

A STUDY OF PHYSICAL FITNESS OF SEVENTH-  
EIGHTH GRADE BOYS OF UNIFIED SCHOOL  
DISTRICT #378 RILEY COUNTY, KANSAS  
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by

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## INTRODUCTION

The subject of fitness is not new to the American school system. There have been numerous times during the educational history of this country when educators have been called upon to upgrade the fitness of American youth. World Wars I and II are prime examples of recent times when a great deal of emphasis was placed on physical fitness in our schools.

During the past few years there has been a renewed stress on the subject of fitness. Results of some physical fitness tests (Kraus-Weber) have revealed the softness of American children and youth as compared to children and youth as compared to children and youth in other countries. Although some of these tests have been criticized by many physical education leaders as not possessing validity, they have created considerable interest in the area of physical fitness. The information from these tests has helped bring about re-emphasis, even by the Presidents of the United States.

A President's Conference on Fitness of American Youth was held at the United States Naval Academy, Annapolis, Maryland, June 18-19, 1956. It was attended by 150 leaders in sports, education, medicine, public relations, government, and other areas. At the close of the session the Vice-

President announced that a President's Council on Youth Fitness, composed of members of the cabinet, would be set up to help improve the mental and physical health of the nation's youth.

Physical fitness, as one aspect to total fitness, involves three important concepts. It is related to the tasks the person must perform, his potential for physical effort, and the relationship of his physical fitness to his total self. The same degree of physical fitness is not necessary for everyone. It should be sufficient to meet the requirements of the job, plus a little extra as a reserve for emergencies.

## DEFINITION OF TERMS

Some definitions of physical fitness that come from leaders in the field are as follows:

Schneider and Karpovich define physical fitness as "fitness to perform some specified task requiring muscular effort, and to be practical, fitness should consider quality of effort as well as intensity of effort."<sup>1</sup>

McCloy and Young define physical fitness as "the type of fitness produced primarily by physical training, and persons who function physically at a high level of efficiency are said to be 'in good condition,' 'in excellent training,' or 'physically fit.'"<sup>2</sup>

Cureton states that, "physical fitness means ability to handle the body well and the capacity to work hard over a long period of time."<sup>3</sup>

Clarke defines physical fitness as "a positive quality extending on a scale from death to abundant life, and the

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<sup>1</sup>E. C. Schneider and P. V. Karpovich, Physiology of Muscular Activity (Philadelphia: W. B. Saunders Co., 1948), pp. 261-262.

<sup>2</sup>C. H. McCloy and N. D. Young, Tests and Measurements in Health and Physical Education (New York: Appleton-Century-Crofts, Inc., 1954), p. 18.

<sup>3</sup>T. K. Cureton, Physical Fitness Appraisal and Guidance (St. Louis: The C. V. Mosby Co., 1947), p. 18.



individual is considered physically fit when his capacity for performance and endurance in physical activities is great; when it is equal to his own potentiality."<sup>4</sup>

Gallagher and Brouha discuss physical fitness in terms of (1) static or medical fitness--soundness of body organs, (2) dynamic or functional fitness--efficiency of body in strenuous work, and (3) motor skills fitness--coordination and strength in performance of activities.<sup>5</sup>

During World War II, the committee for Wartime Physical Fitness for High Schools of the United States, Office of Education, stated the nature of physical fitness in the following terms: "A person who is physically fit for military duty or naval service must be capable of maintaining sustained effort with a maximum of speed and skill."<sup>6</sup>

These definitions of physical fitness show that the term implies such concepts as muscular effort where quality and intensity are involved, the ability to handle the body

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<sup>4</sup>H. H. Clarke, Application of Measurement to Health and Physical Education (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959), p. 163.

<sup>5</sup>J. R. Gallagher and L. Brouha, "Physical Fitness," Journal of the American Medical Association, 125:834-836, July 23, 1964.

<sup>6</sup>United States Office of Education, Physical Fitness Through Physical Education (Washington: U. S. Government Printing Office, 1943).



well, performing physically up to one's capacity, being able to recover rapidly from fatigue, and possessing such components as speed, strength, endurance, agility, and coordination.

The question of how to obtain physical fitness is also a controversial point. Since we do not know exactly what it is and what its components may be, the answer to how you obtain it is also somewhat controversial. We do know, however, that heredity plays an important role. The form and structure of the body is determined largely by parents. Heredity sets certain direction and limitations to development. Good nutrition is essential. Good health habits, such as having proper rest, relaxation and sleep, and otherwise providing good care for the body, are necessary. In addition, there is increasing recognition of the importance of physical activity.

## CLASSIFICATION INDEX

The classification index used in this report was the index which was recommended by the American Association of Health, Physical Education and Recreation. This index has been adopted by the President's Council of Youth Fitness.

This index was devised to give a more accurate account of the pupil's physical fitness level. This index incorporates the age, height and weight of the pupil. The table used for determining this index follows:

| Exponent | Age<br>(Months) | Height<br>(Inches) | Weight<br>(Lb.) | Sum of<br>Exponents | Class |
|----------|-----------------|--------------------|-----------------|---------------------|-------|
| 1        | 120-125         | 50-51              | 60-65           | 0-9                 | A     |
| 2        | 126-131         | 52-53              | 66-70           | 10-14               | B     |
| 3        | 132-137         |                    | 71-75           | 15-19               | C     |
| 4        | 138-143         | 54-55              | 76-80           | 20-24               | D     |
| 5        | 144-149         |                    | 81-85           | 25-29               | E     |
| 6        | 150-155         | 56-57              | 86-90           | 30-34               | F     |
| 7        | 156-161         |                    | 91-95           | 35-38               | G     |
| 8        | 162-167         | 58-59              | 96-100          | 39-                 | H     |
| 9        | 168-173         |                    | 101-105         |                     |       |
| 10       | 174-179         | 60-61              | 106-110         |                     |       |
| 11       | 180-185         |                    | 111-115         |                     |       |
| 12       | 186-191         | 62-63              | 116-120         |                     |       |
| 13       | 192-197         |                    | 121-125         |                     |       |
| 14       | 198-203         | 64-65              | 126-130         |                     |       |
| 15       | 204-209         | 66-67              | 131-133         |                     |       |
| 16       | 210-215         | 68                 | 134-136         |                     |       |
| 17       | 216-            | 69                 | 137             |                     |       |

To classify a pupil according to the classification index, the following information had to be secured:

1. Age to the nearest month.
2. Height in inches to the nearest half-inch (no shoes).

3. Weight to the nearest pound (gym clothes-  
no shoes).

The information was compared to the table and the exponents were determined. These were added to determine the sum of exponents, and then the class was determined.

## PURPOSE OF USING CLASSIFICATION INDEX

The index was used to give a more accurate rating to the pupils on the test, but it was also used in determining the rating of the pupils for physical education classes, because it is usually desirable for instructional purposes that children of similar stages of development and like abilities be grouped together for physical activities. In the upper grades children of the same grade and even the same age show greater differences in their physical maturity. At this time, when team games are being introduced, it is essential that children of similar development and abilities be grouped together for fairness in competition, as well as for instructional purposes. In order that team games may be played by participants of like physical maturity, pupils should be classified and playing schedules for team games and sports be arranged from this classification.



## TEST ADMINISTRATION

This test was given to the seventh and eighth grade boys at Keats, Riley and Leonardville grade schools. This test, which has as its main purpose measuring the physical fitness level of these boys, consists of seven items which can be given in the gymnasium or outdoors. It is suggested that the pull-up, sit-up, standing broad jump, and shuttle-run be given in one period; the 50-yard dash, softball throw for distance, and 600-yard run-walk in a second period.

The boys were informed of the purpose of the tests and how the results would be used. The test items were explained and demonstrated as to proper technique of performing them.

The boys were divided into two groups, and as one was performing the test the other group was assisting as counters and measurers for the different events.

## TESTS AND RESULTS

Following are the instructions for each test, the results and interpretations of the testing.

### Full-ups

**Equipment:** A metal or wooden bar approximately 1½ inches in diameter is preferred. A doorway gym bar can be used and, if no regular equipment is available, a piece of pipe or even the rungs of a ladder can also serve the purpose.

**Description:** The bar should be high enough so that the pupil can hang with his arms and legs fully extended and his feet free of the floor. Use the overhand grasp (palms away from body). After assuming the hanging position, the pupil raises his body by his arms until his chin can be placed over the bar and then lowers his body to a full hang as in the starting position. The exercise is repeated as many times as possible.

#### **Rules:**

1. Allow one trial unless it is obvious that the pupil has not had a fair chance.
2. The body must not swing during the execution of the movement. The pull must in no way be a snap movement. If the pupil starts swinging, check this by holding your

extended arm across the front of the thighs.

3. The knees must not be raised and kicking of the legs is not permitted.

Scoring: Record the number of completed pull-ups to the nearest completed whole number.

TABLE I  
RESULTS OF KEATS PULL-UP TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 4              | 40                |
| 81-90      | 2              | 20                |
| 71-80      | 2              | 20                |
| 61-70      | 0              | 0                 |
| 51-60      | 1              | 10                |
| 41-50      | 0              | 0                 |
| 31-40      | 0              | 0                 |
| 21-30      | 1              | 10                |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table I indicates that the boys at Keats showed exceptional power in the pull-ups. This shows that 80 percent of the boys ranked above the 70th percentile, which is extremely

high for this age group. The boys showed a percentile of 79.9, and a raw score mean of 5.1 pull-ups. There were two which ranked low in this test. In the opinion of the author this is due to the physical development, that of being overweight. The range for the boys in this test was 0-9 pull-ups.

TABLE II  
RESULTS OF RILEY PULL-UP TEST

| Percentile | Number         | Per Cent         |
|------------|----------------|------------------|
| 91-100     | 0              | 0                |
| 81-90      | 0              | 0                |
| 71-80      | 3              | 15               |
| 61-70      | 2              | 10               |
| 51-60      | 1              | 5                |
| 41-50      | 6              | 30               |
| 31-40      | 1              | 5                |
| 21-30      | 4              | 20               |
| 11-20      | 3              | 15               |
| 0-10       | <u>0</u><br>20 | <u>0</u><br>100% |

Table II shows that the boys from Riley were low in this test. Riley only had 25 percent of the students score



above the 60th percentile, with the remaining boys falling into the lower groups. Riley had a percentile of 45.2, and a raw score mean of 1.35 pull-ups per boy. Riley had a range of 0-4. This shows that the boys at Riley need additional exercises to increase the strength of the upper arms.

TABLE III  
RESULTS OF LEONARDVILLE PULL-UP TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 0              | 0                 |
| 81-90      | 0              | 0                 |
| 71-80      | 1              | 10                |
| 61-70      | 1              | 10                |
| 51-60      | 3              | 30                |
| 41-50      | 2              | 20                |
| 31-40      | 2              | 20                |
| 21-30      | 0              | 0                 |
| 11-20      | 1              | 10                |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table III shows that of the ten boys tested only one ranked above the 70th percentile. The majority of the boys fell between the 30th and 70th percentile. This shows that

the boys scored very low on this test; they had only a percentile of 51.2, and a raw score mean of 2.3 pull-ups per boy. The range was from 0-4. This indicates that the boys from Leonardville are weak in this exercise.

TABLE IV  
RESULTS OF U.S.D.#378 PULL-UP TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 4              | 10                |
| 81-90      | 2              | 5                 |
| 71-80      | 6              | 15                |
| 61-70      | 3              | 7.5               |
| 51-60      | 5              | 12.5              |
| 41-50      | 8              | 20                |
| 31-40      | 3              | 7.5               |
| 21-30      | 5              | 12.5              |
| 11-20      | 4              | 10                |
| 0-10       | $\frac{0}{40}$ | $\frac{0}{100\%}$ |

Table IV indicates that for the school district, the boys were low on this test. This shows that of the forty boys tested, 50 percent of them were above the 50th percentile, and 50 percent were below the 50th percentile. The

boys were equally distributed among the percentiles. The school district had a percentile of 55.4, and a raw score mean of 2.52 pull-ups per boy. The range for the district was 0-9. This table shows that the district should give this serious attention in preparing their curriculum for physical education.

### Sit-ups

Equipment: Mat or floor.

Description: The pupil lies on his back, either on the floor or on a mat, with legs extended and feet about two feet apart. His hands are placed on the back of the neck with the fingers interlaced. Elbows are retracted. A partner holds the ankles down, the heels being in contact with the mat or floor at all times.

The pupil sits up, turning the trunk to the left and touching the right elbow to the left knee, returns to starting position, then sits up turning the trunk to the right and touching the left elbow to the right knee. The exercise is repeated, alternating sides.

#### Rules:

1. The fingers must remain in contact behind the neck throughout the exercise.
2. The knees must be on the floor during the sit-up but may be slightly bent when touching elbow to knee.

3. The back should be rounded and the head and elbows brought forward when sitting up as a "curl" up.

4. When returning to starting position, elbows must be flat on the mat before sitting up again.

Scoring: One point is given for each complete movement of touching elbow to knee. No score should be counted if the fingertips do not maintain contact behind the head, if knees are bent when the pupil lies on his back or when he begins to sit up, or if the pupil pushes up off the floor from an elbow. The maximum limit in terms of number of sit-ups shall be 100.



TABLE V  
RESULTS OF KEATS SIT-UP TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 7              | 70                |
| 81-90      | 1              | 10                |
| 71-80      | 2              | 20                |
| 61-70      | 0              | 0                 |
| 51-60      | 0              | 0                 |
| 41-50      | 0              | 0                 |
| 31-40      | 0              | 0                 |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table V shows that the boys from Keats rank very high in sit-ups. All the boys from Keats ranked above the 70th percentile, with 70 percent ranking above the 90th percentile. Keats had a percentile of 91.5, and a raw score mean of 76.1 sit-ups per boy. The range for Keats was 43-100. Even with a low raw score for some boys, they still ranked very high according to the classification index.

TABLE VI  
RESULTS OF RILEY SIT-UP TEST

| Percentile | Number   | Per Cent |
|------------|----------|----------|
| 91-100     | 3        | 15       |
| 81-90      | 5        | 25       |
| 71-80      | 4        | 20       |
| 61-70      | 1        | 5        |
| 51-60      | 3        | 15       |
| 41-50      | 2        | 10       |
| 31-40      | 1        | 5        |
| 21-30      | 1        | 5        |
| 11-20      | 0        | 0        |
| 0-10       | <u>0</u> | <u>0</u> |
|            | 20       | 100%     |

Table VI indicates that Riley had 60 percent of their boys above the 70th percentile. Riley had 20 percent of their boys below the 50th percentile, and the remaining 20 percent ranging between the 50th and 70th percentile. Riley had a percentile of 71.3, and a raw score mean of 51 sit-ups per boy. They had a range of 25-100. This shows the boys from Riley ranked high in the sit-up test.

TABLE VII  
RESULTS OF LEONARDVILLE SIT-UP TEST

| Percentile | Number   | Per Cent |
|------------|----------|----------|
| 91-100     | 2        | 20       |
| 81-90      | 3        | 30       |
| 71-80      | 2        | 20       |
| 61-70      | 1        | 10       |
| 51-60      | 0        | 0        |
| 41-50      | 2        | 20       |
| 31-40      | 0        | 0        |
| 21-30      | 0        | 0        |
| 11-20      | 0        | 0        |
| 0-10       | <u>0</u> | <u>0</u> |
|            | 10       | 100%     |

Table VII shows that Leonardville had 100 percent of their boys scoring above the 40th percentile, with 70 percent of them scoring above the 70th percentile. Leonardville had a percentile of 77.5, and a raw score mean of 61.5 sit-ups per boy. The range for Leonardville students was from 39-100. They showed very high results on this test with the boys showing good ability in performing this exercise.

TABLE VIII  
RESULTS OF U.S.D.#378 SIT-UP TEST

| Percentile | Number   | Per Cent |
|------------|----------|----------|
| 91-100     | 12       | 30       |
| 81-90      | 9        | 22.5     |
| 71-80      | 8        | 20       |
| 61-70      | 2        | 5        |
| 51-60      | 3        | 7.5      |
| 41-50      | 4        | 10       |
| 31-40      | 1        | 2.5      |
| 21-30      | 1        | 2.5      |
| 11-20      | 0        | 0        |
| 0-10       | <u>0</u> | <u>0</u> |
|            | 40       | 100%     |

Table VIII indicates that district #378 had 72.5 percent of the boys above the 70th percentile, and only 5 percent below the 40th percentile. This shows that the district did very well on this test, and that the boys are physically fit in using the abdominal muscles, which are required in this exercise. The district had a percentile of 77.9, and a raw score mean of 59.9 sit-ups per boy. The range for the district was from 25-100.



### Shuttle-Run

**Equipment:** Two blocks of wood, 2" x 2" x 4", and stopwatch. Pupils should wear sneakers or run barefooted.

**Description:** Two parallel lines are marked on the floor 30 feet apart. Place the blocks of wood behind one of the lines. The pupil starts from behind the other line. On the signal "Ready? Go!," the pupil runs to the blocks, picks one up, runs back to the starting line and places the block behind the line; he then runs back and picks up the second block which he carries back across the starting line. If the scorer has two stopwatches or one with a split-second timer, it is preferable to have two people running at the same time. To eliminate the necessity of returning the blocks after each race, start the races alternately, first from behind one line and then from behind the other.

**Rules:** Allow two trials with some rest between.

**Scoring:** Record the better of the two trials to the nearest tenth of a second.

TABLE IX  
RESULTS OF KEATS SHUTTLE-RUN TEST

| Percentile | Number         | Per Cent         |
|------------|----------------|------------------|
| 91-100     | 2              | 20               |
| 81-90      | 2              | 20               |
| 71-80      | 0              | 0                |
| 61-70      | 2              | 20               |
| 51-60      | 3              | 30               |
| 41-50      | 0              | 0                |
| 31-40      | 0              | 0                |
| 21-30      | 1              | 10               |
| 11-20      | 0              | 0                |
| 0-10       | <u>0</u><br>10 | <u>0</u><br>100% |

Table IX shows that Keats had 90 percent above the 50th percentile in the shuttle-run, while they had only 40 percent above the 70th percentile. Keats had a percentile of 69.7, and a raw score mean of 11.13 seconds per boy for the shuttle-run. The range for Keats was from 9.8 seconds to 14.1 seconds. This table shows that the boys did well on this test.

TABLE X  
RESULTS OF RILEY SHUTTLE-RUN TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 0              | 0                 |
| 81-90      | 0              | 0                 |
| 71-80      | 0              | 0                 |
| 61-70      | 5              | 25                |
| 51-60      | 5              | 25                |
| 41-50      | 3              | 15                |
| 31-40      | 3              | 15                |
| 21-30      | 3              | 15                |
| 11-20      | 1              | 5                 |
| 0-10       | $\frac{0}{20}$ | $\frac{0}{100\%}$ |

Table X indicates that Riley had no boys above the 70th percentile. Riley had 85 percent of their boys between the 20th and 70th percentile, and 50 percent above and 50 percent below the 50th percentile. Riley had a percentile of 47.5, and a raw score mean of 11.4 seconds per boy. The range for Riley in this test was from 10.5 seconds to 13.1 seconds. Although Riley had a higher than average raw score, they were still, according to the classification index, below average for this test.

TABLE XI  
RESULTS OF LEONARDVILLE SHUTTLE-RUN TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 0              | 0                 |
| 81-90      | 0              | 0                 |
| 71-80      | 2              | 20                |
| 61-70      | 5              | 50                |
| 51-60      | 0              | 0                 |
| 41-50      | 1              | 10                |
| 31-40      | 2              | 20                |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table XI indicates that Leonardville had 70 percent above the 50th percentile, and no one lower than the 30th percentile. Leonardville had no boys above the 80th percentile in this test. Leonardville had a percentile of 60, and a raw score mean of 10.84 seconds per boy to perform this test. The range for Leonardville was from 10.2 seconds to 12.1 seconds. The raw score for Leonardville was above average, and higher than that of the other schools in the district. In the percentile score which is based on the



classification index Leonardville showed that they ranked lower when based on this index.

TABLE XII  
RESULTS OF U.S.D.#378 SHUTTLE-RUN TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 2              | 5                 |
| 81-90      | 2              | 5                 |
| 71-80      | 2              | 5                 |
| 61-70      | 12             | 30                |
| 51-60      | 8              | 20                |
| 41-50      | 4              | 10                |
| 31-40      | 5              | 12.5              |
| 21-30      | 4              | 10                |
| 11-20      | 1              | 2.5               |
| 0-10       | $\frac{0}{40}$ | $\frac{0}{100\%}$ |

Table XII shows that the district has 65 percent of the boys above the 50th percentile, and only 12.5 percent below the 30th percentile. The district had a percentile of 56.2, and a raw score mean of 11.19 seconds per boy to perform the test. The range for the district was from 9.8 seconds to 14.1 seconds. This table indicates that the district

as a whole ranks about average when compared with the national norms, but they have very few who rank in the top percentiles, or very few who rank extremely low.

### Standing Broad Jump

**Equipment:** Mat, floor, or outdoor jumping pit, and tape measure.

**Description:** Pupil stands with the feet several inches apart and the toes just behind the take-off line. Preparatory to jumping, the pupil swings the arms backward and bends the knees. The jump is accomplished by simultaneously extending the knees and swinging forward the arms.

#### **Rules:**

1. Allow three trials.
2. Measure from the take-off line to the heel or other part of the body that touches the floor nearest the take-off line.
3. When the test is given indoors, it is convenient to tape the tape measure to the floor at right angles to the take-off line and have the pupils jump along the tape. The scorer stands to the side and observes the mark to the nearest inch.

**Scoring:** Record the best of the three trials in feet and inches to the nearest inch.

TABLE XIII  
RESULTS OF KEATS STANDING BROAD JUMP TEST

| Percentile | Number         | Per Cent         |
|------------|----------------|------------------|
| 91-100     | 0              | 0                |
| 81-90      | 7              | 70               |
| 71-80      | 2              | 20               |
| 61-70      | 0              | 0                |
| 51-60      | 1              | 10               |
| 41-50      | 0              | 0                |
| 31-40      | 0              | 0                |
| 21-30      | 0              | 0                |
| 11-20      | 0              | 0                |
| 0-10       | <u>0</u><br>10 | <u>0</u><br>100% |

Table XIII indicates that Keats performed extremely well on the Standing Broad Jump test. Keats had 90 percent of its boys scoring above the 70th percentile, and 100 percent above the 50th percentile. Keats had a percentile of 82, and a raw score percentile of 5' 10" per boy in the test. The range for Keats was from 5' 4" to 6' 9".

TABLE XIV  
RESULTS OF RILEY STANDING BROAD JUMP TEST

| Percentile | Number   | Per Cent |
|------------|----------|----------|
| 91-100     | 1        | 5        |
| 81-90      | 4        | 20       |
| 71-80      | 2        | 10       |
| 61-70      | 3        | 15       |
| 51-60      | 6        | 30       |
| 41-50      | 2        | 10       |
| 31-40      | 1        | 5        |
| 21-30      | 1        | 5        |
| 11-20      | 0        | 0        |
| 0-10       | <u>0</u> | <u>0</u> |
|            | 20       | 100%     |

Table XIV shows that Riley had 35 percent which scored above the 70th percentile, and 80 percent which ranked above the 50th percentile. Riley had 20 percent which fell below the 50th percentile. Riley had a percentile of 64.8, and a raw score mean of 5' 6" jump per boy. The range for Riley was from 4' 6" to 6' 2".



TABLE XV  
RESULTS OF LEONARDVILLE STANDING BROAD JUMP TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 2              | 20                |
| 81-90      | 1              | 10                |
| 71-80      | 2              | 20                |
| 61-70      | 3              | 30                |
| 51-60      | 1              | 10                |
| 41-50      | 1              | 10                |
| 31-40      | 0              | 0                 |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table XV shows that Leonardville had 50 percent above the 70th percentile, with a total of 100 percent scoring above the 40th percentile. The table indicates that the Leonardville boys scored somewhat above the national average or norms established by the classification index. Leonardville had a percentile of 73.8, and a raw score mean of 6'  $\frac{1}{2}$ " per boy. They had a range of 5' 2" to 6' 8" in the test.

TABLE XVI  
RESULTS OF U.S.D.#378 STANDING BROAD JUMP TEST

| Percentile | Number   | Per Cent |
|------------|----------|----------|
| 91-100     | 3        | 7.5      |
| 81-90      | 12       | 30       |
| 71-80      | 6        | 15       |
| 61-70      | 6        | 15       |
| 51-60      | 8        | 20       |
| 41-50      | 3        | 7.5      |
| 31-40      | 1        | 2.5      |
| 21-30      | 1        | 2.5      |
| 11-20      | 0        | 0        |
| 0-10       | <u>0</u> | <u>0</u> |
|            | 40       | 100%     |

Table XVI indicates that the district had 52.5 percent of the boys tested above the 70th percentile. The district only had 12.5 percent below the 50th percentile on this test. The district shows that its results in the standing broad jump are above the national norms. The district had a percentile of 71.35, and a raw score mean of 5' 8 $\frac{1}{2}$ " per boy on the test. The range for this test was from 4' 6" to 6' 9".

### 50-Yard Dash

**Equipment:** Two stopwatches or one with a split-second timer.

**Description:** It is preferable to administer this test to two pupils at a time. Have both take positions behind the starting line. The starter will use the commands "Are you ready?" and "Go!". The latter will be accompanied by a downward sweep of the starter's arm to give the timer a visual signal.

**Rules:** The score is the amount of time between the starter's signal and the instant the pupil crosses the finish line.

**Scoring:** Record in seconds to the nearest tenth of a second.

TABLE XVII  
RESULTS OF KEATS 50-YARD DASH TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 1              | 10                |
| 81-90      | 4              | 40                |
| 71-80      | 2              | 20                |
| 61-70      | 2              | 20                |
| 51-60      | 0              | 0                 |
| 41-50      | 1              | 10                |
| 31-40      | 0              | 0                 |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table XVII shows that Keats had 50 percent above the 80th percentile, and had 90 percent above the 50th percentile. There were no scores below the 40th percentile. Keats showed that they were above average for the 50-yard dash by the fact that they had a 78.9 percentile and a raw score mean of 7.43 seconds per boy to cover the fifty yard run. Keats had a range of from 7.0 seconds to 8.0 seconds.



TABLE XVIII  
RESULTS OF RILEY 50-YARD DASH TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 0              | 0                 |
| 81-90      | 2              | 10                |
| 71-80      | 5              | 25                |
| 61-70      | 1              | 5                 |
| 51-60      | 3              | 15                |
| 41-50      | 4              | 20                |
| 31-40      | 2              | 10                |
| 21-30      | 2              | 10                |
| 11-20      | 1              | 5                 |
| 0-10       | $\frac{0}{20}$ | $\frac{0}{100\%}$ |

Table XVIII indicates that Riley shows a weakness in this event due to the fact that they had only 35 percent above the 70th percentile, and had only 55 percent above the 50th percentile. Riley had a percentile of 56.9, and a raw score mean of 7.9 seconds per boy. The range for Riley was much greater than any of the other schools tested, they showed a range of 7.2 seconds to 9.6 seconds.

TABLE XIX  
RESULTS OF LEONARDVILLE 50-YARD DASH TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 1              | 10                |
| 81-90      | 2              | 20                |
| 71-80      | 5              | 50                |
| 61-70      | 0              | 0                 |
| 51-60      | 1              | 10                |
| 41-50      | 1              | 10                |
| 31-40      | 0              | 0                 |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table XIX shows that Leonardville did exceptionally well on this test, and that they had 80 percent of the boys above the 70th percentile. Leonardville had no one score below the 40th percentile, and had a percentile of 75.2. The raw score mean for Leonardville was 7.27 seconds per boy to complete the 50-yard dash. The range was from 6.9 seconds to 8.4 seconds, and even with the few who ranged in the higher amount of time this was compensated by using the classification index for this series of tests.

TABLE XX  
RESULTS OF U.S.D.#378 50-YARD DASH TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 2              | 5                 |
| 81-90      | 8              | 20                |
| 71-80      | 12             | 30                |
| 61-70      | 3              | 7.5               |
| 51-60      | 4              | 10                |
| 41-50      | 6              | 15                |
| 31-40      | 2              | 5                 |
| 21-30      | 2              | 5                 |
| 11-20      | 1              | 2.5               |
| 0-10       | $\frac{0}{40}$ | $\frac{0}{100\%}$ |

Table XX indicates that the school district is above the national average by the fact that they had 72.5 percent above the 50th percentile. The district only had 12.5 percent below the 40th percentile, and had a percentile of 66.9. The raw score mean for the district was 7.62 seconds to complete the 50 yards. The range was from 6.9 seconds to 9.6 seconds.

### Softball Throw

**Equipment:** Softball(12 inch), small metal or wooden stakes, and tape measure.

**Description:** A football field marked in conventional fashion (five yard intervals), makes an ideal area for this test. If this is not available, it is suggested that lines be drawn parallel to the restraining line, five yards apart. The pupil throws the ball while remaining within two parallel lines, six feet apart. Mark the point of landing with one of the small stakes. If his second or third throw is farther, move the stake accordingly so that, after three throws, the stake is at the point of the pupil's best throw. After five pupils have completed their throws, the measurements may be taken.

**Rules:**

1. Only an overhead throw may be used.
2. Three throws are allowed.
3. The distance recorded is the distance from the point of landing to the nearest point on the restraining line.

**Scoring:** Record the best of the three trials to the nearest foot.



TABLE XXI  
RESULTS OF KEATS SOFTBALL THROW TEST

| Percentile | Number   | Per Cent |
|------------|----------|----------|
| 91-100     | 5        | 50       |
| 81-90      | 4        | 40       |
| 71-80      | 1        | 10       |
| 61-70      | 0        | 0        |
| 51-60      | 0        | 0        |
| 41-50      | 0        | 0        |
| 31-40      | 0        | 0        |
| 21-30      | 0        | 0        |
| 11-20      | 0        | 0        |
| 0-10       | <u>0</u> | <u>0</u> |
|            | 10       | 100%     |

Table XXI indicates very strongly that the boys from Keats excelled on the softball throw test. Keats had 50 percent above the 90th percentile, and had 100 percent above the 70th percentile. The percentile was 88.7 for Keats, and they had a raw score mean of 149.6 feet. The range was from 114 feet to 184 feet for the softball throw.

TABLE XXII  
RESULTS OF RILEY SOFTBALL THROW TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 2              | 10                |
| 81-90      | 4              | 20                |
| 71-80      | 2              | 10                |
| 61-70      | 2              | 10                |
| 51-60      | 1              | 5                 |
| 41-50      | 4              | 20                |
| 31-40      | 3              | 15                |
| 21-30      | 1              | 5                 |
| 11-20      | 1              | 5                 |
| 0-10       | $\frac{0}{20}$ | $\frac{0}{100\%}$ |

Table XXII shows that Riley had only 30 percent above the 80th percentile, and they had 45 percent below the 50th percentile. Riley had a percentile of 60.2, and a raw score mean of 123 feet per throw. Riley had a very large range extending from 79 feet to 181 feet.

TABLE XXIII  
RESULTS OF LEONARDVILLE SOFTBALL THROW TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 0              | 0                 |
| 81-90      | 1              | 10                |
| 71-80      | 4              | 40                |
| 61-70      | 3              | 30                |
| 51-60      | 1              | 10                |
| 41-50      | 1              | 10                |
| 31-40      | 0              | 0                 |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table XXIII indicates that Leonardville is above the national norms in this test, because they had a total of 50 percent above the 70th percentile. Leonardville also showed that 90 percent of those tested ranked above the 50th percentile. They had a percentile of 70.5, and a raw score mean of 141.9 feet per throw. The range for Leonardville was from 99 feet to 181 feet. This is a large range, but due to the fact that the boys were classified according to their age, weight and height, they still scored well on

this test.

TABLE XXIV  
RESULTS OF U.S.D.#378 SOFTBALL THROW TEST

| Percentile | Number   | Per Cent |
|------------|----------|----------|
| 91-100     | 7        | 17.5     |
| 81-90      | 9        | 22.5     |
| 71-80      | 7        | 17.5     |
| 61-70      | 5        | 12.5     |
| 51-60      | 2        | 5        |
| 41-50      | 5        | 12.5     |
| 31-40      | 3        | 7.5      |
| 21-30      | 1        | 2.5      |
| 11-20      | 1        | 2.5      |
| 0-10       | <u>0</u> | <u>0</u> |
|            | 40       | 100%     |

Table XXIV shows that the school district had 57.5 percent above the 70th percentile, and only had 25 percent below the 50th percentile. The school district had a percentile of 69.9, and a raw score mean of 134.4 feet per throw. The range for the district was from 79 feet to 184 feet for the softball throw test.



### 600-Yard Run Walk

**Equipment:** An area using a 50-yard square and stopwatch.

**Description:** Pupils use a standing start. At the signal "Ready? Go!," the subject starts running the 600-yard distance. The running may be interspersed with walking. It is possible to have a dozen subjects run at one time by having the pupils pair off before the start of the event. Then each pupil listens for his partner's time as the latter crosses the finish. The timer merely calls the times as the pupils cross the finish.

**Rules:** Walking is permitted, but the object is to cover the distance in the shortest time possible.

**Scoring:** Record in minutes and seconds.

TABLE XXV  
RESULTS OF KEATS 600-YARD RUN WALK TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 9              | 90                |
| 81-90      | 1              | 10                |
| 71-80      | 0              | 0                 |
| 61-70      | 0              | 0                 |
| 51-60      | 0              | 0                 |
| 41-50      | 0              | 0                 |
| 31-40      | 0              | 0                 |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table XXV shows that Keats ranked extremely high on this test with 90 percent ranking above the 90th percentile, and the remaining 10 percent scoring above the 80th percentile. Keats had a percentile of 94.8, and a raw score mean of 1 minute and 57 seconds for covering the 600-yard distance. The range was from 1 minute and 46 seconds to 2 minutes and 15 seconds for the test.

TABLE XXVI  
RESULTS OF RILEY 600-YARD RUN WALK TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 7              | 35                |
| 81-90      | 8              | 40                |
| 71-80      | 1              | 5                 |
| 61-70      | 1              | 5                 |
| 51-60      | 3              | 15                |
| 41-50      | 0              | 0                 |
| 31-40      | 0              | 0                 |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{20}$ | $\frac{0}{100\%}$ |

Table XXVI indicates that Riley was well above the average in this test and that they had 75 percent above the 80th percentile. Riley had 100 percent above the 50th percentile, and had a percentile of 83.6. Riley's raw score mean was 2 minutes and 10 seconds, and the range was from 1 minute and 45 seconds to 2 minutes and 35 seconds.

TABLE XXVII  
RESULTS OF LEONARDVILLE 600-YARD RUN WALK TEST

| Percentile | Number         | Per Cent          |
|------------|----------------|-------------------|
| 91-100     | 0              | 0                 |
| 81-90      | 2              | 20                |
| 71-80      | 1              | 10                |
| 61-70      | 4              | 40                |
| 51-60      | 3              | 30                |
| 41-50      | 0              | 0                 |
| 31-40      | 0              | 0                 |
| 21-30      | 0              | 0                 |
| 11-20      | 0              | 0                 |
| 0-10       | $\frac{0}{10}$ | $\frac{0}{100\%}$ |

Table XXVII shows that Leonardville ranks slightly above the national average, but they had 100 percent above the 50th percentile. Leonardville had 70 percent between the 50th and 70th percentile, with 20 percent scoring above the 80th percentile. They had a percentile of 67.2, and a raw score mean of 2 minutes and 19 seconds. The range for Leonardville was from 2 minutes and 4 seconds to 2 minutes and 36 seconds for this test.



TABLE XXVIII  
RESULTS OF U.S.D.#378 600-YARD RUN WALK TEST

| Percentile | Number   | Per Cent |
|------------|----------|----------|
| 91-100     | 16       | 40       |
| 81-90      | 11       | 27.5     |
| 71-80      | 2        | 5        |
| 61-70      | 5        | 12.5     |
| 51-60      | 6        | 15       |
| 41-50      | 0        | 0        |
| 31-40      | 0        | 0        |
| 21-30      | 0        | 0        |
| 11-20      | 0        | 0        |
| 0-10       | <u>0</u> | <u>0</u> |
|            | 40       | 100%     |

Table XXVIII indicates that the district is above the national average, because they had no one fall below the 50th percentile in this test. The district had 67.5 percent above the 80th percentile, and a percentile of 82.3. The raw score mean for the district was 2 minutes and 9 seconds for running the 600 yards. The district showed a range from 1 minute and 45 seconds to 2 minutes and 36 seconds for the 600 yards.

## SUMMARY AND CONCLUSIONS

The seventh-eighth grade boys at Keats ranked above average for the entire series of seven tests. Their performances in the sit-ups and 600-yard run walk were exceptionally high. They ranked above the 90th percentile in both of these tests, and above the 80th percentile in the softball throw and standing broad jump. Their performance in pull-ups was very good with a raw score mean of 5.1 pull-ups, and a 79.9 percentile mean. Their weakest scoring was the 69.7 percentile in the shuttle-run, but this ranking is still above the national norms, as Table XXIX shows. The total percentile mean for Keats, in this series of tests, was 83.64.

TABLE XXIX

KEATS PERCENTILE AND RAW SCORE MEANS FOR ALL TESTS

| Test                | Percentile | Raw Score      |
|---------------------|------------|----------------|
| Pull-ups            | 79.9       | 5.1            |
| Sit-ups             | 91.5       | 76.1           |
| Shuttle-Run         | 69.7       | 11.13 sec.     |
| Standing Broad Jump | 82         | 5' 10"         |
| 50-Yard Dash        | 78.9       | 7.43 sec.      |
| Softball Throw      | 88.7       | 149.6 ft.      |
| 600-Yard Run Walk   | 94.8       | 1 min. 57 sec. |

Riley boys showed the lowest ranking of the schools tested. Their poorest scores were recorded in pull-ups with a 45.2 percentile mean, a shuttle-run percentile mean of 47.5 and a 50-yard dash 56.9 percentile mean. They had three tests which ranked them above average. These tests were the softball throw, standing broad jump and sit-ups where they ranged from 60.2 to 71.3. Riley ranked well above the norm in the 600-yard run walk with a percentile mean of 83.6, as Table XXX indicates. The boys from Riley showed a percentile mean of 61.35 for the series of tests.

TABLE XXX  
RILEY PERCENTILE AND RAW SCORE MEANS FOR ALL TESTS

| Test                | Percentile | Raw Score      |
|---------------------|------------|----------------|
| Pull-ups            | 45.2       | 1.35           |
| Sit-ups             | 71.3       | 51             |
| Shuttle-Run         | 47.5       | 11.4 sec.      |
| Standing Broad Jump | 64.8       | 5' 6"          |
| 50-Yard Dash        | 56.9       | 7.9 sec.       |
| Softball Throw      | 60.2       | 123 ft.        |
| 600-Yard Run Walk   | 83.6       | 2 min. 10 sec. |

Table XXXI shows that Leonardville's one weak test of the series was pull-ups, where they only ranked at the 51.2

percentile. The remaining tests in the series showed that they ranked in the average or slightly above average, with the scores falling in a range from 60 to 77.5 percentile. Leonardville showed no outstanding strengths on the tests, according to the classification index. Leonardville had an average percentile mean of 67.9 on the series of tests.

TABLE XXXI

## LEONARDVILLE PERCENTILE AND RAW SCORE MEANS FOR ALL TESTS

| Test                | Percentile | Raw Score          |
|---------------------|------------|--------------------|
| Pull-ups            | 51.2       | 2.3                |
| Sit-ups             | 77.5       | 61.8               |
| Shuttle-Run         | 60         | 10.84 sec.         |
| Standing Broad Jump | 73.8       | 6' $\frac{1}{4}$ " |
| 50-Yard Dash        | 75.2       | 7.27 sec.          |
| Softball Throw      | 70.5       | 141.9 ft.          |
| 600-Yard Run Walk   | 67.2       | 2 min. 19 sec.     |

Table XXXII indicates that the Unified School District had two outstanding weaknesses, the pull-ups and shuttle-run, where the percentile means were 55.4 and 56.2 respectively. The district ranked above average on four tests: 50-yard dash at the 66.9 percentile, softball throw at the 69.9 percentile, standing broad jump at the 71.35



percentile level, and sit-ups at the 77.9 percentile. The best ranking score was for the 600-yard run walk, where they recorded a 82.3 percentile level.

TABLE XXXII

U.S.D.#378 PERCENTILE AND RAW SCORE MEANS FOR ALL TESTS

| Test                | Percentile | Raw Score            |
|---------------------|------------|----------------------|
| Pull-ups            | 55.4       | 2.52                 |
| Sit-ups             | 77.9       | 59.9                 |
| Shuttle-Run         | 56.2       | 11.19 sec.           |
| Standing Broad Jump | 71.35      | 5' 8 $\frac{1}{2}$ " |
| 50-Yard Dash        | 66.9       | 7.62 sec.            |
| Softball Throw      | 69.9       | 134.4 ft.            |
| 600-Yard Run Walk   | 82.3       | 2 min. 09 sec.       |

The seventh-eighth grade boys of the Unified School District, according to the classification index, showed that they need activities which will provide the exercises for the improvement of the arms and shoulders, and agility of the whole body. According to many authorities, activities such as tumbling and weight training would prove helpful in developing these areas. The district should install the following equipment: (To help improve these weaknesses) climbing ropes, parallel bars and a side-horse. These pieces

of equipment could not only be used for improving these weaknesses, but add greater variety to the over-all physical education program of the district. The planned addition of a swimming program in the near future should have a good effect by improving the agility level of the district's students.

The results showed that the boys of the district ranked best on the 600-yard run walk. It is believed that this is in part due to the fact that the test was administered at the close of the basketball season, where endurance should have been at a high level of development.

The other test scores showed the district ranked above the national norms, but these areas must continue to receive attention, and should not be overlooked in order to improve the weaknesses. The district should not change its program only to improve these weak areas, but should add such drills and exercises to the over-all program.

It is very important that we not only look at the group, as a whole, but also look at each school and student individually to see their weaknesses. The purpose of using the classification index was to give a more accurate account of the pupils' physical fitness level.

The main purpose for administering this form of test was that the administrators and physical educators could use it as a guide for evaluating the over-all program. It is

hoped also that they determine the needs of the individual students, and through planned activities, give each student the chance to become totally fit in all physical areas of the body.

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A STUDY OF PHYSICAL FITNESS OF SEVENTH-  
EIGHTH GRADE BOYS OF UNIFIED SCHOOL  
DISTRICT #378 RILEY COUNTY, KANSAS  
1965-1966

by

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AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Physical Education

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

1966



The purpose of this study was to determine the physical fitness level of the Seventh-Eight grade boys of U.S. D.#378. This study was to serve as a guide for administrators and physical educators in determining the strengths and weaknesses of the physical education program. It is hoped also that they will help determine the needs of the individual students, and through planned activities, give each student the chance to become totally fit in all physical areas of the body.

The test used in this report was recommended by the American Association of Health, Physical Education and Recreation. This test was given to the seventh and eighth grade boys of Unified School District #378. This test consists of seven items which can be given in the gymnasium or outdoors. It is suggested that the pull-up, sit-up, standing broad jump, and shuttle-run be given in one period; the 50-yard dash, softball throw, and 600-yard run-walk in a second period.

This report has also incorporated the use of the classification index, which has been adopted by the President's Council of Youth Fitness. This index was devised to give a more accurate account of the pupil's physical fitness level. This index incorporates the age, height and weight of the pupil.

The results of the tests indicates that the Unified School District had two outstanding weaknesses, the pull-ups and shuttle-run, where the percentiles were 55.4 and 56.2 respectively. The district ranked above the national average on four tests: 50-yard dash at the 66.9 percentile, softball throw at the 69.9 percentile, standing broad jump at the 71.35 percentile level, and sit-ups at the 77.9 percentile. The best ranking score was for the 600-yard run-walk, where they recorded a 82.3 percentile level.

The tests results indicate that the boys of Unified School District #378 need activities which will provide the exercises for the improvement of the arms and shoulders, and agility of the whole body. According to many authorities, activities such as tumbling and weight training would prove helpful in developing these areas. Also, to help correct these weaknesses, the district should install the following equipment: climbing ropes, parallel bars and a side-horse. These pieces of equipment could not only be used for correcting these weaknesses, but add greater variety to the over-all physical education program of the district.

It is very important that we not only look at the group, as a whole, but also look at each student individually to see their weaknesses. The purpose of using the classification index was to give a more accurate account of the pupils' physical fitness level.