only if the letters connect in sequence. Connecting letters in sequence means that each new letter must touch the previous letter in the word. In the sample square, the word **clad** is legal. You begin with **C**, then **L** touches **C**, then **A** touches **L**, then **D** touches **A**. However, you may not spell **cling**, since the **N** does not touch the previous letter **I**.
3. The same letter may be used only once in the construction of a single word. In the example, you can spell **sail**, but not **sails**, because the letter **S** would be used twice.
4. Legal words are made up of the combination of letters **A** through **Z**. Apostrophes and hyphens are not permitted.
5. Words must be at least three letters long to receive credit. For example, in the sample square, the word **as** is not credited. (The special case **Qu**, which will appear in one box, counts as two letters in scoring and construction.)

## SAMPLE SQUARE



You can make 45 words from this simple square.  
(Try it.) Here are a few:

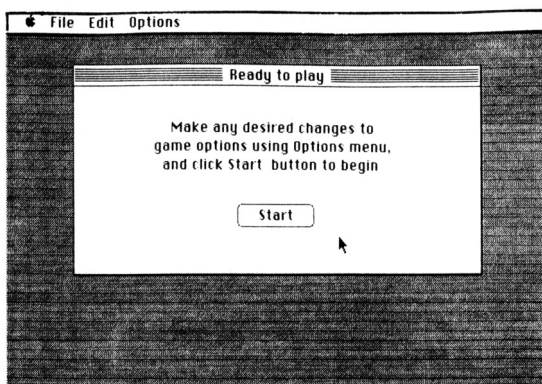
**snail      glanced      sale      sail      dial**

## HARDWARE REQUIREMENTS

To play WORD CHALLENGE, you need a Macintosh system unit with built-in disk drive, with at least 128K bytes of memory, keyboard and mouse.

## GETTING STARTED

To load WORD CHALLENGE, simply turn on your Macintosh, wait until the Macintosh icon with the flashing "?" appears on the screen, then insert your WORD CHALLENGE disk into the drive slot. On the Macintosh, all features are available on pull-down menus and can be activated by simply moving and clicking your mouse. When the dialog box, "Ready to play", appears on your screen, position the arrow on the **Start** button and click your mouse.



You are now ready to play WORD CHALLENGE.  
**GOOD LUCK!!**

## STANDARD GAME

WORD CHALLENGE boots with the Game Options set to the Standard Game Settings. If you choose not to change any options before beginning to play, you will be playing WORD CHALLENGE on a  $4 \times 4$  grid for three minutes. LEX will be set at difficulty level T on a scale from A (most difficult) to Z (least difficult), and the Winning Score is set at 100 points. You may view the setting of these options by selecting **Options menu** and clicking **Display Option Settings**.

## BEGINNING THE GAME

Start entering your words as soon as the grid of letters appears on the screen. To enter a word, use the mouse to position the arrow over the first letter of the word you are spelling. Hold down the mouse button and drag it over each letter of the word in consecutive order. Release the mouse button when you have chosen the last letter of the word. Notice that each letter of the word appears in the "Your Words" box as it is highlighted by the mouse. You may back up and erase letters if you have not yet released the mouse.

Words may also be typed in from the keyboard. Each letter will appear in the "Your Words" box. Words must be separated by a non-alphabetic character such as RETURN, SPACE, COMMA or any other non-alphabetic character you choose. If you have misspelled a word, you can use the edit features of your Macintosh to correct it. However, since there is no penalty for a misspelled word, and since you are racing against the clock, you might find it advantageous to simply enter the word.

While YOU and LEX look for words hidden in the square, the Scorekeeper searches the 90,000 word dictionary to determine all of the possible words in the square. The Timer posts the number of seconds remaining in the game on the scoreboard and visually counts down the remaining time in the game. When less than one minute is left, a bar graph appears on the scoreboard and begins shrinking by the second. Now the final countdown begins. The Timer beeps once per second for the last ten seconds of the game. When time runs out, play stops and the "Your Words" box is cleared to begin scoring.

## SCORING

### First Phase

#### DISPLAY WORDS

Each word found by either player is shown on the screen. Next to each word, the Scorekeeper indicates who found the word by placing a **YES** in the **YOU** column, the **LEX** column or both.

#### SPELL WORDS

In the Standard Game, you are given approximately three seconds to review each word displayed by the Scorekeeper. During that time, the Scorekeeper highlights the word in the square and will trace it out for you, if you hold down any key on the keyboard.

The Scorekeeper compares your list of words with LEX's list of words and gives credit as follows:

<b>YOU</b> have the word but <b>LEX</b> does not	= <b>You receive credit.</b>
<b>LEX</b> has the word but <b>YOU</b> do not	= <b>LEX receives credit.</b>
<b>YOU</b> and <b>LEX</b> both have the word	= <b>No credit is given.</b>

The exact number of points awarded for each word depends on the length of the word and the scoring method you select. Basically, you receive more points for longer words. (See the Setting Game Options section for an explanation of various scoring methods.)

## Second Phase

### DISPLAY UNCREDITED WORDS

Although the Scorekeeper is very knowledgeable and knows 90,000 words, you may find a word it doesn't know. During the secondary scoring phase the Scorekeeper displays all uncredited words and you are given the chance to receive credit for them.

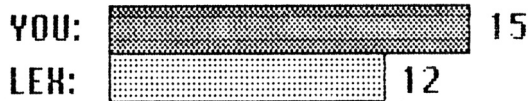
If you would like to view your uncredited and unconstructible words, press **S**. If you would like to bypass the secondary scoring phase, press **C**.

### DISPLAY IMPOSSIBLE CONSTRUCTIONS

During the secondary scoring phase, the Scorekeeper also displays any words you entered that could not be constructed in the square.

### DISPLAY SCORES

The score of a game is displayed on the scoreboard. For each game, the Scorekeeper displays the number of points earned by **YOU** and **LEX** and the number of points tied. The number of words in the square and the maximum number of points available in the square are also displayed on the scoreboard. The running totals for a match are displayed at the bottom of the scoreboard by two bar graphs labeled as follows:



During each game, the match totals are updated by the Scorekeeper.

### WINNING

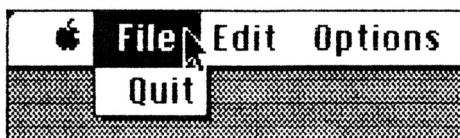
A match is a series of games in which **YOU** and **LEX** compete to gain points toward the Winning Score. The Winning Score may be set to any number from 1 to 999. In the Standard Game, the Winning Score is set at 100 points.

The number of games in a match is not preset but varies with the number of points **YOU** and **LEX** score on each word square. On the final board, the Scorekeeper continues to update game and match totals past the Winning Score, giving credit for all words found by each opponent. The player who has the most points at the end of a match — *not the one who reaches the Winning Score first* — is declared the winner. Then the Scoring window clears, the Introductory Display returns and you are ready to play another match of **WORD CHALLENGE**.



## EXITING THE GAME

To exit WORD CHALLENGE, perform the following step:



- ✓ Pull down the **File** menu and click **Quit**.

Remove your disk and store it in a safe place. Your Macintosh is now ready to insert another application disk.

## SPECIAL FEATURES

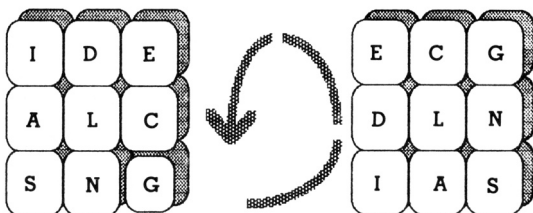
The first three special features can be used during play. They are identified by the three buttons displayed on the right of the scoreboard during play and scoring. They are: **Rotate Left**, **Rotate Right** and **Start Scoring**.

### ROTATE SQUARE LEFT

Use this feature to view the current word square from a different angle. Perform the following step to rotate the word square to the left.

- Select and click the **LEFT** button.

The word square rotates counterclockwise.

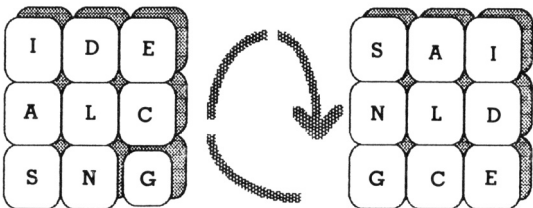


### ROTATE SQUARE RIGHT

Perform the following step to rotate the word square to the right.

- Select and click the **RIGHT** button.

The word square rotates clockwise.



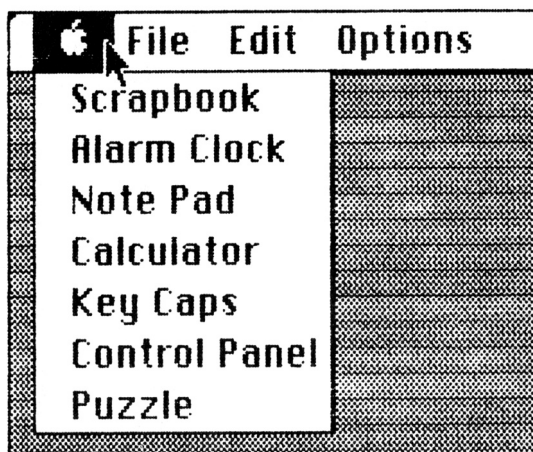
## START SCORING

When you have found all the words you can in a square, select and click the **Start Scoring** button on the scoreboard. This will stop the clock and begin scoring. You do not have to wait for time to run out to end the game. *Note: Scoring cannot begin until the Scorekeeper has finished searching through the dictionary.* Once you have selected the **Start Scoring** button, you cannot enter any more words.

The remaining features in this section are arranged by the menu item that controls them, beginning with the menu item at the far left of your screen, and proceeding to the right.

A feature is activated by selecting the desired menu item, dragging the cursor down to the desired feature, and releasing the mouse button.

## APPLE MENU



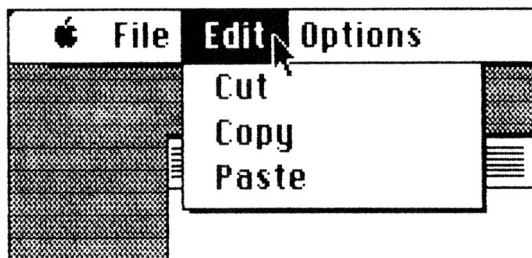
The desk accessories shown on the **Apple menu** are all available under **WORD CHALLENGE**. See the section on "Desk Accessories" in the Macintosh manual (Chapter 4) for a complete explanation.

## FILE MENU



Under the **File** menu is the **Quit** option. Clicking **Quit** cancels the game in progress and ejects the **WORD CHALLENGE** disk. Remove your disk and store it in a safe place. Your Macintosh is now ready to insert another application disk.

## EDIT MENU



**Cut** and **Copy** may be used during a **WORD CHALLENGE** game to select a word or words and copy them to another section of the "Your Words" box. They are also included for use with the Macintosh Desk Accessories. **Paste** can be used to **Paste** a word into the Scrapbook, which provides a pathway into MacWrite.

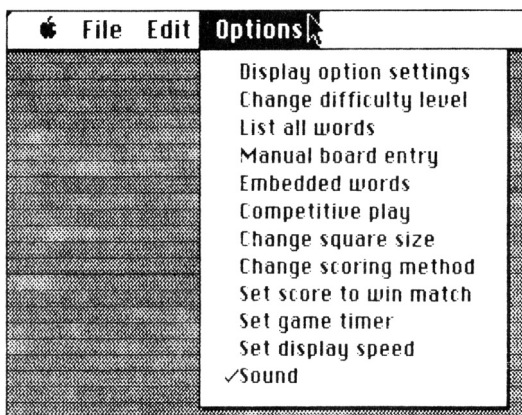
# SETTING GAME OPTIONS

WORD CHALLENGE is a very versatile game. You can determine the character of a game by changing any of the Standard Game Settings. We refer to these variable settings as **options**. This section of the manual describes each option in detail.

Option	Standard Setting	Possible Settings
Change Difficulty Level	T	A-Z
List All Words	No	Y or N
Manual Board Entry	No	Y or N
Embedded Words	None	None, Suffix, or All
Competitive Play	No	Y or N
Change Square Size	4 by 4	3, 4, or 5
Change Scoring Method	B	A, B, C, D, or E
Set Score to Win Match	100 pts	1 - 999
Set Game Timer	180 secs	1 - 999
Set Display Speed	3 secs	0 - 5
Sound	On	On - Off

For the most part, changing your options determines the difficulty of the game. As your vocabulary skills increase, you can play WORD CHALLENGE at more difficult settings making WORD CHALLENGE suitable for people of all ages and skills.

## OPTIONS MENU



To change a particular setting for any option, select the **Options menu**, drag the cursor down until the desired feature is highlighted, then release the mouse button. Changing the setting of

any option on the menu causes the match to be played under your rules. Once the game is underway, you cannot access or change any of the game options.

## DISPLAY OPTIONS SETTINGS

Clicking this option allows the user to view the current setting of the game options. The following menu options allow you to change these settings.

## CHANGE DIFFICULTY LEVEL

There are 26 difficulty levels at which your opponent, LEX, can play WORD CHALLENGE. Level A represents superior playing ability. At Level A, LEX will find all possible words in the square. Level Z represents the easiest level of play. Use the keyboard to enter the level of difficulty you desire.

At lower levels, LEX is restricted in his knowledge to words of shorter length and simpler English construction. At lower levels, LEX is also restricted in the number of words he can process. Since changing levels alters both the kind and amount of words that LEX will find, you can realistically adjust the ability of your opponent.

## LIST ALL WORDS

During the scoring stage of a Standard Game, the Scorekeeper displays only those words that YOU or LEX find in the word square. Selecting the **List All Words** option allows *all* possible words in the square to be displayed, regardless of whether or not the word was found by YOU or LEX. The **List All Words** option allows you to play competitively with LEX at your own skill level and still see all of the possible words that can be constructed in a square.

When the **List All Words** option is activated, a check mark will be displayed in front of that option in the **Options menu**. To deactivate the **List All Words** option, simply select and click the option again in the **Options menu** (removing the check mark).

## MANUAL BOARD ENTRY

Selecting the **Manual Board Entry** option enables you to create your own square! During play, a blank word square board will appear on the screen. You select your letters, one by one, starting in the upper left-hand corner of the blank word square board. If you make an error entering your letters, simply press **BACKSPACE** until you have cleared your error and reenter the correct letter. Before play begins, you will be asked to verify your board. Click the **OK** button when the board is correct. The **Manual Board Entry** option enables you to play games from the newspaper by entering the desired letters.

When the **Manual Board Entry** option is activated, a check mark will be displayed in front of that option in the **Options menu**. To deactivate the **Manual Board Entry** option, simply select and click the option again in the **Options menu** (removing the check mark).

## EMBEDDED WORDS

WORD CHALLENGE players will notice that it is possible to enter a word which has one or more other words contained within it. For example, in the word *strainers*, you can find the following words:

- |            |             |
|------------|-------------|
| – rain     | – strain    |
| – train    | – strainer  |
| – trainer  | – strainers |
| – trainers |             |

These words are referred to as embedded words.

During standard play, if you enter the word *strainers* you will receive credit for only one word, *strainers*. However by selecting the **Embedded Words** option, you can receive credit for some, if not all, embedded words.

By selecting and clicking the **SUFFIX** button, you receive credit for all embedded words that begin with the same letter sequence as your original word. So if you enter *strainers*, you would receive credit for:

- strain
- strainer
- strainers

However, you would not receive credit for any embedded word that does not begin with the same first three letters of your entry. This is called **SUFFIX** mode because you are receiving the root word(s) free without using the additional time needed to enter them into the game.

By selecting and clicking the **ALL** button, you receive credit for *all* words embedded in the original word. For the word *strollers*, you would receive credit for the following:

- |           |             |
|-----------|-------------|
| – roll    | – trollers  |
| – roller  | – stroller  |
| – rollers | – strollers |
| – troll   |             |

WORD CHALLENGE players who just don't have enough time to enter every word they find, will learn to love this option.

## COMPETITIVE PLAY

The **Competitive Play** option allows you to reproduce a square you have already played. If LEX is playing at the same difficulty level each time, even his responses will be reproducible!

Select and click the **Competitive Play** option, then enter the board number you wish to replay in the dialog box and click the **YES** button. Clicking the **YES** button without entering a board number automatically draws a new board on your screen with an assigned number. The board number appears on the scoreboard. This way if you want to replay the new board, remember the number assigned to it and select the **Competitive Play** option at the end of your game.

There are 65,536 distinct competition boards available for each square size. If you wish to replay a specific board in **Competitive Play**, simply enter the number of the desired board. You will notice that there is a slightly different board for each number depending on the size of the grid. If your option settings are the same as before, WORD CHALLENGE will reproduce the previous game exactly.

The **Competitive Play** option is used primarily by those who wish to use the Scorekeeper as a referee between two competitors playing the same square against LEX or the same player playing the same square against LEX at different times. See if you can beat LEX at a certain level. When you have mastered that level, increase the level of difficulty and replay your sequence of boards to determine your progress.

## CHANGE SQUARE SIZE

To change the size of the word square grid, select and click the **Change Square Size** option from your **Options menu**. Then select and click one of the three buttons on the dialog box to indicate the size you want. A  $3 \times 3$  word square grid is the easiest square to play. A  $4 \times 4$  grid is the standard size and the  $5 \times 5$  grid is the most difficult to play.

## CHANGE SCORING METHOD

Choose among five **Scoring Methods**. Use the method recommended for each board size. The methods available to you are alike in three aspects:

1. The scoring method chosen is used to add up both your points and LEX's.

2. Any words found by both YOU and LEX are not credited.
3. One and two letter words are not credited.

Each scoring method has a specific task for which it is best suited.

### Scoring Method A

Recommended for use with  $3 \times 3$  board.

Word length	0 - 2	3	4	5	6	7	8 - up
Points	0	1	2	4	7	10	12

### Scoring Method B

Recommended for use with  $4 \times 4$  board.

Word length	0 - 2	3-4	5	6	7	8 - up
Points	0	1	2	3	4	10

### Scoring Method C

Recommended for use with  $5 \times 5$  board.

Word length	0 - 3	4	5	6	7	8	9	10	11 - up
Points	0	1	2	3	4	6	8	10	11

### Scoring Method D

This method of scoring rewards longer words. You receive one point for each letter in any word.

### Scoring Method E

This method of scoring rewards the most words. You receive one point for each word found, regardless of length. **Hint:** When using this scoring method, concentrate on finding short words. The more words you find, the more points you accumulate!



## SET SCORE TO WIN MATCH

The **Winning Score** determines when a match is over and may be changed to any number from 1 to 999 points. Use the keyboard to select the number of points and click the **OK** button after entering your numbers.

## SET GAME TIMER

The **Timer** limits, in seconds, the amount of time you have to play a **WORD CHALLENGE** game. The **Timer** can be set to any number of seconds ranging from 1 to 999 seconds. You will usually want to allow more than 3 minutes on  $5 \times 5$  squares, but less than 3 minutes on  $3 \times 3$  squares. Use the keyboard to select the number of seconds and click the **OK** button in the dialog box after entering your numbers.

## SET DISPLAY SPEED

At the end of each game, the Scorekeeper displays each word that is found in the word square and pauses between them to allow each word to be examined. The **Display Speed** determines how long the Scorekeeper pauses. Setting this option to 5 allows the longest pause. You may ask the Scorekeeper to trace out each letter of a word by holding down any key during scoring. This will extend the amount of time for which a word is displayed.

## SOUND

Selecting the **Sound** option provides sound during the last ten seconds of the game. In addition, if you ask to have words traced out during scoring (by holding down any key), each letter will flash and play a musical note.

When the **Sound** option is activated, a check mark will be displayed in front of the word **Sound** in the **Options menu**. To turn the sound off, simply select and click the **Sound** option in the **Options menu** (removing the check mark).

# STRATEGY AND THE DICTIONARY

The dictionary used in WORD CHALLENGE is a very specialized word list. It presents an accurate description of the English language and can be a significant tool in improving your vocabulary.

LEX is, *undisputably*, an expert. You will learn new words from LEX and improve your spelling skills. The dictionary your opponent uses includes many everyday words that you will easily recognize plus new terms that have recently been incorporated into English. Many of these new words still do not appear in the best paper-bound dictionaries! However, you can improve your game by knowing a few facts about the types of words in the WORD CHALLENGE dictionary.

## VARIATIONS OF COMMON WORDS

Words with suffixes make up a large portion of the dictionary. Words that end in *-ing*, *-ly*, *-er*, *-ers* and *-ness* account for more than 21,000 entries!

If you find a common root word like *help*, spend some time looking for some of its variants like *helps*, *helped*, *helping* and *helper*. You'll be surprised at the mileage you can get out of a single root word by adding suffixes, if the letters are available in the grid.

## COMMON LETTERS

Every letter of the alphabet has a different number of words in its section of the dictionary. Far more words begin with the letters **c** and **s** than with any other letter. Words that begin with **c** and words that begin with **s** constitute more than one-fifth of the dictionary. In contrast to this, the letters *j*, *k*, *n*, *q*, *v*, *x*, *y*, and *z* combined, account for less than six percent.

Even though the English language does not treat all letters equally, the WORD CHALLENGE Scorekeeper does! So, try spending more time working with common letters like **c** and **s**, than, for instance, a more exotic letter like **x**. While words with **x** like *axolotl*, *calyx* and *xebec* may seem intriguing, they account for less than three percent of the dictionary.

The following chart indicates the approximate number of times each letter of the alphabet appears in the dictionary.

Letter	Number Occurrences	Letter	Number Occurrences
a	59.5	n	56.0
b	15.2	o	47.3
c	32.6	p	22.6
d	27.8	q	1.5
e	93.1	r	58.4
f	10.7	s	73.3
g	22.4	t	56.8
h	16.6	u	25.1
i	75.3	v	8.5
j	1.2	w	5.9
k	6.0	x	2.3
l	45.3	y	14.6
m	21.3	z	3.9

**Occurrences represented in thousands.**

## LONG WORDS

There are many long words in the **WORD CHALLENGE** dictionary, if you can only find them! Over half of the words in the dictionary are between seven and ten letters long. The average word has eight letters and the longest entry has twenty-four. The longest word in the English language has forty-five letters! It is *pneumonoultramicroscopicsilicovolcanoconiosis*.

Since each letter on a **WORD CHALLENGE** board can only be used once while forming a word, there is no need to have entries quite this long in the dictionary. Our longest entry is *transubstantiationists*. By forming just one word over seven letters long, you can add at least six points to your game score. So, work with the letter combinations you find in each square to form longer words. Once you've found one word, try finding its variants. By adding a simple ending, you can transform a short word into a high scorer.

Try switching letters' positions and see what new words can be made. You can gain easy points by utilizing a small set of letter combinations.

## TIME SAVING TIP

Let **WORD CHALLENGE** do some of the work for you, with the **Embedded Words** option. You'll work less and gain points!

Try out these strategies. . .

**GOOD LUCK and HAVE FUN!**

# INSIDE WORD CHALLENGE

If you have been wondering how WORD CHALLENGE works, here is a general overview. The WORD CHALLENGE dictionary is structured in a special manner, so that it is stored economically and can easily be searched by the WORD CHALLENGE Scorekeeper.

## STORING 90,000 WORDS

One of the great challenges faced in developing WORD CHALLENGE was to make the entire dictionary small enough so that it could be used on a personal computer. Normally, to store a list of words on a disk, every character of each word would require a single byte of storage and the end of each word would be marked by the presence of a special byte. For example, the word *run* would require four bytes, one for each character and one to indicate the end of the word. An interesting fact is, using the average length of a word in the WORD CHALLENGE dictionary, you would need more than 800,000 bytes of storage, which would take up five of these disks!

A compression scheme was engineered that shrunk this list of words so that it could fit onto one disk (the dictionary occupies only 93K bytes!). The secret of this amazing compression is the English language itself. In English, many words are formed by adding endings to a smaller set of common root words. For example, a common verb like *touch* is the basis of a large family of words which are created by adding suffixes like *-es*, *-ed* and *-ing*. Here is a list of the many words that can be traced back to the root word *touch*:

<b>touch</b>	<b>touchy</b>
<b>touches</b>	<b>touchier</b>
<b>touched</b>	<b>touchiest</b>
<b>touching</b>	<b>touchily</b>
<b>touchingly</b>	<b>touchiness</b>
<b>toucher</b>	<b>touchless</b>
<b>touchers</b>	<b>touchable</b>

One trick to compressing this list of words was to store the root word *touch* only once, then indicate by code what valid endings it could take. The result is a very compact but exhaustive list of words!

## SEARCHING FOR VALID WORDS

Just as most printed dictionaries are alphabetically ordered and include breaks for each letter of the alphabet, the **WORD CHALLENGE** dictionary is an alphabetic list divided into sections. A high speed search is conducted through the dictionary to find words that are hidden in each board.

When a board is drawn, the Scorekeeper systematically searches for viable two-letter combinations which can begin words. Once a combination is found, the Scorekeeper examines the letters around the combination to find a third letter it can add on. It continues to build words, letter by letter, constantly scanning through the dictionary looking for matches. Once it has exhausted one three-letter combination and found all the words it leads to, the Scorekeeper returns to the initial two-letter combination it found. It then looks for a new third letter to add on which will lead to a new avenue of valid letter combinations and words.

The Scorekeeper delivers words to **LEX** which agree with the level of difficulty selected. Each difficulty level reflects a realistic adjustment in linguistic intelligence. So, while **LEX** will find words such as *ice* and *wig* playing at level *T*, **LEX** will not find more complicated words such as *cede* and *geode* which would be found at a higher level of play. **LEX**'s ability can be adjusted so that an adult and a third grader could each play the same board and find it competitively challenging.

The words you enter are simply compared against the Scorekeeper's list. If the Scorekeeper does not have the word, then the dictionary does not include the entry. However, you are given the option of receiving credit for words that are not on the Scorekeeper's list at the end of a game.

Now that you know how the Scorekeeper and **LEX** operate, try a new game!



Hayden Software Company, 600 Suffolk Street, Lowell, MA 01854