

## **Chess Benefits for Kids**

*Compiled by Dr. David Poston, New Mexico Scholastic Chess Organization, February 2010.*

Most people agree that playing chess is beneficial to children, and coaches/parents of scholastic chess players usually have first-hand evidence to support this conclusion. Going a step further, I decided to search for essays and “hard evidence” concerning the benefits of chess on kids. A simple Google search on “chess benefits for kids” will produce so many hits that it can be hard to know where to start. I’ve compiled what I think are the best high-level summaries of the benefits of chess (although my search is certainly not complete), as well as a bibliography of chess research produced by the United States Chess Federation (USCF).

Many of the studies referenced by the USCF bibliography provide the statistical cornerstones that “prove” the benefits that chess has on children. These studies are important because in the absence of controlled research, it is hard to differentiate/discern the benefits of playing chess. Kids who play/enjoy chess are probably more likely to be naturally “smart” (e.g. intelligent, sharp, logical, creative, etc.) and have parents who are more concerned with their child’s education and enrichment. So, if one simply takes the average grades and/or standardized test scores of a chess player versus the average student, it could be expected that the chess players will have better results. Indeed, there are numerous studies that directly correlate chess players with higher academic performance; the question is whether chess did in fact help them achieve higher performance (a possible chicken-and-egg scenario). *Note: as a parent, I’m not sure if it’s worth asking this question; the simple fact that “chess players have better grades and higher standardized test scores” should be enough to at least introduce your kids to chess (if not strongly encourage them to play).* Fortunately, the “chess-benefit” question appears to have been answered beyond reasonable doubt, as there have been several controlled studies that statistically prove the benefits chess has on kids. In these studies a group of kids learns/plays chess over a fixed period of time, and then these kids are compared to a “control” group (i.e. a group of kids that does not play chess). These studies show that the increase in standardized test scores and grades of the “chess” kids is substantial as compared to the control group, and perhaps more importantly statistically significant. Academic improvements are demonstrated in diverse disciplines, including math, reading, critical thinking, and memory. One important aspect of these studies is that the benefits of chess are not limited to academically gifted kids; in fact, most studies find that chess provides more benefit to average children than to gifted children (where “average” and “gifted” are defined by pre-study test scores). In order to keep this document succinct the details of these studies are not included; instead a few high-level summaries are provided along with the aforementioned USCF bibliography. If you are statistically inclined, I encourage you to examine the studies themselves.

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- 4) “The Morals of Chess”, by Benjamin Franklin (yes THE Benjamin Franklin).
- 5) USCF Chess Research Bibliography.

# Benefits of Chess for Children

By Dean J. Ippolito

Chess has long been considered a way for children to increase their mental prowess, concentration, memory, and analytical skills. To anyone who has known the game, it comes as no surprise that these assumptions were actually proven in several studies on how chess can improve the grades of students.

Although chess has been shown to increase the mental abilities of persons of all ages, the main studies have been done with children. This is first for the obvious reason that students are constantly tested anyway, and therefore the data need only be analyzed, and secondly because children's mental development is more rapid and can be more easily measured than persons at a later life stage.

## Early Conclusions

After several informal studies were done in the early 20th century on the effect that chess has on logical thinking and other such functions, a primary conclusion was drawn that chess does in fact not only demand such characteristics, but develops and promotes them as well. John Artise in *Chess and Education* wrote "Visual stimuli tend to improve memory more than any other stimuli; chess is definitely an excellent memory exerciser the effects of which are transferable to other subjects where memory is necessary."

Improved memory is just the tip of the iceberg. Reports from students, teachers, and parents noticed the academic benefits of chess on math problem solving skills and reading comprehension, an increase in self-confidence, patience, logic, critical thinking, observation, pattern recognition, analysis, creativity, concentration, persistence, self-control, sportsmanship, responsibility, respect for others, self esteem, coping with frustration, and many other influences which are difficult to measure but can make a difference in student attitude, motivation, and achievement.

With this in mind, legislation in the U.S. in 1992 promoting and encouraging the incorporation of chess into the curriculum of schools was passed. The U.S. joined the more than 30 countries which already had chess included in some form in their school curricula. Today it is estimated that that number has more than doubled.

In part due to the educational community, which has noted the increased academic performance of students participating in chess, there has been an explosion in the number of children playing chess in the U.S. This popularity can be seen in the record number of players competing in National Scholastic Events. Scholastic chess players are increasing in numbers more rapidly than adult chess players; scholastic chess membership within the United States Chess Federation now represents more than 50% of the total members. An estimated 250,000 children in the U.S. are introduced every year through the school system to the basics of the game. As the number of children playing chess grows, it has become necessary for actual tests to be performed to determine the benefits of chess. Luckily, these studies have already been done to confirm the hypothesis that chess is linked to increased grades in school; far too many to be listed here. I will touch on some of the more outstanding, thorough studies, all of which have similar findings.

## Case Studies

As reported in *Developing Critical Thinking Through Chess*, Dr. Robert Ferguson tested students from seventh to ninth grades from the years 1979-1983 as part of the ESEA Title IV-C Explore Program. He found that nonchess students increased their critical thinking skills an average of 4.6% annually, while students who were members of a chess club improved their analytical skills an average of 17.3% annually. Three separate tests to determine how chess affects creative thinking were also done as part of the same study. It concluded that on average, different aspects of creative thinking had improved at a rate two to three times faster for chess playing students, as opposed to their non-chess playing counterparts.

Subsequent studies by Dr. Ferguson further supported these original conclusions. In the Tri-State Area School Pilot Study conducted in 1986 and Development of Reasoning and Memory Through Chess (1987-88) chess playing students showed more rapid increased gains in memory, organizational skills, and logic.

In Zaire the study Chess and Aptitudes, was conducted by Dr. Albert Frank at the Uni Protestant School, during the 1973-74 school year. Using sufficiently large experimental and control groups, Dr. Frank wanted to confirm if the ability to learn chess is a function of special aptitude, perceptive speed, reasoning, creativity, or general intelligence. He hypothesized that in order to learn chess well one must have a high level of one or several of these abilities. He also wanted to see to what extent learning chess could influence the development of these abilities. His results were astonishing, yet predictable. There was a significant correlation between the ability to play chess well, and spatial, numerical, administrative-directional, and paperwork abilities. It showed that the ability in chess is not due to the presence of only one or two abilities but that a large number of talents all work together in chess. The conclusion was that students participating in the chess course show a marked development of their verbal and numerical aptitudes. Furthermore, this was noticed in the majority of chess students and not only those who were better players.

A study conducted in four large elementary schools in Texas in 1997 further demonstrated the positivism of chess. Through the Texas Assessment of Academic Skills (TAAS), the study was done to test the difference that chess club had on standardized tests. These schools were selected since all had a chess program in existence for a minimum of two years. The chess clubs met for one hour after school one day per week. Since a few thousand total students took the test and all types of students were tested from special education students to gifted and talented students, the sample was large and diverse enough to make a concrete conclusion. There were significant improvements in both reading and math for all grade levels and all classes of students (regular, gifted and talented, special education, academically able, etc.). Through the Texas Learning Index, or TLI, it was determined that on average the students who played chess improved in reading and mathematics at a rate between 1.5 and two times faster than non-chess playing students.

In terms of verbal improvement specifically, a study by Dr. Stuart Margulies from 1991 addressed this. The study conclusively proved that students who learned chess enjoyed a significant increase in their reading skills. "Margulies Study is one of the strongest arguments to finally prove what hundreds of teachers knew all along-chess is a learning tool. (Inside Chess, February 1994). "

"Can chess promote earlier intellectual maturation" was the question posed in the Chess and Cognitive Development study directed by Johan Christiaen from the 1974-76 school years in Belgium. The results again clearly confirmed that the group of chess playing students showed significantly more improvement than the non chess playing students. In 1982, Dr. Gerard Dullea mentioned this study and proclaimed "...we have scientific support for what we have known all along-chess makes kids smarter! (Chess Life, November 1982) In a similar study done in a test series in New Brunswick, Canada called Challenging Mathematics, the mathematics curriculum used chess to teach logic from grades 2 to 7. The average problem solving score in the province increased from 62% to 81%. In Playing Chess: A Study of Problem-Solving Skills in Students with Average and Above Average Intelligence by Philip Rifner from the 1991-92 school term, the hypothesis that learning general problem solving skills in chess could then be applied to other domains was affirmed.

## Conclusions

We can now say with full confidence that chess has been PROVEN to enhance creativity, problem solving, memory, concentration, intellectual maturity, self esteem, and many other abilities that a parent or teacher would desire. This proves what all of us involved in chess have been saying for years...chess makes you smart!

## Why Offer Chess in Schools? By Chessmaster Jerry Meyers

**1) History.** Chess is a classic game of strategy, invented more than 1500 years ago in India. Legend has it that the ruler of India asked his wise men to devise a way to teach the children of the royal family to become better thinkers and better generals on the battlefield. Chess was the result. In the centuries since its invention, chess has spread to every country in the world. While countless other games have died out, chess lives on. In the United States, it has received endorsements by many educators, ranging from Benjamin Franklin to former U.S. Secretary of Education, Terrell Bell. In Western Pennsylvania, more than 70 schools and a dozen libraries offer chess programs, reaching several thousand students each year.

**2) Academic Benefits.** We have brought chess to the schools because we believe it directly contributes to academic performance. Chess makes kids smarter. It does so by teaching the following skills:

**Focusing** - Children are taught the benefits of observing carefully and concentrating. If they don't watch what is happening, they can't respond to it, no matter how smart they are.

**Visualizing** - Children are prompted to imagine a sequence of actions before it happens. We actually strengthen the ability to visualize by training them to shift the pieces in their mind, first one, then several moves ahead.

**Thinking Ahead** - Children are taught to think first, then act. We teach them to ask themselves "If I do this, what might happen then, and how can I respond?" Over time, chess helps develop patience and thoughtfulness.

**Weighing Options** - Children are taught that they don't have to do the first thing that pops into their mind. They learn to identify alternatives and consider the pros and cons of various actions.

**Analyzing Concretely** - Children learn to evaluate the results of specific actions and sequences. Does this sequence help me or hurt me? Decisions are better when guided by logic, rather than impulse.

**Thinking Abstractly** - Children are taught to step back periodically from details and consider the bigger picture. They also learn to take patterns used in one context and apply them to different, but related situations.

**Planning** - Children are taught to develop longer range goals and take steps toward bringing them about. They are also taught of the need to reevaluate their plans as new developments change the situation.

**Juggling Multiple Considerations Simultaneously** - Children are encouraged not to become overly absorbed in any one consideration, but to try to weigh various factors all at once.

None of these skills are specific to chess, but they are all part of the game. The beauty of chess as a teaching tool is that it stimulates children's minds and helps them to build these skills while enjoying themselves. As a result, children become more critical thinkers, better problem solvers, and more independent decision makers.

**3) Educational Research.** These conclusions have been backed up by educational research. Studies have been done in various locations around the United States and Canada, showing that chess results in increased scores on standardized tests for both reading and math. A study on a large scale chess program in New York City, which involved more than 100 schools and 3,000 children, showed higher classroom grades in both English and Math for children involved in chess. Studies in Houston, Texas and Bradford, Pennsylvania showed chess leads to higher scores on the Watson Glaser Critical Thinking Appraisal and the Torrance Tests of Creative Thinking.

**4) Social Benefits.** In the schools, chess often serves as a bridge, bringing together children of different ages, races and genders in an activity they can all enjoy. Chess helps build individual friendships and also school spirit when children compete together as teams against other schools. Chess also teaches children about sportsmanship - how to win graciously and not give up when encountering defeat. For children with adjustment issues, there are many examples where chess has led to increased motivation, improved behavior, better self-image, and even improved attendance. Chess provides a positive social outlet, a wholesome recreational activity that can be easily learned and enjoyed at any age

## **"Chess: A Learning Tool"**

compiled by Steve Sawyer, Oklahoma Scholastic Chess Organization Charter President

For years, school children in the former Soviet Union, Belgium, East Germany, Zaire, and other countries have been taught chess as a way of improving basic reasoning as well as math and verbal skills. Finally, almost half a century after the Soviets, chess is being introduced formally in our public schools, from New York to California. There are many studies that substantiate the value of chess in the schools. We will take excerpts from several to build our case for "chess is a learning tool." The results as we will see, will lead us to logical conclusion, "Chess exceeds all other thinking development programs available!" (e.g. future problem solving, independent study, problem solving with computers, creative writing, etc.)

Why should we teach chess? What are the hard facts about chess and academic achievement? Chess has been proven to enhance creativity, concentration, critical thinking skills, memory, academic achievement, problem solving, cultural enrichment, intellectual maturity, self-esteem, standardized test scores, and a host of other qualities that every parent and teacher desires. The Margulies' study conclusively proved that students who learned chess enjoyed a significant increase in their reading skills. "Inside Chess" (Feb 21, 1994, p.3) states: "the Margulies Study is one of the strongest arguments to finally prove what hundreds of teachers knew all along, "chess is a learning tool."

In Ferguson's third study, which included many poor readers, the students showed significant growth in verbal reasoning skills. After only one year of chess study in Zaire, the students participating in the chess course showed a marked development of their verbal and numerical aptitudes.

Roger Langen (1992) claims that "children who learn chess at a early age achieve more in the traditional math and sciences. Chinese, European, and American research all find significant correlational values after just one year of systematic chess exposure." Langen also states: "The most striking benefits are those associated with problem-solving and creativity."

Langen goes on to say: "University symposia, like the, "Chess and Mathematics conference" at Forli, Italy, in September 1992, now take the chess and math relation as established." Chess was integrated into the French Canadian school systems beginning in 1984. The New Brunswick research showed that problem solving skills increased an average of 19.2% after the chess in math program was introduced.

The Bradford ESEA Title IV-C Project found that chess demonstrated the greatest growth over all other activities four years in a row. Since critical thinking is crucial in all aspects of life, it is imperative to disseminate the effects of this study and to implement a chess curriculum in the schools. In their study the average annual increase in percentile score for "Critical Thinking Appraisal" in the chess group was 17.3%. Nationally, students who take this test at yearly intervals do not show a gain in percentile ranking.

## **From “The Morals of Chess”, written by Benjamin Franklin in 1750.**

Playing at chess is the most ancient and most universal game known among men; for its original is beyond the memory of history, and it has, for numberless ages, been the amusement of all the civilized nations of Asia—the Persians, the Indians, and the Chinese. Europe has had it above a thousand years; the Spaniards have spread it over their part of America; and it has lately begun to make its appearance in the United States. It is so interesting in itself as not to need the view of gain to induce engaging in it, and thence it is seldom played for money. Those, therefore, who have leisure for such diversions, cannot find one that is more innocent; and the following piece, written with a view to correct (among a few young friends) some little improprieties in the practice of it, shows at the same time that it may, in its effects on the mind, be not merely innocent, but advantageous, to the vanquished as well as the victor.

The game of chess is not merely an idle amusement. Several very valuable qualities of the mind, useful in the course of human life, are to be acquired or strengthened by it, so as to become habits, ready on all occasions. For life is a kind of chess, in which we have often points to gain, and competitors or adversaries to contend with, and in which there is a vast variety of good and evil events that are in some degree the effects of prudence or the want of it. By playing at chess, then, we may learn:

- 1) Foresight, which looks a little into futurity and considers the consequences that may attend an action; for it is continually occurring to the player: "If I move this piece, what will be the advantage of my new situation? What use can my adversary make of it to annoy me? What other moves can I make to support it and to defend myself from his attacks?"
- 2) Circumspection, which surveys the whole chessboard, or scene of action; the relations of the several pieces and situations, the dangers they are respectively exposed to, the several possibilities of their aiding each other, the probabilities that the adversary may make this or that move, and attack this or the other piece, and what different means can be used to avoid his stroke, or turn its consequences against him.
- 3) Caution, not to make our moves too hastily. This habit is best acquired by observing strictly the laws of the game, such as, "If you touch a piece, you must move it somewhere; if you set it down, you must let it stand"; and it is therefore best that these rules should be observed, as the game thereby becomes more the image of human life, and particularly of war, in which, if you have incautiously put yourself into a bad and dangerous position, you cannot obtain your enemy's leave to withdraw your troops and place them more securely, but you must abide all the consequences of your rashness.

And, lastly, we learn by chess the habit of not being discouraged by present appearances in the state of our affairs, the habit of hoping for a favorable change, and that of persevering in the search of resources. The game is so full of events, there is such a variety of turns in it, the fortune of it is so subject to sudden vicissitudes, and one so frequently, after long contemplation, discovers the means of extricating one's self from a supposed insurmountable difficulty, that one is encouraged to continue the contest to the last in hopes of victory by our own skill, or at least of getting a stalemate by the negligence of our adversary. And whoever considers, what in chess he often sees instances of, that particular pieces of success are apt to produce presumption and its consequent inattention, by which the losses may be recovered, will learn not to be too much discouraged by the present success of his adversary, nor to despair of final good fortune upon every little check he receives in the pursuit of it.

## **USCF Chess Research Bibliography**

The following articles are available from the USCF office on cd in PDF format. For your complimentary copy please address requests to U.S. Chess Federation, Attn: Scholastic Department, P.O. Box 3967, Crossville, TN 38557. You may also contact Chuck Lovingood by phone at (931) 787-1234, Ext. 148 or by email [clovingood@uschess.org](mailto:clovingood@uschess.org)

- #1 - "Chess in Education Research Summary" by Robert Ferguson (1995). A 14-page summary of key chess research.
- #2 - "Chess Improves Academic Performance" summary of NY School Chess Program. 1 page.
- #3 - "The Importance of Chess in the Classroom"- Atlantic Chess News-1990 (Michael D. Wojcio) Wojcio teaches chess to slow learners in 5 NJ schools and this describes his program and the benefits. 3 pages.
- #4 - "Chess and Education" (John Artise) After 2 years of psychological research in chess, Artise found cognitive improvements in memory, logic, observation and analysis, and operant conditioning. 3 pages.
- #5 - "The Effect of Chess on Reading Scores" by Stuart Margulies, Ph. D. 13 pages.
- #6 - "Teaching the Fourth R (Reasoning) Through Chess." (Robert Ferguson) A 1979 project teaching the gifted (grade 7-9) in Bradford Pa. Statistical "proof" that chess increases thinking scores. Also, includes description of teaching program. 4 pages.
- #7 - "Chess Legislation" by Roz Katz. New Jersey did it, you can too. 14 pages.
- #8 - "Chess Makes Kids Smart" (Anne Graham-PARENTS-Dec 1985) Urges parents to introduce their kids to chess and quotes work of Pete Shaw, Jeff Chesin, Bob Cotter, etc. Good to show to administrators. 3 pages.
- #9 - "A Guide to Scholastic Chess" (Dewain R. Barber and USCF) A guide to starting a chess club. Very practical. 33 pages.
- #10 - "Chess Makes Kids Smarter" (Dr. Gerard J. Dullea) 1 page.
- #11 - "Chess as a Way to Teach Thinking" (Diane Horgan) 4 pages.
- #12 - "Chess and Standard Test Scores" (James M. Liptrap) Purpose of this study is to document the effect of participation in a chess club upon the standardized test scores of elementary school students. 2 pages.
- #13 - "Craig Hill School Lesson Plans" (Herman Bernhardt) Interesting. 8 pages.
- #14 - "Chess as a Classroom Tool" (Lev Albut) Handout. 2 pages.
- #14a - "Chess Textbook to Aid a Teacher" (Lev Albut) Handout. 2 pages.
- #15 - "Can Chess Improve Thinking, Social and Organizational Skill in Learning Disabled Students? (Carol Ruderman). Chronicles work with bright high school students with adjustment problems, and also learning disabled kids 9-14. Social and emotional progress was demonstrated. 4 pages.
- #16 - "The Social Pedagogical Significance of Chess" (B. Gashunski) After a general introduction he concentrates on academic successes of some Russian programs. 8 pages.
- #17 - "Checkmates" (Susan Elan-Fairfield County Advocate, March 20, 1989) Deals largely with Mr. Jovanovic and the Dalton kids but also deals with the growing popularity of chess with young kids. 4 pgs.
- #18 - "Chess a Subject Taught at School" (Isaac Linder-SPUTNIK-June 1990) Chess is on the curricula in nearly 30 countries. Brief survey. 2 pages.
- #19 - "The World of Youth Hobbies: Chess" (NV Krogus and B.S. Gershunski.) A translation of a 1987 Soviet Pedagogics Magazine article dealing with specific skills chess develops that are used elsewhere (selectiveness, discipline, objectivity). 9 pages.
- #20 - "From Street Kids to Royal Knights" (Jo Coudert-Readers Digest- June 1988) The work of Bill Hall in an East Harlem ghetto, and their trip to Russia. 6 pages.
- #21 - "Washington State Bill" (1985) To establish a mental sports competition and research commission. Key section vetoed. 11 pages.
- #22 - "Chess and Cognitive Development" (Joan Christiaen - translated for MACA) A 65 page study loaded with statistics and bibliography on the benefits of chess to cognitive development in Belgian children. (Piaget tests used)
- #23 - "Commission for Chess in School" comments from an international meeting. 4 pages.

- #24 - "Chess and Education" (Russell Potter) A Bibliography of 11 pages. Useful.
- #25 - "School Chess Handbook" (RV Mahon-Chess Federation of Canada). Very useful on basics such as what you need to know to start a club. 22 pages.
- #26 - "Children and Peace: Report by FIDE to UN" (Naciso Rabell Mendez). Emotional speech but contains summary of research. 6 pages.
- #27 - "Race for the Mind" (Bill North) Appeal for a course in chess analysis in the schools by the chairman of the Santa Clara Chess League. 5 pages.
- #28 - "Chess Expertise in Children" (D. Horgan & D. Morgan) 33 pages.
- #29 - "Chess and the Humanities" Papers at conference in Lincoln, Neb., May 1978. 3 pages.
- #29a - "Chess Contributions to the Understanding of Human Cognition" (Sara E. Goldin-Carnegie-Mellon Univ.) 7 pages including bibliography.
- #29b - "Chess as Education: Character Assassination or Life of the Mind" (Tim Redman) The first 2 pages are charming but seem to knock chess; the rest is solid on benefits, particularly on Frank's Zaire study. 6 pgs.
- #29c - "Global Community: The Phenomenon of Postal Chess" (Helen Warren) Covers history, mechanics, and the character of players and how they benefit from postal chess. 9 pages.
- #29d - "Chess and the Transformations of American Values" (Troy L Armstrong) This study indicates that changing American attitudes toward leisure will bring chess into more prominence. 6 pages.
- #29e - "Some Demographic Aspects of Chess" (Arpad Elo) A brief history of chess and a statistical study of which countries currently have heavy participation. 13 pages.
- #29f - "Chess and the Federal Government" (Bernard Hagerty) Suggestions for getting money from the NEH and the NEA. 6 pages.
- #29g - "Chess and the Search for Freedom" (David Stevenson) Urges Tal as a role model. Seems to say little. 6 pages.
- #29h - "The Social Functions of Chess in Yugoslavia and in America-A Comparative View" (Michael Spangler) In Yugoslavia, chess is much more closely integrated into society, physical conditioning is more stressed, and the chessplayer's disposable income is twice as great. 10 pages.
- #29i - "Chess is for Heavies: Images of Chess in Detective Fiction"(Frank Blaha & Marge Cathcart). 10 pgs.
- #30 - "Using Chess to Promote Self-Esteem in Perceptually Impaired Students." (William Levy -Hopatcong Schools for NJ Dept. of Education) 93 pages of tests and worksheets in a detailed program. (teachers guide)
- #31 - "Chess in the Classroom, an Answer to NIE" (prepared for MACA) A massive document of 57 pages containing a challenge to NIE claims of the non-transferability of chess skills by Adrian de Groot, a critique of another study by Harry Lyman, The Philosophy of Karl Popper as annotated and illustrated on the chess board, and 2 key experiments- the Christiaen one mentioned above and A. Frank's experiment in Zaire in 1973-74.
- #32 - "Chess and Aptitudes" (Albert Frank) Part 1 item F of "Chess in the Classroom, an Answer to NIE" 89 pages.
- #33 - "The Effect of Learning to Play Chess on Cognitive, Perceptual and Emotional Development in Children"(Steven Fried & Norman Ginsburg) The effect of chess training on 3rd and 4th grade children in the 3 areas mentioned in a middle class Brooklyn elementary school. 18 pages.
- #34 - "Chess Gives Hope for Our Youth." (The Saratogian in Saratoga Springs) 1 page.
- #35 - "Educators Using Chess as a Tool of Development" (David Kibbs) 1 page.
- #36 - "Intelligence and Chess" (Rafael Tudela) 2 pages.
- #37 - "How to Develop Experts" (Diane Horgan) 1 page.
- #38 - "Competition, Calibration, and Motivation" (Dianne Horgan) 7 pages.
- #39 - "This Game Might Make You Smart" (Dianne Horgan) 3 pages.
- #40 - "Chairman of the Boards" (Dan Sorenson) Youngsters from Tucson, Ariz. achieve success. 2 pages.