



Sensei Cal and June Moore

Forward

This program has been researched and presented by Sensei Cal Moore. Sensei Moore has spent a lifetime studying Karate Do and incorporating Sport Science into Karate Dojo training. Through his knowledge and leadership, he has developed many National Karate Champions, and at the same time developed and nurtured the spirit of the youth in his Crescent Beach Karate dojo.

On a personal level, Sensei Cal has graciously spent his time and energy working for the betterment of athletes across British Columbia. He volunteers many hours into organizing and participating in events sanctioned by Karate B.C, and has been an active coach and referee in tournaments for a number of years. He has personally helped me develop my curriculum and spent numerous hours guiding me through the often complex world of sport science. I have always appreciated his patience, words of encouragement, and friendship during the past couple of years.

Although this is not a complete work, the information provided ahead provides a comprehensive look at Sport Karate and the stages of development. The decision to pass this work to others has been made easy by Sensei Moore's desire to share information and enhance the profile of Karate Do to the community.

The work and research that Sensei Moore has contributed is a great addition to anyone interested in researching Karate Do for sport purposes.

Despite the wonderful work that has been produced, I know there are countless students, fellow instructors and friends who admire the integrity, work ethic and spirit that Sensei Moore has demonstrated throughout his Karate teaching career. On behalf of these people, I would like to say Thank You for your contribution, and your support guidance will always be appreciated.

Sincerely,

Sandeep Gill
August 10, 2007

Karate Fitness Program

Introduction:

The purpose of this programme is to lay the groundwork for karate instructors to implement a fitness programme with their athletes. This programme clearly identifies stages of development and outlines specific routines suitable for athletes of that age. The Stages of Development are:

1. FUNdamental
2. Learning to train
3. Training to train
4. Training to compete
5. Training to perform
6. Training to win

Using the programme

Fitness test:

This develops a base line for further testing and identifies areas of concern. All participants in a fitness programme should undergo a fitness test. The tests outlined here were chosen specifically for karate. Norms have been provided in appendix A to provide a source of comparison.

Stages of development:

Identify the appropriate stage based on the ages of the athletes. Carefully read the recommendations for that stage including the number of hours of training.

Exercises:

Choose the exercises that are appropriate to your athlete's stage of development. Exercises can be found at the end of each stage of development section in this manual.

On Going Assessments:

Re-test your athletes on an ongoing basis in order to assess their progress and adapt their programme to meet their changing needs.

Testing protocol for ages 5-9

Anthropometric Measurement Tests

Height Measurement

The subject stands straight facing the evaluator. The measurement must be done without footwear. Attach a tape measure to a wall and assure that zero is at floor level. The subject must rest head and back against the tape measure. Once placed correctly, the subject must breathe into a maximum capacity while stretching the neck upwards (keeping the head straight and parallel to the ground). As the subject holds their breath, gently place a square on top of their head and against the tape. The measurement is taken directly under the base of the square.

Weight Measurement

The subjects weight is taken in Kg's. The desired precision is +/- 0.1 Kg. The weight must be taken without footwear and with light clothing.

Dominant Hand Identification

Ask the subject to sign their name or throw a ball; the dominant hand is obvious.

Dominant Eye Identification

Use a sheet of paper 8 1/2 X 11. Make a hole in the centre with a pencil. The subject holds the paper at arms length with both hands. The subject must focus on a distant object through the hole. The subject slowly brings the paper towards their face. The dominant eye will be the one that continues to look through the hole from start to finish.

Motor Skills Measurement Tests

Skipping rope with feet together (Co-ordination)

The child skips for 30 seconds; the total number of jumps is counted. This test is performed twice, with a 30 second rest between each set. The best score for the two attempts is recorded.

Clover leaf (Agility)

Five cones are placed in a 3 meter square, one on each corner and one in the centre. The subject starts at one corner and runs around the centre cone to the next corner, round this corner cone and again round the centre. This process is continued for three laps. Two attempts are given the best time is recorded.

Dribble-Slalom-Soccer (Eye-foot co-ordination)

Six cones are placed in a straight line two meters apart for a total of 10 meters. The child starts at one end and dribbles a soccer ball between the cones to the last cone and then returns through the cones again to the starting position. Two attempts are permitted. The best time is recorded.

Flexibility Test (Sit and reach)

The athlete is seated with knees extended and legs flat on the floor without shoes, (knees are held to make sure they do not come off the floor). The athlete leans forward with arms extended and we measure the distance from the fingertips to the toes. It is best to use a stretch box for this test as it keeps the feet at right angles to the floor. The stretch should be held for two seconds with no bouncing. If the participant reaches past the toes the measurement is recorded as a positive score; if the participant cannot reach their toes the measurement is recorded as a negative score. A subject who reaches exactly to the toes is recorded as a 0. The subject has two tries; the best score is recorded.

Testing Protocol 10-21

Anthropometric Measurement Tests

Height Measurement

The subject stands straight facing the evaluator. The measurement must be done without footwear. Attach a tape measure to a wall and assure that zero is at floor level. The subject must rest head and back against the tape measure. Once placed correctly, the subject must breathe into a maximum capacity while stretching the neck upwards (keeping the head straight and parallel to the ground). As the subject holds their breath, gently place a square on top of their head and against the tape. The measurement is taken directly under the base of the square.

Weight Measurement

The subject's weight is taken in Kg's. The desired precision is +/- 0.1 Kg. The weight must be taken without footwear and with light clothing.

Dominant Hand Identification

Ask the subject to sign their name or throw a ball; the dominant hand is obvious.

Dominant Eye Identification

Use a sheet of paper 8 1/2 X 11. Make a hole in the centre with a pencil. The subject holds the paper at arms length with both hands. The subject must focus on a distant object through the hole. The subject slowly brings the paper towards their face. The dominant eye will be the one that continues to look through the hole from start to finish.

Motor Skills Measurement Tests

Multi-Bounds (To measure leg power and body co-ordination)

From a starting line the subject jumps feet together five times in succession. The distance is measured from the starting line to the heel in the last jump. Each athlete gets three tries. The best effort is recorded.

Vertical Jump (leg power)

Attach a tape measure to the wall. Have the athlete stand sideways to the wall with the closest arm extended. Ask the athlete to touch the wall as high as possible (without overstretching), mark the spot. Instruct the athlete to jump legs together (without a running start), reaching as high as possible on the tape measure. The athlete may bend their knees, but may not take a step. The difference between the standing reach and the highest point of the jump is the athletes score. Each athlete gets three tries. Measurements are expressed in centimeters.

Clover leaf (Agility)

Five cones are placed in a 3meter square, one on each corner and one in the centre. The subject starts at one corner and runs around the centre cone to the next corner, round this corner cone and again round the centre. This process is continued for three laps. Two attempts are given the best time is recorded.

Hand Claps (explosive arm power)

From a push-up position the athlete pushes lifting there torso off the ground and clapping their hands. The number of claps in one minute is counted. If the subject cannot do a handclap in the full pushup position they may do the test from the knee pushup position. This should be noted on the report sheet.

Skipping Test (total body co-ordination)

The total number of "skips" an athlete completes in one minute is counted. Each athlete gets one try. If they miss a jump they resume and continue to the end of one minute.

Shuttle Run or Beep Test (aerobic ability)

This test determines the maximum aerobic endurance of a student. The test was developed in 1982 by Leger.

Flexibility Test (Sit and reach)

The athlete is seated with knees extended and legs flat on the floor without shoes, (knees are held to make sure they do not come off the floor). The athlete leans forward with arms extended

and we measure the distance from the fingertips to the toes. It is best to use a stretch box for this test as it keeps the feet at right angles to the floor. The stretch should be held for two seconds with no bouncing. If the participant reaches past the toes the measurement is recorded as a positive score; if the participant cannot reach their toes the measurement is recorded as a negative score. A subject who reaches exactly to the toes is recorded as a 0. The subject has two tries; the best score is recorded.

Bracing with posterior tilt (core strength-endurance)

The athlete starts face down with their legs completely extended. From their toes, with forearms propped and the elbows located under the shoulder joint, the athlete elevates their body into a straight line. This position is held as long as possible. If the athlete cannot maintain a straight line (pelvis going too low or too high), a warning is given and the position must be immediately corrected. At the second warning the test is stopped. Each athlete gets one try. Scores are expressed in seconds.

FUNdamental STAGE

Chronological Age: Females 6-8, Males 6-9

- FUNdamental movements and skills should be introduced through fun and games.
- FUNdamental sports skills should follow and include basic overall sports skills.
 - FUNdamental movement and sport skills = Physical Literacy.
 - Physical Literacy refers to competency in movement and sport skills.
 - Physical Literacy should be developed before the onset of the adolescent growth spurt. (LTAD 2005)
- ABC`s of Athleticism: Agility, Balance, Co-ordination and Speed.
- ABC`s of Athletics: Running, Cart-Wheels, Jumping and Throwing.
- Sports: Swimming, Soccer, Gymnastics, Skating and Throwing Sports (especially for girls).
- **It is important that children should play a variety of sports that help them develop a basic skill base for karate.**
- **It is very important at this stage to do the activity often but for a short period of time.**
- **Physical Activity:**
 - **Year 1: 6 one hour sessions per week.**
 - **Year 2: 6-7 one to one and a quarter hour sessions per week.**
 - **Year 3: 6-7 one to one and a half hour sessions per week.**

Proposal

	Year 1	Year 2	Year 3
Female	6 years	7 years	8 years
Male	6 -7 years	7-8 years	8-9 years
Karate	3-4 hrs/week	4-5 hrs/week	5-6 hrs/week
Other sports & PE	1.5 hrs/week	1.5 hrs/week	2 hrs/week
Co-ordination	3 X 20 m/week	3-4 X 20 m/week	4 X 20 m/week
Speed	3 X 10 m/week	3 X 15 m/week	3 X 15 m/week
Flexibility	3 X 10 m/week	3 X 10 m/week	3 X 10 m/week
Total	6.5-7 hrs/Week	7.5-8.5 hrs/week	9-10 hrs/week
Parent's responsibility	Coach's responsibility		

FUNdamental fitness guidelines

Performance Factors

Speed:

This is a critical window of accelerated adoption to speed training (efforts of 8 seconds or less). Peak Speed Velocity (PSPV): includes linear, lateral, multi directional speed, change of direction, agility and segmental speed (i.e. the speed of the arm or foot). Quality of movement is vital. The volume and duration of training should be kept low. Activity is less than 5 seconds. Recovery time vital: work/rest ratio of 1:5. Games and sports will help to develop speed.

Strength-endurance:

Strength gains during pre-adolescence are possible. Strength gains before puberty occur through improvements in motor coordination and through morphological and neurological adaptations (Blimki and Marion 1994). Exercise and increased muscle activation will also increase strength. References: Balyi, ITF.

Flexibility:

Introduction to the basics of flexibility training; this should be done through enjoyable games. Flexibility training should be done four to six times per week if flexibility needs to be improved. References: Balyi

Aerobic Endurance: (sub-maximal efforts)

At this stage the “trainability” of the aerobic system is good. Aerobic training should be in the form of games with an aerobic component. Young athletes usually have a short attention span, so a variety of games presented one after the other is ideal. Aerobic games in and out of the dojo should be emphasized. References: Balyi

ABC: (agility, balance and coordination)

ABC – to teach students the basic skills with quality movements: running, jumping, skipping and throwing, catching, bouncing, sliding, kicking, striking and climbing. Coordination – simple, leading to more complex. Balance, rhythm, bi-lateral, space and time. References: Balyi, ITF, Gonzalez. Ochoa.

Recovery:

Hydration – teach children to take fluid regularly, before during and after practice. Nutrition – to develop sound nutritional habits with an emphasis on food selection and mealtimes. References: LTA, Angela Calder.

FUNdamental Fitness Exercise Suggestions

Female: 6-7-8 Male: 6-7-8-9 (unless otherwise indicated)

Exercise 1: Running. The purpose is to develop basic running skills

- Running in a straight line, nice and steady.
- Running in a straight line without using your arms (the body is not stiff).
- Running in a straight line with swinging straight arms.
- Running in a straight line legs crossing with each step.
- Side stepping to the right several paces then sidestepping to the left.
- Running backwards.
- Running relays.

Equipment: None

Duration: 10 – 15 Minutes Efforts: Less than 5seconds Ratio: 1/5

Exercise 2: Skipping without skipping rope.

The purpose is to develop footwork, rhythm and balance.

- Skipping nice and steady.
- Skipping without using your arms (body is not stiff).
- Skipping and really using your arms.
- Skipping using your arms but not raising your knees very high.
- Skipping really lifting your knees high.
- Skipping with your back straight. Lifting your arms and trying to go very high.
- Skipping sideways.
- Skipping sideways following rhythm variations.
- Skipping sideways with body nice and tall.
- Skipping sideways and turning 180 degrees every three steps.
- Skipping sideways and clapping your hands over your head.
- Skipping sideways and clapping hands over head turning 180 degrees every three steps.

Equipment: None

Duration: 5 - 10 minutes Efforts: Less than 5-7 seconds Ratio 1/4

Exercise 3: Skipping rope. Purpose is to develop leg strength, coordination, rhythm. Balance and aerobic endurance

- Skipping nice and steady for 25 to 100 reps forward rope action.
- Skipping nice and steady for 25 to 100 reps backward rope action.

Equipment: Skipping rope.

Duration: 2 – 5 minutes Efforts: 25 to 100 reps.

Exercise 4: Bouncing Balls against Wall. Purpose is to develop hand speed, physical rhythm and spatial awareness

- Using two tennis balls against a wall, keeping a rhythm.
- Using two ping-pong balls against a wall keeping a rhythm.
- As skill is acquired more balls can be added.

Equipment: tennis balls and ping-pong balls.

Duration: 5-10 minutes. Efforts 30 seconds Ratio: 1/2

Exercise 5: Strength and support. Purpose is to develop basic strength and body control

- Wiggly worms.
- Big steps.
- Side steps.
- Walking hips twists backward.
- Calf springs.
- Split jumps and hop scotch.
- Split jump combinations and split jump crossovers.
- Crab walking, crawling.
- Working with Swiss balls and medicine balls (medicine balls 1Kg. limit).

Equipment: Mats, Swiss balls and medicine balls.

Duration: 5-10 minutes Efforts: less than 10-15 seconds Ratio: 1/5

Exercise 6: Balance. Purpose is to develop balance and functional strength

- Walking forward with arms straight out holding a sand bag or tennis ball in each hand.
- Walking forward the same way step with the left leg and balance on the left leg; then step on the right leg and balance on the right leg.
- Standing on one leg with sand bag or something on top of your head, then switching to the other leg.
- Walking with something on top of your head, making trunk rotations or moving arms.
- Walking on a balance beam (use a 2 X 4 as a beam).
- Walking balance beam with something on top of your head.
- Hold an arabesque on one foot.
- Fast run towards end of mat and stop before the end.
- Working with wobble boards, medicine balls, Swiss balls and fit discs.

Equipment: Balance beams, swiss balls, sand bags, fit discs and wobble boards.

Duration: 5-10 minutes Efforts: less than 10 seconds. Ratio 1/3

Exercise 7: Throwing and Catching. Object is to develop hand – eye coordination and spatial awareness.

- Two students facing each other, throwing and making 10 catches each.
- Catching 10 passes with the right hand and 10 with the left hand.
- Two students facing each other running sideways throwing and catching on the move.
- Two students facing each other throwing and catching on the move with one hand behind the back.
- Moving along a wall, throwing and catching the ball off the wall.
- Throwing the ball to the wall, turning and catching after one or no bounces.

Equipment: Different balls

Duration: 5 – 10 minutes Efforts: less than ten seconds. Ratio: 1/5

Exercise 8: Jumping Purpose is to develop basic strength.

- Two leg jumps. (High, long, sideways etc.)
- One leg hops right and left.
- Hop step then stop.
- Clock jumps.

Duration: 5- 10 minutes Efforts: less than 5 – 7 seconds Ratio: 1/5

Exercise 9: Agility. Purpose is to develop footwork, leg speed and ability to change direction.

- Running forward and backward around a cone.
- Running sideways around a cone.
- Running forward and backward around two cones making a figure of eight.
- Running sideways around two cones making a figure of eight.
- Using a hoop, moving around it half way, changing direction many times.
- Slalom courses.

Equipment: hoops, cones mine hurdles etc.

Duration 5 – 10 minutes Efforts: less than 10- 15 seconds Ratio: 1/4

Exercise 10: Reaction. Purpose is to develop reaction time and coordination.

- Speed bag, using various rhythms.
- Double ended bag.
- Punching a swinging ball on a cord.
- Dodging light-foam balls thrown from various distances.
- Punching a tennis ball dropped from various heights.

Equipment: speed bag, double ended bag, light-foam balls, tennis balls and balls on a cord.

Efforts: less than 15 seconds. Ratio 1/4

Exercise 11: Kicking. Purpose is to develop general coordination

- Kicking different ball sizes with right foot.
- Kicking different ball sizes with left foot.
- Keeping a ball in the air with your feet without letting it touch the ground.
- Keeping a hackey sack in the air with your feet.

Equipment: Soccer balls, balls of different sizes and hackey sacks.

Duration: 5 – 10 minutes. Efforts: less than 15 seconds Ratio: ¼

Exercise 12: Orientation. The purpose is to develop spatial awareness.

- Working with balloons hands only.
- Working with balloons feet only.
- Working with balloons feet and hands.

Equipment: balloons.

Efforts: less than 15 seconds

Ratio: ¼

Exercise 13: Various Sports and Games. Games develop speed and agility, decision making ability, strength, balance and aerobic endurance.

- Short sprint competitions.
- Tag.
- Donkey's tail (plucking a ribbon from belt).
- Team relay, sprinting, crawling, etc.
- Games using different balls.
- Games using Swiss balls.
- Obstacles course competitions.

Equipment: balls of various sizes. Duration 5 -30 minutes

Exercise 14: Flexibility. The purpose is to develop individual and sport-specific flexibility.

- Dynamic flexibility exercises are preferable during a karate class warm-up. (Leg and arm swings, body twists etc.)
- Static stretching is best done in a separate specific session if there are problems to be addressed.
- Some games provide excellent flexibility training.

Equipment: Use your imagination.

Duration: 5 – 10 minutes

Efforts: less than 10 seconds

Ratio: 1/3



FUNdamental Event preparation!

Learning to train Stage **Chronological Age: Females 8 – 11, Males 9 - 12**

This is a major motor learning stage. One of the most important periods of motor learning for children is between the ages of eight to twelve. (Balyi and Hamilton, 1996; Rushall, 1998; Viru et al.....1998)

The fundamental skills described earlier should be taken to a higher level at this stage. Basic karate skills should be mastered, but participation in other sports is still encouraged.

Young athletes at this stage learn how to train. The main emphasis is on mastery of basic sport-specific skills. This is a reason to devote a larger amount of time to training rather than competition.

If the fundamental motor skills are not developed between the ages of eight to twelve, skills cannot be fully recaptured at a later time although carefully planned and early remedial programs can contribute with limited success. (Balyi, 2001a; Rushall, 1998)

Training: 70% competition: 30%. (Balyi)

7 – 9 sessions of 1 – 2 hours. Maximum length of session duration is 2 hours.

Proposal

	Year 4	Year 5	Year 6
Female	8 – 9 years	9 – 10 years	10 – 11 years
Male	9 – 10 years	10 – 11 years	11 – 12 years
Karate	8 – 10 hours	10 – 12 hours	12 – 13 hours
Other sports & PE	2 hours	2 hours	2 hours
Co-ordination	4 X 25 minutes	4 X 25 minutes	4 X 20 minutes
Speed	3 X 15 minutes	2 X 15 minutes	2 X 15 minutes
Flexibility	5 X 10 minutes	5 X 15 minutes	5 X 15 minutes
Strength	1 X 15 minutes	2 X 15 minutes	3 X 15 minutes
Endurance	1 X 15 minutes	2 X 15 minutes	3 X 15 minutes
Total	14 – 16 hours	16 – 18 hours	18 – 19 hours
Parent's responsibility	Coaches Responsibility		

Learning to train fitness exercise guidelines

Performance factors

Speed: In this stage emphasize: Reaction speed, speed of coordination, linear/multi directional speed, acceleration, short sprints, agility, specific karate drills and segmental speed.

Activity is less than 8 seconds. Recovery time vital work/rest ration of 1:5.

Strength-endurance: Strength-endurance is developed through: partner, own body weight, 200-500 gr. balls, 1-2 kg medicine balls and rubber band exercises.

Core stability is introduced during this stage.

Explosive-strength: Games and sports should be used to develop explosive-strength. Heavy-bag work can be used as well as all out short sprints.

Flexibility: The introduction of stretching in warm up should be through dynamic flexibility. It is important that this becomes a part of their regular routine. Static or passive flexibility should be added at the end of the training session, or better still in a separate session.

Aerobic endurance: Aerobic games in and outside the dojo should be emphasized. Aerobic training should be in the form of different sports, games and relays. Aerobic stamina should be introduced with moderation through the cool-down at the end of workouts.

ABC: (agility, balance and coordination) the basic skills of: running, jumping, throwing, skipping, kicking and striking should be taken to a higher level with quality movements. Coordination drills should become more complex and include both static and dynamic movements as well as specific footwork.

Recovery: Hydration – teach children to take fluid regularly before, during and after practice. Nutrition – inform children about food and mealtimes, which will help them train better. Cool-down is introduced at the end of workouts.

The following exercises are intended for females 8 -11 years and males 9 -12 years; unless otherwise stated.

Warm – up

Purpose: To increase body temperature, prime the cardiovascular system and get the heart and lungs ready to engage in vigorous activity, to improve joint range, to help to ingrain proper movement patterns and to wake up the nervous system.

- Five minutes of jogging or skipping, focus on change of direction.
- Five minutes of free sparring, with no contact.
- Five minutes of dynamic stretching, like arm and leg swings, lunges and trunk twists etc.

Equipment: skipping ropes

Speed and agility

Exercise 1: Ball drops. The purpose is to develop reaction speed, starting ability and agility.

- The instructor stands in front of the student with one ball in each hand arms extended to the side. The instructor drops either one of the balls and you try to catch the ball before it bounces a second time. The instructor should vary the starting positions with reference to the student.

Equipment: Use different balls to get different types of bounces.

Sets/reps/rest: 2 to 3 sets of 6 to 10 reps. Rest: 90 sec. between sets.

Exercise 2: The ball and the wall. The purpose is to develop reaction speed, starting ability and agility.

- The student faces a wall and instructor or partner stands behind. The distance to the wall will vary depending on the student's skill level. Start at three meters and move closer as the students skill level improves.
- The instructor throws the ball against the wall and the student has to catch it before the second bounce.
- The student stands back facing the wall with a ball in hand. Using an underhanded position the ball is thrown against the wall. As soon as the ball is thrown the student must turn and catch the ball without bounce.

Equipment: Tennis balls.

Sets/reps/ rest: 2 to 3 sets of 6 to 10 reps. Rest: 90 sec. between sets.

Exercise 3: The ball and the partner. The purpose is to develop reaction speed and agility.

- Student and partner face each other. Start six meters apart. The student is in fighting position. The partner throws the ball at the students head. The student blocks or punches the ball.
- The distance apart can vary according to ability.
- The partner throws the ball and dictates which hand should block or punch.

Equipment: very soft rubber balls.

Sets/reps/rest: 2 to 3 sets of 6 to 10 reps. Rest: 60 sec. between sets.

Exercise 4: Sprint duel. The purpose is to develop reaction speed and starting ability.

Set-up: Competition mat or two lines ten meters apart.

- Two students face each other one meter apart. Student A has his back to the opposite edge of the mat, one meter in from student B, who is at the edge of the mat. Student A initiates a sprint to the other side of the mat. Student A should reach the other side of the mat before student B touches him.
- The same as above except that student B initiates the sprint.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 90 sec. between sets and 30 sec. between reps.

Exercise 5: Ball drop catches. The purpose is to develop segmental speed reaction and hand eye coordination.

- Stand facing your instructor or partner. The instructor should hold both arms straight in front of his body, with a ball in each hand. With hands to your head keep eyes inline with the balls. As the instructor drops a ball (randomly rather than alternately), try to catch it before it bounces,
- As a progression, the instructor drops both balls and you must catch both before they bounce.

Equipment: Tennis balls.

Sets/reps/rest: 2 to 3 sets of 6 to 10 reps. Rest: 30 sec. between sets.

Exercise 6: Agility ladder. The purpose is to develop agility, balance and basic strength.

- Running through the ladder with one foot in each space.
- One foot hops, right and left, changing sequences.
- Side shuffle.
- Cross over.
- Two feet in and out.
- Running through the ladder with two steps in each space.
- **Precision first and speed second (very important).**

Sets/reps/rest: 2 to 3 sets of 3 to 5 exercises Rest: 20 sec. between reps and 60 to 90 sec. between sets.

Exercise 7: Mini-hurdle races. The purpose is to improve running technique, to make students aware of the importance of pelvis positioning in order to clear the hurdles and to improve the action of the foot on the ground.

- Over a 10 to 15 meters distance, place small cones, then medium cones and finally low hurdles in succession.
- Leave a space of 0.5 to 1 meter between the cones or hurdles depending on the student's height and level of difficulty.
- Use different situations going forward, backward, sideways, etc.

Equipment: small soft cones and hurdles of various heights.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 20 – 30 sec. for reps and 90 sec. for sets.

Exercise 8: Agility courses. The purpose is to improve running technique, ability to change direction and speed.

- Over 10 to 15 meters distance, place small cones hoops or low hurdles to make different course designs,
- Organize different situations working shuffle steps, running around cones, changing rhythm, etc.

Equipment: small cones hoops and low hurdles.

Sets/reps/rest: 2 to 3 sets 4 to 5 reps. Rest: 20 to 30 sec. for reps and 90 sec. for sets.

Strength

Exercise 1: The purpose is to develop core strength.

- Lying on the stomach on a mat with the legs completely extended on your toes with forearms propped with the elbows located under the shoulder joint. Hold the position.

Sets/reps/rest: 1 to 3 sets of 10 to 90 sec: Rest 30 to 90 sec. between sets.

Exercise 2: The purpose is to develop core strength.

- Lying on the side one leg on top of the other. One arm is propped up, with the elbow located under the shoulder joint. From this position, slowly press into the mat on the forearm and at the same time, keep the body stiff. Hold the position then switch side.

Sets/reps/rest: 1 to 3 sets of 10 to 30 sec. Rest: 30 to 90 sec. between sets.

Exercise 3: Bracing with anterior tilt (superman). The purpose is to develop core strength.

- Lying on your stomach with arms full extended overhead. Lift both arms and legs simultaneously. Hold this position for 1 to 5 sec. and return to starting position.

Sets/reps/rest: 1 to 3 sets of 5 to 10 reps of 1 to 5 sec. Rest: 30 to 120 sec. between sets.

Exercise 4: Bracing (Shoulder/Upper Body). The purpose is to develop core strength.

- Lying supine with outstretched legs and with forearms propped. Slowly lift the body off the mat with the forearms. Keep the body straight. Hold this position.
- Progression is lifting one leg then the other from the floor.

Sets/reps/rest: 1 to 3 sets of 10 to 60 sec. Rest: 30 to 120 sec. between sets.

Exercise 5: Chest pass. The purpose is to develop strength in the upper body.

- Two students stand 2 to 3 meters apart. One holds a medicine ball in front of their chest. The student passes the ball to the partner. The partner returns the ball as quickly as possible.

Equipment: Medicine balls from 500g to 1 -2 kg.

Sets/reps/rest: 1 to 3 sets of 6 to 10 reps. Rest: 60 to 90 sec. between sets.

Exercise 6: Overhead toss. The purpose is to develop power in the upper body.

- Two students stand 2 to 3 meters apart. One student holds a medicine ball overhead. The ball is tossed to the partner who returns the ball in the same manner as quickly as possible.

Equipment: Medicine balls from 500g to 1kg.

Sets/reps/rest: 1 to 3 sets of 6 to 10 reps. Rest: 60 to 90 sec. between sets.

Exercise 7: Side throws. The purpose is to develop power in the upper body.

- Stand 2 to 3 meters from your partner, facing sideways. Hold a medicine ball with both hands at shoulder height.
- Throw the ball to your partner using the chest pass technique and a trunk rotation.
- When you receive the ball try to return it to your partner as quickly as possible.

Equipment: Medicine balls from 500g to 1kg.

Sets/reps/rest: 1 to 3 sets of 6 to 10 reps. Rest: 60 to 90 sec, between sets.

Exercise 8: Lunges. The purpose is to develop strength in the lower body and to develop dynamic balance.

- Stand with your feet 20cm apart, with your hands on your hips.
- Take a large step forward and position your body over your front leg. Bend your front knee so it is in line with or slightly in front of the ankle joint and does not project beyond a line drawn up front of your shoe. Return to the starting position by pushing your weight backward and straightening your front leg. Keep your trunk erect during the exercise by looking straight ahead and keeping your chest out. You can do 5 to 6 reps with the same leg then switch or alternate legs.
- As a progression you can use a barbell, dumbbells or medicine balls,

Equipment: Barbells, dumbbells or medicine balls.

Sets/reps/rest: 1 to 2 sets of 5 to 6 reps each side. Rest: 30 to 60 sec. between sets.

Exercise 9: Push-ups. The purpose is to develop upper body strength.

- Hands placed shoulder-width apart with your body in a straight line from your toes to your head.
- Slowly lower yourself down until your upper arm is parallel to the ground. Push yourself forward until the elbows are completely straight and try to round your back outward like a cat. This rounding motion at the end of the push-up is very important as it increases the work by the muscles that stabilize your shoulder blade.

Sets/reps/rest: 1 to 2 sets of 10 to 15 reps. Rest: 60 to 120 sec. between sets.

Other possibilities: Working with Swiss balls, balance boards, rubber bands, partners and other abdominal exercises like crunches and trunk rotations with moderation.

Flexibility

Stretching method 1: Dynamic

- Performed before a match or training to achieve karate specific muscular and neural activation.
- See warm-up.

Stretching method 2: Static

- The optimum time to perform static stretching is either two hours before or two hours after a workout.
- If time is a concern then post exercise is your best option.
- Useful for increasing the range of motion.
- Requires a low level of muscular effort and induces muscular relaxation.
- Some research is advised regarding stretches that are contra-indicated.

Aerobic endurance

Aerobic endurance

- This can be developed through games and sports.
- Karate students should do at minimum some light jogging three times a week for 15 minutes.

Coordination

Exercise 1: Running techniques. The purpose is to develop general balance and coordination.

- Walking straight legs from heel to the toes.
- Walking straight from heel to the toes lifting the other leg up.
- Skipping, power skipping, side skipping.
- High knees, butt kicks, pull – through.
- Drum major, carioca.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 3 to 5 exercises rest: 60 sec. between sets.

Exercise 2: Precision throws. The purpose is to develop spatial and temporal orientation and to develop throwing and catching abilities at different speed levels.

- 2 groups of 3 to 5 students 3 to 5 meters apart, 2 students one on each group are partners.
- The first group is called the throwing group and the second group is called the catching group.
- The student without the throwing ball starts running/sprinting in one direction while his partner must throw the ball in his direction with precision, the running student must catch the ball at different heights when running. After a rotation they switch groups.

Equipment: Different kinds of balls or light objects.

Sets/reps/rest: 2 to 3 sets of 4 to 6 reps. Rest: 90 sec. between sets.

Exercise 3: Agility ladder. The purpose is to develop coordination, balance and agility.

- Side shuffles.
- Carioca using two ladders side by side.
- Side shuffles + dribbling a basketball.
- Use your imagination, an agility task + an upper body task.
- Three ladders side by side can provide an infinite variety of agility, coordination and balance exercises.

Equipment: Agility ladders.

Sets/reps/rest: 2 to 3 sets of 3 to 5 exercises. Rest: 20 to 30 sec. between reps and 60 to 90 sec. between sets.

Exercise 4: Skipping rope. The purpose is to develop general coordination, differentiation, balance strength and aerobic endurance.

- Working every situation possible.
- One foot, two feet, split steps, crossover steps.
- Long steps, short steps, combined long and short steps.
- Going fast and slow, relays, making doubles.
- Going sideways, forward, backward.
- 100 to 300 reps nice and steady, etc.

Equipment: Skipping ropes.

Sets/reps/rest: 3 to 5 sets of 30 to 60 sec. Rest: 60 to 90 sec. between sets.

See the warm-up.

Exercise 5: Hoops To develop rhythm and general coordination.

- The instructor rolls a hoop and the student runs with one foot in and one foot out.
- The students pass a ball to each other through the rolling hoop.

Equipment: Hoops.

Sets/reps/rest: 2 to 3 sets of 3 to 5 reps. Rest: 20 sec. between reps and 60 to 90 sec. between sets.

Sports and games

It is important that students are exposed to other games and sports. Soccer, basketball, hockey, swimming, biking, volleyball, tennis etc. The preceding list is not intended to be exclusive. The purpose is to develop agility, balance and coordination, to develop decision- making ability, to develop bilateralism, to develop aerobic endurance and to develop the ability to recover quickly.

Variations of sports and games can be used in the dojo as part of a warm-up and to develop team spirit.



Developmental differences are apparent; these students are less than 9 months apart in chronological age.

**Training to train
Chronological Age: Females 11 to 14, Males 12 to 15**

This stage is the foundation of aerobic and strength fitness for the female students and the foundation aerobic fitness for males. At this stage, both males and females should further develop speed capacities.

Athletes internalize the advanced training techniques of physical, technical and recovery activities. The large majority of students will reach puberty during this stage. The onset of Peak Height Velocity (PHV) should be used as a reference point to design programs for the pubertal student. (Balyi)

It is very important that biological age and the differences between girls and boys are now taken into account in determining the physical work. The physical training loads given therefore assume the student is average (i.e. not an early or late to mature). Biological and chronological age can be four years apart (two years higher or two years lower).

Athletes who miss this stage of training will never reach their full potential, regardless of their participation in remedial programs. The reason why so many athletes plateau later in their careers is primarily because of an overemphasis on competition instead of on training, during this important period of their athletic development.

Training: 60% competition: 40% (Balyi)

9 to 12 sessions of 1h – 2h 30 min. Maximum length of session duration is 2h 30 min.

	Proposal		
	Year 7	Year 8	Year 9
Female	11 – 12 years	12 – 13 years	13 - 14 years
Male	12 -- 13 years	13 – 14 years	14 – 15 years
Karate	13 – 14h	14 – 15 h	15 -16 h
Other sports	1h		
Coordination	3 X 20 m	3 X 20 m	3 X 20
Speed	3 X 20 m	3 X 20 m	2 X 30
Flexibility	6 X 20 m	6 X 20 m	6 X 20
Strength	3 X 20 m	3 X 25 m	3 X 30
Endurance	3 X 20 m	3 X 25 m	3 X 30
Total	20 – 21 hours	20.5 – 21.5 hours	22 – 23 h
Parents' Responsibility	Coaches Responsibility		

Activity should be less than 8 seconds with a work/rest ratio of 1:5. Speed training should be done after the warm-up. Running technique exercises should be introduced at this stage.

Strength – endurance: This is developed through your own body weight exercises, light weight exercises, medicine ball, Swiss ball and circuit training exercises. Emphasis is on technique for weight exercises. The optimal period to start strength training is immediately after Peak Height Velocity (PHV) for females and 12 – 18 months after PHV for males. (Balyi)

Explosive – strength: This is developed through resistance sprints, sports and horizontal jumps. Upper body work is done through exercises with medicine balls of 1 - 2 Kg.

The athlete must be able to repeat quality sprints and efforts (Explosive strength endurance).

Flexibility: The warm-up Routine should consist of dynamic stretching. If time is a consideration some static or passive stretching can be accommodated at the end of the workout. Static or passive stretching is best at least two hours before a workout or two hours after workout.

Aerobic endurance: Aerobic endurance both in and outside the dojo should be emphasized. The student must be capable of maintaining sub-maximal efforts for twenty to thirty minutes.

Aerobic-Anaerobic endurance: Introduction of intermittent work through sub-maximal efforts.

ABC: (agility, balance and coordination): Prioritize refining the basic skill of; running, jumping, throwing and catching. The former skills help with the development of complex karate specific skills. Complex karate drills and dynamic balance 4 – 6 times per week that include specific footwork drills. Be patient with growing kids.

Recovery: This is an important stage for the introduction of physical therapies like active and passive rest, hydro therapies and sport massage (Calder)
Hydration, nutrition and cool down should be included in the student's routine.

Warm – up

The purpose is to increase body temperature, to prime the cardiovascular system and get the heart and lungs ready to engage in vigorous activity, to improve joint range, to help to engrain proper movement patterns and to wake up the nervous system.

- 5 – 7 minutes of jogging, skipping rope or using specific activities that focuses on agility.
- 7 – 8 minutes of dynamic stretching like arm swings, leg swings, lunges and trunk twists etc.

Equipment: Various.

Speed and agility

Exercise 1: Ball drops. The purpose is to develop reaction speed, starting ability and agility.

- The instructor stands in front of the student with one ball in each hand and arms extended to the side.
- The instructor drops either one of the balls and you try to catch it before it bounces a second time.
- The instructor should vary his positioning with reference to the student.
- Change the starting positions, Feed more than one ball.

Equipment: Use different balls to get types of bounces.

Sets/reps/rest: 2 to 3 sets of 6 to 10 reps. Rest: 90 sec. between sets.

Exercise 2: Sprint duel. The purpose is to develop reaction speed, starting ability and agility.

Set-up:

- Two cones 20 meters apart a centre line is established.
- The instructor stands on the centre line facing two students.
- The students are a meter apart on each side of the centre line facing and ten meters from the instructor.
- On command the students start jogging towards the instructor maintaining their distance on each side of the centre line.
- At any time as the students approach the instructor can raise his left or right arm indicating that the student on the same side as the arm raised must sprint to the indicated side.
- This student attempts to reach the boundary of the area before being tagged by the other student.

Equipment: Cones.

/sets/reps/rest: 2 to 3 sets of 4 to six reps. Rest: 90 sec. between sets and 30 sec. between reps.

Exercise 3: Colour balls

The purpose is to develop a student's reaction and adaptation ability to a visual signal and to improve body movement, speed and movement technique.

- Four speed activities, each with a distinctive colour, are arranged in the shape of a cross. It is the responsibility of the instructor to devise activities according to the physical, technical strengths and limitations of the students.
- Students react to the colour of the ball that the coach feeds and perform the corresponding circuit.

Equipment: Cones, slats, sticks, hurdles, ladder, use balls of different colours.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Exercise 4: Mini - hurdle races. The purpose is to improve running technique, to make students aware of the importance of pelvis positioning in order to clear the hurdles and to improve the action of the foot on the ground.

- Over a 10 to 25 meters distance, place small cones, then medium cones and finally low hurdles in succession.
- Leave a space of 0.6 to 1 meter between the cones or hurdles depending on the student's height and the desired level of difficulty.

Equipment: Small soft cones, 10 to 15 cm height + cones 20 to 30 cm height + 4 to 6 hurdles 30 to 50 cm height.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Exercise 5: Backward and forward sprints. The purpose is to develop forward and backward speed.

- 2 cones 3 to 5 meters apart.
- The student starts to sprint between the 2 cones running forward and backward during 7 sec.

Equipment: 2 cones.

Sets/reps/rest: 1 to 3 sets of 4 to 5 reps. Rest: 30 sec for reps and 90 sec for sets.

Exercise 6: Face touch. The purpose is to develop arm speed.

- Two students face each other within touching distance of their partners face.
- Both hold their hands forward at shoulder height with arms bent.
- On command one student attempts to touch their partners face before the touch is blocked.

Equipment: none.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 20 sec. between sets.

Exercise 7: Lateral agility shuffle. The purpose is to develop lateral movement, agility and the action of the foot on the ground.

- 2 cones 1.5 to 3 meters apart.
- (Exercise 7 Continued)
- The student stands in the middle and behind the 2 cones.
- She moves to her right side and starts to shuffle laterally to weave a figure of eight around the cones going to her left and right side alternately. No crossover steps are allowed.

Equipment: 2 cones.

Sets/reps/rest: 1 to 2 sets of 3 to 5 reps of 7 sec. Rest: 60 sec. between reps and 90 sec. between sets.

Exercise 8: Agility courses. The purpose is to improve running technique and the ability to change direction and speed.

- Over 10 to 15 meters distance, place small cones, hoops or low hurdles to make different course designs.
- Organize different situations working shuffle steps, running around cones, changing rhythm, etc.

Equipment: Small cones, hoops and low hurdles.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Strength

It is possible to work strength and explosive-strength by circuit training.

Exercise 1: Step-ups. The purpose is to develop strength and balance in the lower body.

- Stand with your hands by your sides.
- Using a stool or a gym step of approximately 0.3m high. Step onto the object with one foot and bring your other leg up until your knee is at waist level. Hold your leg there for a count of three and return to the starting position. Alternate legs 6 to 12 reps.

Equipment: A stool or gym step 0.3m high.

Sets/reps/rest: 2 to 3 sets of 6 to 12 reps. Rest: 60 to 120 sec. between sets.

Exercise 2: Push-ups. The purpose is to develop the strength of the upper body.

- Hands placed shoulder – width apart with your body in a straight line from your toes to your head.
- Slowly lower yourself down until your upper arm is parallel to the ground. Push yourself upwards until the elbows are completely straight and round back outwards like a cat. This rounding motion at the end of the push-up is very important and increases the work by the muscles that stabilize your shoulder blades.

Equipment: None.

Sets/reps/rest: 2 to 5 sets of 15 to 20 reps. Rest: 60 to 120 sec. between sets.

Exercise 3: Seated row. The Purpose is to develop the strength of the upper body.

- Stand up with your knees slightly flexed and your hands holding rubber tubing. Secure the tubing, about waist high to something solid.
- While keeping the upper body erect and not leaning forward, pull band handles towards the chest and upper abdomen area. Keep the elbows close to your sides. Slowly return to start position.

Equipment: Rubber tubing.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 60 to 120 sec. between sets.

Exercise 4: Swiss ball 1 (cross body rear deltoid raise). The purpose is to develop strength in the back of the shoulder and to stabilize the shoulder blades.

- Lie sideways over the ball, with the ball placed in your armpit and to the side of your chest. This lateral position must be maintained throughout the movement.
- Begin the movement by setting your abdominal muscles and drawing in your navel. With your arm extended and pointing towards the floor, begin to raise your arm away from your body.

Equipment: Swiss balls, dumbbells.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 60 to 120 sec. between sets.

Exercise 5: Swiss ball 2 (dumbbell press). The purpose is to develop strength in the upper body (whole pectoral area).

- Hold the dumbbells that you will be pressing. From a seated position on the ball, slowly walk out until your head and shoulders are supported by the ball. Place your feet slightly more than hip-width apart to provide a safe initial base of support.
- Begin by setting your abdominal muscles. Then, press your arms upward until your hands are directly above your eyes.

Equipment: Swiss balls, dumbbells.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 60 to 120 sec. between sets.

Exercise 6: Swiss ball 3 (wall squat). The purpose is to develop lower body strength. The wall squat unloads some of your body weight, which helps athletes prepare to progress to free weight squats.

- Stand facing away from a wall. Place a stability ball against the wall at low back height. Plant your feet body width apart and slightly in front of your body.
- Leaning into the ball, lower your body until your knees are flexed at a 90 degree angle. Hold this position for two seconds. As you squat, the ball will move to your mid to upper back region. Note your feet- your weight should be on your heels, not your toes, and your knees should not be out past your toes. Except to check your knee position, keep your head and eyes up. Extend your legs to elevate your body back to the setup position.

Equipment: Swiss balls.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 60 to 120 sec. between sets.

Exercise 7: Swiss ball 4 (jackknife). The purpose is to develop core and shoulders stabilization.

- Crouch down and place your abdomen on top of the ball. Roll forward until your hands reach the ground in front of the ball. Walk forward until only your feet remain on top of the ball. Contract the core to hold a strong link – your body should be in a straight, firm line from head to foot.
- Hold your push-up position and retain a strong core. Keep your torso facing square to the ground. Bend at the knees and pull the ball up towards your torso, as if to draw your knees into your chest. Keep the speed of movement under control. Extend your legs to move the ball back to the start position. At the end of each repetition, your body should be linked by strong contractions forming one level, straight line.

Equipment: Swiss balls.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 60 to 120 sec. between sets.

Exercise 8: Bracing with posterior tilt. The purpose is to develop core strength.

- Lying on the stomach with legs completely extended on your toes with the forearms propped with the elbows located under the shoulder joint. Hold the position.
- In addition, one leg can be raised.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 30 to 90 sec. Rest: 30 to 120 sec. between sets.

Exercise 9: Bracing with lateral tilt. The purpose is to develop core strength.

- Lying on the side, one leg is lying on top of the other. One arm is propped up, with the elbow located under the shoulder joint. From this position, slowly press into the mat on the forearm and at the same time, keep the body stiff. Hold the position then switch side.
- In addition, one leg can be raised.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 20 to 60 sec. Rest: 30 to 120 sec. between sets.

Exercise 10: Bracing with anterior tilt (superman). The purpose is to develop core strength.

- Lying on your stomach with arms fully extended overhead. Lift both arms and legs simultaneously. Hold this position.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 10 reps of 1 to 5 sec. Rest: 60 to 120 sec. between sets.

Exercise 11: Crunch. The purpose is to develop strength in the abdominal muscles.

- Lie on the back with the knees bent and feet flat on the floor. Hold your hands behind the head with the elbows to the sides, or crossed resting on top of your chest. Refrain from pulling the head forward with hands.
- Curl the upper body from the floor, including the head and the shoulders, until you can feel the abdominal muscles contracting. The upper body should be off the ground by about three inches at the shoulder blades. Lower until the shoulder blades touch the ground and repeat.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 15 to 20 reps. Rest: 60 to 90 sec. between sets.

Exercise 12: Russian twist. The purpose is to develop strength in the abdominal muscles.

- Secure feet against the floor, with the knees bent and the body leaning back at a 45 degree angle. Hold the arms straight out from the shoulders so that they are parallel with the thighs. Hold a light weight to increase the resistance of the exercise.
- Rotate side to side, turning the shoulders until the arms are at a 90 degree angle with the body. Make a full twist to the opposite side. Left and right make one repetition.

Equipment: Light weights.

Sets/reps/rest: 2 to 3 sets of 15 to 20 reps. Rest: 60 to 90 sec. between sets.

Explosive – strength

Exercise 1: Resistance running. The purpose is to develop power in the lower body, to improve stride frequency and to improve bracing ability.

- The runner has a belt around their waist, which is connected to a pulley system by a rope. Their partner located behind them controls the running speed. The runner should attempt to sprint over a distance of 20 meters as quickly as possible in spite of the resistance of the rope.
- There are many forms of resistance that can be used to perform this drill. Use your imagination.

Equipment: rope, pulley and various resistance materials.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 1 min. between reps and 3 min. between sets.

Exercise 2: Two-footed slalom jumps. The purpose is to develop elastic strength in the ankle, and dynamic balance.

- Stand on one side of a line. Jump two-footed to the other side of the line and back. Repeat this pattern, making three to five contacts on each side of the line. Focus on quick ground contact. After the final contact finish with a split step.

Sets/reps/rest: 2 to 3 sets of 6 to 10 reps. Rest: 1 min. between sets.

Exercise 3: Single leg push-off. The purpose is to condition the athlete to push into the ground.

- To start, the student places one foot on a sturdy box, 20 to 40 cm high. By pushing-off with the “up” leg, he will jump as high as possible. The student should then land softly on the same leg with which he pushed off, with the front of the foot making contact on the surface of the box. Repeat for the required number of repetitions and then switch to the other leg. Use the arms to help “lift” the body from the ground.

Equipment: A sturdy box.

Sets/reps/rest: 2 to 3 sets of 5 to 6 reps each leg. Rest: 90 sec. between sets.

Exercise 4: Split squat jump. The purpose is to improve hip flexibility and hip flexor power.

- The student assumes a split squat position with one foot forward and the other projected to the rear. Hands can be placed on the hips. In this position the front knee will be bent at 90 degrees and the rear knee will be almost touching the ground. The student will jump as high as possible and switch the position of the legs before landing. Focus on the landing and maintain the torso in an upright posture.
- Equipment: None.

Sets/reps/rest: 2 to 3 sets of 5 to 6 reps each leg. Rest: 90 to 120 sec. between sets.

Exercise 5: Horizontal jumps working with hoops. The purpose is to improve leg power, coordination and balance.

- Working on different possibilities with hoops.

Equipment: Hoops.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps each leg. Rest: 90 to 120 sec. between sets.

Exercise 6: Push-up hand clap. The purpose is to develop explosive arm power.

- The student assumes a push-up position arms straight and body straight from head to feet.
- The student bends her arms and explodes upward to lift the body and allow her to clap her hands.
- Students who cannot accomplish this movement from a strict push-up position can do the same from their knees.
- As a progression students can try two claps during each explosive movement.

Equipment: None

Sets/reps/rest: 2 to 3 sets of 5 to 10 reps. Rest: 60 to 90 sec. between sets.

Flexibility

Stretching method 1: Ballistic and dynamic.

Characteristics:

- Involves explosive rebounding in order to elongate the target muscles.

Benefits:

- Performed before a contest or training this can achieve good karate specific muscular and neural activation.

Practical application:

- Can be used to good effect in the warm-up. Dynamic flexibility exercises may also be used additionally or alternatively.

Equipment: None.

See Warm-up.

Stretching method 2: Static

- The optimum time to perform static stretching is either two hours before or two hours after a workout.
- If time is a concern then post exercise is your best option.
- Useful for increasing the range of motion.
- Requires a low level of muscular effort and induces muscular relaxation.
- Some research is advised regarding stretches that are contraindicated.

Aerobic endurance

Aerobic endurance: is always trainable but make aerobic a priority after the onset of PHV (Peak height velocity).

*** Note that aerobic trainability is dependent on the maturation levels of the athlete. For this reason, the timing of training emphasis differs depending on whether athletes are early, average or late to mature.**

Exercise 1: Basic endurance training. The purpose is to develop basic aerobic endurance.

- Running, cycling, skating, swimming, etc.
- Continuous work for 20 to 30 minutes, 2 to 3 times a week,
- Intensity is moderate.

Exercise 2: Intermittent training. The purpose is to develop aerobic endurance in a general way.

- 10 to 20 intermittent efforts of 6 to 8 minutes moderate to difficult intensity.

Light biking, light jogging or light swimming must be developed three to five times a week for 15 minutes plus 10 to 15 minutes of stretching.

Coordination

Exercise 1: Reaction. Purpose is to develop reaction time and coordination.

- Speed bag, using various rhythms.
- Double ended bag.
- Punching a swinging ball on a cord.
- Dodging light-foam balls thrown from various distances.
- Punching a tennis ball dropped from various heights.

Equipment: speed bag, double ended bag, light-foam balls, tennis balls and balls on a cord.
Efforts: less than 15 seconds. Ratio 1/4

Exercise 2: Kicking. Purpose is to develop general coordination

- Kicking different ball sizes with right foot.
- Kicking different ball sizes with left foot.
- Keeping a ball in the air with your feet without letting it touch the ground.
- Keeping a hackey sack in the air with your feet.

Equipment: Soccer balls, balls of different sizes and hackey sacks.

Duration: 5 – 10 minutes. Efforts: less than 15 seconds Ratio: ¼

Exercise 3: Kicking a double-end bag. The purpose is to develop lower body coordination.

- Double or triple kicks to a speed bag suspended by bungee cords.
- The object is to achieve as many kicks as possible in a 10 sec. interval.

Equipment: Speed bag with bungee suspension.

Duration: 5 to 10 minutes. Efforts: 10 to 15 sec. Rest: 30 sec. between efforts.

Exercise 4: Rotational kicks on a heavy bag. The purpose is to coordinate precision kicking with other students.

- 3 or 4 students stand at kicking distance (front leg kicks) around a heavy bag.
- Each student kicks in turn for 10 sec. then they change direction of rotation and kick for a further 10 sec.
- Various kicks and kicking patterns can be employed.

Equipment: Heavy bag.

Duration: 3 to 5 min. Efforts: 10 to 15 sec. Rest: 15 sec. between efforts.

Exercise 5: Skipping rope. The purpose is to develop general coordination, differentiation, balance strength and aerobic endurance.

- Working every situation possible.
- One foot, two feet, split steps, crossover steps.
- Long steps, short steps, combined long and short steps.
- Going fast and slow, relays, making doubles.
- Going sideways, forward, backward.
- 100 to 300 reps nice and steady, etc.

Equipment: Skipping ropes.

Sets/reps/rest: 3 to 5 sets of 30 to 60 sec. Rest: 60 to 90 sec. between sets.

See the warm-up.

Exercise 6: Swiss ball passes. The purpose is to develop balance and coordination.

- 2 students face each other 3 meters apart balanced with knees on a Swiss ball.
- The partners pass a ball back and forth.
- Advanced drill is standing on a Swiss ball and passing a ball. (break-fall expertise is advised)

Equipment: Swiss balls and other balls.

Duration: 5 min. Efforts: 1 min. Rest: 30 sec.

Exercise 7: Swiss ball race. The purpose is to develop balance and coordination.

- A number of students are balanced with knees on Swiss balls.
- By using their hands and knees they propel the balls along a pre determined course.
- If a student falls from a ball they go back to the start.

Equipment: Swiss balls.

Duration: Time required to complete the course.

Sports and games

It is important that students enjoy continued exposure to other games and sports. Soccer, basketball, hockey, swimming, biking, volleyball, tennis etc. The preceding list is not intended to be exclusive. The purpose is to develop agility, balance and coordination, to develop decision- making ability, to develop bilateralism, to develop aerobic endurance and to develop the ability to recover quickly.

Variations of sports and games can be used in the dojo as part of a warm-up and to develop team spirit.

Training to compete

Chronological Age: Females 14 – 17, Males 15 – 18

During the previous two stages, athletes learn how to train properly. One of the major objectives of this stage is to learn how to compete under diverse circumstances, in environments that are: hot, dry, humid, cold or at high altitudes etc. Athletes also learn how to cope with jet lag, extended travel and different diets.

The foundation of an “optimal individual taper” procedure should be laid down early in this stage.

This stage of development is introduced after the goals and objectives of the learning to train and training to train stages have been achieved. Remedial programs should be immediately implemented if shortcomings have been identified. The earlier the remedial programs are implemented the better the results they will produce. Physical evaluation tests are important to determine the individual strengths and weaknesses.

During this stage, high intensity individual and sport-specific training is provided to athletes year round. Special emphasis is placed on optimum preparation. Optimal Periodization of the training factors will ensure that short and long- term priorities will not conflict.

Other sports are recreational activities only.

9 to 12 sessions of 1 to 2.5 hours. Maximum length of session duration is 2.5 hours.

Proposal

	Year 10	Year 11	Year
12 Female	14 to 15 years	15 to 16 years	16 to 17 years
Male	15 to 16 years	16 to 17 years	17 to 18 years
Karate	16 to 20 hours	18 to 22 hours	18 to 24 hours
Coordination	3 X 20 min	3 X 20 min	3 X 20 min
Speed	2 to 3 X 30 to 45 min	2 to 3 X 30 to 45 min	2 to 3 X 30 to 45 min
Strength	2 to 3 X 45 to 60 min	2 to 3 X 45 to 60 min	2 to 3 X 45 to 60 min
Flexibility	6 X 20 min	6 X 20 min	6 X 20 min
Endurance	6 X 15 min	6 X 15 min	6 X 15 min
Total:	24 to 30 hours	26 to 32 hours	28 to 32 hours
	Coach's responsibility		

Training to Compete fitness exercise guidelines.

Speed: (efforts of 8 sec. or less). It is important to work on the dissociation between upper and lower body during the various sprints.

Recovery time is vital. A work rest ratio of 1:5 is suggested.

It is recommended to train speed after the warm-up.

Develop the following: Reaction speed, speed of coordination, acceleration, short sprints, agility specific karate drills and segmental speed.

Strength – endurance: Gains are achieved by using light to moderate loads

Core stability should be enhanced. Longer training and preparation sessions are encouraged. Isometric exercise is also useful at this stage.

Maximum strength: This is pursued through repeated efforts. Maximum efforts should be limited.

Explosive-strength: This is enhanced through resistance sprints and plyometrics. Upper body work is accomplished through exercised with medicine balls 1 to 4 Kg. and light weights. Explosive-strength endurance is enhanced by intermittent work.

Flexibility: The warm-up routine should consist of dynamic stretching. If no other time is available for static or passive stretching a limited amount can be done at the end of a workout. Static or passive stretching is best done in a session at least two hours before or two hours after a workout.

Aerobic endurance: Aerobic training in and out of the dojo should be emphasized. This is important for health and active rest. Students should be capable of maintaining a sub-maximal effort for over 30 minutes.

ABC: During this stage the priority is to maintain basic skills. Complex karate specific skills should be refined with karate specific exercises. Coordination could be introduced during the warm-up.

Recovery: This is an important stage for the introduction of relaxation techniques like breathing exercises, muscle relaxation, meditation, music, visualization and flotation. Recovery routines such as: hydration, cool downs, massages, hydro-therapies, meditation and yoga should be maintained.

Warm – up

The purpose is to increase body temperature, to prime the cardiovascular system and get the heart and lungs ready to engage in vigorous activity, to improve joint range, to help to engrain proper movement patterns and to wake up the nervous system.

- 5 – 7 minutes of jogging, skipping rope or using specific activities that focuses on agility.
- 7 – 8 minutes of dynamic stretching like arm swings, leg swings, lunges and trunk twists etc.

Equipment: Various.

Speed and agility

Exercise 1: Ball drops. The purpose is to develop reaction speed, starting ability and agility.

- The instructor stands in front of the student with one ball in each hand and arms extended to the side.
- The instructor drops either one of the balls and you try to catch it before it bounces a second time.
- The instructor should vary his positioning with reference to the student.
- Change the starting positions, Feed more than one ball.

Equipment: Use different balls to get types of bounces.

Sets/reps/rest: 2 to 3 sets of 6 to 10 reps. Rest: 90 sec. between sets.

Exercise 2: Sprint duel. The purpose is to develop reaction speed, starting ability and agility.

Set-up:

- Two cones 20 meters apart a centre line is established.
- The instructor stands on the centre line facing two students.
- The students are a meter apart on each side of the centre line facing and ten meters from the instructor.
- On command the students start jogging towards the instructor maintaining their distance on each side of the centre line.
- At any time as the students approach the instructor can raise his left or right arm indicating that the student on the same side as the arm raised must sprint to the indicated side.
- This student attempts to reach the boundary of the area before being tagged by the other student.

Equipment: Cones.

/sets/reps/rest: 2 to 3 sets of 4 to six reps. Rest: 90 sec. between sets and 30 sec. between reps.

Exercise 3: Colour balls. The purpose is to develop a student's reaction and adaptation ability to a visual signal and to improve body movement, speed and movement technique.

- Four speed activities, each with a distinctive colour, are arranged in the shape of a cross. It is the responsibility of the instructor to devise activities according to the physical, technical strengths and limitations of the students.
- Students react to the colour of the ball that the coach feeds and perform the corresponding circuit.

Equipment: Cones, slats, sticks, hurdles, ladder, use balls of different colours.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Exercise 4: Mini - hurdle races. The purpose is to improve running technique, to make students aware of the importance of pelvis positioning in order to clear the hurdles and to improve the action of the foot on the ground.

- Over a 10 to 25 meters distance, place small cones, then medium cones and finally low hurdles in succession.
- Leave a space of 0.6 to 1 meter between the cones or hurdles depending on the student's height and the desired level of difficulty.

Equipment: Small soft cones, 10 to 15 cm height + cones 20 to 30 cm height + 4 to 6 hurdles 30 to 50 cm height.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Exercise 5: Backward and forward sprints. The purpose is to develop forward and backward speed.

- 2 cones 3 to 5 meters apart.
- The student starts to sprint between the 2 cones running forward and backward during 7 sec.

Equipment: 2 cones.

Sets/reps/rest: 1 to 3 sets of 4 to 5 reps. Rest: 30 sec for reps and 90 sec for sets.

Exercise 6: Face touch. The purpose is to develop arm speed.

- Two students face each other within touching distance of their partners face.
- Both hold their hands forward at shoulder height with arms bent.
- On command one student attempts to touch their partners face before the touch is blocked.

Equipment: none.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 20 sec. between sets.

Exercise 7: Lateral agility shuffle. The purpose is to develop lateral movement, agility and the action of the foot on the ground.

- 2 cones 1.5 to 3 meters apart.
- The student stands in the middle and behind the 2 cones.
- She moves to her right side and starts to shuffle laterally to weave a figure of eight around the cones going to her left and right side alternately. No crossover steps are allowed.

Equipment: 2 cones.

Sets/reps/rest: 1 to 2 sets of 3 to 5 reps of 7 sec. Rest: 60 sec. between reps and 90 sec. between sets.

Exercise 8: Agility courses. The purpose is to improve running technique and the ability to change direction and speed.

- Over 10 to 15 meters distance, place small cones, hoops or low hurdles to make different course designs.
- Organize different situations working shuffle steps, running around cones, changing rhythm, etc.

Equipment: Small cones, hoops and low hurdles.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Exercise 9: Karate specific lateral movements. The purpose is to develop lateral segmental and lateral speed.

- The instructor pulls a double-ended speed bag back.
- When it is released the student blocks the bag moves to the side and attempts to punch the bag as it returns from the block.
- This can also be done with a heavy bag which is slower.

Equipment: Double-ended speed bag and heavy bag.

Sets/reps/rest: 3 sets of 10 reps left and right foot advanced. Rest: 30 sec. between sets.

Strength

Exercise 1: Step-ups. The purpose is to develop balance and lower body strength.

- Stand with your hands on your hips or with a barbell behind your neck and stabilized with your hands or holding dumbbells at your sides.
- Using a stool or a gym step of approximately 0.3 meters high. Step on to the object with one foot and bring your other leg up until your knee is at waist level. Hold your leg there for a count of three and return to the starting position. Alternate legs for 6 to 10 reps.

Equipment: A stool or gym step 0.3 meters high, barbells, dumbbells, or medicine balls.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets depending on the kind of strength you wish to develop.

Exercise 2: Lunges. The purpose is to develop strength in the lower body and to develop dynamic balance.

- Stand with your feet 20cm apart, with your hands on your hips.
- Take a large step forward and position your body over your front leg. Bend your front knee so it is in line with or slightly in front of the ankle joint and does not project beyond a line drawn up front of your shoe. Return to the starting position by pushing your weight backward and straightening your front leg. Keep your trunk erect during the exercise by looking straight ahead and keeping your chest out. You can do 5 to 6 reps with the same leg then switch or alternate legs.
- As a progression you can use a barbell, dumbbells or medicine balls,

Equipment: Barbells, dumbbells or medicine balls.

Sets/reps/rest: 1 to 2 sets of 5 to 6 reps each side. Rest: 30 to 60 sec. between sets.

Exercise 3: Crossover lunges. The purpose is to develop strength in the lower body and to develop dynamic balance.

- Instead of stepping forward, move your front leg in a 45 degree diagonal (moving the left leg in a crossing direction in front of your right leg and foot). You can do 6 to 10 reps with the same legs then switch, or alternate legs.

Equipment: Barbell, dumbbells, medicine balls.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets depending on the kind of strength you want to develop.

Exercise 4: Lateral lunges. The purpose is to develop strength in the lower body and to develop dynamic balance.

- Step laterally to the right, keeping both feet pointed straight ahead, feet flat, left leg straight, sit the right hip back squatting as low as possible, then exploding off the right leg into complete extension, transferring the maximal amount of force to the ground, back to the starting position. Repeat 6 to 10 times with the same leg then switch or alternate.

Equipment: Barbells, dumbbells.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets depending on the kind of strength your want to develop.

Exercise 5: Overhead squat on your toes. The purpose is to develop strength in the lower body and to develop dynamic balance.

- Stand on your toes with your feet shoulder-width apart, holding a barbell overhead with your arms completely extended. Bend your knees and hips to lower your body until the tops of your thighs are at 90 degrees, but keep your ankles extended. Stay in that position for one to two seconds before recovering to the starting position. Repeat 6 to 10 times.

Equipment: barbells.

Sets/ reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets depending on the kind of strength you want to develop.

Exercise 6: Wide grip bench press. The purpose is to develop upper body strength.

- Lying face-up on the bench with barbell in hands (wide grip) and arms fully extended above chest, palms facing your feet, Keep the stomach tight, with feet on the ground.
- Slowly lower the barbell to your chest and press back with explosiveness to starting position.

Equipment: Barbells.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets depending on the kind of strength you want to develop.

Exercise 7: Dumbbells fly. The purpose is to develop upper body strength.

- Lying face-up on the bench with a dumbbell in each hand and arms extended above the chest. Keep the stomach tight, with the feet on the ground.
- Slowly lower the dumbbells until the arms are just a little lower than parallel to the floor, and return with explosiveness to starting position.

Equipment: Dumbbells.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets depending on the kind of strength you want to develop.

Exercise 8: Dumbbell one arm one leg row. The purpose is to develop upper body strength and core stability.

- Hold weight in right hand, bend from the hip until the body is parallel to the floor, right knee slightly bent, left arm on a stable surface in front of the body. Extend the left leg behind, squeezing the gluts, and keep the hips parallel to the floor. Maintain a level back with natural lumbar curvature. If core is tight good posture will be maintained. Weight should be hanging straight down from the right shoulder.
- Squeeze shoulder blade back and bring dumbbell to the waist. Keep elbow at 90 degrees and close to the body. Maintain level back and good posture throughout the exercise. Lower to the starting position and repeat.

Equipment: Dumbbells.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 80 sec. between sets depending on the kind of strength you want to develop.

Exercise 9: Pullovers. The purpose is to develop upper body strength.

- Lying on a bench with your knees bent at 90 degrees, using both arms, slowly lift a dumbbell from your chest over your head as far as you can and then slowly return it to the starting position.
- It is important to keep your elbows facing forward as much as possible throughout the motion.

Equipment: Dumbbells.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets depending on the kind of strength you want to develop.

Exercise 10: Bracing with posterior tilt. The purpose is to develop core strength.

- Lying on the stomach with legs completely extended on your toes with the forearms propped with the elbows located under the shoulder joint. Hold the position.
- In addition, one leg can be raised.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 30 to 90 sec. Rest: 30 to 120 sec. between sets.

Exercise 11: Bracing with lateral tilt. The purpose is to develop core strength.

- Lying on the side, one leg is lying on top of the other. One arm is propped up, with the elbow located under the shoulder joint. From this position, slowly press into the mat on the forearm and at the same time, keep the body stiff. Hold the position then switch side.
- In addition, one leg can be raised.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 20 to 60 sec. Rest: 30 to 120 sec. between sets.

Exercise 12: Bracing with anterior tilt (superman). The purpose is to develop core strength.

- Lying on your stomach with arms fully extended overhead. Lift both arms and legs simultaneously. Hold this position.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 10 reps of 1 to 5 sec. Rest: 60 to 120 sec. between sets.

Exercise 13: Physiotherapy core exercise 1. The purpose is to isolate the abdominal muscles.

- Lying on your back with arms fully extended at each side of the body keeping your knees slightly bent.
- Contract the pelvic floor muscles, contract the lower abdominals and remember to breathe.
- Ensure that the initial contraction is isolated (no other muscles substituting), the contraction should begin slowly with control, low effort is all that is required, breathe normally.

Equipment: None.

Sets/reps/rest: 1 to 2 sets of 5 to 10 reps of 10 sec. each. Rest 60 to 90 sec. between sets.

Exercise 14: Physiotherapy core exercise 2: The purpose is to isolate the abdominal muscles.

- Lying on your back with arms fully extended at each side of the body keeping your knees slightly bent.
- Contract the pelvic floor muscles, contract the lower abdominals and remember to breathe.
- Ensure that the initial contraction is isolated (no other muscles substituting), the contraction should begin slowly with control, low effort is all that is required, breathe normally.
- Once you have mastered isolating the lower abdominal muscles with a normal breathing pattern, progress to sliding out one leg at a time. Keep the lower abdominal muscles tight during the entire exercise and slowly straighten one leg while sliding it along the surface of the floor and then returning to the start position to a count of ten. Repeat with the other leg. 5 to 10 times on each leg. This exercise can be made more challenging by lifting the foot of the floor as you slide it out and back.

Equipment: None.

Sets/reps/rest: 1 to 2 sets of 5 to 10 reps of 10 sec. each leg. Rest: 60 to 90 sec. between sets.

Other possibilities

Many of the resistance exercises can be done using a Swiss ball.

Explosive-strength

Exercise 1: Resistance running. The purpose is to develop power in the lower body, to improve stride frequency and to improve bracing ability.

- The runner has a belt around their waist, which is connected to a pulley system by a rope. Their partner located behind them controls the running speed. The runner should attempt to sprint over a distance of 20 meters as quickly as possible in spite of the resistance of the rope.
- There are many forms of resistance that can be used to perform this drill. Use your imagination.

Equipment: rope, pulley and various resistance materials.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 1 min. between reps and 3 min. between sets.

Exercise 2: Side-to-side box shuffle. The purpose is to develop the ability to push off the ground in a lateral direction, and to develop dynamic balance.

- The student stands next to a sturdy box approximately 0.5 meters wide and 0.3 meters high. She places the right foot on the box while the left foot remains on the ground. She pushes up and across the top of the box; landing with the left foot in the middle of the box and the right foot on the ground. Continue to shuffle back and forth across the box for 6 to 10 repetitions.
- The student should try to move back and forth in a smooth manner in controlled soft landings.

Equipment: A sturdy box 0.3 meters high and 0.5 meters wide.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 1 minute between sets.

Exercise 3: Split squat jump. The purpose is to improve hip flexibility and hip flexor power.

- The student assumes a split squat position with one foot forward and the other projected to the rear. Hands can be placed on the hips. In this position the front knee will be bent at 90 degrees and the rear knee will be almost touching the ground. The student will jump as high as possible and switch the position of the legs before landing. Focus on the landing and maintain the torso in an upright posture.
- Equipment: None.

Sets/reps/rest: 2 to 3 sets of 5 to 6 reps each leg. Rest: 90 to 120 sec. between sets.

Exercise 4: Single-leg bounds. The purpose is to improve hip extension and flexion strength.

- Get a slow running start and hopping on one leg. Try to bring the thigh up into a parallel position with each hop.

Equipment: None.

Sets/reps/rest: 2 to 3 sets of 5 to 6 reps each leg. Rest: 90 to 120 sec. between sets.

Exercise 5: Bench jump. The purpose is to develop leg power.

- From a position with your thighs parallel to the ground jump as high as possible on to a bench or box landing with both feet and legs fully extended. Regain the starting position and do 5 to 8 repetitions.

Equipment: A bench or box.

Sets/ reps/ rest: 2 to 5 sets of 5 to 8 reps. Rest: 60 to 90 sec. between sets.

Exercise 6: medicine ball push. The purpose is to develop upper body power.

- Partners face each other three meters apart. One partner passes a medicine ball held at chest level by pushing forward as fast as possible. The other partner catches the ball and passes it back in similar fashion.
- The distance can be increased; balls of different weights can be used. Weight range is 1 to 4 Kg.

Equipment: Medicine balls from 1 to 4 Kg.

Sets/ reps/ rest: 3 to 5 sets of 8 to 10 reps. Rest: 90 sec. between sets.

Exercise 7: Medicine ball rotational throw. The purpose is to develop upper body strength and to strengthen the core.

- Partners stand side by side 3 meters apart. One partner passes the ball rugby fashion to the other partner, who passes the ball back in similar manner.

Equipment: Medicine balls 1 to 4 Kg.

Sets/ reps/ rest: 3 to 5 sets of 8 to 10 reps. Rest: 90 sec. between sets.

Exercise 8: Medicine and Swiss ball challenge. The purpose is to develop upper body, core strength and balance.

- Partners face each other 3 meters apart with their knees on Swiss balls. One partner passes a medicine ball to the other, who passes it back.
- The object is to remain balanced while passing the ball fast enough to unbalance your partner.

Equipment: Swiss balls, Medicine balls.

Sets/ reps/ rest: 3 sets of 30 sec. Rest: 90 sec. between sets.

Exercise 9: Medicine balls dynamic core exercises. The purpose is to develop upper body power and core strength.

- On the ground chest pass, sit-up toss, side tosses etc.
- On a Swiss ball overhead toss, side tosses and one hand throws.
- On a Swiss ball, one foot on the ground, same throws.
- On the ground partner throws.

Equipment: Medicine balls 1 to 4 Kg, Swiss ball.

Sets/ reps/ rest: 2 to 5 sets of 6 to 10 reps. Rest: 30 to 90 sec. between sets.

Exercise 10: Adapted dynamic power lifting movements. The purpose is to develop power, core strength, balance, coordination and shoulder stabilization.

- In a gym perform adapted dynamic power lifting movements.

Equipment: Barbells.

Sets/ reps/ rest: 2 to 5 sets of 6 to 8 reps. Rest: 90 to 120 sec. between sets.

Flexibility

Stretching method 1: ballistic and dynamic

See Warm-up.

Stretching method 2: static

See Cool Down.

Stretching method 3: passive

Characteristics:

- Should be performed with the help of an assistant, who moves the muscle group in order to increase ROM.
- Can be performed statically or using the contraction-relaxation technique.

Benefits:

- With the help of an assistant, more muscle or muscle groups can be stretched as compared to static stretching exercises.
- A good method to combine with contraction-relaxation techniques.

Practical application:

- Best performed on a treatment table.
- The routine normally starts with the lower extremities and continues with the spine, upper extremities and finishes with the neck.
- Ideally performed at the end of the day after all karate and physical training work has been completed. Optimally two hours after training.

Aerobic endurance

Aerobic endurance: is always trainable but make aerobic a priority after the onset of PHV (Peak height velocity).

*** Note that aerobic trainability is dependent on the maturation levels of the athlete. For this reason, the timing of training emphasis differs depending on whether athletes are early, average or those late to mature.**

Exercise 1: Basic endurance training. The purpose is to develop basic aerobic endurance.

- Running, cycling, skating, swimming, etc.
- Continuous work for 20 to 30 minutes, 2 to 3 times a week,
- Intensity is moderate to a little difficult.

Exercise 2: Intermittent training. The purpose is to develop aerobic endurance in a general way.

- 10 to 20 intermittent efforts of 6 to 8 minutes difficult to very difficult intensity.

Light biking, light jogging or light swimming must be developed three to five times a week for 15 minutes plus 10 to 15 minutes of stretching.

Coordination

Exercise 1: Reaction. Purpose is to develop reaction time and coordination.

- Speed bag, using various rhythms.
- Double ended bag.
- Punching a swinging ball on a cord.
- Dodging light-foam balls thrown from various distances.
- Punching a tennis ball dropped from various heights.

Equipment: speed bag, double ended bag, light-foam balls, tennis balls and balls on a cord.
Efforts: less than 15 seconds. Ratio 1/4

Exercise 2: Kicking. Purpose is to develop general coordination

- Kicking different ball sizes with right foot.
- Kicking different ball sizes with left foot.
- Keeping a ball in the air with your feet without letting it touch the ground.
- Keeping a hackey sack in the air with your feet.

Equipment: Soccer balls, balls of different sizes and hackey sacks.

Duration: 5 – 10 minutes. Efforts: less than 15 seconds Ratio: ¼

Exercise 3: Kicking a double-end bag. The purpose is to develop lower body coordination.

- Double or triple kicks to a speed bag suspended by bungee cords.
- The object is to achieve as many kicks as possible in a 10 sec. interval.

Equipment: Speed bag with bungee suspension.

Duration: 5 to 10 minutes. Efforts: 10 to 15 sec. Rest: 30 sec. between efforts.

Exercise 4: Rotational kicks on a heavy bag. The purpose is to coordinate precision kicking with other students.

- 3 or 4 students stand at kicking distance (front leg kicks) around a heavy bag.
- Each student kicks in turn for 10 sec. then they change direction of rotation and kick for a further 10 sec.
- Various kicks and kicking patterns can be employed.

Equipment: Heavy bag.

Duration: 3 to 5 min. Efforts: 10 to 15 sec. Rest: 15 sec. between efforts.

Exercise 5: Skipping rope. The purpose is to develop general coordination, differentiation, balance strength and aerobic endurance.

- Working every situation possible.
- One foot, two feet, split steps, crossover steps.
- Long steps, short steps, combined long and short steps.
- Going fast and slow, relays, making doubles.
- Going sideways, forward, backward.
- 100 to 300 reps nice and steady, etc.

Equipment: Skipping ropes.

Sets/reps/rest: 3 to 5 sets of 30 to 60 sec. Rest: 60 to 90 sec. between sets.

See the warm-up.

Exercise 6: Swiss ball passes. The purpose is to develop balance and coordination.

- 2 students face each other 3 meters apart balanced with knees on a Swiss ball.
- The partners pass a ball back and forth.
- Advanced drill is standing on a Swiss ball and passing a ball. (break-fall expertise is advised)

Equipment: Swiss balls and other balls.

Duration: 5 min. Efforts: 1 min. Rest: 30 sec.

Exercise 7: Swiss ball race. The purpose is to develop balance and coordination.

- A number of students are balanced with knees on Swiss balls.
- By using their hands and knees they propel the balls along a pre determined course.
- If a student falls from a ball they go back to the start.

Equipment: Swiss balls.

Duration: Time required finishing the course.

Sports and games

The purpose is to develop explosive strength, agility, coordination, aerobic and muscular endurance, decision-making ability and team spirit.

Exercise 1: Gyaku zuki war.

- Students are spread out at random on the dojo floor.
- The object is to gyaku zuki any other student. At the same time blocking or avoiding other students.
- Students who are scored on leave the floor. Until there is a winner.
- A variation is to have two or three teams.
- A further development is multiple teams.

Equipment: None.

Exercise 2: Take the tail from the donkey.

- The same as exercise 1 except that the object is to steal a small tape looped through the back of a student's belt.
- No contact is permitted.

Equipment: Coloured tapes.

Training to win

Chronological Age: Females 17+, Males 18+.

This is the final stage of athletic preparation. All the athlete's physical, technical and mental capacities are now fully established and the focus of training has shifted to the optimization of performance. Athletes are trained for major tournaments. Recovery protocols and short rest periods or prophylactic breaks should be implemented every 10 to 15 weeks.

Constant evaluation will determine the athlete's needs; what should receive priority and which areas will be maintained or consolidated? Maintenance can be achieved by training strength every seven to ten days and training the aerobic system two to three times per week.

The student's strengths and weaknesses, as well as the time available before the next tournament, will determine the content of training. It should be noted that students and instructors are often very reluctant to take time out of competition to retrain some factors where maintenance has failed and detraining has taken place. Block loading can be used to retrain these weaknesses: not taking time out to fix problem areas will contribute to a plateau and to poor performance. This leads to a "catch 22" situation where students cannot improve performance because of lack of fitness or technical weakness. Competition schedules must not be allowed to reduce the student's remedial opportunities.

Training in this stage is characterized by high intensity and relatively high volume.

Other sports are recreational activities only.

Training: 25% competition: 75% (Balyi, Bompa)

10 to 15 sessions of 1 to 2.5 hours. Maximum length of session is 2.5 hours.

Proposal

	Year 13	Year 14	Year
15 Female	17 to 18 years	18 to 19 years	19 to 20 years
Male	18 to 19 years	19 to 20 years	20 to 21 years
Karate	18 to 24 hours	18 to 24 hours	18 to 24 hours
Coordination	3 X 15 min	3 X 15 min	3 X 15 min
Speed	2 to 3 X 45 to 60 min	2 to 3 X 45 to 60 min	2 to 3 X 45 to 60 min
Strength	2 to 3 X 45 to 60 min	2 to 3 X 45 to 60 min	2 to 3 X 45 to 60 min
Flexibility	6 X 20 min	6 X 20 min	6 X 20 min
Endurance	6 X 15 min	6 X 15 min	6 X 15 min
Total:	26 3/4 to 32 3/4 hours	26 3/4 to 32 3/4 hours	26 3/4 to 32 3/4 hours
	Coach's responsibility		

Training to win fitness exercise guidelines

Speed: (efforts of 8 sec. or less). It is important to work on the dissociation between upper and lower body during the various sprints.

Recovery time is vital. A work rest ratio of 1:5 is suggested.

It is recommended to train speed after the warm-up.

Develop the following: Reaction speed, speed of coordination, acceleration, short sprints, agility specific karate drills and segmental speed.

Strength – endurance: Gains are achieved by using light to moderate loads

Core stability should be enhanced. Longer training and preparation sessions are encouraged. Isometric exercise is also useful at this stage.

Maximum strength: This is pursued through repeated efforts. Maximum efforts should be limited.

Explosive-strength: This is enhanced through resistance sprints and plyometrics. Upper body work is accomplished through exercised with medicine balls 1 to 4 Kg. and light weights. Explosive-strength endurance is enhanced by intermittent work.

Flexibility: The warm-up routine should consist of dynamic stretching. Flexibility/stretching should be a part of the athlete's regular routine.

Aerobic endurance: Aerobic training in and out of the dojo should be emphasized. This is important for health and active rest. Students should be capable of maintaining a sub-maximal effort for over 30 minutes.

ABC: During this stage the priority is to maintain basic skills. Complex karate specific skills should be refined with karate specific exercises 4 to 6 times per week. Coordination could be introduced during the warm-up.

Recovery: Refine and maintain all the techniques taught.

Warm-up

The purpose is to increase body temperature, to prime the cardiovascular system and get the heart and lungs ready to engage in vigorous activity, to improve joint range, to help to engrain proper movement patterns and to wake up the nervous system.

- 5 – 7 minutes of jogging, skipping rope or using specific activities that focuses on agility and coordination.
- 7 – 8 minutes of dynamic stretching like arm swings, leg swings, lunges and trunk twists etc.
- Light sparring with no contact 5 to 8 minutes.

Equipment: Various.

Speed and agility

Exercise 1: Ball drops. The purpose is to develop reaction speed, starting ability and agility.

- The instructor stands in front of the student with one ball in each hand and arms extended to the side.
- The instructor drops either one of the balls and you try to catch it before it bounces a second time.
- The instructor should vary his positioning with reference to the student.
- Change the starting positions, Feed more than one ball.

Equipment: Use different balls to get types of bounces.

Sets/reps/rest: 2 to 3 sets of 6 to 10 reps. Rest: 90 sec. between sets.

Exercise 2: Sprint duel. The purpose is to develop reaction speed, starting ability and agility.

Set-up:

- Two cones 20 meters apart a centre line is established.
- The instructor stands on the centre line facing two students.
- The students are a meter apart on each side of the centre line facing and ten meters from the instructor.
- On command the students start jogging towards the instructor maintaining their distance on each side of the centre line.
- At any time as the students approach the instructor can raise his left or right arm indicating that the student on the same side as the arm raised must sprint to the indicated side.
- This student attempts to reach the boundary of the area before being tagged by the other student.

Equipment: Cones.

/sets/reps/rest: 2 to 3 sets of 4 to six reps. Rest: 90 sec. between sets and 30 sec. between reps.

Exercise 3: Colour balls. The purpose is to develop a student's reaction and adaptation ability to a visual signal and to improve body movement, speed and movement technique.

- Four speed activities, each with a distinctive colour, are arranged in the shape of a cross. It is the responsibility of the instructor to devise activities according to the physical, technical strengths and limitations of the students.
- Students react to the colour of the ball that the coach feeds and perform the corresponding circuit.

Equipment: Cones, slats, sticks, hurdles, ladder, use balls of different colours.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Exercise 4: Mini - hurdle races. The purpose is to improve running technique, to make students aware of the importance of pelvis positioning in order to clear the hurdles and to improve the action of the foot on the ground.

- Over a 10 to 25 meters distance, place small cones, then medium cones and finally low hurdles in succession.
- Leave a space of 0.6 to 1 meter between the cones or hurdles depending on the student's height and the desired level of difficulty.

Equipment: Small soft cones, 10 to 15 cm height + cones 20 to 30 cm height + 4 to 6 hurdles 30 to 50 cm height.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Exercise 5: Backward and forward sprints. The purpose is to develop forward and backward speed.

- 2 cones 3 to 5 meters apart.
- The student starts to sprint between the 2 cones running forward and backward during 7 sec.

Equipment: 2 cones.

Sets/reps/rest: 1 to 3 sets of 4 to 5 reps. Rest: 30 sec for reps and 90 sec for sets.

Exercise 6: Face touch. The purpose is to develop arm speed.

- Two students face each other within touching distance of their partners face.
- Both hold their hands forward at shoulder height with arms bent.
- On command one student attempts to touch their partners face before the touch is blocked.

Equipment: none.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 20 sec. between sets.

Exercise 7: Lateral agility shuffle. The purpose is to develop lateral movement, agility and the action of the foot on the ground.

- 2 cones 1.5 to 3 meters apart.
- The student stands in the middle and behind the 2 cones.
- She moves to her right side and starts to shuffle laterally to weave a figure of eight around the cones going to her left and right side alternately. No crossover steps are allowed.

Equipment: 2 cones.

Sets/reps/rest: 1 to 2 sets of 3 to 5 reps of 7 sec. Rest: 60 sec. between reps and 90 sec. between sets.

Exercise 8: Agility courses. The purpose is to improve running technique and the ability to change direction and speed.

- Over 10 to 15 meters distance, place small cones, hoops or low hurdles to make different course designs.
- Organize different situations working shuffle steps, running around cones, changing rhythm, etc.

Equipment: Small cones, hoops and low hurdles.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 30 sec. for reps and 90 sec. for sets.

Exercise 9: Karate specific lateral movements. The purpose is to develop lateral segmental and lateral speed.

- The instructor pulls a double-ended speed bag gack.
- When it is released the student blocks the bag moves to the side and attempts to punch the bag as it returns from the block.
- This can also be done with a heavy bag which is slower.

Equipment: Double-ended speed bag and heavy bag.

Sets/reps/rest: 3 sets of 10 reps left and right foot advanced. Rest: 30 sec. between sets.

Strength

Exercises 1 to 14: See training to compete.

Exercise 15: Squat. The purpose is to develop mobility, stability and strength in the hips and torso.

- Perfect posture, barbell placed across the trapezius and shoulders, hands grasping the bar just outside shoulder width, chest up, abdominals tight, feet just outside the hips, weight on mid-foot to heel. Eyes focused on a point at eye level.
- Head and torso in a straight line, chest up, inhale, pull abdominals in tight, initiate the movement with the hips back and down, keeping the knees behind the toes, lower the hips until the top of the thighs are at 90 degrees, then pressing back up by forcefully driving through your feet, legs, hips and chest.

Equipment: Barbells.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets. Depending on the type of strength you want to develop.

Exercise 16: Leg curl. The purpose is to develop hamstring strength.

- Lying on your stomach, your kneecaps should extend horizontally just over the end of the bench, and the back of your ankles should rest against the padded bar.
- Begin the exercise by bending your knees as far as possible, trying to touch the pad to your buttocks, pause, then slowly return to the starting position.

Equipment: Leg curl machine.

Sets/reps/rest: 2 to 3 sets of 6 to 10 reps. Rest: 60 to 180 sec. between sets depending on the kind of strength you want to develop.

Exercise 17: Hyperextensions. The purpose is to develop erector spinae strength.

- Lying on your stomach on a table or specific machine, with the trunk and upper body hanging off the end. On a table have a partner hold down your lower body.
- From a lowered starting position, raise the upper body until it is in line with the rest of the body or until your back is tight. Lower the upper body to a 30 degree angle or just before the lower back curves.

Equipment: Table or specific machine.

Sets/reps/rest: 2 to 3 sets of 20 reps. Rest: 60 to 120 sec. between sets.

Exercise 18: Reverse hyperextensions. The purpose is to develop erector spinae strength.

- Lying on your stomach, on a table or specific machine, with your legs hanging off the end.
- Keeping the feet together, raise and lower your legs. Perform this slowly and repeat.

Equipment: Table or specific machine.

Sets/reps/rest: 2 to 3 sets of 20 reps. Rest 60 to 120 sec. between sets.

Exercise 19: Manual wrist supination/pronation. The purpose is to develop strength in forearms and wrists.

- Hold pipe palms facing each other, one above the other.
- Pronate/supinate wrists to unravel rope from pipe. Once rope is fully unraveled, rewind rope onto the pipe until it is fully wrapped.

Equipment: Pipe, barbell, dumbbells.

Sets/reps/rest: 2 to 3 sets. Rest: 120 sec. between sets.

Exercise 20: Core isolation. The purpose is to isolate abdominal muscles.

- Lying on your back with your arms fully extended at each side of your body and with your knees slightly bent.
- Contract the pelvic floor muscles, contract the lower abdominals and remember to breathe.
- Ensure that the initial contraction is isolated (no other muscles substituting), the contraction should begin slowly with control, low effort is all that is required, breathe normally.
- Once you have mastered isolating the lower abdominals with a normal breathing pattern, let one leg fall out to the side and back to a count of ten. Repeat with the other leg but be sure to keep the lower abdominals on the entire time and continue to breathe. Repeat 5 to 10 times on each leg.
- Don't let the opposite hip come up.

Equipment: None.

Sets/reps/rest: 1 to 2 sets of 5 to 10 reps X 10 sec. Rest: 60 to 90 sec. between sets.

Exercise 21: Core isolation. The purpose is to isolate the abdominal muscles.

- Lying on your back with your arms fully extended at each side of your body and with your knees slightly bent.
- Contract the pelvic floor muscles, contract the lower abdominals and remember to breathe.
- Ensure that the initial contraction is isolated (no other muscles substituting), the contraction should begin slowly with control, low effort is all that is required, breathe normally.
- Once you have mastered isolating the lower abdominals with a normal breathing pattern, move your feet up and down several inches for a count of 10 seconds. Repeat 5 to 10 times each leg.

Equipment: None.

Sets/reps/rest: 1 to 2 sets of 5 to 10 reps X 10 sec. each leg. Rest: 60 to 90 sec. between sets.

Exercise 22: Injury prevention. The purpose is to develop strength and prevent shoulder injuries.

- Pro-retraction.
- Sawing.
- Extension.
- Pull-over.

Equipment: Rubber tubing.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 60 to 90 sec. between sets.

Exercise 23: Swiss ball hip extension knee flexion. The purpose is to develop hamstring strength both as a knee flexor and hip extensor.

- Lying on your back place a ball under your heels. Place your arms in a T position to assist with balance.
- Movement is initiated by squeezing your glutes and raising your hips off the ground. Once your ankles, knees and hips are aligned, bring your heels toward you by flexing at the knee.
- Once your heels are at the end of their range, reverse the movement. After extending your knees lower your hips.
- Try using a single leg movement instead of a double-leg movement.

Equipment: Swiss ball.

Sets/reps/rest: 2 to 3 sets of 10 reps. Rest: 60 to 90 sec. between sets.

Other possibilities: Working other exercises with the Swiss ball.

Explosive-strength

Exercise 1: Resistance running. The purpose is to develop power in the lower body, to improve stride frequency and to improve bracing ability.

- The runner has a belt around their waist, which is connected to a pulley system by a rope. Their partner located behind them controls the running speed. The runner should attempt to sprint over a distance of 20 meters as quickly as possible in spite of the resistance of the rope.
- There are many forms of resistance that can be used to perform this drill. Use your imagination.

Equipment: rope, pulley and various resistance materials.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 1 min. between reps and 3 min. between sets.

Exercise 2: Sand running. The purpose is to develop overall power, to improve dynamic balance, to promote maximal physical efforts, fighting spirit and to hone proprioceptive skills.

- Use a long jump pit or a natural sand site.
- The student sprints at maximal speed in the sand.
- The student can start with a roll forward or a jump over a hurdle.

Equipment: Sand area, hurdles, cones and rubber tubing.

Sets/reps/rest: 2 to 3 sets of 4 to 5 reps. Rest: 45 sec. for reps and 3 minutes for sets.

Other possibilities:

Uphill speed runs (1 to 3 degree incline), partner tubing resisted speed runs, stadium stairs, parachute running, falling starts, downhill speed runs (3 to 7 degree decline), uphill-to-flat contrast speed runs (5 degree incline).

Exercise 3: Side-to-side box shuffle. The purpose is to develop the ability to push off the ground in a lateral direction, and to develop dynamic balance.

- The student stands next to a sturdy box approximately 0.5 meters wide and 0.3 meters high. She places the right foot on the box while the left foot remains on the ground. She pushes up and across the top of the box; landing with the left foot in the middle of the box and the right foot on the ground. Continue to shuffle back and forth across the box for 6 to 10 repetitions.
- The student should try to move back and forth in a smooth manner in controlled soft landings.

Equipment: A sturdy box 0.3 meters high and 0.5 meters wide.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 1 minute between sets.

Exercise 4: Sit on a bench. The purpose is to develop leg power.

- From a sitting position on a bench you must jump as high as possible. Then you go to the starting position and start over for 5 to 8 repetitions.

Equipment: Bench.

Sets/reps/rest: 2 to 5 sets of 5 to 8 reps. Rest: 60 to 90 sec. between sets.

Exercise 5: Medicine ball toss with shuffle steps. The purpose is to develop upper body power, agility and to strengthen core.

- Stand across from a partner, 3 to 5 meters. Moving sideways with shuffle steps 10 meters one way and then back, passing a medicine ball of comfortable weight back and forth. Keeping the medicine ball at chest level go from side to side one to three times.

Equipment: Medicine balls from 1 to 4 Kg.

Sets/reps/rest: 2 to 5 sets of 1 to 3 reps. Rest: 20 sec. between reps and 90 sec. between sets.

Exercise 6: Rotation into first step speed. The purpose is to develop upper body power and the ability to move quickly.

- Two hands throw from an open stance combined to shuffle steps.
- Two hands throw from an open stance combined to crossover steps.
- Wide positions.
- Wide positions with one hand medicine ball throw.
- Low positions, high positions.
- Rotate and one crossover step (one hand medicine ball).
- Overhead throws with first big step.

Equipment: Medicine balls from 1 to 4 Kg.

Sets/reps/rest: 2 to 5 sets of 4 to 10 reps. Rest: 90 to 120 sec. between sets.

Exercise 7: Medicine balls dynamic core exercises. The purpose is to develop upper body power and core strength.

- On the ground chest pass, sit-up toss, side tosses etc.
- On a Swiss ball overhead toss, side tosses and one hand throws.
- On a Swiss ball, one foot on the ground, same throws.
- On the ground partner throws.

Equipment: Medicine balls 1 to 4 Kg, Swiss ball.

Sets/reps/rest: 2 to 5 sets of 6 to 10 reps. Rest: 30 to 90 sec. between sets.

Exercise 8: Adapted dynamic power lifting movements. The purpose is to develop power, core strength, balance, coordination and shoulder stabilization.

- In a gym perform adapted dynamic power lifting movements.

Equipment: Barbells.

Sets/reps/rest: 2 to 5 sets of 6 to 8 reps. Rest: 90 to 120 sec. between sets.

Flexibility

Stretching method 1: Dynamic

Stretching method 2: Static

Stretching method 3: Passive

Stretching method 4: PNF

Characteristics:

- Contraction-relaxation is one technique commonly used. It involves passive movement to the onset of muscle stretch, and a maximal voluntary contraction performed against resistance (5 to 10 seconds) before relaxation (10 to 15 seconds) and then passive movement further into the range.
- Some exercises can be performed individually, however assistance and resistance are typically provided by an instructor or a partner.

Benefits: Proven to improve flexibility more than other stretching techniques.

Practical application:

- Almost all the passive stretching exercises can be performed with the PNF technique.
- Students can practice PNF daily or every time they stretch passively. PNF stretches are best conducted at the end of the day.

Stretching method 5: Postural

Characteristics:

- Different postures are held for an extended period of time (5 minutes) in order to stretch muscle groups and chains.

Benefits:

- Gains in flexibility are related to the time of the stretch.

Practical application:

- A complete session of postural stretching takes 15 to 20 minutes.
- This sort of stretching should be performed one to two times per week.

Aerobic endurance

Exercise 1: Basic endurance training. The purpose is to develop basic aerobic endurance.

- Running, cycling, skating, swimming, etc.
- Continuous work for 20 to 30 minutes, 2 to 3 times a week,
- Intensity is moderate to a little difficult.

Exercise 2: Intermittent training. The purpose is to develop aerobic endurance in a general way.

- 10 to 20 intermittent efforts of 6 to 8 minutes difficult to very difficult intensity.

Light biking, light jogging or light swimming must be developed three to five times a week for 20 minutes plus 10 to 15 minutes of static, passive or PNF stretching.

Coordination

Exercise 1: Reaction. Purpose is to develop reaction time and coordination.

- Speed bag, using various rhythms.
- Double ended bag.
- Punching a swinging ball on a cord.
- Dodging light-foam balls thrown from various distances.
- Punching a tennis ball dropped from various heights.

Equipment: speed bag, double ended bag, light-foam balls, tennis balls and balls on a cord.
Efforts: less than 20 seconds. Ratio 1/4

Exercise 2: Kicking. Purpose is to develop general coordination

- Kicking different ball sizes with right foot.
- Kicking different ball sizes with left foot.
- Keeping a ball in the air with your feet without letting it touch the ground.
- Keeping a hackey sack in the air with your feet.

Equipment: Soccer balls, balls of different sizes and hackey sacks.

Duration: 5 – 10 minutes. Efforts: less than 15 seconds Ratio: ¼

Exercise 3: Kicking a double-end bag. The purpose is to develop lower body coordination.

- Double or triple kicks to a speed bag suspended by bungee cords.
- The object is to achieve as many kicks as possible in a 10 sec. interval.

Equipment: Speed bag with bungee suspension.

Duration: 5 to 10 minutes. Efforts: 10 to 15 sec. Rest: 30 sec. between efforts.

Exercise 4: Rotational kicks on a heavy bag. The purpose is to coordinate precision kicking with other students.

- 3 or 4 students stand at kicking distance (front leg kicks) around a heavy bag.
- Each student kicks in turn for 10 sec. then they change direction of rotation and kick for a further 10 sec.
- Various kicks and kicking patterns can be employed.

Equipment: Heavy bag.

Duration: 3 to 5 min. Efforts: 10 to 15 sec. Rest: 15 sec. between efforts.

Exercise 5: Skipping rope. The purpose is to develop general coordination, differentiation, balance strength and aerobic endurance.

- Working every situation possible.
- One foot, two feet, split steps, crossover steps.
- Long steps, short steps, combined long and short steps.
- Going fast and slow, relays, making doubles.
- Going sideways, forward, backward.
- 100 to 300 reps nice and steady, etc.

Equipment: Skipping ropes.

Sets/reps/rest: 3 to 5 sets of 30 to 60 sec. Rest: 60 to 90 sec. between sets.

See the warm-up.

Exercise 6: Swiss ball passes. The purpose is to develop balance and coordination.

- 2 students face each other 3 meters apart balanced with knees on a Swiss ball.
- The partners pass a ball back and forth.
- Advanced drill is standing on a Swiss ball and passing a ball. (break-fall expertise is advised)

Equipment: Swiss balls and other balls.

Duration: 5 min. Efforts: 1 min. Rest: 30 sec.

Exercise 7: Swiss ball race. The purpose is to develop balance and coordination.

- A number of students are balanced with knees on Swiss balls.
- By using their hands and knees they propel the balls along a pre determined course.
- If a student falls from a ball they go back to the start.

Equipment: Swiss balls.

Duration: Time required finishing the course.

Sports and games

The purpose is to develop explosive strength, agility, coordination, aerobic and muscular endurance, decision-making ability and team spirit.

Exercise 1: Gyaku zuki war.

- Students are spread out at random on the dojo floor.
- The object is to gyaku zuki any other student. At the same time blocking or avoiding other students.
- Students who are scored on leave the floor. Until there is a winner.
- A variation is to have two or three teams.
- A further development is multiple teams.

Equipment: None.

Exercise 2: Take the tail from the donkey.

- The same as exercise 1 except that the object is to steal a small tape looped through the back of a student's belt.
- No contact is permitted.

Equipment: Coloured tapes.

Use your creativity to come up with fun games and activities your students can play.

Conclusion:

This manual provides ideas that can help build a foundation of information for your school or dojo. In order to be successful at the National and International level, some understanding of sport science and training methods is essential to gaining positive results.

Please consider this a working text, and continue to build and refine the ideas that are presented.

Good Luck.