

THE CONSTRUCTION OF A PHYSICAL EDUCATION  
KNOWLEDGE TEST FOR THE SIXTH GRADE

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Master of Science

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by

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## ABSTRACT

In the past few years elementary school physical education has made giant strides. Because of these advances it seems necessary to determine the tangibility of the information being given to students. The problem was to construct a physical education knowledge test for sixth grade students about basic activities. The major body of concern was Foundations of Movement.

One hundred-eighty items were constructed. The items were evaluated in two ways: by a panel of professional educators in elementary education and physical education, and by the use of an item analysis. The tests were evaluated by the Kuder-Richardson measure of reliability and by a summary table for analysis of written test as established by the "University Examination Service of the State University of Iowa."

As a result of this study the following conclusions are drawn:

1. The final test is a satisfactory measure of knowledge for sixth grade students.
2. The test can be used in conjunction with any elementary physical education curriculum.
3. The test can also serve as a guide in construction of future teacher-made tests.

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## CHAPTER 1

### INTRODUCTION

In the past twenty to twenty-five years, elementary physical education has made giant strides. It has moved from a program of either playtime or calisthenics and physical fitness testing to a program designed to familiarize the student with himself as he acts on or in his environment, as it acts on him, and what is contained in his environment for him through physical education.

Because of these advances it seems necessary to determine the tangibility of the information being given to the student. This can be done in two ways, through skill testing and knowledge tests. There are a variety of skill tests available, but few written tests from which to choose for the intermediate level student. It was for this reason that this test was constructed.

#### Statement of the problem

The problem was to construct a physical education knowledge test for sixth grade students about basic activities. The major body of concern was Foundations of Movement. Areas to be covered were mechanical principles, action of body joints, muscle action, locomotor movements, combination of basic locomotor movements, nonlocomotor movements, and basic catching patterns to which the student is exposed during his primary and intermediate grade education.

### Need for the study

Few written objective tests for children in elementary physical education have been constructed. Authors of recent text books in elementary physical education have suggested various areas of content such as concepts, rules, strategies, and safety as test items. (13:139) (10:VIII, IX) An elementary physical education knowledge test for periodic evaluation should be of value in improving the program in physical education at the elementary level if progress is to be accurately measured. (10:VIII,IX)

### Delimitations

The sixty-question pilot test was given during a sixty minute session to a sixth grade class in a parochial school, a public school, and the University Campus School in LaCrosse, Wisconsin. The final seventy-question test was given in a sixty minute session to a sixth grade class from a well established elementary physical education program in Wauwatosa, Wisconsin. All tests were given during the final two months of the 1970-1971 school year. The sixty question pilot test was converted to a questionnaire and sent to nine physical education specialists and nine elementary classroom teachers in Wisconsin and Minnesota for their evaluation of the questions.

### Limitations

Because of the broad scope of knowledges within physical education it was necessary to limit the questions to the area of Foundations of Movement. The students used in the pilot study were from a parochial, a public, and the university

carus school where the approach to and the concentration on physical education varied in each case. The teachers asked to evaluate the test items were from different areas and possibly held varying educational philosophies.

#### Definition of terms

Panel of experts. A group of professionals who teach sixth grade academic subjects and/or physical education.

Pilot test. Three tests made up of fifty-nine, sixty, and sixty-one questions given to three different segments of education for the purpose of further evaluating the quality of the questions to be used on a final test.

Physical education specialist. An individual who teaches almost exclusively elementary physical education.

Classroom teacher. The elementary teacher whose duties and concerns are primarily those dealing with the instruction of academic subjects.

Foundations of Movement. All movement skills, all basic movement in terms of: qualities of movement, space, body action and relationships.

#### Assumption and hypothesis.

It was assumed that in the primary and intermediate grades students are exposed to the movement principles in physical education and sport activities.

It was hypothesized that these areas of knowledge can be used to construct a comprehensive objective test.

## CHAPTER II

### REVIEW OF LITERATURE

Knowledge tests on specific physical education activities have been devised since 1932 when Harphill (7) wrote an objective test for high school boys. Snell (16) constructed a sports knowledge test in 1937 which was revised in 1935 to evaluate students in the Women's Physical Education program at the University of Minnesota. Two other similar tests were constructed, one by French (3) in 1943 and another by Hennis (6) in 1956. All of these tests were designed to evaluate college students. Of the tests mentioned above, none dealt with Foundations of Movement as such. In 1965 Kohn (9) constructed a sports knowledge test for senior high school boys and Graham (5) constructed a test dealing with a specific sport activity for junior high school boys. Through a review of literature, no physical education or sport test of any kind for elementary students was located.

## CHAPTER III

### PROCEDURE

#### Selection of subjects

Subjects selected for a pilot study were sixth grade students in LaCrosse, Wisconsin elementary schools: A public school, a parochial school, and the University of Wisconsin-LaCrosse Campus School. There were a total of eighty-six students participating, thirty from the public school, thirty from the parochial school, and twenty-six from the campus school. The three different educational programs were utilized so that the test items might be administered to students representing a wide range of physical education experiences. After the pilot study was completed, a revised test was constructed and prepared for administration.

The subjects selected for the administration of the revised test were a sixth grade class of thirty-one students in the Waumatawa, Wisconsin school system, which is regarded by leaders in physical education as having a well established elementary physical education program.

#### Selection of a panel of experts

To help determine the reliability of test items a panel of experts in elementary education were asked to evaluate the questions. The panel members were drawn from Wisconsin and eastern Minnesota. Contacts were made through professional colleagues and university professors to produce

the panel. Eighteen professionals comprised the panel, nine elementary classroom teachers and nine elementary physical education teachers.

#### Selection of the basic texts and subject matter

Two texts were chosen, Schurr (13) Movement Experiences for Children because it contained discussions of basic skills, application of them to recreational and sport skills, and discussions of specific sports and the skills involved. A second text, Knowledge and Understanding in Physical Education (10) ed. Larson was chosen to supplement the first text. Larson was used because it made clear-cut statements and supplied knowledges and understandings for specific grade groupings.

#### Construction of questions

An outline of the above material was made from which the questions were drawn. One hundred-eighty multiple response type questions were constructed. This type of question was chosen because it could be adjusted to test for various depths of understanding, it is completely objective in scoring, and tests the students ability to eliminate incorrect responses as well as selecting the correct answer. (15:100) For the pilot study the 180 items were divided into three tests consisting of fifty-nine, sixty, and sixty-one items.

#### Query of the panel of experts

The tests, in questionnaire form, were sent to the panel of experts for evaluation. Each of the three tests

was judged by a separate group of six professionals, three elementary teachers and three elementary physical education teachers. They were asked to judge the questions on the test for comprehension, content relating to physical education, sentence structure, wording, vocabulary, etc. Accompanying the questionnaire was a letter of introduction, explanation, directions, and a self-addressed stamped envelope.

#### Administration of the pilot tests

The pilot tests were given during the last week in April and first week in May. Each class was allowed sixty minutes to complete the test. The test was designed so that the student could place his answer in a space next to the question. The answers were then transferred to a computer answer sheet. The computer was used to score the test from which a difficulty index, discrimination analysis, and Kuder-Richardson measure of reliability were used to evaluate the questions and the tests. The Kuder-Richardson Formula Method is recommended because it does not require the correlation, it requires only one administration of the test, and it operates on the same assumptions as the Spearman-Brown Prophecy Formula with regard to item difficulty and discrimination. It also provides the lower limit as to what the real reliability of a test may be. (1:407) The three pilot tests were compared to the form-summary table for analysis of written tests as established by the "University Examination Service of the State University of Iowa." (15:130)

### Selection of the final test items

The test items from the pilot study were examined for validity by using the difficulty index and discrimination analysis scores from the item analysis computer print-out. (Appendix). It is recommended in Scott and French (15) that a range of .10 to .90 for difficulty index be used and that only items with a .20 or better discrimination analysis be used. (15:122-29)

The opinion of the professionals on the panel of experts was taken into consideration. The items with the best difficulty index and discrimination analysis were kept and reduced to the final seventy-question test. To arrive at a total of seventy questions, the items with the highest difficulty index and easier questions were eliminated.

The final test was compared to the suggested form-summary table for analysis of written tests as established by the "University Examination Service of the State University of Iowa", (15-130) before the final administration.

### Administration of the final test

The final seventy-item test was given the last week of school, June, 1971 to thirty-one sixth grade students from the Wauwatos<sup>o</sup>, Wisconsin, Public School System. The students were allowed sixty minutes to complete the test. Each student was asked to record his answer on a separate computer answer sheet which was provided for him. (Appendix)

### Final item analysis

The test was scored and each item examined for validity

using the difficulty index and the discrimination analysis. The results of each item were compared with results of that item in the first trial of the pilot study.

A comparison was made of the Kuder-Richardson measure of reliability from the three parallel pilot tests and the measure of reliability from the final test. The test was compared to the form-summary table for analysis of written test as established by the "University Examination Service of the State University of Iowa." (15:136)

CHAPTER IV  
ORGANIZATION AND ANALYSIS OF DATA

Empirical validity was utilized in the construction of 180 test items on physical education. Following a pilot test, an item analysis was run on the 180 questions for the purpose of selecting the best items for the final instrument. Of the 180 questions, ninety-eight met the recommended minimum level of .20 for discrimination analysis. (11:83) (Table 1) One hundred sixty-eight questions were within the .10-.90 difficulty index level which is the recommended range. [15:122]

From items within the recommended limits, questions having a difficulty index of .19 or better and a discrimination analysis value of .20 and above were retained. Ninety-four questions met this standard. Sixty-seven questions were chosen from those items with a difficulty index no greater than .64. Two questions with a difficulty index of less than .19 were included to obtain a sufficient number of difficult questions. Inadvertantly one question with a discrimination analysis value of  $-.38$  was retained.

Eleven of the members of the panel of experts responded with one person failing to follow directions. This response was voided. There were three returns for pilot test I, four for pilot test II, and three for pilot test III. Of the 180 items only twenty were deemed unacceptable by a majority of the panel. If there was a discrepancy between the item analysis and the opinion of the panel of experts about any

TABLE I

DIFFICULTY INDEX AND DISCRIMINATION ANALYSIS  
SCORES AND PANEL OF EXPERTS EVALUATION

## KEY TO TABLES:

- D.I. = Difficulty Index  
 D.A. = Discrimination Analysis  
 P.E. = Panel of Experts Favorable Responses  
 \* = Item meets chosen D.I. and D.A. limits  
 x = Indicates final test item

## PILOT TEST 1

Item Number	x	*	D.I.	D.A.	P.E. of 3
1		*	.75	.25	3
2	x	*	.50	.25	2
3	x	*	.38	.25	3
4		*	.75	.25	3
5			.38	.00	3
6	x	*	.44	.88	3
7	x	*	.56	.38	3
8			.75	.00	3
9		*	.75	.25	3
10		*	.81	.38	3
11	x	*	.56	.38	2
12	x	*	.50	.75	2
13	x	*	.56	.63	2
14			.69	.13	2
15			.44	.13	3
16			.75	.00	2
17			.50	.00	2
18			.19	.13	3
19		*	.56	.38	2
20	x	*	.56	.63	3
21			.81	.13	3
22			.50	.00	2
23	x	*	.25	.25	2
24	x	*	.31	.38	1
25			.25	.00	3
26			.94	.13	3
27			.81	.13	1
28			.25	.00	1
29	x	*	.25	.50	3
30			.25	-.25	2
31			.00	.00	1

## PILOT TEST 1 (Continued)

Item Number	x	*	D.I.	D.A.	P.E. of 3
32	x	*	.38	.25	2
33			.44	.13	3
34	x	*	.19	.38	2
35	x	*	.56	.38	3
36			.25	-.25	3
37	x	*	.19	.38	2
38			.11	-.13	2
39	x	*	.63	.50	1
40			.88	.25	2
41	x	*	.50	.50	2
42			.88	.25	3
43			.25	.00	3
44	x	*	.50	.75	3
45			.06	.13	3
46	x	*	.44	.63	3
47			.50	-.50	3
48			.50	.00	3
49			.31	.13	3
50	x	*	.19	.38	3
51	x	*	.44	.88	3
52	x	*	.19	.38	3
53	x	*	.63	.75	3
54			.88	.25	2
55			.44	-.38	1
56		*	.81	.38	3
57			.06	.13	3
58			.19	.13	3
59			.31	-.13	3
60		*	.75	.25	3
61	x	*	.38	.50	3

## PILOT TEST 11

Item Number	x	*	D.I.	D.A.	P.E. of 4
1	x	*	.25	.50	4
2			.81	.13	3
3			.31	.13	4
4	x	*	.50	.50	3

## PILOT TEST II (Continued)

Item Number	X	*	D.I.	D.A.	P.R. of 4
5			.06	.13	3
6	x	*	.25	.50	4
7			.31	.13	3
8			.69	.13	3
9	x	*	.56	.38	4
10			.19	.13	1
11	x	*	.38	.50	4
12		*	.88	.25	4
13	x	*	.19	.38	3
14	x	*	.56	.38	3
15		*	.69	.63	2
16		*	.69	.63	2
17			.13	-.25	2
18	x		.13	.25	4
19	x	*	.31	.63	2
20	x	*	.38	.50	3
21		*	.75	.50	4
22			.13	.00	3
23			.38	-.25	1
24	x	*	.44	.38	4
25	x	*	.31	.38	1
26			.19	.13	4
27			.31	-.13	3
28	x	*	.38	.50	4
29			.31	.13	4
30	x	*	.31	.38	3
31			.94	.13	4
32		*	.98	.25	4
33	x	*	.50	.25	3
34			.19	.13	4
35			.19	.13	4
36	x	*	.38	.75	3
37			.19	.13	1
38	x	*	.38	.25	1
39		*	.81	.38	2
40		*	.69	.63	3
41	x	*	.25	.50	2
42			.19	.13	3
43	x	*	.50	1.00	3
44	x		.19	-.38	2
45			.06	.13	4
46			.06	.13	3
47			.00	.00	1
48			.19	-.13	2
49			.13	.00	2
50	x	*	-.44	.88	2

## PILOT TEST II (Continued)

Item Number	x	*	D. I.	D. A.	P. E. of 4
51	x	*	.63	.25	3
52	x		.13	.25	1
53	x	*	.56	.63	3
54		*	.81	.38	4
55	x	*	.56	.38	3
56	x	*	.31	.38	4
57			.25	-.25	2
58			.00	.00	3
59		*	.81	.38	4

## PILOT TEST III

Item Number	x	*	D. I.	D. A.	P. E. of 3
1	x	*	.50	.43	1
2			.36	-.14	1
3		*	.71	.57	3
4			.50	.14	2
5			.29	.00	1
6		*	.86	.29	2
7			.93	.14	3
8	x	*	.64	.43	3
9			.64	.14	3
10			.21	.14	2
11			.43	.00	2
12			.29	.00	1
13	x	*	.36	.43	1
14	x	*	.64	.43	3
15	x	*	.57	.57	2
16	x	*	.43	.29	2
17			.79	.14	2
18	x	*	.57	.57	2
19	x	*	.64	.43	3
20	x	*	.57	.29	3
21		*	.71	.57	3
22			.07	-.14	1
23			.93	.14	3
24			.64	.14	3
25	x	*	.43	.57	1
26	x	*	.43	.86	2
27		*	.71	.57	2
28			.50	.14	3
29			.14	-.29	2
30		*	.71	.57	3

## PILOT TEST III (Continued)

Number	x	*	D.I.	D.A.	P.R. of 3
31		*	.71	.57	3
32	x	*	.50	.43	3
33			.36	.14	3
34		*	.79	.43	2
35			.29	.00	3
36			.36	.14	1
37	x	*	.50	.71	2
38			.21	-.14	2
39			.21	-.14	2
40		*	.71	.29	2
41	x	*	.43	.57	1
42			.00	.00	2
43			.14	.00	3
44	x	*	.64	.71	2
45			.36	.14	3
46			.14	.00	3
47	x	*	.43	.57	1
48			.43	.00	2
49	x	*	.36	.43	3
50			.14	.00	2
51	x	*	.50	.71	3
52			.21	-.43	3
53			.36	.43	1
54			.57	.00	3
55			.07	.14	3
56			.21	.14	3
57	x	*	.43	.57	3
58		*	.79	.43	3
59			.21	.14	1

question, the final choice was determined by use of the item analysis. Therefore, seven of the twenty objectionable questions as evaluated by the panel of experts were placed on the final test. Most of their objections were about the use of terminology and vocabulary which some panel members considered beyond comprehension of sixth grade students.

The Kuder-Richardson measure of reliability was computed on each of the three pilot tests. Test I had a reliability of .5741, test II .6401, and test III .6489.

The final test was made up of seventy questions chosen as described above. An item analysis was run on these seventy questions and the results compared to the results of the first item analysis of each question. (Table II). Of the sixty-eight questions that fell within the .19 to .64 chosen difficulty index on the first item analysis, fifty-six fell within the same range on the second item analysis and sixty-seven fell within the recommended range. Of the sixty-nine questions with a discrimination analysis value of .20 or better on the first item analysis, thirty-seven had a value above that on the second item analysis. Of the three items with ratings below either the chosen difficulty index or discrimination analysis, none increased either of its rating enough to fall within both limits.

Categorizing the final test questions, thirty-one items fell within both difficulty index and discrimination analysis limits as set by the author of the remaining items; twenty-four items were within the .19 to .64 difficulty index but

TABLE II

## DIFFICULTY INDEX AND DISCRIMINATION ANALYSIS SCORES

## FINAL TEST

Final Test Number	Pilot Test Number	D. I.	D. A.
1		.75	.00
	1-III	.50	.43
2		.19	.13
	44-I	.50	.75
3		.75	.25
	8-III	.64	.43
4		.44	.63
	11-II	.38	.50
5		.69	.13
	35-I	.56	.38
6		.13	.00
	51-III	.50	.71
7		.31	.13
	34-I	.19	.38
8		.44	.88
	1-II	.25	.50
9		.63	.50
	3-I	.38	.25
10		.38	.00
	12-I	.50	.75
11		.69	.13
	39-I	.63	.50
12		.31	.13
	41-III	.43	.57
13		.50	.50
	56-II	.31	.38
14		.25	.00
	41-II	.25	.50
15		.75	.50
	44-III	.64	.71
16		.63	.50
	46-I	.44	.63
17		.19	.38
	19-II	.31	.63
18		.38	.25
	26-III	.43	.86
19		.31	.38
	53-III	.36	.43
20		.25	.25
	50-I	.19	.38
21		.56	.63
	9-II	.56	.38

TABLE II

## DIFFICULTY INDEX AND DISCRIMINATION ANALYSIS SCORES

## FINAL TEST (continued)

Final Test Number	Pilot Test Number	D. I.	D. A.
22		.06	-.13
	20-II	.38	.50
23		.31	.13
	18-III	.57	.57
24		.06	.13
	52-II	.13	.25
25		.81	.38
	19-III	.64	.42
26		.63	.25
	43-II	.50	1.00
27		.31	-.13
	38-II	.38	.25
28		.00	.00
	18-II	.13	.25
29		.38	.25
	25-III	.43	.57
30		.25	.00
	33-II	.50	.25
31		.31	.63
	29-I	.25	.50
32		.25	.50
	14-II	.56	.38
33		.63	.00
	36-II	.38	.75
34		.19	-.38
	32-I	.19	.38
35		.56	.63
	13-I	.56	.63
36		.44	.13
	44-II	.19	-.38
37		.38	.25
	6-I	.44	.88
38		.38	.50
	53-I	.63	.75
39		.19	-.13
	6-II	.25	.50
40		.38	.50
	32-I	.38	.25
41		.31	.63
	55-II	.56	.38
42		.69	.13
	7-I	.56	.38
43		.44	.13
	20-I	.56	.63

TABLE II

## DIFFICULTY INDEX AND DISCRIMINATION ANALYSIS SCORES

## FINAL TEST (continued)

Final Test Number	Pilot Test Number	D. I.	D. A.
44		.41	.13
	24-II	.44	.38
45		.31	.13
	41-I	.50	.50
46		.19	.13
	32-III	.50	.43
47		.31	.38
	29-III	.57	.29
48		.56	.13
	13-II	.19	.38
49		.69	.63
	14-III	.64	.43
50		.38	.50
	23-I	.25	.25
51		.38	.00
	24-I	.31	.38
52		.50	.25
	51-II	.63	.25
53		.25	.00
	25-II	.31	.38
54		.38	.00
	15-III	.57	.57
55		.19	.13
	50-II	.44	.88
56		.44	.38
	30-II	.31	.38
57		.31	.38
	2-I	.50	.25
58		.63	.75
	37-III	.50	.71
59		.56	.38
	11-I	.56	.38
60		.75	.50
	53-II	.36	.63
61		.50	.25
	13-III	.36	.43
62		.19	.38
	16-III	.43	.29
63		.44	.38
	47-III	.43	.57
64		.44	.38
	49-III	.36	.43
65		.13	.25
	37-I	.19	.38
66		.31	.13
	4-II	.50	.50
67		.44	.13
	28-II	.38	.50

TABLE II

## DIFFICULTY INDEX AND DISCRIMINATION ANALYSIS SCORES

## FINAL TEST (continued)

Final Test Number	Pilot Test Number	D. I.	D. A.
68		.38	.25
	51-I	.44	.88
69		.44	.13
	61-I	.38	.50
70		.56	.13
	57-III	.43	.57

below the .20 discrimination analysis, five items were above the .64 difficulty index limit and above the .20 discrimination analysis, four items were above the .64 difficulty index and below the .20 discrimination analysis, four items were below the .19 difficulty index and below the .20 discrimination analysis, and one item was below the .19 difficulty index and above the .20 discrimination analysis.

The results of the Kuder-Richardson measure of reliability were compared and the final test reliability was .6657. Thus, through the process of refinement the final test had an increased reliability. (Table III). Each test was compared to the suggested form-summary table for analysis of written tests as established by the "University Examination Service of the State University of Iowa". (Table IV)

TABLE III

## RESULTS OF THE KUDRR-RICHARDSON MEASURE OF RELIABILITY

PILOT TEST I	- .5741
PILOT TEST II	- .6401
PILOT TEST III	- .6449
FINAL TEST	- .6652

TABLE IV

SUMMARY TABLE FOR ANALYSIS OF WRITTEN TESTS AS  
ESTABLISHED BY THE "UNIVERSITY EXAMINATION SERVICE  
OF THE STATE UNIVERSITY OF IOWA"

## PILOT TEST I

No. of Answer Sheets.	30	Scores		
Content		Mean	28.4000	
Total No. of Items.	61	Standard Deviation	5.9050	
Multiple Choice	61			
Validity				
Difficulty Rating	Per Cent	Number	Per Cent	Judgment
90-100%	5%	1	3%	fair
10- 89%	90%	57	93%	good
0- 09%	5%	3	5%	fair
Index of Discrimination				
.41 and up	more than 25%	13	21%	fair
.21-.40	more than 25%	22	35%	excellent
.01-.20	less than 15%	10	11%	good
.00 and below	less than 5%	16	25%	poor
Functioning of Responses				
All responses function	5%	26	43%	
1 response fails to function		27	44%	
2 responses fail to function		5	8%	
More than 2 fail to function		3	5%	
Reliability				
Method Used		Kuder-Richardson		
Coefficient		.5741		
Comments				
Ave. D.I. .475		Ave. D.A. .238		

TABLE IV  
SUMMARY TABLE

## PILOT TEST II

No. of Answer Sheets.	30	Scores		
Content		Mean	23.8000	
Total No. of Items.	58	Standard Deviation	6.1890	
Multiple Choice	58			
Validity				
Difficulty Rating	Per Cent	Number	Per Cent	Judgment
90-100%	5%	1	3%	fair
10- 89%	90%	53	89%	excellent
00- 0%	5%	4	8%	fair
Index of Discrimination				
.41 and up	more than 25%	16	27%	excellent
.21-.40	more than 25%	18	30%	excellent
.01-.20	less than 15%	14	26%	poor
.00 and below	less than 5%	10	16%	poor
Functioning of Responses 5%				
All responses function		41	70%	
1 response fails to function		15	26%	
2 responses fail to function		2	4%	
More than 2 fail to function		0	0%	
Reliability				
Method Used		Kuder-Richardson		
Coefficient		.6401		
Comments				
Ave. D.I. .389		Ave. D. A. .273		

TABLE IV  
SUMMARY TABLE

## PILOT TEST III

No. of Answer Sheets.	26	Scores		
Content		Mean	26.9231	
Total No. of Items	59	Standard Deviation	6.3241	
Multiple Choice	59			
Validity		Number	Per Cent	Judgment
Difficulty Rating	Per Cent			
90-100%	5%	2	4%	excellent
10- 89%	90%	54	91%	excellent
00- 09%	5%	3	5%	excellent
Index of Discrimination				
.41 and up	more than 25%	25	40%	excellent
.21-.40	more than 25%	4	7%	poor
.01-.20	less than 15%	16	27%	poor
.00- and below	less than 5%	14	26%	poor
Functioning of Responses	5%			
All responses function		27	45%	
1 response fails to function		22	38%	
2 responses fail to function		7	12%	
More than 2 fail to function		3	5%	
Reliability				
Method Used		Kuder-Richardson		
Coefficient		.6449		
Comments				
Ave. D.I. 462		Ave. D.A. .261		

TABLE IV  
SUMMARY TABLE

## FINAL TEST

As set up using summary table as guide before administration.

No. of Answer Sheets.	31			
Content		Scores		
Total No. of Items	70			
Multiple Choice	70			
Validity				
Difficulty Rating		Number	Per Cent	Judgment
90%-100%		0	0%	
10 - 89%		70	100%	
0 - 89%		0	0%	
Index of Discrimination				
.41 and up	more than 25%	42	60%	
.21-.40	more than 25%	27	38%	
.01-.20	less than 15%	0	0%	
.00 and below	less than 5%	1	2%	
Functioning of Responses	55			
All responses function		47	67%	
1 response fails to function		17	24%	
2 responses fail to function		6	9%	
More than 2 fail to function		0	0%	
Reliability				
Method Used				
Coefficient				
Comments				
Ave. D.I.				Ave. D.A.

TABLE IV  
SUMMARY TABLE

## FINAL TEST

No. of Answer Sheets.	31	Scores	
Content		Mean	39.0000
Total No. of Items	70	Standard Deviation	7.6238
Multiple Choice	70		

Validity		Number	Per Cent	Judgment
Difficulty Rating	Per Cent			
90-100%	5%	0	0%	poor
10-89%	90%	67	96%	good
0-90%	5%	3	4%	excellent

Index of Discrimination		Number	Per Cent	Judgment
.41 and up	more than 25%	17	24%	excellent
.21-.40	more than 25%	20	28%	excellent
.01-.20	less than 15%	18	26%	poor
.00 and below	less than 5%	15	21%	poor

Function of Responses	5%		
All responses function		50	71%
1 response fails to function		19	27%
2 responses fail to function		0	0%
More than 2 fail to function		1	2%

Reliability	
Method Used	Kuder-Richardson
Coefficient	.6652

Comments	
Ave. D.I. A13	Ave. D.A. .250

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to construct a valid, reliable knowledge test for sixth grade. As a preliminary step to the construction of the items for the test a review was made of suggested elementary physical education curricula. Because of the scope of knowledges within physical education it was necessary to limit the questions to the areas of Foundations of Movement.

Multiple-choice type items were constructed and used in all of the tests. The original form of the test was 180 items divided into three smaller tests and administered to three classes of sixth grade students each from different philosophical backgrounds.

All items were analyzed to determine difficulty index and discrimination analysis. This was done by computer. From the item analysis, questions were eliminated on the basis of poor discrimination analysis and whether the item was easy or difficult. From these items, questions were selected for the final test. An additional evaluation of the test items were sent to nine professionals in elementary physical education and nine professionals in elementary education.

The results of the pilot tests were compared with the standards for classroom tests established by the "University Examination Service of the State University of Iowa." The

final test was set up in accordance with this standard and was also compared to the standard after administration. A final item analysis was performed and the results compared to the first trial.

The reliability of the pilot and final form of the test were calculated by the Kuder-Richardson measure of reliability. In each instance the reliabilities were above .57 and the final test was above .66 which was a result of a process of refinement.

Though each item on the test did not meet all the standards, the final test as a whole did meet most of the standards satisfactorily. As a result of this study the following conclusions are drawn:

1. The final test is a satisfactory measure of knowledge for sixth grade students.
2. The test can be used in conjunction with any elementary physical education curriculum because of its generalized nature.
3. The test can also serve as a guide in construction of future teacher-made tests.

As a result of this study the following recommendations have been made:

1. That the test items should be administered enough times to be sure that foils are functional.
2. That foils that are not chosen be reworked to increase the strength of the question.
3. That items that have poor discrimination analysis values and difficulty index values be reworked to strengthen the test rather than eliminating the item.
4. That the number of professionals contacted be increased and represent a greater area of the country.

5. That all the items constructed be evaluated by all of the professionals contacted.

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APPENDIX



Wisconsin State University - La Crosse  
La Crosse, Wisconsin 54601

James E. Pake  
WITTICH HALL  
1710 Pine Street

April 24, 1971

Physical Education Teacher

Dear \_\_\_\_\_,

I am presently working on my thesis for the completion of my Masters Degree. My topic is the construction of a knowledge test of physical education for sixth grade students.

I have selected a body of knowledge and written questions about it which I deem important. The body of knowledge covers Foundations of Movement which include Mechanical principles, Action of body joints, Muscle action, Locomotor movements, Combination of basic locomotor movements, Nonlocomotor movements and basic catching patterns.

I have chosen to have these questions evaluated by a panel of experts-Physical Educators and Classroom teachers. I am asking the physical educator to evaluate the questions on the comprehension and content relating to Physical Education. On the test there will be space after each question for your comments.

Along with the test and answer sheet, I have included a self-addressed stamped envelope. I know from my own teaching experience that the last months of school are hectic; I would appreciate it if the test, with your comments, could be in my hands by May 24, 1971.

Thank you for your time and response.

Sincerely,  
*James E. Pake*  
James E. Pake



Wisconsin State University - La Crosse  
La Crosse, Wisconsin 54601

James E. Pake  
WITTICH HALL  
1710 Pine Street

April 24, 1971

Elementary Teacher

Dear \_\_\_\_\_,

I am presently working on my thesis for the completion of my Masters Degree. My topic is the construction of a knowledge test of physical education for sixth grade students.

I have selected a body of knowledge and written questions about it which I deem important. The body of knowledge covers Foundations of Movement which include Mechanical principles, Action of body joints, Muscle action, Locomotor movements, Combination of basic locomotor movements, Nonlocomotor movements and basic catching patterns.

I have chosen to have these questions evaluated by a panel of experts-Physical Educators and Classroom teachers. I am asking the classroom teacher to evaluate the questions on the basis of the ability of the sixth grader to comprehend the question-sentence structure, wording, vocabulary, etc... On the test there will be space after each question for your comments.

Along with the test and answer sheet, I have included a self-addressed stamped envelope. I know from my own teaching experience that the last months of school are hectic; I would appreciate it if the test, with your comments could be in my hands by May 24, 1971.

Thank you for your time and response.

Sincerely,

*James E. Pake*  
James E. Pake

## ANSWERS TO PHYSICAL EDUCATION SURVEY TEST I

- |        |        |        |
|--------|--------|--------|
| 1. a.  | 30. c. | 56. d. |
| 2. d.  | 31. a. | 57. b. |
| 3. b.  | 32. b. | 58. a. |
| 4. e.  | 33. a. | 59. e. |
| 5. c.  | 34. d. | 60. b. |
| 6. c.  | 35. e. | 61. b. |
| 7. b.  | 36. e. |        |
| 8. a.  | 37. c. |        |
| 9. c.  | 38. a. |        |
| 10. e. | 39. d. |        |
| 11. d. | 40. b. |        |
| 12. c. | 41. e. |        |
| 13. e. | 42. c. |        |
| 14. c. | 43. e. |        |
| 15. b. | 44. d. |        |
| 16. c. | 45. b. |        |
| 17. a. | 46. e. |        |
| 18. e. | 47. e. |        |
| 19. b. | 48. a. |        |
| 20. e. | 49. d. |        |
| 21. c. | 50. b. |        |
| 22. e. | 51. d. |        |
| 23. d. | 52. c. |        |
| 24. b. | 53. a. |        |
| 25. e. | 54. d. |        |
| 26. b. | 55. b. |        |
| 27. d. |        |        |
| 28. b. |        |        |
| 29. e. |        |        |

SIXTH GRADE PHYSICAL EDUCATION SURVEY

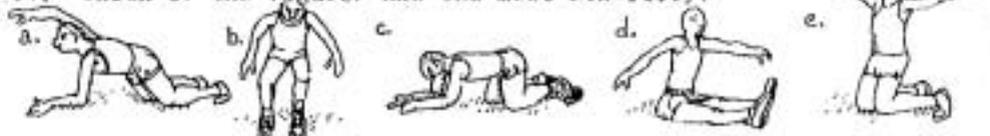
TEST DIRECTIONS - MULTIPLE CHOICE: For each question there is one and only one correct answer. Choose the one that you think best answers the question and write the letter in the space next to the question number.

1. You are losing and regaining stability by moving the legs alternately, what are you doing?
  - A. Walking
  - B. Standing
  - C. Crawling
  - D. Jumping
  - E. Kicking
  
2. Which form of locomotion is used most?
  - A. A car
  - B. A skip
  - C. A run
  - D. A walk
  - E. A kick
  
3. When running the weight should be taken by what part of the foot?
  - A. Heel
  - B. Ball
  - C. Toes
  - D. Side
  - E. All the foot
  
4. Which of the following uses the run?
  - A. Split
  - B. Jump
  - C. Skip
  - D. Gallop
  - E. Jog
  
5. Which is characteristic of the hop?
  - A. Take-off and land on both feet.
  - B. Take-off and land on opposite foot.
  - C. Take-off and land on the same foot.
  - D. Used to cover large distances.
  - E. Use instead of walking.

6. The skip is a combination of two activities, which two?
- A. walk-run
  - B. walk-jump
  - C. walk-hop
  - D. leap-walk
  - E. jump-hop
7. When one foot is kept stationary and the other foot moves forward or backward, what is the activity?
- A. stopping
  - B. pivoting
  - C. sliding
  - D. landing
  - E. hopping
8. When one does not land on his feet after losing their balance, they have done what?
- A. fallen
  - B. slide
  - C. tripped
  - D. rolled
  - E. started running
9. If the thumbs are pointed toward each other when catching, the player is catching an object thrown?
- A. below the waste
  - B. off to the side
  - C. above the waist
  - D. at the feet
  - E. out of reach
10. The best pattern to use when throwing for distance is?
- A. the three-quarters
  - B. the side-arm
  - C. the underhand
  - D. the opposite hand
  - E. the overhand
11. What happens if there is not enough follow through?
- A. too much speed on the object
  - B. object will go too far
  - C. no throw will occur
  - D. speed will be lost
  - E. no spin on the object
12. What other body movement other than the arm is needed for a good throw?
- A. head moving up and down
  - B. shuffle
  - C. rotation of the trunk
  - D. twiddling of the thumbs
  - E. all the above

13. When the center of gravity is directly over the base of support what is happening to the body?
- it is falling forward
  - it tips sideways
  - it is walking
  - it is falling backward
  - it is balanced (perfectly still)

14. Which of the figures has the most stability?



15. When spinning like a top, how can you prevent dizziness?
- keep eyes closed
  - focus eyes on one spot
  - keep eyes open and watch everything go by
  - look straight down
  - keep eyes on the ceiling

16. What will it take to move a heavier object?

- more time
- more inertia
- more force
- more gravity
- more knowledge

17. When receiving a fast moving object or heavy force, what is the best position for the base?

- wide base in the direction of the throw
- wide base from side to side
- wide base from front to back
- widen base by using one knee
- kneel on both knees

18. When lifting heavy objects from the floor, what method should be used?

- arm lift
- back lift
- stomach lift
- Bay City lift
- leg lift

19. If an individual applies force to the floor but slips, what does he need more of?

- |             |         |
|-------------|---------|
| a. inertia  | e. time |
| b. friction |         |
| c. mass     |         |
| d. momentum |         |

- 20. Which is true about a body in motion?
  - a. it remains stationary
  - b. it is easily stopped
  - c. there are no forces acting on it
  - d. it cannot transfer its momentum to another object
  - e. less force is needed to keep it moving than start it
  
- 21. In which direction does gravity pull an object?
  - a. upward
  - b. forward
  - c. downward
  - d. backward
  - e. sideward
  
- 22. What effect does air resistance have on an object in flight?
  - a. pushes with the object
  - b. makes it fall faster
  - c. does not effect the flight
  - d. is never present
  - e. slows its fall
  
- 23. Which is a factor determining the amount of friction?
  - a. type of motion
  - b. leverage
  - c. distance traveled
  - d. surface area in contact
  - e. gravity
  
- 24. Which of these will increase friction?
  - a. softness of surface
  - b. roughness of surface
  - c. hardness of surface
  - d. smoothness of surface
  - e. height of surface
  
- 25. Which of the following would increase friction the most?
  - a. lifting up
  - b. pushing straight ahead
  - c. pulling upward
  - d. pulling straight ahead
  - e. pushing downward
  
- 26. When you jump off the ground what brings you down?
  - a. your weight
  - b. gravity
  - c. friction
  - d. air pressure
  - e. speed

27. What is stability?
- moving fast
  - overcoming friction
  - maintaining inertia
  - maintaining balance
  - watching your weight
28. Which will increase your stability?
- stand on one leg
  - lower body by bending knees
  - put arms out to the side
  - close your eyes
  - change direction
29. Where is the control center for balance located?
- behind the eyes
  - in the throat
  - in the muscles
  - in the heart
  - in the ear
30. What effect does inertia have on a moving object?
- has no effect
  - cause it to stop
  - keeps it in motion
  - changes its direction
  - changes its speed
31. When you push on the floor, what does the floor do?
- pushes back
  - pulls back
  - sinks
  - gets harder
  - nothing
32. What effect will air resistance have on a light object?
- make it fall faster
  - keep it air born longer
  - opposes direction of flight
  - has no effect
33. What does friction always do to an object?
- slows or stops it
  - speeds it up
  - makes it move easier
  - changes its size
  - all of the above

34. What force pulls away from the center on objects moving in a semi-circle or circle pattern?
- centripetal force
  - gravity
  - friction
  - centrifugal force
  - rotary
35. Which will produce more force?
- arms
  - stomach
  - back
  - shoulder
  - legs
36. Which action will produce more force?
- slow and steady
  - light and lively
  - constant and direct
  - indirect and slow
  - fast
37. Which helps to absorb force easiest?
- joints held firm
  - extend joints as contact is made
  - flex joints as contact is made
  - flex only the major joint
  - extend only the major joint
38. What will the flight of an object be if released at a large angle?
- high and short distance
  - equal height and distance
  - more distance than height
  - high and long distance
  - low and short distance
39. Where should the eyes focus when using projectiles?
- on the projectile
  - on the people to make sure they are safe
  - on the boundary line
  - on the target
  - in the opposite direction
40. What is the action when a joint bends?
- extension
  - flexion
  - rotation
  - inversion
  - ligament

41. When the action at a joint is extension, what has happened?

- a. flexing
- b. bending
- c. rotating
- d. expanding
- e. straightening

42. Which is the most basic skill one can do?

- a. run
- b. skip
- c. walk
- d. hop
- e. jump

43. What is done when not walking on level surfaces?

- a. lean away from the slope
- b. lengthen stride
- c. keep body erect
- d. reduce base of support
- e. shift center of gravity

44. Which statement describes part of a run, but is not true for the walk?

- a. arms swing in opposition of the legs
- b. flexion and extension of the hip and knee
- c. weight is transferred from one foot to the other
- d. there is a period of momentary suspension
- e. push off against the ground

45. Which pair of activities is most similar to each other?

- a. walk-slide
- b. run-leap
- c. leap-jump
- d. hop-jump
- e. slide-run

46. Why would a leap be better for getting over obstacles than a jump or a hop?

- a. easier to stop after
- b. land on both feet
- c. can get great distance
- d. arms do not have to move
- e. does not interrupt the running pattern.

47. Which of these is the jump used for?
- gain height
  - gain distance
  - gain speed
  - both a and c
  - both a and b
48. The slide is a combination of what two basic locomotor movements?
- step and leap
  - hop and leap
  - step and hop
  - jump and hop
  - walk and hop
49. What is the movement when the walk and the hop are combined?
- gallop
  - pivot
  - slide
  - skip
  - dodge
50. The key to a good landing is?
- keep feet close together
  - keep center of gravity over base
  - keep base of support small
  - keep center of gravity high
  - keep body parts rigid
51. What is the movement when one part of the body is stationary and the other parts move around it?
- a dodge
  - a pivot
  - a stretch
  - a pivot
  - an escape
52. What is a change in forward direction?
- a stop
  - a pivot
  - a dodge
  - a turn
  - a twist
53. Which area can best absorb a fall?
- the seat
  - the hands
  - the knees
  - the elbows
  - the spine

54. What areas of the body should a person try not to fall on?

- a. fatty areas
- b. round areas
- c. hairy areas
- d. bones
- e. clean areas

55. Which forceful action is done with a combination of body parts?

- a. stretch
- b. push
- c. bend
- d. stand
- e. twist

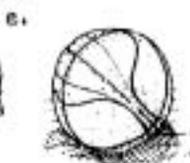
56. Where should the object be held while lifting it?

- a. at arms length away from the body
- b. out to either side of the body
- c. above the head
- d. close to the body

57. When is the best time to drop off a swing rope?

- a. when it is closest to the ground
- b. at the end of a swing
- c. anytime during the swing
- d. during the forward motion of the swing
- e. when the rope is straight up and down

58. Which object will be affected most by friction?



59. Which object is being acted on by centrifugal force?



60. What is the best form for lifting heavy objects?



61. Which player is ready to catch an object thrown low?



1. b.	30. d.	58. b.
2. e.	31. b.	59. c.
3. c.	32. d.	
4. a.	33. d.	
5. d.	34. e.	
6. b.	35. c.	
7. e.	36. a.	
8. d.	37. d.	
9. e.	38. d.	
10. b.	39. e.	
11. c.	40. e.	
12. d.	41. a.	
13. d.	42. d.	
14. d.	43. b.	
15. b.	44. e.	
16.	45. c.	
17. b.	46. b.	
18. e.	47. d.	
19. c.	48. b.	
20. d.	49. e.	
21. d.	50. e.	
22. e.	51. a.	
23. e.	52. d.	
24. e.	53. b.	
25. a.	54. e.	
26. b.	55. e.	
27. e.	56. e.	
28. c.	57. c.	
29. a.		

SIXTH GRADE PHYSICAL EDUCATION SURVEY

TEST INSTRUCTIONS - MULTIPLE CHOICE: For each question there is one and only one correct answer. Choose the one that you think best answers the question and write the letter in the space next to the question number.

1. For which walking activity would one shift the center of gravity forward?
  - a. walking with wind blowing at the back
  - b. walking up a steep hill
  - c. walking down a hill
  - d. walking on a basketball floor
  - e. walking on ice.
  
2. When the center of gravity is directly over the base of support, what is taking place?
  - a. the back foot only is on the ground
  - b. the front foot only is on the ground
  - c. the right foot is off the ground
  - d. the left foot is off the ground
  - e. both feet are on the ground
  
3. Which makes running different from walking?
  - a. feet move alternately
  - b. arms move in opposition of legs
  - c. both feet are momentarily off the ground
  - d. weight shifts from one foot to the other
  - e. the knee bends when the foot touches down
  
4. A characteristic of any jump is?
  - a. momentary suspension of the body in mid-air
  - b. the coverage of great distances
  - c. covering only a short distance but great height
  - d. covering great distances and gaining great height
  - e. none of the above
  
5. The glide is a combination of two activities, which two?
  - a. run-walk
  - b. run-jump
  - c. walk-jump
  - d. walk-leap
  - e. hop-leap

- 6. Which of the following is the best method for landing after a jump?
  - a. body straight with head bent down
  - b. leg and waist bent with head held high
  - c. feet close together, body bent forward
  - d. land flat on the feet
  - e. land with feet wide apart, knees straight and body bent forward
  
- 7. After running, a person takes a step, hops into the air, lands on both feet with knees and waist bent, head held high, what has the person done?
  - a. pivoted
  - b. danced
  - c. changed direction
  - d. slide
  - e. stopped
  
- 8. Where does flexion (bending) take place?
  - a. elbow
  - b. skull
  - c. chest
  - d. humerus
  - e. spine
  
- 9. How can one absorb the shock when catching a fast moving object?
  - a. make the hand flat
  - b. keep the fingers stiff
  - c. watch the ball all the way
  - d. move out of the way
  - e. bend the arms while catching
  
- 10. All things being equal, which is the best angle of release when throwing for distance?
  - a. 15
  - b. 45
  - c. 70
  - d. 25
  - e. 90
  
- 11. How should the thrower stand before starting the throwing pattern?
  - a. throwing side of body pointed toward the target
  - b. with the body facing square to the target
  - c. nonthrowing side of body pointing toward the target
  - d. leaning forward and bent at the waist
  - e. close to the target to be sure of hitting it

12. What causes a jumper to return to the ground?
- his weight
  - stability
  - air pressure
  - gravity
  - motion
13. When the body is put in motion what happens?
- equilibrium is increased
  - balance is greater
  - center of gravity is lower
  - stability is removed
  - none of above
14. For the best stability where should the center of weight be?
- outside the base of support
  - behind the base of support
  - under the base of support
  - over the base of support
  - all the above
15. An object resting on the floor will do which of the following first?
- move to another spot on the floor
  - remain in the same place
  - get smaller and disappear
  - get larger and divide
  - become stuck to the floor
16. When force is applied to an object, what does the object do?
17. What is most effective for maintaining stability when stopping after a fast run?
- feet together, center of gravity low
  - feet forward stride, center of gravity low
  - feet forward stride, center of gravity high
  - feet sideward stride, center of gravity high
  - feet sideward stride, center of gravity low

18. When pushing an object in a straight line where should the force be applied?
- above the center of gravity
  - to the side of the center of gravity
  - a direct line with the center of gravity
  - between the centers of gravity
  - below the center of gravity
19. An effect on the body that makes it hard to stop is?
- mass
  - speed
  - momentum
  - time
  - size
20. What happens when a stationary object is struck by an object in motion?
- momentum is transferred to the still object
  - there is no change in either object
  - both objects become stationary
  - half the momentum is transferred to the still object
  - both objects move at equal momentum.
21. What does one do when they accelerate?
- change direction
  - alter size
  - they do not react
  - change the rate of speed
  - understand time
22. What will have the greatest effect on an object with a large surface?
- acceleration
  - centrifugal force
  - gravity
  - momentum
  - air resistance
23. What could be used to overcome friction and allow motion?
- mass
  - acceleration
  - air
  - lubrication
  - push
24. What is the activity when one jumps and supports his weight with his hands and arms while passing over an obstacle?
- |                |            |
|----------------|------------|
| a. mounting    | d. leaping |
| b. dismounting | e. lifting |
| c. vaulting    |            |

25. What force pulls a moving object away from a center of rotation?
- centrifugal force
  - centripetal force
  - incenter force
  - semi-circular force
  - concentric force
26. When a human is standing; still and erect where is the center of gravity located?
- in the chest above the heart
  - above and to the rear of the hips
  - between the head and shoulders
  - in the stomach
  - in the head
27. When would it be favorable to have the center of gravity outside the base of support?
- to stop
  - for standing
  - for stooping
  - to sit
  - to move
28. What effect would spreading the feet shoulder width apart have on balance?
- you would fall over
  - a decrease in stability
  - stability would increase
  - balance would be lost
  - no change in stability
29. When spinning around how can you prevent dizziness?
- watch one spot
  - close your eyes
  - cover your ears
  - watch everything; fly by
  - look down at the ground
30. Which of the following forces does not effect motion?
- gravity
  - air-resistance
  - friction
  - stability
  - push

- 31. Which force pulls to the center of the earth?
  - a. friction
  - b. gravity
  - c. air resistance
  - d. mass
  - e. push
  
- 32. When two objects rub together, what force is created?
  - a. air resistance
  - b. gravity
  - c. speed
  - d. friction
  - e. weight
  
- 33. Which of these will increase friction?
  - a. smooth surface
  - b. pushing upward
  - c. decreasing surfaces
  - d. heavy object
  - e. decreasing force
  
- 34. In which position will one spin the fastest?
  - a. arms out to the side, feet split
  - b. arms bent, hands on hips
  - c. arms at the side, feet spread
  - d. arms extended, feet together
  - e. arms at the side, feet together
  
- 35. Which would let you lift the heaviest load?
  - a. arms and back
  - b. arms, shoulders, and back
  - c. arms, back and legs
  - d. legs and back
  - e. stomach and back
  
- 36. Which statement best describes a good performance?
  - a. body parts should act in order
  - b. body parts have no order of action
  - c. body parts should act out of order
  - d. the same performance may be acted many ways
  - e. there is no specific order for any performance

37. At what angle should one throw an object for the best distance?
- 90 degrees
  - 75 degrees
  - 60 degrees
  - 45 degrees
  - 30 degrees
38. What will the flight of an object be if released at a low angle?
- high and short distance
  - low and great distance
  - equal height and distance
  - low and short distance
  - high and long distance
39. Which of these is a joint?
- humerus
  - skull
  - scapula
  - heel
  - knee
40. When the action at a joint is flexion, what has happened?
- extending
  - straightening
  - bending
  - rotating
  - expanding
41. Which system feeds the muscles?
- circulatory
  - nerves
  - digestive
  - reproductive
  - respiratory
42. Which best describes the beginning of a walk?
- lift a leg
  - place leg out in front
  - swing arms forward
  - foot pushes against ground
  - head forward at the waist

43. Which of these statements is not characteristic of the walk?
- a. both feet have momentary contact with the surface
  - b. the arms swing across the front of the body
  - c. weight is transferred from one foot to the other
  - d. flexion and extension in the hip and knees
  - e. arms swing in opposition of the legs
44. Which pair of activities are most similar to each other?
- a. hop-jump
  - b. jump-leap
  - c. jump-run
  - d. walk-hop
  - e. run-walk
45. What should be gained from the leap?
- a. distance
  - b. speed
  - c. height
  - d. length
  - e. direction
46. What distinguishes the jump from the leap and the hop?
- a. land on one foot
  - b. land on both feet
  - c. take off from one foot
  - d. land on take off foot
  - e. similar to the run
47. Which is not a characteristic of the jump?
- a. quick action of extensor muscles against ground
  - b. strong arm swing in direction of movement
  - c. take off from a crouching position
  - d. doesn't interrupt the running pattern
  - e. used for a quick stop
48. When the slide movement is done forward, what is it called?
- a. skip
  - b. gallop
  - c. frolic
  - d. gattop
  - e. pivot

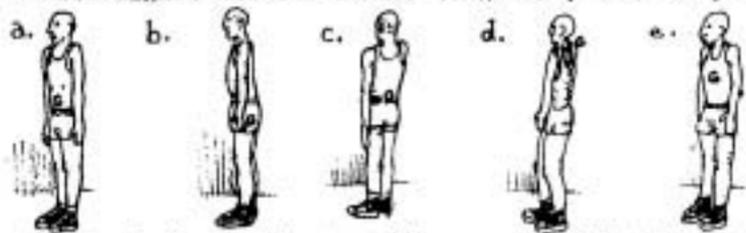
49. In what way are the skip, walk, and run alike?
- a combination of two basic skills
  - main purpose is to gain height
  - lead with the same foot
  - good for changing direction
  - arms swing in opposition to feet
50. What is the advantage of a step-hop before a step?
- gain more distance
  - make the body unstable
  - check forward motion
  - gain great height
  - change direction
51. What do the dodge, pivot and slide have in common?
- used to change direction
  - used to overcome force
  - used to overcome friction
  - used to gain speed
  - used to change momentum
52. What is most effective for a quick dodge?
- keep weight low and over base of support
  - keep center of gravity inside base of support
  - base of support should be under body weight
  - put body weight outside base of support
  - don't let body weight outside base of support
53. When balance or stability cannot be regained, what has happened?
- a dodge
  - a fall
  - a pivot
  - a stop
  - a shift
54. Which is the most dangerous area to fall on?
- hands
  - knees
  - elbows
  - back
  - head

55. What is the action when a body part or object is moved from one level to another level?
- a. push
  - b. turn
  - c. bend
  - d. stretch
  - e. lift

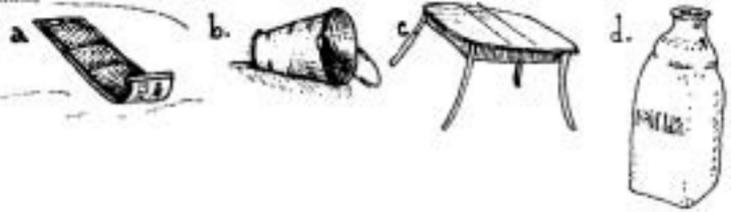
56. What is the effect on the body when an object is held away from the body?
- a. increase the base of support
  - b. elevates the center of support
  - c. decreases the base of support
  - d. lowers center of gravity
  - e. shifts center of gravity outside base of support

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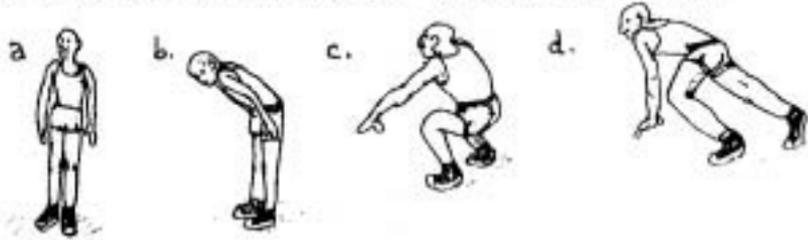
57. Which figure has the center of gravity located properly?



58. Which of these objects will overcome friction easiest?



59. Which position is best for landing after a jump?



- |        |        |        |
|--------|--------|--------|
| 1. c.  | 30. e. | 58. c. |
| 2. a.  | 31. e. | 59. d. |
| 3. d.  | 32. e. | 60. b. |
| 4. b.  | 33. e. |        |
| 5. e.  | 34. a. |        |
| 6. e.  | 35. d. |        |
| 7. a.  | 36. b. |        |
| 8. a.  | 37. e. |        |
| 9. e.  | 38. c. |        |
| 10. e. | 39. a. |        |
| 11. a. | 40. d. |        |
| 12. d. | 41. b. |        |
| 13. e. | 42. d. |        |
| 14. e. | 43. e. |        |
| 15. e. | 44. e. |        |
| 16. e. | 45. d. |        |
| 17. e. | 46. b. |        |
| 18. d. | 47. e. |        |
| 19. d. | 48. e. |        |
| 20. a. | 49. a. |        |
| 21. e. | 50. d. |        |
| 22. e. | 51. b. |        |
| 23. a. | 52. e. |        |
| 24. d. | 53. e. |        |
| 25. b. | 54. a. |        |
| 26. e. | 55. e. |        |
| 27. a. | 56. a. |        |
| 28. d. | 57. b. |        |
| 29. e. |        |        |

SIXTH GRADE PHYSICAL EDUCATION SURVEY

TEST DIRECTIONS - MULTIPLE CHOICE: For each question there is one and only one correct answer. Choose the one that you think best answers the question and write the letter in the space next to the question number.

1. When walking on a slippery surface, it is best to?
  - a. to take long steps
  - b. wear leather sole shoes
  - c. to take short steps
  - d. to walk fast
  - e. to walk with knees high
  
2. While a man is running, he wishes to increase his speed. He can best do this by?
  - a. taking short driving steps
  - b. lengthen his stride
  - c. get more height
  - d. run in an erect position
  - e. carry arms down at sides
  
3. When running around a circle or arc, what should be done?
  - a. lean body away from center of circle
  - b. lean body forward
  - c. lean body backward
  - d. lean body toward the center of arc
  - e. try to run straight up
  
4. When jumping for height or distance which is needed?
  - a. a forward lean of the body
  - b. strong extension of the legs and swinging of the arm
  - c. the angle of take-off at about 45 degrees off the ground
  - d. the take-off be from an erect body position
  - e. running to gain top speed just before making jump
  
5. When the slide is done forward and backward, it is called a?
  - a. skip
  - b. slide
  - c. dodge
  - d. run
  - e. gallop

6. Which of the following is the best method for stopping?
- knees kept straight, lean body forward
  - slide to a sitting position on the floor
  - bend knees and waist with weight backward
  - slide and bend down to one knee
  - dropping to the floor and sliding on the stomach
7. The pivot is best used for which activity?
- changing direction
  - landing
  - stopping
  - increase speed
  - jumping higher
8. When catching an object the receiver should?
- get in line with object
  - catch it the best he can
  - catch it off to the side
  - catch with one hand
  - keep the arm stiff
9. What must happen first before one can catch an object?
- get the body in position
  - wear gloves for protection
  - keep your eyes on the object
  - be on a team with somebody
  - be sure the hands and fingers are relaxed
10. When starting the delivery in the overhand pattern, the ball should be held at about what level?
- shoulder level
  - waist level
  - ear level
  - head level
  - chin level
11. What should be done to regain balance after the throw follow through?
- take a step with the throwing side foot
  - stand straight up
  - kneel down on one knee
  - take a step with the opposite foot
  - do nothing

12. The point about which all of the body parts exactly balance is?
- a. center of weight
  - b. center of stability
  - c. center of equilibrium
  - d. center of gravity
  - e. center of base
13. The body parts and all the area of the supporting surface between them is known as what?
- a. point
  - b. mass
  - c. base
  - d. distance
  - e. sum
14. When lifting or carrying a heavy object, how should it be carried?
- a. away from the body
  - b. to one side of the body
  - c. low to the ground
  - d. behind the body
  - e. close to the body
15. Which effects how fast an object will move?
- a. acceleration
  - b. inertia
  - c. force applied
  - d. direction
  - e. gravity
16. The quantity of matter of an object is what?
- a. its length
  - b. its weight
  - c. its size
  - d. its base
  - e. its mass
17. What force between shoe and floor helps starting and stopping?
- a. gravity
  - b. inertia
  - c. friction
  - d. fiction
  - e. motivation

18. What is the effect if a body has more momentum than another?

- a. it will stop sooner
- b. it will gain speed
- c. it will increase in size
- d. it will travel further
- e. it will lose direction

19. Which of the following is a force?

- a. mass
- b. run
- c. speed
- d. push
- e. shape

20. The center of gravity in people is located where?

- a. the hips
- b. the legs
- c. the chest
- d. the arms
- e. the heel

21. If greater acceleration is desired, what must happen?

- a. apply less force
- b. change direction
- c. maintain same force
- d. maintain same direction
- e. increase force

22. What must an object have if there is to be motion?

- a. time
- b. distance
- c. friction
- d. action
- e. gravity

23. Why is it more difficult to walk on ice than cement?

- a. no friction
- b. no salt
- c. no sand
- d. too much water
- e. too cold

24. It is easier to move a heavy object when what is true?

- a. it is square
- b. it has a large flat surface
- c. the shape is uneven
- d. when rolling is used
- e. when tracks are used

25. If centrifugal force were taken away, which direction would the object travel?

- a. in a circle
- b. a straight line
- c. an arc
- d. an ellipse
- e. a cone

26. What causes a loss of balance?

- a. center of gravity shifts over the base of support
- b. the base of support enlarges
- c. center of gravity shifts outside the base of support
- d. center of gravity gets closer to the base of support
- e. air pressure causes a vacuum

27. Which will increase stability?

- a. low center of gravity
- b. reduce size of the base
- c. raise center of gravity
- d. close your eyes
- e. move center of gravity near edge of base of support

28. Which of the senses will aid stability?

- a. listening
- b. tasting
- c. feeling
- d. seeing
- e. smelling

29. If an object is at rest, what causes it to stay at rest?

- a. gravity
- b. friction
- c. inertia
- d. air pressure
- e. weight

- 30. What happens to a moving object when you apply a stronger push in the same direction the object is already moving?
  - a. changes direction
  - b. decelerates
  - c. pivots
  - d. separates
  - e. accelerates
  
- 31. What effect does gravity have on an object?
  - a. pushes away from the earth
  - b. pulls in a straight line
  - c. pulls to the center of earth
  - d. pushes in a straight line
  - e. pulls in all directions
  
- 32. when you start walking or running but slip, what force do you need to prevent slipping?
  - a. gravity
  - b. speed
  - c. air resistance
  - d. hold
  - e. friction
  
- 33. What happens when you release an object that is swung in a circle or semi-circle pattern?
  - a. it stays in its circular pattern
  - b. it stops moving
  - c. moves in a straight line
  - d. moves to the center
  
- 34. where does the body get its force from?
  - a. muscles
  - b. speed
  - c. mass
  - d. tendons
  - e. ligaments
  
- 35. Where would be the best place to apply force when pushing an object?
  - a. at its base
  - b. just above center of weight
  - c. at the top
  - d. at the center of weight
  - e. just below center of weight

36. How can one absorb force easiest?

- a. on a small area
- b. on a large area
- c. very quickly
- d. directly
- e. unconventionally

37. Which of the following will make a good projectile?

- a. alley cat
- b. dry sand
- c. whiffel ball
- d. cotton ball
- e. softball

38. Which is true if a projectile is released at a large angle?

- a. it stays low to the ground
- b. it is in the air for two minutes
- c. it will be in the air a longer time
- d. it will be in the air for 36 feet
- e. it will be in the air over a greater distance

39. Which is most responsible for keeping a joint together?

- a. muscle
- b. skin
- c. nerves
- d. cartilage
- e. bone

40. What is the action when a joint straightens?

- a. flexion
- b. bending
- c. rotating
- d. extension
- e. inversion

41. Why are the actions of muscles reversible?

- a. they are ambidextrous
- b. they are paired
- c. they are uncoordinated
- d. they are symmetrical
- e. they are singular

42. Which will determine how large a step one can take while walking?
- gravity
  - push off
  - stride
  - friction
  - centrifugal force
43. Which statement does not describe the run?
- arms swing in opposition of the legs
  - flexion and extension in the hip and knees
  - both feet have momentary contact with a surface
  - weight is transferred from one foot to the other
  - land on the ball of the foot
44. Which is not a good running technique?
- lean slightly forward
  - swing arms backward and forward
  - lengthen stride to maintain speed
  - shorten stride to increase speed
  - land on sole of foot
45. which is a characteristic of the leap but not the run?
- take off on one foot and land on the other
  - land on ball of foot
  - lean slightly forward
  - arms move upward
  - period of no support
46. When jumping for distance, which will lengthen the jump?
- push-off straight up
  - tuck legs after take-off
  - arch the back and throw head back
  - extend leg after take-off
  - swing arms downward hard
47. What is distinctive about the hop?
- take off and land on opposite feet
  - take off on one foot and land on both feet
  - take off and land on the same foot
  - take off of both feet and land on both feet
  - take off on both feet and land on either foot

48. What movement is well balanced and allows for a quick change of direction?

- a. skip
- b. run
- c. slide
- d. leap
- e. jump

49. Which is not a good technique for landing on the feet?

- a. land on the sole of the feet
- b. bend ankles, knees, and waist
- c. extend arms to the side
- d. keep center of gravity over base of support
- e. keep upper body and head erect

50. Which will not help an individual stop?

- a. lean back at the waist
- b. keep head up
- c. lower center of gravity
- d. lock ankles and knees
- e. increase base of support

51. What makes the pivot difficult to perform?

- a. keeping center of gravity too low
- b. base of support is too small
- c. spinning on ball of foot
- d. body weight over base of support
- e. using moveable foot to push with

52. Which statement is not helpful to perform a good dodge?

- a. bend knees and lower weight
- b. lean away from original direction
- c. push off in new direction
- d. stabilize after start of change of direction
- e. maintain stability throughout change of direction

53. What should you do after landing from a fall?

- a. lay perfectly still
- b. stand up as quickly as possible
- c. roll in the direction of the fall
- d. sit up and bend the knees
- e. lay on the stomach and breath deep for five minutes

54. Which forceful action is done mostly with the arms?

- a. pull
- b. bend
- c. stretch
- d. push
- e. turn

55. What muscles are most effective for lifting heavy objects?

- a. shoulder and back muscles
- b. arm muscles
- c. chest and stomach muscles
- d. waist and hip muscles
- e. leg muscles

56. What happens at the end of a swinging motion?

- a. momentary pause
- b. increase in speed
- c. increase in height
- d. decrease in the effect of gravity
- e. continuous motion

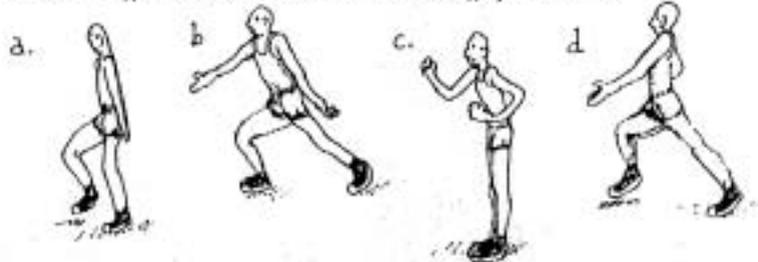
57. Which figure shows the best stability?



58. Which surface has the least friction?

- a. wood floor
- b. dirt
- c. ice
- d. concrete
- e. black top

59. Which figure has the best walking pattern?



60. WHICH PLAYER IS READY TO CATCH AN OBJECT THROWN HIGH?



SIXTH GRADE PHYSICAL EDUCATION TEST

TEST DIRECTIONS - MULTIPLE CHOICE: For each question there is one and only one correct answer. Choose the one that you think best answers the question and darken the space on the answer sheet provided.

1. When walking on a slippery surface, it is best to?
  - a. to take long steps
  - b. wear leather sole shoes
  - c. to take short steps
  - d. to walk fast
  - e. to walk with knees high
2. Which statement describes part of a run, but is not true for the walk?
  - a. arms swing in opposition of the legs
  - b. flexion and extension of the hip and knees
  - c. weight is transferred from one foot to the other
  - d. there is a period of momentary suspension
  - e. push off against the ground
3. When catching an object the receiver should?
  - a. get in line with object
  - b. catch it the best he can
  - c. catch it off to the side
  - d. catch with one hand
  - e. keep the arm stiff
4. How should the thrower stand before starting the throwing pattern?
  - a. throwing side of body pointed toward the target
  - b. with the body facing square to the target
  - c. non-throwing side of body pointing toward the target
  - d. leaning forward and bent at the waist
  - e. close to the target to be sure of hitting it
5. Which will produce more force?
  - a. arms
  - b. stomach
  - c. back
  - d. shoulder
  - e. legs
6. What makes the pivot difficult to perform?
  - a. keeping center of gravity too low
  - b. base of support is too small
  - c. spinning on ball of foot
  - d. body weight over base of support
  - e. using moveable foot to push with

7. What force pulls away from the center of objects moving in a semi-circles or circles pattern?
- a. centripetal force
  - b. gravity
  - c. friction
  - > d. centrifugal force
  - e. rotary
8. For which walking activity would one shift the center of gravity forward?
- a. walking with wind blowing at the back
  - > b. walking up a steep hill
  - c. walking down a hill
  - d. walking on a basketball floor
  - e. walking on ice
9. When running the weight should be taken by what part of the foot?
- a. Heel
  - > b. Ball
  - c. Toss
  - d. Side
  - e. All the foot
10. What different body movement other than the arm is needed for a good throw?
- a. head moving up and down
  - b. shuffle the feet
  - > c. rotation of the trunk
  - d. twiddling of the thumbs
  - e. all the above
11. Where should the eyes focus when using projectiles?
- a. on the projectile
  - b. on the people to make sure they are safe
  - c. on the boundary line
  - > d. on the target
  - e. in the opposite direction
12. Why are the actions of muscles reversible?
- a. they are ambidextrous
  - > b. they are paired
  - c. they are uncoordinated
  - d. they are asymmetrical
  - e. they are singular

13. What is the effect on the body when an object is held away from the body?
- increase the base of support
  - elevates the center of support
  - decreases the base of support
  - lowers center of gravity
  - shifts center of gravity outside base of support
14. Which system feeds the muscles?
- circulatory
  - nerves
  - digestive
  - reproductive
  - respiratory
15. Which is not a good running technique?
- lean slightly forward
  - swing arms backward and forward
  - lengthen stride to maintain speed
  - shorten stride to increase speed
  - land on sole of foot
16. Why would a leap be better for getting over obstacles than a jump or a hop?
- easier to stop after
  - land on both feet
  - can get great distance
  - arms do not have to move
  - does not interrupt the running pattern
17. An effect on the body that makes it hard to stop is?
- mass
  - speed
  - momentum
  - time
  - size
18. What causes a loss of balance?
- center of gravity shifts over the base of support
  - the base of support enlarges
  - center of gravity shifts outside the base of support
  - center of gravity gets closer to the base of support
  - air pressure causes a vacuum
19. What should you do after landing from a fall?
- lay perfectly still
  - stand up as quickly as possible
  - roll in the direction of the fall
  - sit up and bend the knees
  - lay on the stomach and breath deep for five minutes

20. The key to a good landing is?
- keep feet close together
  - keep center of gravity over base
  - keep base of support small
  - keep center of gravity high
  - keep body parts rigid
21. How can one absorb the shock when catching a fast moving object?
- make the hand flat
  - keep the fingers stiff
  - watch the ball all the way
  - move out of the way
  - bend the arms while catching
22. What happens when a stationary object is struck by an object in motion?
- momentum is transferred to the still object
  - there is no change in either object
  - both objects become stationary
  - half the momentum is transferred to the still object
  - both objects move at opposite momentum
23. What is the effect if a body has more momentum than another?
- it will stop sooner
  - it will gain speed
  - it will increase in size
  - it will travel further
  - it will lose direction
24. What is most effective for a quick dodge?
- keep weight low and over base of support
  - keep center of gravity inside base of support
  - base of support should be under body weight
  - put body weight outside base of support
  - don't let body weight outside base of support
25. Which of the following is a force?
- mass
  - run
  - speed
  - push
  - shape
26. Which of these statements is not characteristic of the walk?
- both feet have momentary contact with the surface
  - the arms swing across the front of the body
  - weight is transferred from one foot to the other
  - flexion and extension in the hip and knees
  - arms swing in opposition of the legs

27. What will the flight of an object be if released at a small angle?
- a. high and short distance
  - b. low and great distance
  - c. equal height and distance
  - ^ d. low and short distance
  - e. high and long distance
28. When pushing an object in a straight line where should the force be applied?
- a. above the center of gravity
  - b. to the side of the center of gravity
  - c. a direct line with the center of gravity
  - d. between the centers of gravity
  - ) e. below the center of gravity
29. If centrifugal force were taken away, which direction would the object travel?
- a. in a circle
  - ^ b. a straight line
  - c. an arc
  - d. an ellipse
  - e. a cone
30. Which of these will increase friction?
- a. smooth surface
  - b. pushing upward
  - c. decreasing surfaces
  - ^ d. heavy object
  - e. decreasing force
31. Where is the control center for balance located?
- a. behind the eyes
  - b. in the throat
  - c. in the nucleus
  - d. in the heart
  - x e. in the ear
32. For the best stability where should the center of weight be?
- a. outside the base of support
  - b. behind the base of support
  - c. under the base of support
  - ^ d. over the base of support
  - e. all the above

33. Which statement best describes a good performance?
- \* a. body parts should act in order
  - b. body parts have no order of action
  - c. body parts should act out of order
  - d. the same performance may be acted many ways
  - e. there is no specific order for any performance
34. What is a change in forward direction?
- a. a stop
  - b. a pivot
  - \* c. a dodge
  - d. a turn
  - e. a twist
35. When the center of gravity is directly over the base of support what is happening to the body?
- a. it is falling forward
  - b. it tips sideways
  - c. it is walking
  - d. it is falling backward
  - \* e. it is balanced (perfectly still)
36. Which pair of activities are most similar to each other?
- a. hop-jump
  - b. jump-leap
  - c. jump-run
  - d. walk-hop
  - \* e. run-walk
37. The skip is a combination of two activities, which two?
- a. walk-run
  - b. walk-jump
  - \* c. walk-hop
  - d. leap-walk
  - e. jump-hop
38. Which area can best absorb a fall?
- \* a. the feet
  - b. the hands
  - c. the knees
  - d. the elbows
  - e. the spine
39. Which of the following is the best method for landing after a jump?
- a. body straight with head bent down
  - \* b. leg and waist bent with head held up
  - c. feet close together, body bent forward
  - d. land flat on the feet
  - e. land with feet wide apart, knees straight and body bent forward

40. What effect will air resistance have on a light object?
- make it fall faster
  - keeps it air born longer
  - opposes direction of flight and time
  - has no effect
41. What is the action when a body part or object is moved from one level to another level?
- push
  - turn
  - bend
  - stretch
  - lift
42. When one foot is kept stationary and the other foot moves forward or backward, what is the activity?
- stopping
  - pivoting
  - sliding
  - landing
  - hopping
43. Which is true about a body in motion?
- it remains stationary
  - it is easily stopped
  - there are no forces acting on it
  - it cannot transfer its momentum to another object
  - less force is needed to keep it moving than start it
44. What is the activity when one jumps and supports his weight with his hands and arms while passing over an obstacle?
- mounting
  - dismounting
  - vaulting
  - leaping
  - lifting
45. When the action at a joint is extension, what has happened?
- flexing
  - bending
  - rotating
  - expanding
  - straightening
46. When you start walking or running but slip, what force do you need to prevent slipping?
- gravity
  - speed
  - air resistance
  - hold
  - friction

47. The center of gravity in people is located where?
- a. the hips
  - b. the legs
  - c. the chest
  - d. the arms
  - e. the heel
48. When the body is put in motion what happens?
- a. equilibrium is increased
  - b. balance is greater
  - c. center of gravity is lower
  - d. stability is removed
  - e. none of the above
49. When lifting or carrying a heavy object, how should it be carried?
- a. away from the body
  - b. to one side of the body
  - c. low to the ground
  - d. behind the body
  - e. close to the body
50. Which is a factor determining the amount of friction?
- a. type of motion
  - b. leverage
  - c. distance traveled
  - d. surface areas in contact
  - e. gravity
51. Which of these will increase friction?
- a. softness of surface
  - b. roughness of surface
  - c. hardness of surface
  - d. smoothness of surface
  - e. height of surface
52. What do the dodge, pivot and slide have in common?
- a. used to change direction
  - b. used to overcome force
  - c. used to overcome friction
  - d. used to gain speed
  - e. used to change momentum
53. What force pulls a moving object away from a center of rotation?
- a. centrifugal force
  - b. centripetal force
  - c. incenter force
  - d. semi-circular force
  - e. concentric force

54. Which effects how fast an object will move?
- a. acceleration
  - b. inertia
  - c. force applied
  - d. direction
  - e. gravity
55. What is the advantage of a step-hoy before a stop?
- a. gain more distance
  - b. make the body unstable
  - c. check forward motion
  - d. gain great height
  - e. change direction
56. Which of the following forces does not effect motion?
- a. gravity
  - b. air- resistance
  - c. friction
  - d. stability
  - e. push
57. Which form of locomotion is used most?
- a. a car
  - b. a ship
  - c. a run
  - d. a walk
  - e. a bike
58. Which of the following will make a good projectile?
- a. alley cat
  - b. dry sand
  - c. whiffel ball
  - d. cotton ball
  - e. softball
59. What happens if there is not enough follow through?
- a. too much speed on the object
  - b. object will go too far
  - c. no throw will occur
  - d. speed will be lost
  - e. no spin on the object
60. When balance or stability cannot be regained, what has happened?
- a. a dodge
  - b. a fall
  - c. a pivot
  - d. a stop
  - e. a shift

61. The body parts and all the area of the supporting surface between them is known as what?
- point
  - mass
  - base
  - distance
  - man
62. The quantity of matter of an object is what?
- its length
  - its weight
  - its size
  - its base
  - its mass
63. What is distinctive about the hop?
- take off and land on opposite feet
  - Take off on one foot and land on both feet
  - take off and land on the same foot
  - take off on both feet and land on both feet
  - take off on both feet and land on either foot
64. Which is not a good technique for landing on the feet?
- land on the sole of the foot
  - band ankles, knees, and waist
  - extend arms to the side
  - keep center of gravity over base of support
  - keep upper body and head erect
65. Which helps to absorb force easiest?
- joints held firm
  - extend joints as contact is made
  - flex joints as contact is made
  - flex only the major joint
  - extend only the major joint
66. A characteristic of any jump is?
- momentary suspension of the body in mid-air
  - the covering of great distances
  - covering only a short distance but great height
  - covering great distances and gaining great height
  - none of the above
67. What effect would spreading the feet shoulder width apart have on balance?
- you would fall over
  - a decrease in stability
  - stability would increase
  - balance would be lost
  - no change in stability

68. What is the movement when one part of the body is stationary and the other parts move around it?

- a. a glide
- b. a pivot
- c. a stretch
- d. a pivot
- e. an aslope

69. Which player is ready to catch an object thrown low?

a.



b.



c.



d.



70. Which figure shows the best stability?

a.



b.



c.



d.

