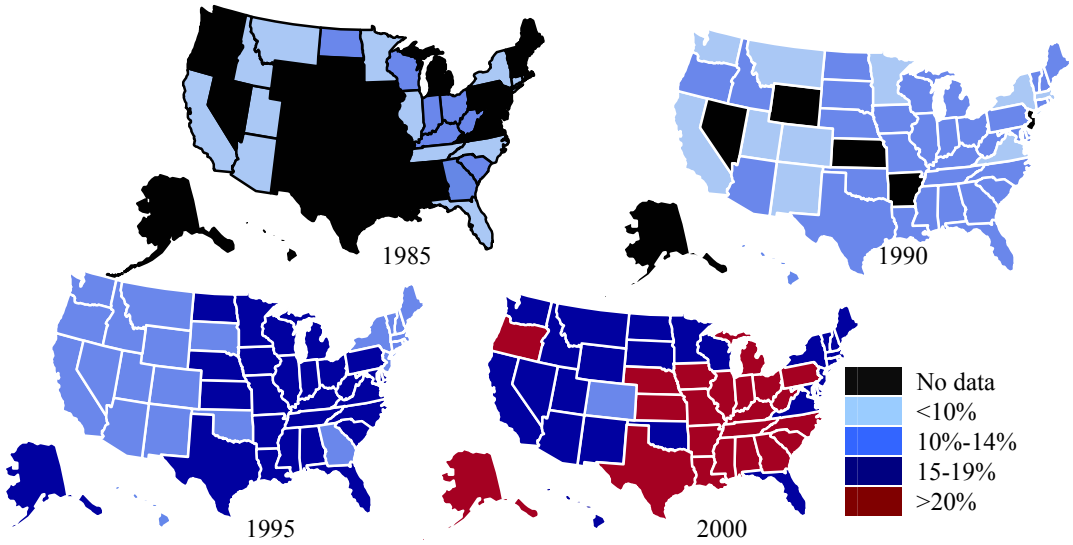
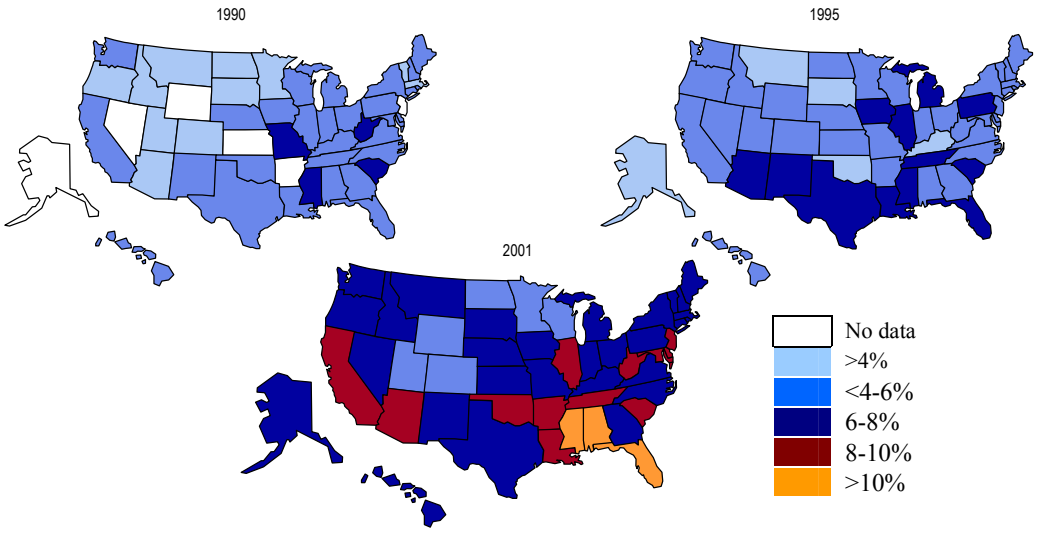
APPENDICES

Appendix-01 Obesity trends Among U.S. Adults (1985-1990-1995-2000)



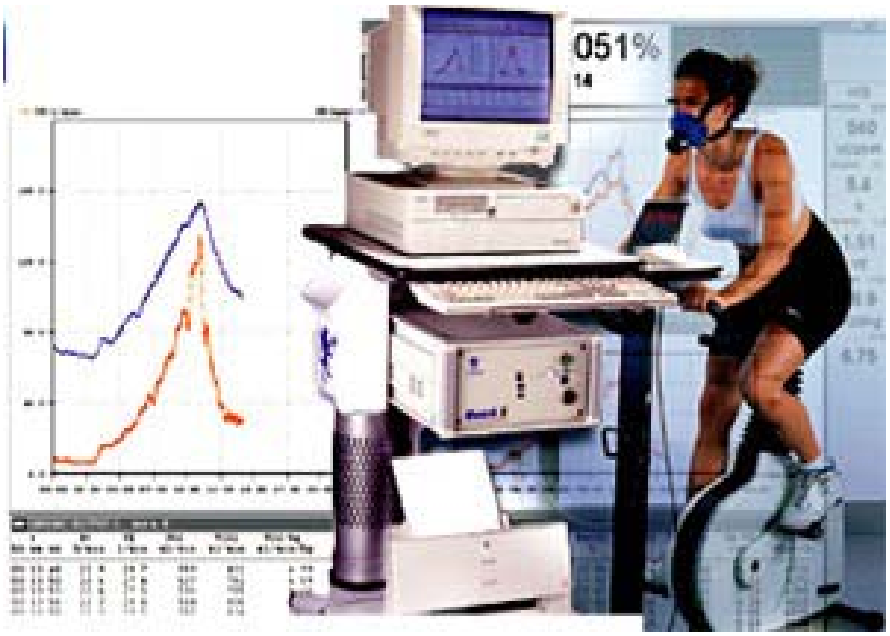
Source: Mokdad A H, et al. *JAMA* 1999 & 2001

Appendix-02: Diabetes trends Among U.S. Adults (1990-1995-2001)



Source: Mokdad et al., *Diabetes Care* 2000;23:1278-83; *JAMA* 2001;286:10

Appendix -03 Direct measurement of aerobic capacity (VO2 max) in laboratory



Appendix-04 FITNESSGRAM- measurement procedures and equipments

(1) Aerobic Capacity: 1 Mile walk/run

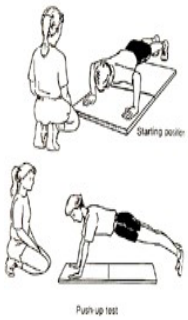
Purpose:	To measure aerobic capacity
Objective:	To run a mile at the fastest pace possible. If a student can't run the total distance, walking is permitted
Equipment:	1. A flat running course; 2. Stopwatch; 3. Score sheets.
Instruction:	Do some warm up and cool-down before the and after the test. Prior to beginning the test, students should take their position on the starting line. Students begin on the signal "Ready, Start."(Provide a fair start for all students) As they cross the finish line, elapsed time should be called to the participants (or their partners) It is possible to test 15 to 20 students at one time by dividing the group and assigning partners. While one group runs, partners count laps and make note of finish time.
Scoring:	The score is the time it takes to complete the run and is recorded in minutes and seconds.
Administration 	Preparation for the test should also include instruction about how to running this long distance against time, and how to pace. Without instruction, students will usually run too fast early in the test and then be forced to walk in the latter stages. Walking is also permitted. Although the objective is to cover the distance in the best possible time, a student who must walk should not be made to feel inferior. Encourage students who walk to walk at a fast pace, rather then stroll. Attainment of the Healthy Fitness Zone is important. Students should always warm up prior to taking the test. It is also important that students cool down by continuing to walk for several minutes after completing the distance. Administration of the test under conditions of unusually high temperatures and /or high humidity or when the wind is strong should be avoided, as these elements may be unsafe or lead to an invalid estimate of aerobic capacity. In addition, a system for recording laps should be established. For example, pairing the students and having the resting partner count laps and record time for the runner is an effective method.

(2) Abdominal Strength and Endurance: Curl-up (Cadence)

Purpose:	To measure Abdominal Strength and Endurance
Objective	To complete as many curl-ups as possible up to a maximum of 75.
Equipment:	1. Mats; 2. Cardboard strip 11.4 cm wide; 3. Tape player; 4. Audiotape for cadence)
Instruction:	This curl-up protocol is quite different from the one-minute sit-up. Students perform this test in groups of three. One student performs the curl-ups, the second supports the head of the performer with his or her hands cupped under performer's head, and the third secures the strip so that it does not move. The students

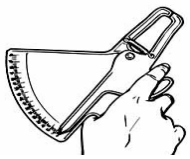
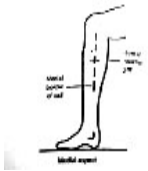
	being tested lies in a supine position on the mat with knees bent at a 140 degree angle, feet flat on the floor, legs slightly apart, arms straight and parallel to the trunk with the palms of the hands resting on the mat and fingers touching the nearer edge. The cardboard strip on the mat under the performer's legs so that the fingertips are just resting on the nearest edge. The third student stands on the strip so that it does not move during the test. The Student being tested curl-up slowly, sliding the fingertips past the tape until the fingertips reach the other side, then back down until the head touches the partner's hands. Heels must remain in contact with the mat all the time. The student performs as many curl-ups as possible while maintaining a cadence of 1 curl-up every 3 seconds, but stops at the maximum number of 75. Pauses and rest periods are not allowed. The movement should be slow, continuous and rhythmic with the cadence. Teacher checks for form corrections and count the number of correctly completed curl-ups. The test continues until the student can no longer continue or has completed 75 curl-ups. Students will be allowed time to practice to learn the correct form of skill.
Scoring:	Record only those curls-ups done with proper form and in rhythm.

(3) Upper Body Strength and Flexibility: Push-up (Cadence)

Purpose:	To measure upper body muscle strength
Objectives:	To complete as many push-up as possible at a rhythmic pace (20 times/minute).
Equipment:	1. Mats; 2. Tape player; 3. Audiotape for controlling cadence(20 push-ups per minute)
Instruction: 	The students should be paired; one will perform the test while the other counts push-ups and watches to see that student being tested bends the elbow to 90 degrees with the upper arm parallel to the floor. During the testing, the student lies face down on the mat in push-up position with hands under shoulders, fingers straight. Legs should straight, parallel, and slightly apart, with the toes supporting the feet. The student straightens the arms, keeping the back and knees straight, then lowers the arms until there is a 90-degree angle at the elbows, with the upper arms parallel to the floor. A partner holds his/her hand at the point of the 90-degree angle so that the student being tested goes down only until his/her shoulder touches the partner's hand. Then the student pushes back up and assumes the straight-arm position. The push-ups are done to an audiotape with one complete push-up every three seconds, and are continued until the student has not done the last three in rhythm or the student is stopped when the second form correction is made.
Scoring:	Record only those push-ups done with proper form and in rhythm. For ease of administration, it is permissible to count the first incorrect push-up. It is important to be consistent with all students.
Administration	Prior to test day, students should be allowed to practice doing push-ups. During practice, the teacher should stop and correct students' form. Form corrections include:

	stopping to rest, not to maintaining a rhythmic pace, not achieving a 90-degree angle with the elbow on each repetition, not maintaining correct body position and/or not extending arms fully. The test should be stopped if the student appears to be in extreme discomfort or pain.

(4) Body Composition: Skinfolds measurement / Body Mass Index

Purpose:	To measure the body composition
Objective:	To measure the triceps and calf skinfold thickness for calculating percent of body fat.
Equipment: 	A skinfold calliper (and a teacher who has had sufficient training and practice.) Skin-folds measurements were assessed with Slim Guide Skinfold Calipers. This is the only low cost callipers accurate enough to be used for professional measurements and is the most widely used professional skinfold callipers. It is easy to use and the most durable of all calipers.
Instruction:  	Skinfold measurements is a body composition test that provides an estimate of the percent of a student's weight that is fat in contrast to lean body mass, such as muscles, bones, and organs. The triceps and calf skinfolds were chosen for FITNESSGRAM because they are easily measured and highly correlated with total body fatness. The calliper measures a double layer of subcutaneous fat and skin. The triceps skinfold is measured on the back of arm over the triceps muscle of the right arm midway between the elbow and the acromion process of the scapula. The student should be instructed to bend the right arm to a 90-degree angle for the purpose of marking the midpoint of the triceps. A piece of string can be used to find the midpoint. The skinfold site should be vertical. The calf skinfold is measured on the inside of the right leg at the level of maximal calf girth. The student places the right foot on an elevated surface with the knee flexed at a 90-degree angle. The vertical skinfold should be grasped just above the level of maximal girth and the measurement made below the grasp.
Scoring:	The skinfold measure is registered on the dial of the calliper. Each measurement should be taken three times, with the recorded score being the median, or middle, value of the three scores. Each reading should be recorded to the nearest 5 mm.
Administration	Measurement technique is very important. The student should be instructed to relax the arm or leg being measured. The skinfold should be firmly grasped between the thumb and forefinger and lifted away from the other body tissue. The grasp should not be so firm as to be painful. This separation, however, is very important. The calliper should be placed 1/2 inch below the pinch site. The calliper should be placed in the middle of the fold. The recommended procedure is to do one measurement at each site before doing the second measurement at each site and finally the third set of measurements. Skinfold testing should be conducted in an appropriate setting that provides the student with privacy;

(5) Trunk Extensor Strength and Flexibility: Trunk Lift

Purpose:	To measure trunk extensor strength and flexibility
Objective:	To lift upper body off the floor using and hold the position to allow for measurement.
Equipment:	Gym mats and a ruler (mark the 6, 9, and 12 inches marks with coloured tape)
Instruction:  Trunk lift	The student being tested lies on the mat in a prone position with toes pointed and hands under the thighs. Place a coin or other marker on the floor in line with the student's eyes. Maintaining focus on the spot on the floor should assist in maintaining the head in a neutral position. During the movement, the student's focus should not move from the coin or marker. The student lifts the upper body off the floor, in a very slow and controlled manner, to a maximum height of 12 inches (30.48 centimetres). The position is held long enough to allow the tester to place the ruler on the floor in front of the student and determine the distance from the floor to the student's chin. The ruler should be placed at least one inch in front of the student's chin and not directly under the chin. Once the measurement is taken, the student returns to the starting position in a controlled manner. Allow two trials, recording the highest score.
Scoring:	The score is recorded to the nearest inch.
Administration	Do not allow students' feet to come off the ground. Do not encourage students to go about 12 inches. The Healthy Fitness Zone ends at 12 inches. And computer will not accept scores beyond 12 inches. Maintaining focus on the spot on the floor should assist in maintaining the head in a neutral position.

(6) Flexibility: Back-Saver Sit & Reach

Purpose:	To measures predominantly the flexibility of the hamstring muscles.
Objective:	To reach as far as possible on the right and left sides of body.
Equipment:	A flexibility box, a measuring scale (A measuring scale is placed on top of the box with the 23 centimetres mark parallel to the face of the box against which the student's foot will rest. The "zero" end of the scale is nearest the student.
Instruction:  Back-saver sit-and-reach test	The students remove shoes and sits on floor with knees extended; one leg is fully extended with the foot flat against the end of the box. Another knee is bent with sole on the floor and 2-3inch (5-8cm) to the side of the straight knee. The arms are extended forward over the measuring scale with hands placed on top of the other, With palms down, the student reaches directly forward with both hands along the scale four times and holds the position on the fourth reach for at least 1 second. After measuring one side, check for proper body alignment before switching the position of the legs and reach again. The student may allow the bent knee to move to the side as the body moves by it if necessary. Normal hamstring flexibility allows rotation of the pelvis in forward bending movements and posterior tilting of the pelvis for proper sitting. In the test, students are not encouraged to hyperextend during the testing.

Scoring:	Record the number of inches on each side to the nearest half-inch reached to a maximum score of 12 inches. Performance is limited to discourage hypermobility.
Administration	Students should do a light warm up and perform some static stretching before testing begins. The tester may place one hand on the student's knees to remind and help him/her to keep the knee straight. Hands should reach forward evenly. The trial should be repeated if the hands reach unevenly or the knee bents. Hips must remain square to the box. Don't allow the students to turn the hip away from the box as they reach. We suggest testing the left side first, with the left leg straightened and right leg bent. This will be of assistance when you recording the data, because the Fitnessgram software asks you to submit the left side data prior to the right side data.

Appendix-05 FITNESSGRAM standards for Healthy Fitness Zone*

MALES

Item/Age	10	11	12	13	14	15	16
One Mile (min:sec)**	11:30-9:00	11:00-8:30	10:30-8:00	10:00-7:30	9:30-7:00	9:00-7:00	8:30-7:00
PACER (# laps)	17-55	23-61	29-68	35-74	41-80	46-85	52-90
VO_2 max (ml/kg/min)	42-52	42-52	42-52	42-52	42-52	42-52	42-52
Percent Fat	25-10	25-10	25-10	25-10	25-10	25-10	25-10
BMI (Kg/m^2)	21-15.3	21-15.8	22-16.0	23-16.6	24.5-17.5	25-18.1	26.5-18.5
Curl-up (completed)	12-24	15-28	18-36	21-40	24-45	24-47	24-47
Trunk Lift (Inches)	9-12	9-12	9-12	9-12	9-12	9-12	9-12
Push-up (#completed)	7-20	8-20	10-20	12-25	14-30	16-35	18-35
Pull-up (#completed)	1-2	1-3	1-3	1-4	2-5	3-7	5-8
Flexed Arm Hang (sec.)	4-10	6-13	10-15	12-17	15-20	15-20	15-20
Sit & Reach**(inches)	8	8	8	8	8	8	8
Shoulder Stretch	Passing=Touching the fingertips together behind the back.						

Number on left is lower and on right is upper end of HFZ. **Test scored Pass/Fail; must reach this distance to pass.

FEMALES

Item/Age	10	11	12	13	14	15	16
One Mile (min:sec)**	12:30-9:30	12:00-9:00	12:00-9:00	11:30-9:00	11:00-8:30	10:30-8:00	10:00-8:00
PACER (# laps)	7-35	9-37	13-40	15-42	18-44	23-50	28-56
VO_2 max (ml/kg/min)	39-47	38-46	37-45	36-44	35-43	35-43	35-43
Percent Fat	32-17	32-17	32-17	32-17	32-17	32-17	32-17
BMI (Kg/m^2)	23.5-16.6	24-16.9	24.5-16.9	24.5-17.5	25-17.5	25-17.5	25-17.5
Curl-up (completed)	12-26	15-29	18-32	18-32	18-32	18-35	18-35
Trunk Lift (Inches)	9-12	9-12	9-12	9-12	9-12	9-12	9-12
Push-up (#completed)	7-15	7-15	7-15	7-15	7-15	7-15	7-15
Pull-up (#completed)	1-2	1-2	1-2	1-2	1-2	1-2	1-2
Flexed Arm Hang (sec.)	4-10	6-12	7-12	8-12	8-12	8-12	8-12
Sit & Reach**(inches)	9	10	10	10	10	12	12
Shoulder Stretch	Passing=Touching the fingertips together behind the back.						

Number on left is lower and on right is upper end of HFZ. **Test scored Pass/Fail; must reach this distance to pass.

Appendix-06 Report Sheet of FITNESSGRAM Test

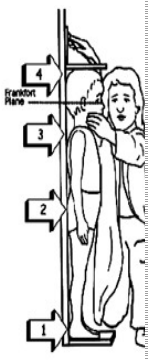
Class		Aerobic Capacity		Flexibility		Trunk Extensor Strength & Flexibility	Abdominal Strength	Upper Body Strength			Body Composition							
Date		1 mile run/walk		sit and reach		Trunk Left	Curl-up	Push-up	Pull-up	Flex arm hang	Skinfold		BMI			WHR		
No.	G	Name	Time (min)	HR	Left	Right	Shoulder	(Cm)	(Times)	(Times)	(Times)	(Time)	Triceps	Calf	Weight	Height	Waist	Hip
01																		
02																		
03																		
04																		
05																		
06																		
07																		
08																		
09																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		

Appendix-07 Body Mass Index measurement (weight and height)

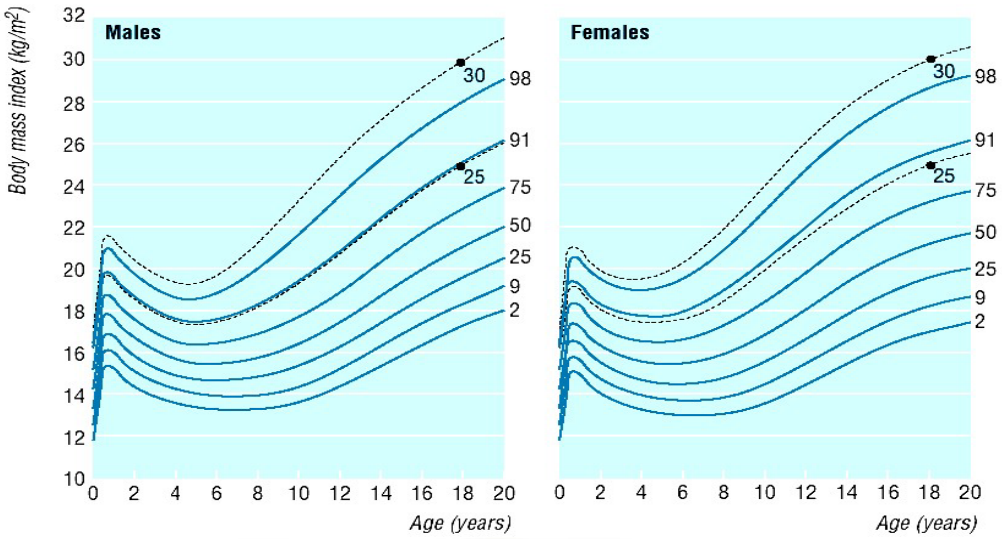
(a) Measurement of body weight

Purpose:	To measure body weight
Equipment:	A beam balance scale or a digital scale.
Calibration	Children should be weighed using a platform scale. It can be a beam balance scale or a digital scale. Check the scale carefully to get accurate measurement. Scale should be calibrated on a routine basis. Calibration involves putting known weight on the scale to check accuracy.
Procedure	Ask child to remove outer clothing and shoes. Place the scale in the zero position before the child steps on the scale. Ask the child to stand still with both feet in the center of the platform. Record the measurement to the nearest 0.1kg then have the child step off the scale.

(b) Measurement of body height

Purpose:	To measure body height
Equipment:	A standing height board or stadiometer
Calibration	A standing height board or stadiometer is required. This device has a flat vertical surface on which a measuring rule is attached. It also has a moveable headpiece and either a permanent surface to stand or the entire device is mounted (level to the floor) on the wall of a room.
Procedure 	Ask child remove shoes, hat, and bulky clothing. Ask the child to remove or undo hair styles and hair accessories that interfere with taking a measurement. In rare cases, a child may be unwilling to undo an intricate or costly hairstyle. In these situations, care should be taken to locate the actual crown of the head. Direct the child to stand erect with shoulders level, hands at sides, thighs together, and weight evenly distributed on both feet. The child's feet should be flat on the floor or foot piece, with heels comfortably together and touching the base of the vertical board. There are four contact points between the body and the stadoimeter: head, upper back, buttocks and heels (see arrows 1-4 on the diagram). Ask child to adjust the angle of his/her head by moving the chin up or down in order to align head into the Frankfort Plane. The Frankfort Plane is an imaginary line from the lower margin of eye socket to the notch above the tragus of the ear. This is best viewed and aligned when viewer is directly to the side of and at the eye level of child. When aligned correctly, the Frankfort Plane is parallel to the horizontal headpiece and perpendicular to the vertical back piece of the stadiometer. Note: When the chin is correctly positioned, the back of the head may not make contact with the board. In fact, in a very few individual, only two points will make contact with the vertical back piece. Ask the child to breathe in and maintain his/her position. Lower the headpiece until if firmly touches the crown of head and is at a right angle with the measurement surface. Check contact points to ensure that the lower body stays in the Proper position and the heels remain flat. Some children may stand up on their toes, But verbal reminders are usually sufficient to get them in proper position. Record height to the nearest 0.1cm

Appendix-08 International BMI Standard for Children's Overweight and Obesity



	Body mass index 25 kg/m²		Body mass index 30 kg/m²	
Age (years)	Males	Females	Males	Females
2	18.41	18.02	20.09	19.81
2.5	18.13	17.76	19.80	19.55
3	17.89	17.56	19.57	19.36
3.5	17.69	17.40	19.39	19.23
4	17.55	17.28	19.29	19.15
4.5	17.47	17.19	19.26	19.12
5	17.42	17.15	19.30	19.17
5.5	17.45	17.20	19.47	19.34
6	17.55	17.34	19.78	19.65
6.5	17.71	17.53	20.23	20.08
7	17.92	17.75	20.63	20.51
7.5	18.16	18.03	21.09	21.01
8	18.44	18.35	21.60	21.57
8.5	18.76	18.69	22.17	22.18
9	19.10	19.07	22.77	22.81
9.5	19.46	19.45	23.39	23.46
10	19.84	19.86	24.00	24.11
10.5	20.20	20.29	24.57	24.77
11	20.55	20.74	25.10	25.42
11.5	20.89	21.20	25.58	26.05
12	21.22	21.68	26.02	26.67
12.5	21.56	22.14	26.43	27.24
13	21.91	22.58	26.84	27.76
13.5	22.27	22.98	27.25	28.20
14	22.62	23.34	27.63	28.57
14.5	22.96	23.66	27.98	28.87
15	23.29	23.94	28.30	29.11
15.5	23.60	24.17	28.60	29.29
16	23.90	24.37	28.88	29.43
16.5	24.19	24.54	29.14	29.56
17	24.46	24.70	29.41	29.69
17.5	24.73	24.85	29.70	29.84
18	25	25	30	30

Appendix-09 International Physical Activity Questionnaire (short vision)

The International Physical Activity Questionnaires (IPAQ) comprises a set of 4 questionnaires. Long (5 activity domains asked independently) and short (4 generic items) versions for use by either telephone or self-administered methods are available. The purpose of the questionnaires is to provide common instruments that can be used to obtain internationally comparable data on health–related physical activity.

Background on IPAQ

The development of an international measure for physical activity commenced in Geneva in 1998 and was followed by extensive reliability and validity testing undertaken across 12 countries (14 sites) during 2000. The final results suggest that these measures have acceptable measurement properties for use in many settings and in different languages, and are suitable for national population-based prevalence studies of participation in physical activity.

Using IPAQ

Use of the IPAQ instruments for monitoring and research purposes is encouraged. It is recommended that no changes be made to the order or wording of the questions as this will affect the psychometric properties of the instruments.

Translation from English and Cultural Adaptation

Translation from English is supported to facilitate worldwide use of IPAQ. Information on the availability of IPAQ in different languages can be obtained at www.ipaq.ki.se. If a new translation is undertaken we highly recommend using the prescribed back translation methods available on the IPAQ website. If possible please consider making your translated version of IPAQ available to others by contributing it to the IPAQ website. Further details on translation and cultural adaptation can be downloaded from the website.

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ **days per week** No vigorous physical activities ***Skip to question 3***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

_____ **hours per day** _____ **minutes per day** _____Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ **days per week** No moderate physical activities ***Skip to question 5***

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day** _____ **minutes per day** _____Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week** No walking ***Skip to question 7***

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day** _____ **minutes per day** _____Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day** _____ **minutes per day** Don't know/Not sure

This is the end of the questionnaire, thank you for participating.

Appendix -10 Questions Selected from 2001 Youth Risk Behavior Survey

The U.S. Youth Risk Behavior Surveillance System (YRBSS) is an epidemiologic surveillance system that was established by the Centers for Disease Control and Prevention (CDC) to monitor the prevalence of youth behaviors that most influence health. The 2001 national school-based Youth Risk Behavior Survey (YRBS) is one component of the YRBSS. The YRBS focuses on priority health-risk behaviors established during youth that result in the most significant mortality, morbidity, disability, and social problems during both youth and adulthood. These include: tobacco use; unhealthy dietary behaviors; inadequate physical activity; alcohol and other drug use; sexual behaviors that may result in HIV infection, other sexually transmitted diseases; unintended pregnancies; and behaviors that may result in violence and unintentional injuries. The results from the YRBS will be used by CDC to (1) monitor how priority health-risk behaviors among high school students increase, decrease, or remain the same over time; (2) evaluate the impact of broad national, state, and local efforts to prevent priority health-risk behaviors; and (3) monitor progress in achieving three leading health indicators. Results also will be used to help focus programs and policies for comprehensive school health education on the behaviors that contribute most to the leading causes of mortality and morbidity.

Questions selected from 2001 YOUTH RISK BEHAVIOR SURVEY

Q30 During the past 30 days, on how many days did you smoke cigarettes?

Q31 During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

Q42 During the past 30 days, on how many days did you have at least one drink of alcohol?

Q74 During the past 7 days, how many times did you eat fruit?

Q78 During the past 7 days, how many times did you eat other vegetables?

Q79 During the past 7 days, how many glasses of milk did you drink?

Q80. On how many of the past 7 days did you exercise or participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities?

Q81. On how many of the past 7 days did you participate in physical activity for at least 30 minutes that did not make you sweat or breathe hard, such as fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors?

Q82 On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?

Q83 On an average school day, how many hours do you watch TV?

Q84 In an average week when you are in school, on how many days do you go to physical education classes?

Q85 During an average PE class, how many minutes do you spend actually exercising or playing sports?

Q86 During the past 12 months, on how many sports teams did you play?

Appendix-11 The Children's Lifestyle Questionnaire (Portuguese)

Este inquérito tem fins meramente científicos. Por favor responda de forma verdadeira; pode assinalar as suas respostas com uma cruz ☒ A confidencialidade dos dados que constam neste inquérito é garantida.

Número: _____ Sexo: ☐ rapaz ☐ rapariga. Data de nascimento (dia)____ (mês)_____ (ano) 19_____

1. QUESTÕES SOBRE A FAMÍLIA:

	PAI	MÃE
A1) - A3)	Idade = (anos), Altura = (m), Peso = (kg)	Idade = (anos), Altura = (m), Peso = (kg)
A4) Fuma?	**A** Nunca **B** Às vezes **C** Todos os dias	**A** Nunca **B** Às vezes **C** Todos os dias
A5) Bebe?	**A** Nunca **B** Às vezes **C** Todos os dias	**A** Nunca **B** Às vezes **C** Todos os dias
A6) Faz desporto por semana?	**A** Nunca **B** Às vezes **C** 1 vez **D** 2 ou mais	**A** Nunca **B** Às vezes **C** 1 vez **D** 2 ou mais
A7) Gosta de desporto?	**A** Não **B** Às vezes **C** Sim	**A** Não **B** Às vezes **C** Sim
A8) Habilitações?	**A** ≤ 6º **B** 9º **C** 12º **D** Curso Superior	**A** ≤ 6º **B** 9º **C** 12º **D** Curso Superior

2. QUESTÕES SOBRE TI

Actividade física:

B1) Para além da Educação Física na escola, com que frequência e quando tempo fazes exercício por semana?

A Nunca **B** 1-2 vez por mês (Se respondeste "A ou B ", não respondes à próxima questão)

Nível Médio: ____ dia(s) por semana _____ minutos por dia; Nível Elevado: ____dia(s) por semana, ____ minutos por dia

Para Professor:---

C 1dia por semana **D** 2 dias por semana **E** 3 dias por semana **F** 4 dias por semana **G** Mais de 4 dias por semana

B2) Fazes desporto de competição? **A** Não **B** Sim. Qual? _____. Quantas horas por semana?_____.

B3) Normalmente, como vais para o escola?

A de carro **B** de autocarro **C** de bicicleta ___minutos, ___dias por semana **D** a pé ___minutos, ____dias por semana

B4) Quantas horas vês televisão por dia (segunda-feira a sexta-feira)?

A Raramente **B** 0.5 hora **C** 1 hora **D** 2 horas **E** 3 horas **F** 4 horas ou mais

B5) O que fizeste no fim de semana passado? (sábado e domingo)

A Ver televisão, Jogar de vídeo ou jogar de computador:___horas **B** Fazer exercício:___horas

B6) Que desportos praticas mais? _____, _____. Que desportos gostas mais? _____, _____.

A Basquetebol **B** Futebol **C** Andebol **D** Voleibol **E** Culturismo **F** Atletismo **G** Ténis **H** Natação

I Badmington **J** Aeróbica **k** Ginástica **L** Karaté **M** Patinagem **N** Ciclismo **O** Corrida **P** Outro____.

B7) Sabes a diferença entre exercício "Aeróbico" e " Anaeróbico? **A** Não sei **B** Sei. Quais?_____.

B8) Quando fazes os exercícios, o teu propósito é:_____, _____.

A jogar **B** ser o melhor **C** ser popular **D** ser forte **E** ser saudável **F** ser bonito

B9) Para além da Educação Física na escola, com quem fazes exercício mais frequentemente?

A só **B** com os amigos **C** com os pais **D** com os irmão **E** com outros

B10) Gostas da disciplina de Português? **A** Adoro **B** Gosto **C** Mais ou menos **D** Pouco **E** Não gosto

Gostas da disciplina de Educação Física? **A** Adoro **B** Gosto **C** Mais ou menos **D** Pouco **E** Não gosto

Gostas da disciplina de Matemática? **A** Adoro **B** Gosto **C** Mais ou menos **D** Pouco **E** Não gosto

Questões sobre alimentação:

C1) Que refeições costumas fazer?				
Pequeno almoço	**A** Todos os dias	**B** Às vezes	**C** Raramente	**D** Nunca
Lanche a meio da manhã	**A** Todos os dias	**B** Às vezes	**C** Raramente	**D** Nunca
Almoço	**A** Todos os dias	**B** Às vezes	**C** Raramente	**D** Nunca
Lanche	**A** Todos os dias	**B** Às vezes	**C** Raramente	**D** Nunca
Jantar	**A** Todos os dias	**B** Às vezes	**C** Raramente	**D** Nunca
Lanche antes de deitar	**A** Todos os dias	**B** Às vezes	**C** Raramente	**D** Nunca

C2) Costumas comer comida rápida ("fast food")? **A** Todos os dias **B** Às vezes **C** Raramente **D** Nunca

C3) Quantas vezes almoçaste ou jantaste fora na semana passada? **A** Nunca **B** ____vezes

C4) O que bebeste mais ontem? **A** Refrigerante **B** Café **C** Cerveja **D** Leite **E** Sumo **F** Água **G** Outro_____

C5) De que bebidas gostas mais? **A** Refrigerante **B** Café **C** Cerveja **D** Leite **E** Sumo **F** Água **G** Outro_____

C6) Com que frequência tomaste os seguintes alimentos na semana passada?

Gelado	**A** Várias vezes por dia	**B** 1 vez por dia	**C** Algumas vezes por semana	**D** Raramente	**E** Nunca
Batatas fritas	**A** Várias vezes por dia	**B** 1 vez por dia	**C** Algumas vezes por semana	**D** Raramente	**E** Nunca
Chocolate-Doces	**A** Várias vezes por dia	**B** 1 vez por dia	**C** Algumas vezes por semana	**D** Raramente	**E** Nunca
Bolachas ou Donuts	**A** Várias vezes por dia	**B** 1 vez por dia	**C** Algumas vezes por semana	**D** Raramente	**E** Nunca
Legumes	**A** Várias vezes por dia	**B** 1 vez por dia	**C** Algumas vezes por semana	**D** Raramente	**E** Nunca
Fruta	**A** Várias vezes por dia	**B** 1 vez por dia	**C** Algumas vezes por semana	**D** Raramente	**E** Nunca
Pão	**A** Várias vezes por dia	**B** 1 vez por dia	**C** Algumas vezes por semana	**D** Raramente	**E** Nunca
Arroz e massa	**A** Várias vezes por dia	**B** 1 vez por dia	**C** Algumas vezes por semana	**D** Raramente	**E** Nunca

Questões sobre a saúde:

D1) Tens doenças de longa data? **A** Não **B** Sim (Quais?) .....

D2) Já tiveste alguns sinais de doenças? **A** Coração **B** Tensão alta **C** Diabetes **D** Dores de costas **E** Peso

D3) Já foste ao hospital este ano? **A** Não **B** Sim (Quantas vezes?) ____Vezes

D4) Estiveste doente no mês passado? **A** Não **B** Sim (Quantas vezes?) ____Vezes

D5) Já bebeste vinhos ou cervejas? **A** Não (Se respondeste "Não", não respondes à próxima questão)

B Sim. Comecei a beber aos __ (anos). Na semana passada, bebi ____copos de vinhos e ___copos de cervejas.

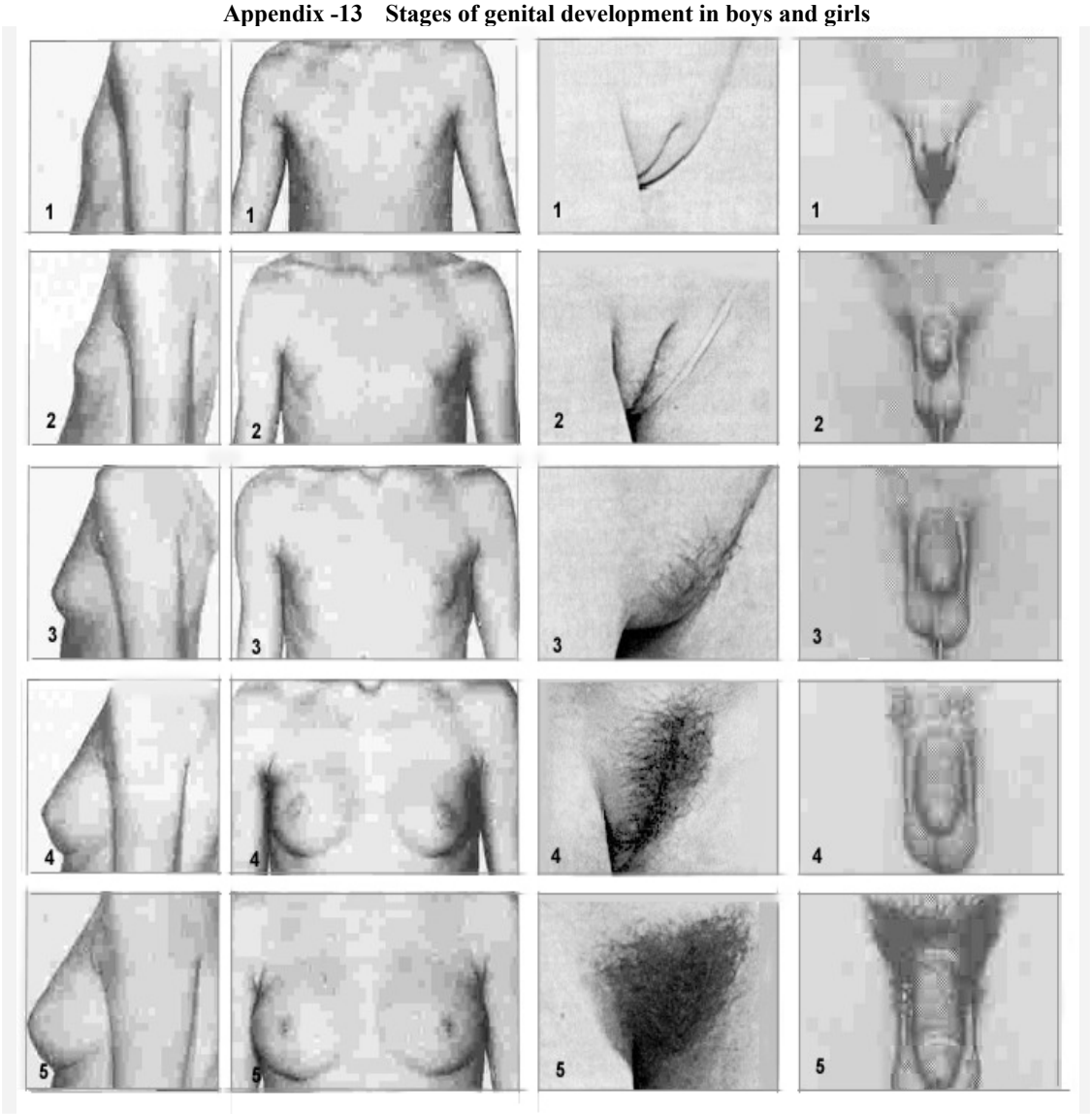
D6) Já fumaste? **A** Não (Se respondeste "Não", não respondes à próxima questão) **B** Sim. Comecei a fumar aos __ (anos).

Fumo **C** Todos os dias **D** Todas as semanas **E** Todas os meses **F** Raramente

Appendix -12 Heart Rate Monitor- measurement procedures and equipments

Purpose:	To assess the physical activity during school physical education
Objective	To know children's percentage of active time being spent in physical education classes (includes football, basketball, handball, volleyball, gymnastics, and skill evaluation and etc.) To know children's continues period of time being spent in physical education classes To keep the Experimental Groups PE classes in aerobic zone.
Equipment:	S810 Polar Heart Rate Monitor Watch
Instruction: 	The Polar S810 Heart Rate Monitor used in this study consisted of a chest strap with wireless electrodes and a watch receiver-microcomputer. The HRMs were preset to record and store heart rate data every 5s during the duration of a class's period. Each time, one boy and one girl were selected randomly from a coeducational physical education class. The subjects were asked to wear a HRM and lie perfectly still on a bench for approximately 3 minutes to record their resting heart rate before physical education class began. Teachers were instructed to maintain their normal methods of teaching. Subjects were informed to join the class and do everything as normal. The researcher reminded children to start and stop the HRMs when their teachers began and finished t class. A total of 14 boys and girls were tested in various 90-minute classes and 14 boys and girls in various 45-minute classes. We also e used the HRM to control the physical activity levels of aerobic exercise at the moderate-to-vigorous level (60%-90%MHHR). How to put on the HRM: 1. Attach the transmitter to the elastic strap. 2. Adjust the strap length to fit snugly and comfortably. Secure the strap around the chest and below the chest muscles. Lock the buckle. 3. Lift the transmitter off your chest and wet the grooved electrode areas. 4. Check that the wet electrode areas are firmly against the skin and the Polar logo is in a central upright position. 5.Wear the wrist receiver as one would wear an ordinary watch. If the HRM is used while biking, the wrist receiver can be attached to a Polar Bike Mount. Keep the wrist receiver within the transmission range (1 metre/3 feet).

Appendix -13 Stages of genital development in boys and girls



Source: Taner JM (1962). Growth at adolescence (2nd ed.). Oxford: Blackwell Scientific

Classification of genitalia maturity stages in girls		
Stage	Breasts	Pubic hair
1	Preadolescent-The juvenile breast has an elevated papilla (nippleshaped projection) and small, flat areola.	Preadolescent-No pubic hair is present; a fine vellus hair covers the genital area.
2	Breast and papilla elevate as a small mound; areolar diameter increases.	A sparse distribution of long, slightly pigmented straight hair appears bilaterally along the medial border of the labia majora.
3	Breast and areola continues to enlarge; no separation of breast contours is noted.	The pubic hair pigmentation increases; it begins to curl and spread sparsely over the mons pubis.
4	The areola and papilla separate from the contour of the breast to form a secondary mound.	The pubic hair continues to curl and becomes coarse in texture. The number of hairs continues to increase
5	Mature-The areolar mound recedes into the general contour of the breast. The papilla continues to project as the nipple.	Mature-The pubic hair attains an adult feminine triangular pattern, with spread to the surface of the medial thigh.

Adapted from Tanner IM: Growth at Adolescence. Oxford, Blackwell, 1962.

Classification of genitalia maturity stages in boys (after Tanner 1962)			
Stage	Pubic hair	Penis	Testes
1	Preadolescent-No Pubic hair present; a fine vellus hair covers genital area.	Preadolescent-The penis is the same as in childhood	Preadolescent-The testes and scrotum penis are the same as in childhood. Testes less than 3 ml in volume.
2	Sparse distribution of long, slightly pigmented hair appears at base of penis.	Slight enlargement	The testes enlarge. The scrotum enlarges, developing a reddish hue and altering in skin texture.
3	Hair pigmentation increases; begins to curl and spread laterally in a scanty distribution	Penis longer	The testes and scrotum continue to grow.
4	Resembles adult type in being coarse and curly but less in quantity; adult type of distribution is attained.	The penis grows in width, and the glans penis develops.	The testes and scrotum continue to grow; the scrotal skin darkens.
5	Mature- adult distribution; spread to medial surface of thighs.	Adult size and shape	Mature-The testes and scrotum are adult size.

Adapted from Tanner: Growth at Adolescence. Oxford, Blackwell, 1962.

Appendix -14 PE-plan of teaching-learning organization (Ministry Of Education)

QUADRO MODELO COMPOSIÇÃO CURRICULAR (ENSINO BÁSICO)				
5.º ANO	6.º ANO	7.º ANO	8.º ANO	9.º ANO
FUTEBOL (elementar)	**VOLEIBOL** (elementar)	**BASQUETEBOL** (elementar)	**ANDEBOL** (introdução)	**ANDEBOL** (elementar)
VOLEIBOL **(introdução)** JOGO (avançado)	**FUTEBOL** (continuação) **BASQUETEBOL** (introdução)	**ANDEBOL** (introdução) **FUTEBOL** (continuação) **VOLEIBOL** (continuação)	FUTEBOL BASQUETEBOL **VOLEIBOL** (continuação) **BASQUETEBOL** (continuação)	FUTEBOL (avançado) **VOLEIBOL** (continuação) BASQUETEBOL (continuação)
GINÁSTICA SOLO(elem.) APARELHO(elem.) RÍTMICA (introd.) (um aparelho)	GINÁSTICA SOLO(elem.) **APARELHO**(elem.) **RÍTMICA** (introd.) (outro aparelho)	GINÁSTICA SOLO(elem.) **APARELHO**(elem.) **AEROBÁTICA** (introdução)	GINÁSTICA SOLO(elem.) **APARELHO**(cont.) **AEROBÁTICA** (introdução)	GINÁSTICA (elementar e avançado)
ATLETISMO (introdução)	**ATLETISMO** (elementar)	**ATLETISMO** (elementar)	**ATLETISMO** (elementar e avançado)	**ATLETISMO** (elementar e avançado)
LUTA (introdução)	**LUTA** (introdução)	**RAQUETAS** Badminton (introd.)	RAQUETAS (elementar)	RAQUETAS (elementar)
DANÇA (elementar)	**DANÇA** (continuação)	**DANÇA** (elementar)	**DANÇA** (elementar)	JOGOS TRADICIONAIS
PATINAGEM (elementar)	**PATINAGEM** (continuação)	**PATINAGEM** (elementar)		
		ORIENTAÇÂO (introdução)		

Appendix-15 Guideline of PE (5th -9th Grade) in Middle School of Real (2001/2002)

Escola E.B. 2,3, de Real ---Planificação de Educação Física (Ano Lectivo 2001/2002)

	1º Período	2º Período	3º Período
5 ano	**Condição Física** **Atletismo** . Resistência . Técnica de corrida . Velocidade - 30m **Jogos Pré- desportive** **Dança** **Futebol**	**Condição Fisica** **Atletismo** . Velocidade - 30 e 40m . Lançamento de bola . Salto em comprimento Voleibol **Ginástica artística** . Solo . Aparelhos	Condição Física **Atletismo** . Salto em altura Corfebol **Actividade alternativa** . Luta
6 ano	**Condição Física** **Atletismo** . Resistência .Velocidade . Técnica de corrida . Salto em comprimento **Dança** **Basquetebol**	**Condição Física** **Atletismo** . Velocidade - 30 e 40m . Técnica de corrida . Estafetas, . Salto em altura **Futebol** **Ginástica artística** . Solo	**Condição Fisica** **Atletismo** . Lançamento de peso . Corrida de obstáculos Ginástica artística . Aparelhos Voleibol
7 ano	**Condição Física** **Atletismo** . Resistência . Técnica de corrida **Andebol** **Ginástica artística** . Solo	**Condição Física** **Atletismo** . Lançamento de Peso . Velocidade . Salto em comprimento **Basquetebol** **Mini – trampolim**	**Condição Fisica** **Voleibol** **Orientação** **Atletismo** . Estal'etas . Barreiras
8 ano	**Condição Física** **Atletismo** . Resistência . Técnica de corrida . Salto em comprimento **Futebol , Mini-trampolim**	**Condição Física** **Ginástica artística** . Solo . Aparelhos Andebol **Raquetes**	**Condição Fisica** **Voleibol** **Atletismo** . Estafetas/velocidade . Barreiras . Salto em altura
9 ano	**Condição Física** **Atletismo** . Resistência . Técnica de corrida . Salto em altura **Andebol**	**Condição Física** **Atletismo** . Velocidade . Lançamento de Peso **Ginástica artística** . Aparelhos Voleibol	**Condição Física** **Ginástica artística** . Solo **Mini - trampolim** **Basquetebol** Raquetes

Appendix-16 PE intervention schedule for the experimental groups

PE Class table of the Experimental Groups and control Groups

Group	6 grade	7grade	9grade
Test Group	Friday: 09:15-10:45 Tuesday: 08:20-09:05	Friday: 08:20-09:05 Wednesday: 17:00-18:30	Wednesday: 16:00-16:45 Monday: 11:55-13.25
Control Group	Friday: 11:15-13:25 Tuesday: 11:00-11:45	Friday: 16:00-16:45 Monday: 09:15-10:45	Monday: 12:00-12:45 Wednesday: 12:00-13:25

Week by week lesson schedule for Intervention Groups

Time	90-min PE (include 3-min health education intervention in theory)		45-min PE(only practise)
Pre-Int.	FITNESSGRAM test1	Concept of health	Introduction the investigation in school
Pre-Int.	FITNESSGRAM test2	Health-related physical fitness	Normal PE
Week 1	AE (Low Impact)	Results of FITNESSGRAM	AE (Running) + RT
Week 2	AE (Low & High Impact)	AE & Anaerobic Exercise	AE (Basketball) + T & F
Week 3	AE (High Impact)	Regular PA & Keep fit	AE (Football) + RT
Week 4	AE (Review of AE)	Nutrition & Healthy Eating	AE (Badminton) + RT
Week 5	AE (Jazz-Aerobics)	Food & Exercise Pyramid	AE (Volleyball) + AE (running)
Week 6	AE (Modern Dance)	Walking to school & etc.	AE (KickBoxing1) + RT
Week 7	AE (Review of AE)	TV, Sedentary& Obesity	Gymnastic + Aerobic Running
Week 8	AE (Rock and Roll.)	BMI, Obesity & CVD	AE (Basketball) + RT
Week 9	AE (Hip Hop.)	Holiday Eating & Eating Out	AE (Football) + RT
Week 10	AE (Review AE)	Caloric Balance	AE (Badminton) + T & F
Week 11	AE (Group Aerobics1)	Flexibility & Low Back Pain"	AE (Volleyball) + AE (running)
Week 12	AE (Group Aerobics2)	Maturation	AE (KickBoxing2) + RT
Week 13	AE (Group Aerobic 1&2)	Fruits & Vegetable	A.E (Handball) + RT
Week 14	AE (Group Aerobics3)	Upper body strength training	AE (Football) + RT
Week 15	AE (Group Aerobics4)	Abdominal strength training	AE (Basketball) + RT
Week 16	AE (Group Aerobic 3&4)	Overcome the Barriers of PA	Gymnastics + RT
Week 17	AE (Group Aerobic 1,2,3&4)	Monitoring exercise intensity	AE (Football) + RT
Week 18	AE (Group Aerobic Dance1)	Planning your PA	AE (Basketball) + T & F
Week 19	AE (Group Aerobic Dance2)	Recording your PA	AE (Badminton) + RT
Week 20	AE (Group Aerobic Dance 1&2)	Healthy lifestyle	AE Aerobic Running + T & F
Week 21	AE (Floor AE)	Introduction AE (Floor exercise)	AE (Basketball) + T & F
Week 22	AE (Yoga Basic)	Introduction AE (Yoga)	AE (football) + RT
Week 23	AE (Step AE)	Introduction AE (Step AE)	AE (Running) + T & F
	…		
Post-int.	FITNESSGRAM test again		
AE: Aerobic Exercise, T & F: Track and Field; RT: Resistance training; PA: Physical Activity; int.: intervention			

Appendix -17 Health education on physical activity, nutrition and health

PHYSICLA ACTIVITY & HEALTH:

Objective-01: To know the concept of health, physical fitness, health-related & skill-related physical fitness

Health: a state of complete physical, mental, and social well-being and not merely the absence of disease

Physical Fitness- Physical fitness is required in order to maintain a healthy lifestyle, to meet demands of life safely and effectively, but without exhaustion or undue stress.

Health-related physical fitness: physical fitness that relate with health. The components include (1) body composition, (2) cardiovascular fitness, (3) flexibility, (4) muscular endurance and strength.

- Aerobic (cardiovascular) fitness - The body's ability to take in and use oxygen to supply energy throughout the body
- Muscular fitness - The strength and endurance of muscles
- Flexibility - The ability to move joints and stretch muscles fully through their normal range of motion
- Body composition - The amount of fat tissue in relation to other tissue in the body

Aerobic (or cardiovascular) fitness is one of the most important components of overall physical fitness. It reflects the amount of oxygen in the blood pumped by the heart and transported to the working muscles, as well as the muscles efficiency in using that oxygen. Increasing your aerobic fitness means increasing your heart and cardiovascular systems capacity to perform their most important task, supplying oxygen and energy to your entire body. The best way to improve your aerobic fitness is through activities that put the body´s large muscle groups to work dynamically-for example, walking, jogging, running, swimming, skating, cycling, stair-climbing and cross-country skiing.

Physically fit: The achievement of all minimum standards in Health-related physical fitness.

Skill-related physical fitness: physical fitness that relate with sports and motor skills. The components include: (1) Agility, (2) Balance, (3) Coordination, (4) Power, (5) Speed, and (6) Reaction time.

- Agility is the ability to change body positions quickly and accurately to the indicated response or situation.
- Balance refers to the ability of a person to maintain a specific body position while still or in motion.
- Coordination is the speed and accuracy of correct muscle response to produce a desired movement.
- Power is the application of strength and speed during a muscular movement.
- Speed is the ability to move the body or a region of the body as rapidly as possible from one point to another.
- Reaction time refers to the time lapse between the presentation of the stimulus (sound-sight-touch) and the first muscular movement of the performer.

Objective-02: To define aerobic and anaerobic and understand the implications of each type of program.

Anaerobic exercise: 'Anaerobic' means 'without oxygen'.The body has relies on the anaerobic energy system during brief periods of high intensity activity. The body relies on its anaerobic metabolism for activities like lifting heavy weights or sprinting.

Aerobic exercise: 'Aerobic' means 'with oxygen'. Aerobic exercise is when the body uses oxygen while producing energy for physical activity. Aerobic metabolism occurs when the body breaks down fat and glucose by combining with oxygen. During intense aerobic exercise, the body uses more oxygen; breathing and heart rate increase. Over time, regular aerobic exercise improves a person's health and fitness and reduces levels of body fat. Regular physical activity reduces the incidence of cardiovascular disease and helps to prevent diabetes, injury and some forms of cancer, as well as positively influencing mental and social health and wellbeing.

The intensity of aerobic exercise: Exercising does not need to be strenuous or vigorous. Moderate intensity activities (activity that is energetic, but at a level at which a conversation can be maintained) such as walking and cycling are enough to gain health benefits. People who are able and wish to participate in more vigorous activity (for example aerobics, netball or touch football) are encouraged to continue to do so, as these activities may provide additional benefits in terms of cardiovascular health.

Moderate Physical Activity: Activity which elicits a heart rate of 50% MHRR

Moderate to Vigorous Physical Activity: Activity which elicits a heart rate of 60% MHRR

Vigorous Physical Activity: Activity which elicits a heart rate of 75% MHRR

High Impact Aerobics: Both feet are simultaneously off the floor during exercise.

Low Impact Aerobics: One foot is continuously on the floor during exercise.

(MHRR=maximum heart rate reserve)

Aerobic exercise – how often and for how long?

The Heart Foundation and other leading authorities recommend that people include at least 30 minutes or more of moderate intensity physical activity (such as brisk walking) on most, if not all, days of the week. The 30 minutes can be accumulated in shorter bouts, such as three 10-minute walks.

The health benefits of regular aerobic exercise

Being physically active on a regular basis will promote a range of health benefits, including:

Reduced likelihood of cardiovascular disease, diabetes and some cancers; Strengthened heart and cardiovascular system

Increased muscle strength; Stronger bones, especially if the activity is weight bearing; Improved stamina; Lowered blood cholesterol levels; Reduced blood pressure; Loss of excess body fat; An effective treatment for depression, Improve mental health and quality.

Types of aerobic exercise

Exercise is aerobic if it is performed continuously for approximately 20 to 30 minutes, which is a sufficient amount of time to gain health benefits. Whatever type of aerobic exercise is chosen, it should be enjoyable. There are numerous activities that can provide an aerobic workout, including biking, jogging, running, swimming, cross-country skiing, basketball, jumping rope, roller skating, brisk fitness walking and some types of dancing. In addition to these activities, an aerobic workout can be achieved in a specially designed aerobic dance class or by using stationary exercise machines (cycles, treadmills, stair-steppers,

rowing machines) that can be found at a local gym or health club. Most of these machines can also be purchased and set up for home use.

Aerobic exercise as a daily routine

There are also many convenient opportunities to be active throughout normal daily routine, such as walking to and from work, buying lunch or walking children to school.

A typical aerobic routine includes: 1) Warm up, (2) Stretching, (3) Workout period, (4) Cooling down (5) Stretching

Warm up: Try some mild running in place, jumping rope, or jumping jacks. Increasing heart rate by about 20 beats/min. above resting level will help prevent injury during the stretching and workout periods.

Stretching: Stretching reduces the risk of muscle soreness and injury, while increasing flexibility. Assume a stretch position slowly until resistance, not pain, is felt. Hold for 30-60 seconds; release slowly. Repeat 3-5 times for each position. (See example box below.)

Workout period: (at least 20-30 minutes, 3-4 times per week). Start out slowly. Set long-term goals, but also set weekly goals. Gradually exercise for longer periods of time and/or at a faster rate. If jogging is one goal, a walk/run program might be a good way to begin.

Find your target heart rate In order to exercise at a safe (and efficient) level, monitor heart rates during workout periods. First, find the pulse after 10-minutes of activity. (The best places to take a pulse are the wrist and neck.) Count the pulse for 15 seconds and multiply by 4 to determine the number of times your heart beats per minute. Then follow the directions below to find best target heart rates. If you fall within the target heart rate range according to age, continue exercising at the current pace. If you are below it, increase the intensity of your activity. If you're above it, decrease the intensity of your workout.

1) Find your maximum heart rate by subtracting your age from 220: 220-10=210 maximum heart rate;
2) Then find 65 to 85 percent of your maximum heart rate: 65% x 210=137 and 85% x 210= 179 ;
3) The goal of a 10-year-old exerciser would be to maintain a target heart rate of 137-179 bpm throughout his workout

Cooling down: It is important in an exercise routine to "cool down" (keep moving for several minutes at low intensity such as slow jogging, walking, or marching in place) after a workout. This allows blood, rich in oxygen, to be distributed from the working muscles to the brain and other organs of the body, thus preventing blood from pooling in muscles that are no longer active. This phase prevents the dizziness, nausea, and muscle cramps that can occur after a workout.

Stretching: Stretching positions should be repeated after the cool down period to enhance muscle strength and flexibility.

The basic form of aerobic classes in a health club environment

The basic from of Aerobic classes begins with the warm-up, when people slowly start to exercise, gradually raising their heart rate. After they have warmed up, they move into more intense cardiovascular exercise, increasing their heart rate by performing a variety of movements, including knee lifts and lunges. In the strengthening portion of the workout, people may use hand-held weights and heavy elastic tubing to tone muscles of the upper and lower body. Sit-ups are generally done during this part of the class as well.

People then gradually cool down by moving at a slower pace and returning the heart to a resting pulse rate; they also stretch out the muscles used during the workout. Students follow the routine by imitating the instructor's movements. As the students become familiar with a routine's exercises, the instructor can direct the class verbally, shouting out the name of a specific movement or exercise. To maintain a workout of high intensity, instructors usually choose popular music with an upbeat tempo. Students enjoy listening to the music, especially during difficult portions of the workout, and the tempo keeps them exercising at a rapid rate. In specific classes of aerobics: Many forms of group fitness focus most intensely on cardiovascular conditioning, which involves the strengthening of the heart and blood vessels through exercise that makes the heart beat faster for a short period of time.

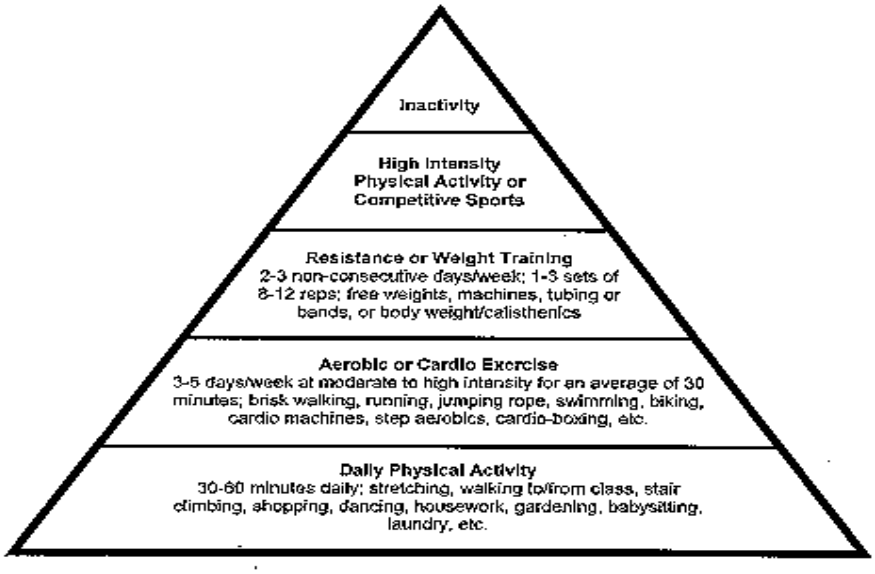
To distinguish and locate the various large muscles of the body

Upper Body Muscles: Upper Back Muscles: • Trapezius, • Rhomboids, Shoulder Muscles: • Deltoids, • Rotator Cuff (Rotators), Chest Muscles: • Pectorals, Arm Muscles: • Biceps, • Triceps, • Forearm Muscles

Body Muscles : Abdominis, Rhomboids,Trapezius

Lower body Muscles: Upper leg: Quadriceps (made of 4 muscles), Hamstrings (made of 3 muscles), Gluteus maximus, Iliopsoas, Lower leg- Calf, Tibialis anterior

Pyramid of physical activity



- Start at the bottom of the pyramid and work your way up. The least amount of time should be spent in the "inactive zone."
- Warm-up and cool-down, including stretching, should be a part of every activity/exercise session.
- Try not to sit for more than 30 minuets at a time - while working at the computer, watching TV or just hanging out.
- Choose activities and exercises that you enjoy and that fit into your lifestyle.

- If you don't know how to use a piece of exercise equipment you increase your risk for injury. Ask someone who is trained to teach you the proper technique.
- Maintain a flexible schedule - do what you can, when you can, and don't feel guilty if you miss a day or two; consistent activity over months or years is most important.
- Balance your activity/exercise with healthy eating patterns.

Some forms of aerobic exercise

(a) Walking: Walking is an often underrated form of aerobic exercise. It is fast becoming a popular form of exercise for many adults because it requires little in the way of equipment or facilities. A major benefit of walking is that it can be performed by people of all ages and does not require a great deal of ability or technique in order to be effective. A second benefit is that walking is a great calorie burner that can be of great help in maintaining optimal body fat levels. Because walking is a low impact activity it is often an effective alternative for individuals who have trouble with high impact activities such as running or jogging. Walking does, however, need to be performed at a brisk pace so that an aerobic training effect will occur. Individuals who embark on a walking program should monitor their heart rate and elevate it to at least a moderate level of intensity, which has been described as approximately 40 percent of maximum heart rate reserve. When walking at a lower intensity level, individuals need to exercise for a longer period of time, approximately 40 to 60 minutes and more frequently during a week. Walkers should attempt to burn a minimum of 2,000 calories per week to reduce the risk of heart disease.

(b) Jogging/Running: Jogging and running are two activities that are growing in popularity. In the U.S. today, it is estimated that over 15 million Americans jog or run to develop cardiovascular endurance. One advantage jogging or running has over walking however, is that an individual is able to cover greater distances in a shorter period of time, which allows for greater numbers of calories to be burned. It is also relatively easy to maintain a training heart rate of sufficient intensity to develop cardiovascular endurance while participating in a jogging or running program.

Jogging is usually defined as slow running at a comfortable pace of between 8 to 12 minutes per mile while running is defined as a faster pace lower than 8 minutes per mile. Jogging and running technique differs most when considering that joggers tend to have a shorter stride and land on their heels while runners tend to have longer strides and land on the balls of their feet.

(c) Choreographed Aerobic Exercise: Choreographed aerobic dance, currently enjoyed by millions of people, is a very popular form of exercise throughout the world. While originally aerobic dance was in fact very dance oriented, most aerobic routines today utilize fewer dance steps and more athletic movements. There are some organizations that are still dance oriented such as Jazz-exercise; but most groups have found more success in developing routines that are less complicated and more along the lines of movements that are athletic in nature. For this reason, more men are participating than ever before, even at the professional level where many professional teams in football and baseball now employ aerobic instructors to teach the players aerobics on a regular basis. One of the key reasons why choreographed aerobic dance is so popular is that it uses motivating music to create an exciting atmosphere. Instructors also blend music of the appropriate tempo with the various segments of a routine as a guide for the participants. What is created is a

fun workout that seems to fly by. There are three distinct types of choreographed aerobic dance currently being taught: low impact, high impact, or a combination of the two.

(d) Low impact aerobics strives to lessen the number of injuries associated with the continuous pounding that feet, legs, and joints take in a normal high impact workout. Low impact aerobic steps never allow both feet to be off the ground at the same time. By keeping one foot down on the floor at all times high impact injuries such as shin splints are less likely to be experienced. The down side to low impact aerobics is that it is less intense and for some highly trained individuals it may be difficult for them to reach a training heart rate. Knowledgeable instructors will know to greatly increase the use of arm movements and kick steps to challenge the advanced pupil in a low impact aerobics class.

(e) High impact aerobics routines utilize few if any movements that allow one foot to stay on the ground at all times. These workouts are high in intensity and allow individuals to reach and maintain their training heart rates easily. However, participants and instructors may run the risk of developing injuries. Participants can protect themselves to some degree by' using good aerobic shoes that provide both support and cushion and by patronizing facilities that provide a specially designed aerobic floor. The worst floors are those that are concrete or that are concrete with carpet covering them.

(f) A combination aerobic dance class incorporates both high and low impact movements. These types of classes are currently the most popular aerobics classes. Typically the low impact moves are used during the warm up and the cool down phases of the routine. In all three types of aerobics classes individual students can vary the intensity of the workout to best meet their fitness needs by increasing, decreasing or dropping out the arm movements. Also if the routine becomes too complicated or too intense, the student can simply in place until they feel comfortable and can return to the prescribed exercises.

(g) Box Aerobics / Kata Box / Kick Box/ Boxercise is a high-intensity, low-impact aerobic workout with exercises based on fitness basics, skills and sparring movements from the sport of boxing and martial arts. An exciting and challenging, controlled cardiovascular (upper and lower body) workout that improve your balance, coordination and agility. A full range of physiological benefits can result from this workout with a sport focus, as well as additional benefits of increased concentration, speed and focus.

(h) Challenge Aerobics/High Energy Class/Aero-Fit is an high-impact aerobic workout combined with a variety of resistance, sporting and versa-training movements. This form of aerobic exercise is designed for those who want to burn calories and need a challenge to improve their fitness level. More fitness focused movements and less choreographic content. (This fitness class content can differ according to instructor training & instructor preference.)

(i) Step Aerobics incorporates the use of a step or bench typically about one foot wide and three feet long and about six inches high. Although a number of companies manufacture sleek looking, hi-tech style step benches, many organizations simply build their own from wood. The best steps are light and can be easily stored. These steps are durable and provide a solid non-slip platform. The best steps can also be adjusted to increase or decrease the height of the step to accommodate individuals of different heights and to increase or decrease the intensity of the workout. Instructors use many moves that require participants to step up and down from the platform. Good instructors will have students move from one end of the step to the other and will incorporate the use of the arms to maintain intensity and keep students interested. Once again instructors

use music that is appropriate in tempo for each of the segments. Step aerobics is a great aerobic activity that is low impact and fun.

(j) Step / Basic Step / Beginner Step aerobics uses an adjustable step or bench as focus of the workout. Easy-to-follow basic step and floor movements, as well as specific lower body exercises, work the major muscle groups in the leg and buttocks. Upper body conditioning is added through specific arm movements that are combined with the step actions, with the purpose of overall body conditioning and improvement of cardio respiratory fitness.

(k) **Power Step/Advanced Step/Athletic Step** is the advanced step class. It includes an intense, high-low impact and cardiovascular workout, with a combination of new step movements on an adjustable step or bench. Some combinations are taught with additional propulsions and advanced choreography to increase the intensity of the workout. Challenging step movements contribute to the overall conditioning of the body and strong arm movements are used to maximise the upper body workout. Knowledge of basic step movements is required to participate in this exercise.

(l) Step & Weight/ Step & Punch/Step & Sculpt is a medium-level cardiovascular workout combining step movements with overall body conditioning exercises, designed to define, sculpt and condition the muscles. Resistance toning is incorporated with the use of small hand weights, rubber bands, tubes, and Body-Bars, focusing the fitness conditioning on all the muscle groups. Step & Punch is an aerobic workout combining basic step movements and the fundamental movements of the boxing aerobic discipline.

(m) Power Yoga/ Body Mind is an exercise class with a mind and body approach to fitness. Emphasis is on maintaining a lower-intensity level during exercises for a longer period of time. This class challenges the body with stretching and strengthening positions and movements.

(n) Pilates / Pilates-Combo is a highly specialised and comprehensive form of exercise. It is a low-stress fitness training method for physical and mental conditioning, designed to work the entire body through a specific set of progressive exercises. (This unique system of exercises was developed at the turn of the century by Joseph Pilates to strengthen and tone muscles, improve posture, provide flexibility and balance and unite body and mind toward the goal of overall fitness.) Modern Pilates programmes can be divided into three categories: Traditional Pilates, Pilates-Method programmes and Pilates-Based programmes. Other Pilates programmes are modified versions of the original method and can include a wide repertoire of hybrid programmes such as the Pilates-Combo classes.

(o) Weight Workout/Strength & Conditioning Aerobic Workout/ Power Pump Workout/ Power-Bar workout is a low-impact, overall body-conditioning class, using aerobic content and various resistance training techniques with free weights, body bars and bar weights to tone and condition muscle groups. The bar weights, combined with steps and mats, provide specific opportunities in the class to work out with added resistance. This type of class appeals to both men and women.

(p) Water Aerobics is very popular with people who love the water and enjoy moving to music. Water aerobics incorporates a variety of movements from both swimming and land aerobics to develop vigorous routines that are aerobic in nature. Water aerobics utilizes the resistance to movement that water creates to elevate heart rates while benefiting from the water's cushioning effect. This is a low-impact workout for individuals who do not enjoy high-impact forms of exercise.

(q) Swimming is a very popular form of regular exercise among adults. Lap swimming is the most effective form of swimming for cardiovascular fitness. When done at a continuous pace within the training heart rate guidelines previously discussed, an excellent workout can be accomplished. Swimming is an activity that is low-impact in nature and can be relatively injury-free if participants utilize proper swimming strokes and do not swim excessively. Swimming is an excellent activity for the development of the cardiorespiratory system since it requires the use of both the arms and legs, unlike other popular activities such as aerobic dance, cycling, and running. Due to water resistance, the amount of energy required to swim a certain distance is greater than that needed to run or walk the same distance (Miller & Alien, 1995). A second strong advantage of swimming is that it is a non-weight bearing activity. For this reason, swimmers can swim for long periods of time without risk of injury, unlike runners who develop shin splints and stress fractures from putting in too many miles. Because swimming is non-weight bearing, it is also a good activity for the overweight, arthritic, injured and those who are prone to joint problems (Miller Kamp; Alien, 1995).

(r) Stationary Cycling/ Outdoors Bicycling Stationary cycling or bicycling are excellent forms of aerobic exercise when done continuously. In the controlled setting of stationary cycling a more consistent and efficient workout can normally be performed in comparison to bicycling outdoors. However, many people find stationary cycling for long periods of time to be boring and unmotivating. Boredom can be alleviated if one reads or watches television while cycling indoors. It is important however, that individuals continuously monitor heart rate in either case in order to maintain an appropriate intensity level for cardiovascular fitness. Bicycling outdoors is a more exciting form of aerobic exercise and can be much more enjoyable than is stationary cycling. Individuals cycling outdoors need to follow a number of safety precautions when they ride. For example, helmets should be worn and lights and reflectors should be employed when riding after dusk. Cyclists should find routes that will allow them plenty of shoulder area on the road and that are not in high traffic areas. Finally, it is a good idea to have a buddy to bike with in case of an accident. By maintaining a steady pace and pedaling continuously, cyclists can enjoy a good aerobic workout. Although cycling can provide health benefits, many cyclists view cycling more as pleasure than as healthy exercise. As a result, they do not pedal fast enough to raise their heart rates to a level necessary for cardiovascular benefits.

(s) Jumping Rope: Jumping rope can be a great aerobic workout as long as it is performed at a slow to moderate pace and is done continuously for a relatively long period of time (15 minutes). Because it is a rather strenuous activity it is not a recommended activity for beginners. Jumping rope can be made interesting if a variety of jump steps are incorporated into the jumping routine or if it is incorporated within an aerobic dance or exercise routine.

The basic technique for jumping rope entails holding the ends of the rope at waist level with the hands pointed away from the body and the elbows close to the body. The forearms move in a tight circular motion while the wrists rotate allowing for a tight consistent rope spin. The jump should be performed by pushing off the toes while jumping just high enough for the rope to pass under the feet.

(t) Other Aerobic Activities---ball game: There are many other activities that can be aerobic in nature and can lead to cardiovascular fitness. An activity such as cross country skiing, however, requires the appropriate geographical location and expensive equipment. Some sports and games can also be aerobic in

nature if all participants are active continuously. Individuals can design their own aerobic activity by putting together continuous exercise utilizing sport movements or dance movements in an organized fashion. Soccer, basketball, and handball are, at their most basic level, a form of running. They combine running with hand-eye or foot-eye coordination skills. Both sports add a slight anaerobic benefit to the aerobic benefits of running, since there is some minor muscular resistance in each sport, such as shooting or kicking the ball.

While we have discussed many aerobic activities there are many more that can be used to develop and maintain cardiovascular fitness. Individuals should try a variety of aerobic activities to find an activity they like best and that best suits their needs and abilities. If an individual likes to exercise alone then jogging or swimming may be best; however, if one likes to workout with a group and needs someone directing them then aerobic dance or water aerobics might be their activity.

NUTRITIONS AND HEALTH

Six types of nutrients

Essential nutrients are nutrients that cannot be made in the body and therefore, must be supplied by what we eat and drink. These nutrients are carbohydrates, fats, protein, vitamins, minerals and water.

Carbohydrates, fats and protein are the energy yielding nutritions.

Carbohydrates break down and are formed into glucose; Fat called triglycerides, break down to fatty acid; Protein breaks down into amino acids. These tiny particles (glucose, fatty acids, and amino acids) are absored into the bloodstream and transported to the cells.

To establish the four components of a healthy food intake: Hydration, Variety, Balance, and Moderation:

Hydration: Water is one of the most important nutrients required by the body and make up 65% of the body weight. It plays a key role in the body's energy needs, temperature control, and elimination of waste products. Dehydration occurs when levels of water in the body decrease below the normal levels. This can occur in a short period of time, especially during exercise in hot weather.

Variety: No single food supplies all the nutrients you need. A varied diet includes many different foods from the Pyramid's five major food groups which together meet nutritional recommendations.

Balance: A balanced diet incorporates appropriate amounts of foods from all five food groups every day, providing needed calories and nutrients. Age, sex and physical activity levels make a difference in the number of servings needed to maintain a well-balanced diet.

Moderation: Carefully selecting foods and beverages helps control calories and the total amount of fat, saturated fat, cholesterol, salt, sugars and, if consumed, alcoholic beverages. This allows more flexibility to enjoy the variety of foods available.

Pyramid of Food:

The tools used to reduce calories intake and improve the overall quality of food intake: U.S. the HW4L Food Guide Pyramid,

1. Eat a variety of foods.
2. Maintain healthy weight.
3. Choose a diet low in fat, saturated fat and cholesterol.

4. Choose a diet with plenty of vegetables, fruits and grain products.
5. Use sugars only in moderation.
6. Use salt and sodium only in moderation.
7. If you drink alcoholic beverages, do so in moderation.

Additional objectives:

To learn how to read labels for better health.

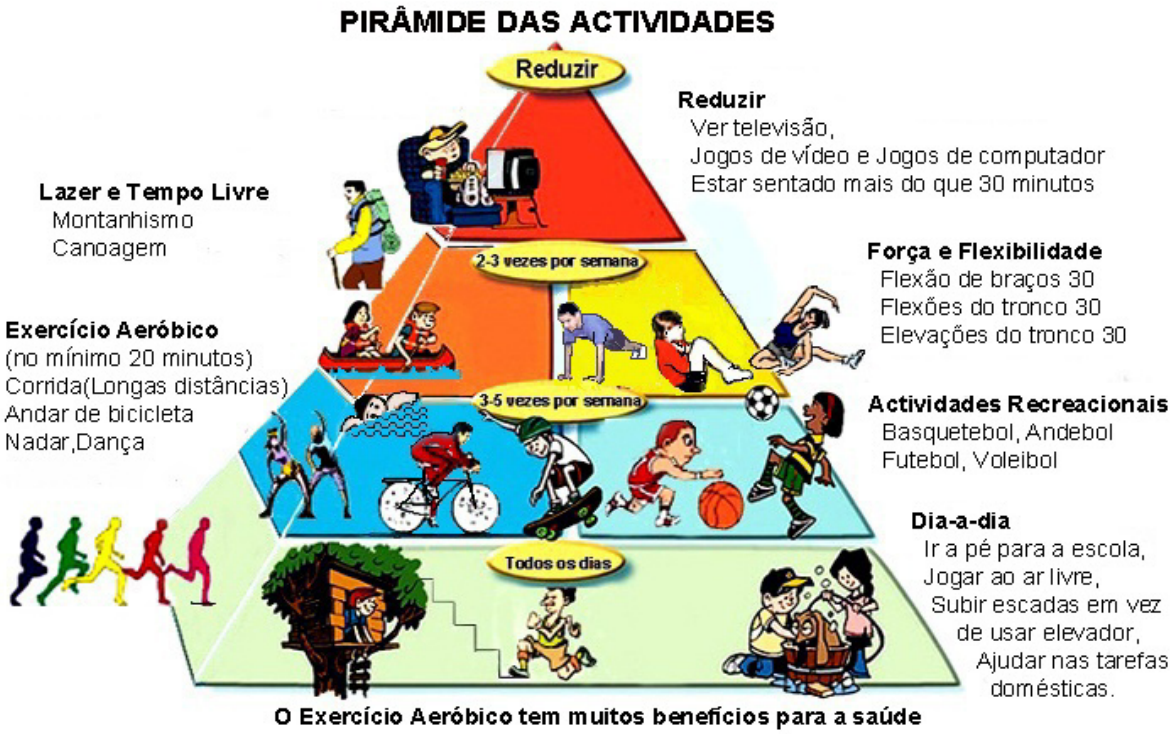
To understand the functions of water in body, how to increase fluid intake, and how to determine hydration.

To understand the negative health consequences of fad diets, specially, high protein, low carbohydrate diet

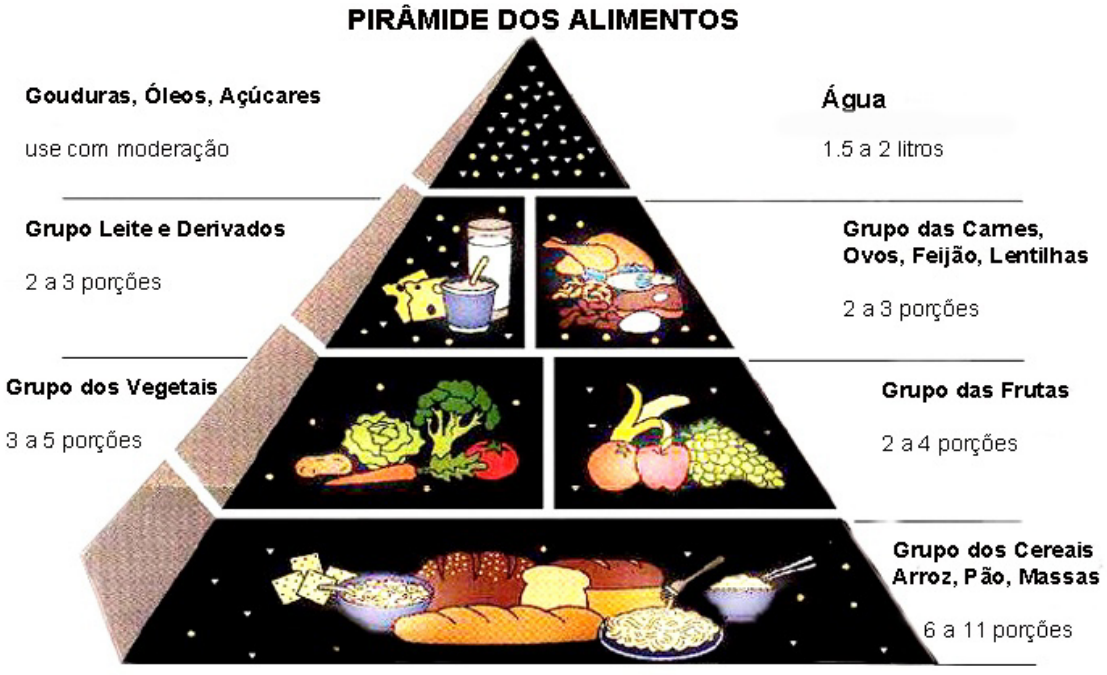
Promoting Healthy Lifestyles and Improving Health in the School Setting:

Schools have the opportunity to promote healthy lifestyles and prevent obesity through a team approach. The health- promoting school team includes but is not limited to the school board, school administrators, school nurses, food service staff, classroom teachers, physical education teachers, health educators, students and their families, and health professionals from the community. The school health team conveys consistent messages, models appropriate behavior and works cooperatively to promote health and prevent obesity. School nutrition services comprised of school lunch and nutrition education teaches by example and providing information to promote making healthy food selections. A quality physical education program promotes positive attitudes towards vigorous activity, improves health, develops leadership and teamwork skills and enriches quality of life. Physical education also contributes to cognitive, psychomotor, and emotional domains of learning. Lifelong participation in physical activity may be encouraged through positive experiences in physical education.

Appendix-18 Exercise and Food Pyramid- recommendations to children and parents



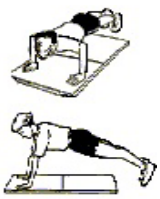
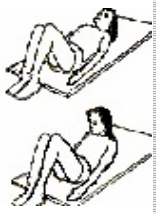
Source: Adapted from Corbin & Lindsey (2002)



Source: US Diet association

Appendix -19 The sample of FITNESSGRAM test result to the children

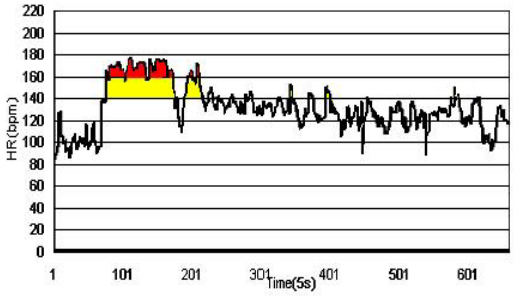
PADRÃO DOS TESTES (FITNESSGRAM) PARA A SAÚDE

		1609 metros	Soma de tricípite e barriga da perna	Flexões do tronco	Flexão de braços	Elevações do tronco	Flexão de tronco
							
Rapaz	11	<11.0 minutos	12mm< ΣSKF <32mm	>15	>8	>23cm	>20.5cm
	12	<10.5 minutos		>18	>10		
	13	<10.0 minutos		>21	>12		
	14	< 9.5 minutos		>24	>14		
	15	< 9.0 minutos		>24	>16		
	16	< 8.5 minutos		>24	>18		
Rapariga	11	<11.0 minutos	20mm< ΣSKF <47mm	>7	>15	>23cm	>25.4cm
	12	<10.5 minutos			>18		>25.4cm
	13	<10.0 minutos			>18		>25.4cm
	14	< 9.5 minutos			>18		>25.4cm
	15	< 9.0 minutos			>18		>30.5cm
	16	< 8.5 minutos			>18		>30.5cm
Eu							

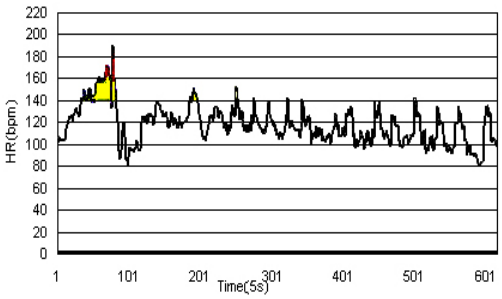
Indice de Massa Corporal (IMC)	IMC **(Rapaz)**	IMC(**Rapariga**)
11 anos	21.0>IMC>15.8	24.0>IMC>16.9
12 anos	22.0>IMC>16.0	24.5>IMC>16.9
13 anos	23.0>IMC>16.6	24.5>IMC>17.5
14 anos	24.5>IMC>17.5	25.0>IMC>17.5
15 anos	25.0>IMC>18.1	25.0>IMC>17.5
16 anos	26.5>IMC>18.5	25.0>IMC>17.5

Appendix 20 Heart Rate curves in school physical education classes

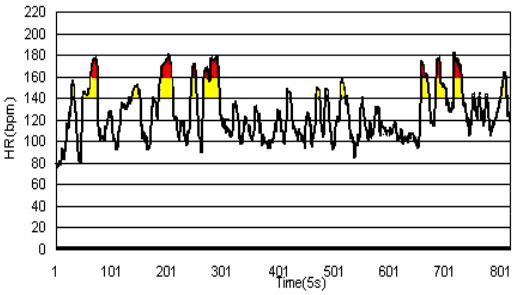
Traditional school physical education (Gymnastics)---One is practising, others are being asked to sit and watch



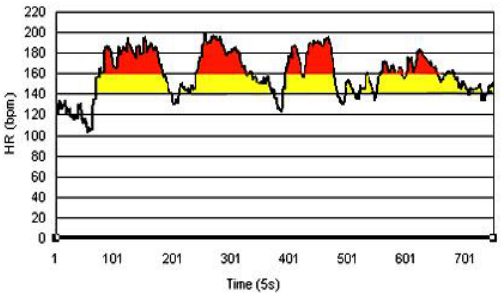
Traditional school physical education (Gymnastics) ---One practise, others stand!!!



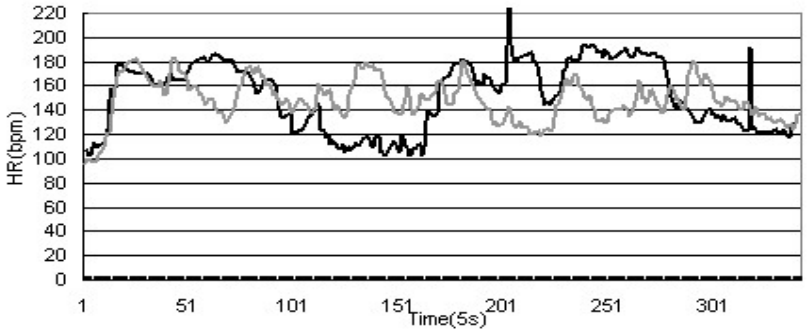
Traditional school physical education (Handball) ---Waiting just for one shot



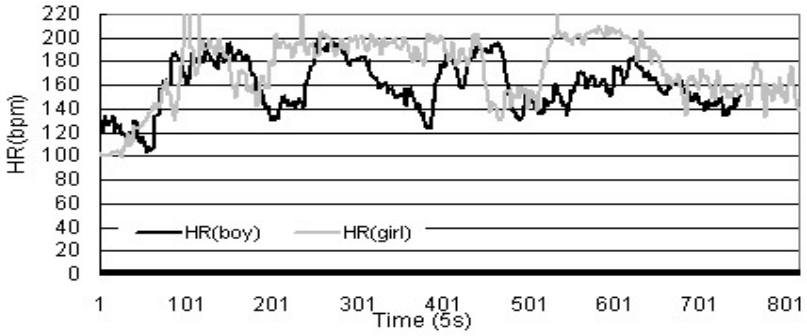
Aerobic exercise model (Low impact and high impact) --- Everyone is in exercising



Comparing the HRs of 13yr boy (1.46m/43kg) and 12yr girl (1.53m/57kg) in co-educated 45-min-PE class of football at 800-m^2 indoor playground.



Comparing the HRs of 14yr boy (1.76m/59kg) and 13yr girl (1.49m/44kg) in co-educated 90-min-PE class of football at 800-m^2 indoor playground.



Appendix-21 Comparing two different model in school physical education classes

Students are not so active during the traditional school physical education classes

t need to take one class to learn the start skill

It need to take another class to learn the relay skill

We don't have enough playground

We don't have enough mats for everybody

How much we like to play!

I have no patient to wait

We are writing and talking in PE class because of wrong suits

Finally, it is my turn

It is time to wait, let's sit and talk

Students use every minute to be physically active in aerobic exercise model

Aerobic Exercise (High-Impact)

Aerobic Exercise (Low-Impact)

Floor exercise for the triceps

Floor exercise for chest and arms

Resistance exercise

Running under the music

Group Aerobic Exercise

Intervention also include anaerobic exercise