• Contents:

1. Getting to know fitness at the Sports Centre

Preface

This handbook is a supplement to the fitness course for beginners at the Sports Centre Rijksuniversiteit en Hanzehogeschool in Groningen. During and after this course this handbook will be a welcome source of information and reference, for example if there is uncertainty about anything during the course.
In the following Chapter we will describe the house rules of the Sports Centre and other important related issues. Chapter 3 is an introduction to the following chapters and describes what one can achieve with fitness and what the general conditions are for the training of your body. In Chapter 4 we will single out the practical side; how to set up a machine and explain what sets and reps are. Chapter 5 is dedicated to some basic rules concerning training principles; all training laws will be explained, of which super compensation is most important. In Chapter 7 the theory and practice of the submaximal test will be singled out.
Chapter 8 focuses on all aspects of cardio training and how to train while using a heartbeat monitor. Seeing that most training is done to get a flatter stomach. Chapter 11 gives information about some general injuries and how to prevent them. Chapter 12 consists of two parts, a part about general advice and a part containing some interesting links, allowing you to find useful information on the internet as well. The course covers five 1½ hour introductory lessons. The goal of this course is to allow participants to train independently, safe and responsibly. Each lesson consists of a theoretical and a practical part. The content of the lessons is shortly described below. Chapter 13 describes the cardio- and weight training exercises.

Contents lesson 1:
Short tour through the hall (+ going through a number of house rules)
Explanation of a number of cardio machines (bike, and cross trainer)
Explanation of a number of weight machines (legs, chest and shoulders)
Cardio-work-out assignment: bike test (+ explanation use of heartbeat monitor)
Weight-work-out assignment: carry out the assigned exercises and make a note of training weight on the outline

Contents lesson 2:
Explanation training principles, training goal and intensity
Explanation of a number of cardio machines (rower, treadmill and arm bike)
Explanation of a number of weight machines (back, arms, stomach)
Cardio-work-out assignment: warming up
Weight-work-out assignment: carry out the assigned exercises and make a note of training weight on the outline

Contents lesson 3:
Cardio-work-out assignment: warming up + cardiovascular training
Weight-work-out assignment: drawing up an individual training outline
Weight-work-out assignment: submaximal fitness test, estimate 65% value

Contents lesson 4:
Explanation dumbbell exercises + separate exercises (bars, discs, and benches)
Cardio-work-out assignment: warming up + cardiovascular training
Weight-work-out assignment: carry out the assigned exercises

Contents lesson 5:
Cardio-work-out assignment: warming up + cardiovascular training
Weight-work-out assignment: drawing up an individual training outline

2. House rules for the fitness centre at the Sports Centre

A. Use of the fitness centre:

In this fitness centre the following rules apply:

1. **Every user should bring his/her personal valid fitness card** (sports card (ACLO/SPR) + fitness-sticker).
2. Training in the fitness centre is only allowed **in sportswear** and **with sport shoes**
3. Bags are to be placed on the racks.
4. Training is only allowed **with use of a towel**.
5. The cardio machines must be cleaned after use.
6. You must use **a bottle (bidon)** for the water station
7. Any food in the fitness centre is prohibited.
8. **Loose weights** (dumbbells and discs) **are to be put back** on the racks after use, and not te be used as extra weight on the machines
9. When using the bar-bells with discs, **clamps must be used**!!
10. It's not allowed to take weights to another hall.
11. Orders of **supervisors** and fitness instructors are to be followed
12. **If the rules are not followed**, **access** to the fitness **will be denied** for a certain period.

B. Facilities:

Rules concerning the facilities:

1. On set times a supervisor will be present (can be recognized by a black t-shirt) for questions and tips concerning fitness.
2. Heartbeat monitors can be used for free. You can get a heartbeat monitor by handing your sports card at the front desk at the Sports Centre.

C. Getting a fitness card (sticker):

A fitness card can be purchased when:

1. ***you participated in a fitness course of at least 4 lesson of 1,5 hours.***
2. ***Or you show in a intake lesson that your fitness skills are well developed***

The purchase of a fitness card (sticker) costs 65 euros (Sept. to Sept.)

Subject to alterations ***September 2012***

3. A short introduction: Fitness

The literal meaning of fitness is "to be fit". When you check the Oxford Advanced Learner's Dictionary it is described as: "the state of being physically healthy and strong". We call it preventive healthcare because you undertake activities which make you feel fitter and thus healthier.

Is fitness the same as bodybuilding?

In the second half of the eighties fitness was associated with bodybuilding. This had a negative image because of association with the use of prohibited stimulating drugs. The appeal of bodybuilding decreased and the image of the sports schools worsened.
Halfway through the nineties a number of sports schools decided to dissociate themselves from this. Not the image (bodybuilding), but health became the basis for the offered activities. In concrete terms this meant a shift to fitness and aerobics. With this a different kind of public was addressed and it did the image of the sports schools good. Some sports schools even prohibit the wearing of short tops and singlet's. In this way they attempt to keep out bodybuilders. Developments in the fitness industry made sure that more and more advanced equipment was put out into the market. This equipment is user friendly and safe.

Necessity of exercise

The effects of too little exercise could be: weight problems, high blood pressure, back complaints, cardio vascular diseases and depression. The government propagates "more exercise" since the end of the sixties. The Ministry of Public Health says concerning this issue: "the stimulating of sport and exercise has become necessary as an effect of the 'exercise poverty' in our contemporary society. Fitness is an effective and efficient way of exercising."

The benefits of Fitness:

- independent on the weather, safe and effective
- peaceful and undisturbed whenever it suits you
- listen to music or watch television during training
- ideal for busy people, who find it hard to plan a visit to a sports school because of their lifestyle, or cannot participate in (team) sports
- ideal for elderly people, people recovering from a disease or people who are overweight
- draw up your own training outline together with an expert

What can you achieve with Fitness?

A better condition of fitness, thicker muscles or a streamlined body? It can be achieved through exercising with machines or loose weights. By training regularly, rolls of fat, beer guts and double chins will disappear. This does not happen over weeks, but only after some months of hard training combined with a diet.

Other effects of Fitness training:

- the efficient functioning of the respiratory organs
- the blood circulation and supporting the heart
- the blood pressure stabilises
- the amount of 'healthy' cholesterol rises
- decreased chance of heart conditions
- it helps stabilising the blood sugar level
- the general activity level rises
- it keeps the joints supple, the muscles in condition and decreases the chance of osteoporosis (bone descaling, a disease in which bones become fragile and are more likely to break)
- with regular training it helps you to stay on the same weight or to lose weight
- the digestive system stabilises and improves
- the power of concentration improves and the self confidence is stimulated
- stimulates normal and healthy fatigue, which allows you to sleep more soundly
- inhibits the effects of ageing
- helps to keep up social contacts

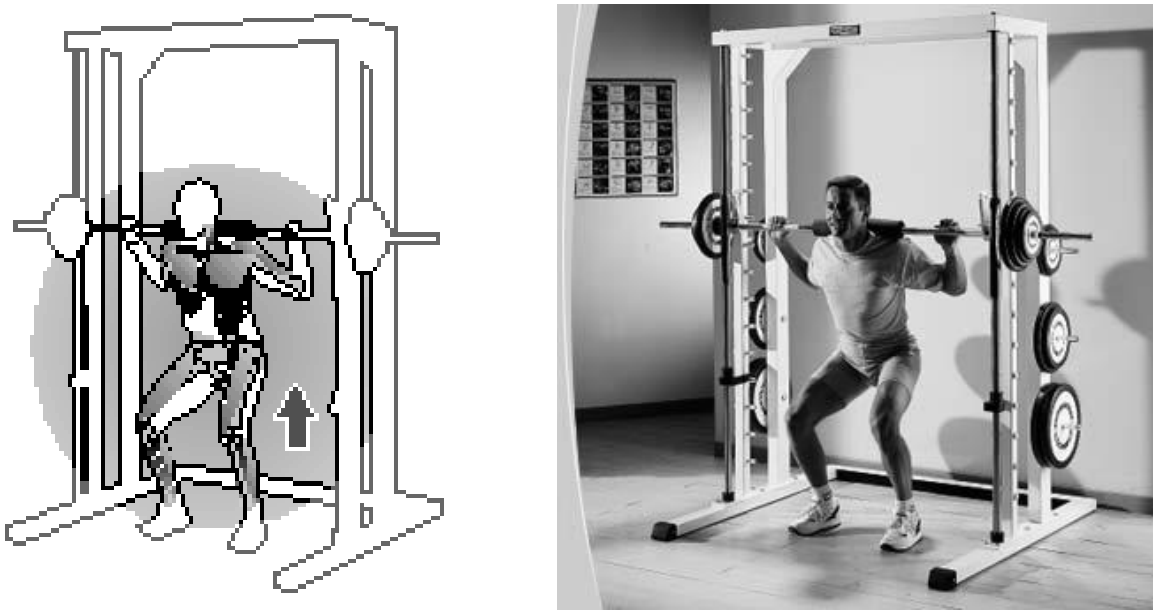


Fig. 1. Squatting at the multi power.

4. Training on fitness equipment

Training that strengthens muscular tissue can be done on every level; from very light to very heavy, for strengthening your body or to put an injury right. To carry out movements in which you experience resistance is specific for fitness training. Think of loose weights that you have to lift up against the gravity of the earth, or of equipment that allows you to program the amount of resistance in a training session.

Effects of training that strengthens muscular tissue:

The name says it all: training that strengthens muscular tissue causes muscles to strengthen and to become more powerful. However, for the rest of the body it means much more, namely:

Bone density

Pull and push loads of the bones during training sessions stimulate a sound skeleton development among youngsters but also in adults. Through training that strengthens muscular tissue the bone density increases; even at a later age! The heavier the load, the more the bones are stimulated and also the tendons and the sinews. Thus, weight training is a great way to prevent osteoporosis (bone descaling) and tests have even shown that it can decrease existing bone descaling through training with weights. Next to that the agility and suppleness increase.

Posture, back- , neck- and arm complaints

A good posture is important to stay ahead of some possible complaints. In our daily life so often we already have to cope with postures that are not well, which makes extra training all the more important. Someone who often sits or stands with their arms lifted up (hair dresser, computer, and ironing) can suffer severely from pain in the neck- and shoulder area and someone with a sitting profession can get into trouble in the area around their lower back. But also when your shoulders start to slightly hang forward because of weak higher back muscles and too short chest muscles or when your stomach muscles are too weak you can also expect complaints. With a proper program designed to strengthen muscular tissue you can keep the right muscles strong and maybe make others suppler. Even after an injury you can start carefully to prevent it from happening again.

Fat burning

Burning fat has everything to do with your metabolism, otherwise known as your burning speed. The higher the quantity of muscles you have got, the higher your metabolism. So you understand that exercises strengthening muscular tissue are very important, although they may not directly start on your fat reserves (for that we have got cardio-training) they do work indirectly on your total use of energy.

Muscular growth

With regular and with the right intensity in training muscular growth can occur. Special training outlines, well planned rest periods and proper nutrition are essential here as you will not be able to bring about any muscular growth just like that with exercising fitness twice a week, even though you might train very hard. Muscular growth does not come for free; it needs hard work and a lot of drive. It is a matter of taste whether you think it looks good or not but most of the time the really muscular people invested years of many disciplined hours before they got like that.

How do you set up a machine?

Before you start working with a machine, check the list below:

1. Which muscle group will you train (check the picture, check the information pillar)
2. Enter the right training weight
3. Adjust the machine to your body measurements (turning points of the joints)
4. Place a towel on the machine (hygiene, preserve equipment)
5. Breathe out when you pull your weight, breathe in when moving to go back
6. Carry out the whole movement

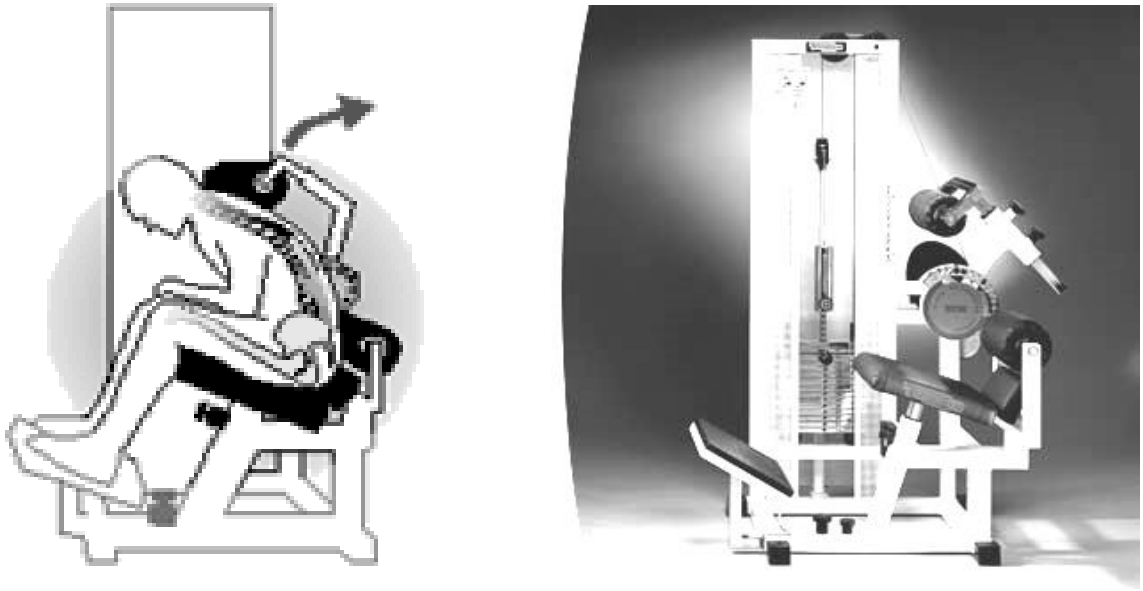


Fig. 4. Lower Back R.O.M.

Depending on your physical condition and training goal you do an **X amount of repetitions, and X amount of sets and an X amount of minute(s) rest.**

Repetitions

The more repetitions you do (15-25) the more the accent moves from strength to the training of the endurance of the muscle.
The less repetitions you do (1-12) the more the accent will move to the training of strength.

Sets

When you have only just started, it is important that you master your coordination (technique of the exercise). Do two sets in that case.
When you want to completely exhaust the muscle do more sets (3-5).

Rest after the set

The resting times between the sets make sure that the muscle can partly recover. Generally speaking you can say that: you must rest longer the heavier you train (filling up the phosphate system).

5. What you need to know before you start

The training laws.

The training process is based on the laws of adaptation. This means that the body – within certain boundaries – adapts to the done labour for new situations. This adaptation comes from homeostasis, the inclination of the body to – within certain boundaries – stabilise bodily functions. A number of training laws are derived from the principle of adaptation.

Namely:
1. Specificity
2. Reversibility
3. Optimal load
4. Diminished returns
5. Super compensation
6. Individuality

1. Specificity:
The body adapts to the direction of the load. So only the parts that are trained, improve. For example, when you want to improve the muscular strength in the leg muscles, only do those specific exercises aimed for the leg muscles.

2. **Reversibility**:
All training effects are lost just as fast as they are built up (reversibility). If you do not train for a while, the body will go back to the condition it was in before the training. Endurance especially will decrease rapidly.

3. Optimal load:
An optimal load provides an optimal training effect. Too much or too heavy training will cause injuries or strain. Too little or too light training means that little to no progress will be booked.

4. Diminished returns:
During the course of a training process intensity and scope will have to change. When the body has adapted to a certain load, the same training will provide a lot less effect, simply because the body can cope with the load more easily. Change the training schedule after 6-8 weeks: choose other exercises, change the intensity, choose a different training method or change tempo.

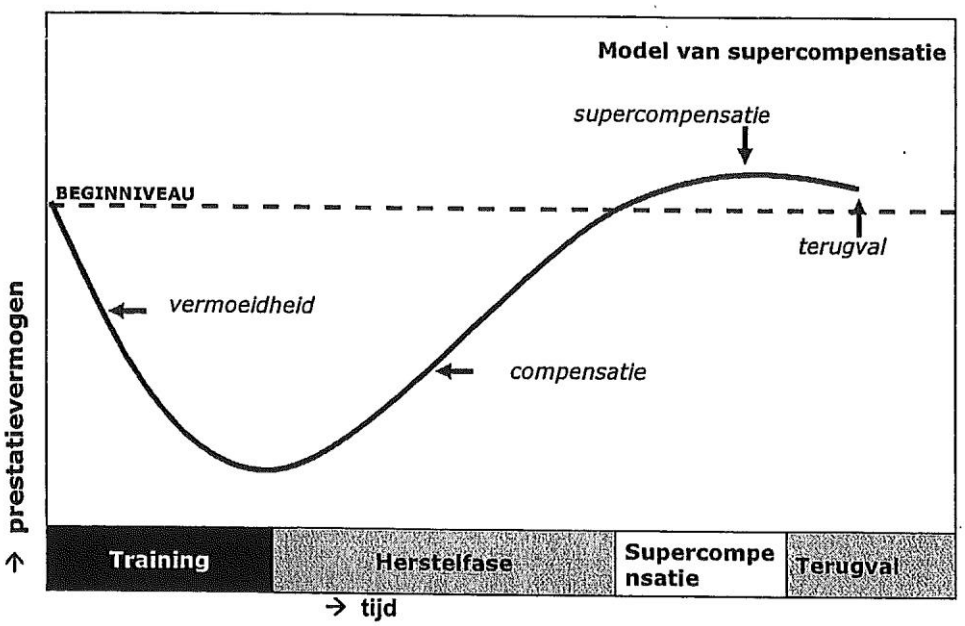
5. Super compensation:
In the training practise the law of super compensation is tremendously important. That is why we emphasise this issue. The measure to which super compensation (also called over compensation) occurs, determines the effect of a training session.
The process of super compensation consists of three phases.

Phase 1. The load phase
In a training unit the body is loaded. The amount of fuel decreases, muscles and tendons are damaged, and waste products are formed, etcetera.
All sorts of levels in the body are affected during a training session.

Phase 2. The compensation phase
After the training unit the body will recover. This happens among others firstly by rest, followed by nutrition. The recovery can take between one to three days, as degree and direction of the load differ.

Phase 3. The overcompensation phase
After the recovery phase super compensation sets in. In other words: the body prepares itself for new loads of the same nature. A kind of defensive reaction occurs.
That which was broken down in the training unit will be produced in larger quantities in this phase. After phase three the ideal moment must be chosen to plan another training to take place. When the next training does not follow soon enough, the law of reversibility will start working. Thus, the body regains the condition it was in before the training.

Note: Two training sessions can succeed each other too quickly. Phase three is not yet reached and the second training still takes place in phase two. Thus, the body is overloaded. No progress will be booked. To top that, injuries are lurking in the background.



6. Individuality
Everybody reacts differently. The preceding factors are strongly determined by individual characteristics. Concerning super compensation, we strongly need to take this into account.


Fig. 3. Standing Biceps Curl

6. Training goals:

In the outline below you will find four training goals, with next to that the guideline for drawing up the outline. Do you want to know what your 100% weight is for a certain exercise? Then do the submaximal fitness test.

Training goal	Explanation	Intensity	Amount of sets	Frequency
Maximal strength	Capacity to lift a load as heavy as possible with one repetition (weightlifting)	**100%** 1 repetition, 3 or more min. Rest between sets	Max. 3 sets	Max. 2x a week
Explosive strength	Capacity to move a great load with the fastest possible speed (sprinter/tennisser)	**± 80%** 8-12 repetitions, ± 4 min. rest between sets, emit with high tempo	3 sets	Max. 2x a week
Hypertrophia	Growth of muscular volume	**70-80%** 8-12 repetitions, 1-2 min. rest between sets	3-5 sets	2/3 training sessions with the same program
Strength-endurance	Capacity to keep up a light load for a longer span of time (endurance sport). Muscle does not become thicker, but stronger.	**50-65%** 15-25 repetitions, 30-60 sec. rest between sets	2-3 sets	2/3 training sessions with the same program

Fig. 5. Outline training goal

Below we will comment on a few objectives:

1. General condition
The general condition really covers everything that makes you feel better. This goal contains among others to feel better, the increase of self-esteem, relaxation and a generally improved health. For this goal nothing specific is recommended. The only advise for this goal is to keep the training sessions varied (cardio-training and weight training). The general condition is not only a matter of exercise, but also a matter of proper nutrition.

2. Fat loss
Fat loss is primarily stimulated by training for a longer period of time (minimal 30 min.) on cardio-equipment. The following methods can be used to stimulate fat loss.

- ***First cardio training then fitness exercises!***
- Do fitness exercises that address the larger muscle groups.
- Do more than 20 repetitions
- Eat relatively more healthy fats
- Eat more carbohydrates instead of fats
- For more information check ‘training with a heartbeat monitor’

3. Strength
Strength is improved by applying relatively short series (8-15 repetitions) with weights.

- Possibly do cardio-training after weight-training to stay supple.

4. Muscle growth
Muscle growth is primarily caused by doing relatively short series with heave weights (just like strength development).

- Possibly do cardio-training after weight-training

5. Strength / endurance
Endurance means: the ability of the muscle to accomplish long labour on a certain intensity. With an improvement of the endurance is thus meant: the improved performance of the muscle in the same time unit.

- The training consists of cardio- and fitness-training
- Do 15–25 repetitions per exercise

6. Fitness and fat loss
The method to use fitness training to slim down was wrongly underestimated for too long. Next to the fact that fitness is good for a healthy and supple body, it is also a great method to polish up your figure. The principle is very simple: muscle mass is metabolically very active. This means, the more muscle mass you have got, the more energy (calories) your body needs. Even when you rest or sleep the metabolism is maintained on a high tempo. In the opposite case, such as with a shrinking muscle mass, due to inactivity or a low calorie diet, the metabolism slows down, something that all too often results in an increase of the bodily fats.

Fig. 6. Cross trainer

With aerobe endurance activities bodily fats might be burned but the muscle mass does not increase. Fitness training or body shaping lessons give you more muscle mass. (Provided that the program is heavy enough). When you strive for physical fitness and fat loss at the same time, then a regularly carried out aerobe endurance training, alternated with fitness training is the ideal combination. Complete it with a balanced dietary pattern, rich with nutrients and that holds enough kilocalories.

You can get the looks of a bodybuilder only by training extremely hard, but that is a very long road to travel. Muscle mass is simply heavier then body weight and weight is not a factor that matters. What it is about, is the right relation between muscles and body fat. Muscles are heavier and tighter then body fat, but heavier.
Note: so your weight can even increase!

7. De submaximal fitness test

Via the submaximal fitness test you determine the 1-RM value (100%).
This is 100%, is the weight you can repeat with a maximum of one time.
The number of repetitions depends on the training goal you wish to complete.

Carrying out the submaximal method:

- Choose an exercise: extended warming-up, 15 repetitions with a light weight (check of the movement technique).
- Choose a weight that you repeat technically perfect between 10 and 15 times (75% - 65% of your maximal strength).
- The weight has to move continually. If it stops it's end of story.
- Can you do more than 28 repetitions or longer the one minute, then the chosen weight is too light, do the exercise again with a heavier weight.
- Count the number of repetitions that you accomplished during this minute continually, with the right speed of movement and the right way of carrying out the movement.
- Read off of the table below which load percentage comes with the scored number of repetitions.

Load in % of the maximum	The maximum number of repetitions
100%	1 repetition
95%	± 2 repetitions
90%	± 4 repetitions
85%	± 6 repetitions
80%	± 8 repetitions
75%	± 10 repetitions
70%	± 12 repetitions
65%	± 15 repetitions
60%	± 20 repetitions
55%	± 24 repetitions
50%	± 28 repetitions

Fig. 12. 1-RM table

With the help of the calculation that you will find below you are able to determine the weight that goes together with your maximal strength (100%).

- Let's say you can repeat an estimated weight of 40kg's a total of 15 times.
- Read from the table: with 15 repetitions goes 65%.
- 65% of your maximal strength ms.
- Ms = 100 : 65 X 40 kg = 61,5 kg
- We round this down to whole kg or 5 kg.
- In this case ms is (100%) = 60 kg.

According to the submaximal fitness test you should be able to repeat a weight of 60 kg once with this exercise.

Read from the table below
(Topmost value = number of repetitions, bottom values = weight (increasing))

16-24 60%	12-19 65%	9-15 70%	7-11 75%	6-9 80%	4-6 85%	3-4 90%	2-3 95%	1 100%
1	1	1	1	1	1	2	2	2
2	2	2	3	3	3	3	3	3
3	3	4	4	4	4	5	5	5
4	4	5	5	5	6	6	6	7
5	5	6	6	7	7	8	8	8
6	7	7	8	8	9	9	10	10
7	8	8	9	9	10	11	11	12
8	9	9	10	11	11	12	13	13
9	10	11	11	12	13	14	14	15
10	11	12	13	13	14	15	16	17
11	12	13	14	15	16	17	17	18
12	13	14	15	16	17	18	19	20
13	14	15	16	17	18	20	21	22
14	15	16	18	19	20	21	22	23
15	16	18	19	20	21	23	24	25
16	17	19	20	21	23	24	25	27
17	18	20	21	23	24	26	27	28
18	20	21	23	24	26	27	29	30
19	21	22	24	25	27	29	30	32
20	22	23	25	27	28	30	32	33
21	23	25	26	28	30	32	33	35
22	24	26	28	29	31	33	35	37
23	25	27	29	31	33	35	36	38
24	26	28	30	32	34	36	38	40
25	27	29	31	33	35	38	40	42
26	28	30	33	35	37	39	41	43
27	29	32	34	36	38	41	43	45
28	30	33	35	37	40	42	44	47
29	31	34	36	39	41	44	46	48
30	33	35	38	40	43	45	48	50
31	34	36	39	41	44	47	49	52
32	35	37	40	43	45	48	51	53
33	36	39	41	44	47	50	52	55
34	37	40	43	45	48	51	54	57
35	38	41	44	47	50	53	55	58
36	39	42	45	48	51	54	57	60
37	40	43	46	49	52	56	59	62
38	41	44	48	51	54	57	60	63
39	42	46	49	52	55	59	62	65
40	43	47	50	53	57	60	63	67

16-24 60%	12-19 65%	9-15 70%	7-11 75%	6-9 80%	4-6 85%	3-4 90%	2-3 95%	1 100%
41	44	48	51	55	58	62	65	68
42	46	49	53	56	60	63	67	70
43	47	50	54	57	61	65	68	72
44	48	51	55	59	62	66	70	73
45	49	53	56	60	64	68	71	75
46	50	54	58	61	65	69	73	77
47	51	55	59	63	67	71	74	78
48	52	56	60	64	68	72	76	80
49	53	57	61	65	69	74	78	82
50	54	58	63	67	71	75	79	83
51	55	60	64	68	72	77	81	85
52	56	61	65	69	74	78	82	87
53	57	62	66	71	75	80	84	88
54	59	63	68	72	77	81	86	90
55	60	64	69	73	78	83	87	92
56	61	65	70	75	79	84	89	93
57	62	67	71	76	81	86	90	95
58	63	68	73	77	82	87	92	97
59	64	69	74	79	84	89	93	98
60	65	70	75	80	85	90	95	100
61	66	71	76	81	86	92	97	102
62	67	72	78	83	88	93	98	103
63	68	74	79	84	89	95	100	105
64	69	75	80	85	91	96	101	107
65	70	76	81	87	92	98	103	108
66	72	77	83	88	94	99	105	110
67	73	78	84	89	95	101	106	112
68	74	79	85	91	96	102	108	113
69	75	81	86	92	98	104	109	115
70	76	82	88	93	99	105	111	117
71	77	83	89	95	101	107	112	118
72	78	84	90	96	102	108	114	120
73	79	85	91	97	103	110	116	122
74	80	86	93	99	105	111	117	123
75	81	88	94	100	106	113	119	125
76	82	89	95	101	108	114	120	127
77	83	90	96	103	109	116	122	128
78	85	91	98	104	111	117	124	130
79	86	92	99	105	112	119	125	132
80	87	93	100	107	113	120	127	133

16-24 60%	12-19 65%	9-15 70%	7-11 75%	6-9 80%	4-6 85%	3-4 90%	2-3 95%	1 100%
81	88	95	101	108	115	122	128	135
82	89	96	103	109	116	123	130	137
83	90	97	104	111	118	125	131	138
84	91	98	105	112	119	126	133	140
85	92	99	106	113	120	128	135	142
86	93	100	108	115	122	129	136	143
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88	95	103	110	117	125	132	139	147
89	96	104	111	119	126	134	141	148
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91	99	106	114	121	129	137	144	152
92	100	107	115	123	130	138	146	153
93	101	109	116	124	132	140	147	155
94	102	110	118	125	133	141	149	157
95	103	111	119	127	135	143	150	158
96	104	112	120	128	136	144	152	160
97	105	113	121	129	137	146	154	162
98	106	114	123	131	139	147	155	163
99	107	116	124	132	140	149	157	165
100	108	117	125	133	142	150	158	167
101	109	118	126	135	143	152	160	168
102	111	119	128	136	145	153	162	170
103	112	120	129	137	146	155	163	172
104	113	121	130	139	147	156	165	173
105	114	123	131	140	149	158	166	175
106	115	124	133	141	150	159	168	177
107	116	125	134	143	152	161	169	178
108	117	126	135	144	153	162	171	180
109	118	127	136	145	154	164	173	182
110	119	128	138	147	156	165	174	183
111	120	130	139	148	157	167	176	185
112	121	131	140	149	159	168	177	187
113	122	132	141	151	160	170	179	188
114	124	133	143	152	162	171	181	190
115	125	134	144	153	163	173	182	192
116	126	135	145	155	164	174	184	193
117	127	137	146	156	166	176	185	195
118	128	138	148	157	167	177	187	197
119	129	139	149	159	169	179	188	198
120	130	140	150	160	170	180	190	200

8. Cardio-equipment

Cardio training or cardiovascular training has everything to do with heart and blood vessels. The aim is that training is done in such a way that the heart rate increases and that the blood vessels and lungs will start to work harder. At least 1/3 of your muscles should be active. Several activities are very suitable for this such as walking, cycling, walking stairs, jumping, rowing, cross-country skiing, etc. (You will find machines such as the following among cardio training: treadmills, step machines, rowers and home trainers).

Effects of cardio training:

During a condition training the heart rate goes up, your body temperature rises, you start to perspire. The first 30 minutes carbohydrates are being burnt (your fuel to be able to train properly), after 30 minutes the body will start to burn bodily fats. The duration, longer then 30 minutes plus the intensity during the aerobe part in the lesson, is of great importance here. The body becomes more powerful and a better burning machine. (A must for losing weight and slimming down!!)
The heart and lung system start to work more efficiently. Because of this the lung capacity increases, the size and resilience of lungs is increased which makes it possible to hold in more oxygen. A larger maximal breathing capacity is the sign of true fitness! Your endurance improves, the heart muscle is strengthened and pumps blood (oxygen and nutrients) through the body with less beats. The blood supply in organs improves and they function better. The content of harmful fats in the blood decreases, while the concentration of healthy lipoprotein in the blood increases. These substances carry off fat and cholesterol out of the blood. Your blood pressure will drop.

As the heart, blood vessels and lungs attain a better condition, your aerobe strength increases; one of the most important criterions for fitness (regardless of your age). Everyday life comes more easily. When studying your power of concentration will improve. You will have more energy left for a tough job or a busy house hold which used to get you tired in the evenings.

The immune system improves; you will be less susceptible to diseases and colds etcetera. According to one of the latest researches regular training offers protection against serious diseases, such as cancer and cardio-vascular diseases. In 1999 there was even a special research on intestinal and breast cancer. People who live an active life had 80% less chance to this serious disease as people with a non-active lifestyle. A conclusion would be: sport extends life!!

Training with a heartbeat monitor

These days every cycling tourist or jogger who takes their hobby seriously sports with a special device around their chest and wrist: a heartbeat monitor.
The heartbeat monitor is an apparatus that measures the heartbeat frequency, the amount of beats per minute. That heartbeat frequency tells us something about how great the effort is. On the basis of that a sportsman or woman can adjust his or her training to a level that provides optimal training effects: to train endurance the heartbeat must not stay too low (or there will be hardly any training effect) but also should not go up too much (because then you train resistance instead of endurance). Especially beginning sportsmen and women tend to go too fast which tires them out and often causes them to drop out.
The intensity of an effort must be adjusted for everyone individually in function of the training condition.

Heartbeat zones

One can find four zones, to be calculated as a percentage of the maximal heart rate (220 min age). With a heartbeat monitor you train safe and effective in the right zone, depending on your goal and condition.
For example, for someone who is recovering/rehabilitating, of who begins sports, exercising on an effort level of 50-60% of the maximal heart rate is very good, while for an athlete who wants to run a marathon it is better to do the most training on 60-80% of the maximal heart rate. Depending on your goal you make a choice from one of the following heart rate zones:

1. Light intensity (50-60% of the maximal heart rate) – daily activities
This is the effort level for when you aim you become more active. For someone who has not done sports before, someone who has considerable weight problems or someone who is only starting again after an interruption or disease, this is an important level to start off with. This level can be maintained for a long time. Examples of efforts on this level are hiking, light aerobics, cycling, swimming, etc.

2. Light to average intensity (60-70% of the maximal heart rate) – improving health
For the improving of fitness this is the ideal level and is also recommended to those who wish to stabilise their weight or bring it up to standard. The intensity is heavy enough to develop the body, but it still feels bearable. Examples of activities are substantial hiking, jogging, aerobics and cycling.

3. Average intensity (70-85% of the maximal heart rate) – improving condition
Exercising on this level develops the heart, the breathing system, the lung function and the general endurance. The aerobe power – the capacity of the body to take oxygen to the muscles and to carry off waste materials – improves. In this case it could be for example jogging, running, cycling, swimming or aerobics.

4. Heavy intensity (85-100% of the maximal heart rate) - achievement-oriented training
On this level doing sports soon becomes anaerobe, which means that the blood that is pumped through the heart can no longer carry enough oxygen to the muscles. This causes the forming of lactic acid in the muscles. Training on this intensity causes tired muscles, heavy breathing and exhaustion. This level is only recommended to trained sportsmen or women, during short periods of time, once or twice a week.
This kind of training makes sure the athlete can function longer and better on a high effort level without getting complaints concerning the nasty effects of too little oxygen.

The heaviest level (above 90% of the maximal heart rate) is only interesting for people with a very good condition. Training on this intensity is pre-eminently anaerobe. Short sprints on an extremely high intensity improves the cellular metabolism.

9. Stomach muscles / Abs

There are many myths and misconceptions when it comes to stomach muscle training. A lot of informative sources claim that you can burn fat locally with stomach muscle exercises but unfortunately this is not true. You can have strong stomach muscles but when they are covered with fat you will never see them. For burning fat you will still need to start doing cardio training. Strong stomach muscles give you a good posture and a healthy back. A good technique is crucial in training your stomach muscles in the right way.

The straight stomach muscles

The straight stomach muscle is divided into the upper stomach muscles (the 6/8 blocks or the rings on the stomach) and the lower stomach muscle. The basic function of these muscles is to pull together the upper part of the body and the lower part of the body (elasticity of the torso), to stabilize the body and to protect the internal organs. These exercises can be divided into sit-ups (every exercise where the upper part of the body rises compared to the legs) and crunches (bringing the upper and the lower stomach muscles closer together).

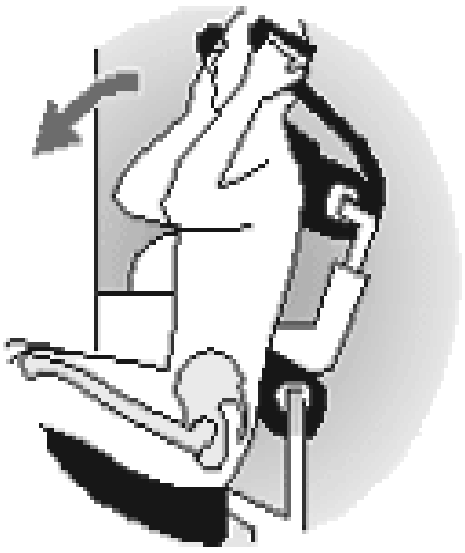


Fig. 7. Ab Crunch R.O.M.

The oblique stomach muscles

The basic function of the oblique stomach muscles is to turn the upper part of the body (rotation) and to protect the internal organs (especially the kidneys) against outside influences.

How many times a week should you train your stomach muscles?

There are different schools and philosophies, but in most view the assumption is being made that it is enough to train your stomach muscles twice or thrice a week.

How many repetitions and sets?

It is best to start with the lower stomach muscles, then the oblique following by the upper stomach muscles with three or four sets per exercise.
Take your time and carry out the exercises well and carefully.
Rest as little as possible in between the sets (30-45sec).

The number of repetitions per exercise depends on how advanced your are with training, but should be somewhere between 10 and 30 repetitions for every set.
If you easily make 30 repetitions you can place a light weight on your stomach to increase the resistance and increase the amount of repetitions.

Fig. 8. Crunch bank

fig. 9. Result?

Guidelines to remember while training your stomach muscles

- Do not pull your neck when you train.
- Keep your chin at fist length off of your chest.
- Begin with your arms crossed over your chest, move your arms backwards the stronger your stomach muscles get.
- Carry out exercises in a controlled way.
- Do not push or pull to finish your exercise.
- Keep your stomach muscles tensed and keep your back flat against the floor.
- Always breathe out when you pull your weight, breathe in when moving back.

10. Fitness and nutrition

To attain your goals, it's important to maintain a good combination of exercise and nutrition. However perfect your exercise schedule is, if your nutrition isn't adjusted to it, achieving your goals will be very difficult!
This chapter will provide information on good fluid and solids intake while exercising.

Fluid intake while exercising

A fluid deficiency leads to muscles functioning less well, which can result in cramping. If fluids are not replenished in time, this can lead to dehydration. Not only will performance be poorer but this can damage health as well. Although sports drinks are extremely popular, knowledge about them among those doing sports leaves much to be desired. The choice in the supermarket is so large that knowing what to choose can be difficult. Which sports drinks are good and, more importantly, when should you use them?

Sports drinks contain carbohydrates, salts and vitamins that help retain fluids in your body. Since water does not contain these, the extra liquid is lost more quickly through urination. Sports drinks are better for heavy exercise, to combat dehydration.
In other words: a sports drink is a mixture of water, carbohydrates and electrolytes (salts). Your body needs these to perform to the best of its ability. Of all the electrolytes (minerals such as sodium, potassium, calcium, magnesium and chloride), sodium in particular helps absorb liquid faster, which also increases thirst and leads to drinking more. Carbohydrates provide more energy for the body while exercising. Too many carbohydrates can inhibit the body's liquid uptake, so if you're thirsty, a sports drink with only a few carbohydrates is the best.

There are three different types of sports drinks on sale. The difference is in the amount of carbohydrates and electrolytes they contain and therefore the speed at which the body can absorb them.

Fig. 10 Drink enough fluids, about 150-250 ml of water for every 15 minutes of exercise

1. **Hypotonic drinks**
   A hypotonic drink has a relatively low osmotic value, which means that it contains less parts (sugars and electrolytes) per 100 ml than the body's fluids. Because it is more diluted, it is absorbed more quickly than water. A hypotonic drink contains on average less than 6 grams of carbohydrates per 100 ml.
   Hypotonic drinks: water, sports water

2. **Isotonic drinks**
   An isotonic drink has the same osmotic value as body fluids, which means that it contains roughly the same amount of parts per 100 ml and therefore is absorbed as quickly or quicker than water. Most commercial isotonic drinks contain between 6 and 8 grams of carbohydrates per 100 ml. In principle, isotonic drinks are the perfect compromise between replenishing fluids and energy. The choice between hypotonic and isotonic drinks is largely a matter of personal preference and taste. Some find isotonic drinks to be too concentrated and get stomach cramps.
   Isotonic drinks: AA isotone, Aquarius, Extran Thirst Quencher, Isostar
3. **Hypertonic drinks**
   It's all in the name – a hypertonic drink has a greater osmotic value than body fluids since it contains more parts per 100 ml, or in other words is more concentrated. This leads to its being absorbed more slowly than water. A hypertonic drink usually contains more than 8 grams of carbohydrates per 100 ml.
   Hypertonic drinks: Carbo Power, ACE multivitamin drink, Whey Amino Drink, Fatburner drink, Red Force, Extran Energy, AA high energy, AA multi-nine, Dextro Energie, but also soft drinks such as Coke and Fanta, and fruit juice too.

When to drink what

- When exercising for ½ -1 hour, replenishment of 150-250 ml per fifteen minutes.
- If exercising for longer than 1 hour, sports drinks are advisable, preferably 30-80 grams of carbohydrates per hour.
- Make sure that whatever you're drinking isn't too cold, otherwise your body will lose energy heating it to body temperature.

Nutrition

Here are a number of important tips on nutrition and a healthy and balanced diet:

In order to provide these, some information on nutrients is necessary, i.e. on carbohydrates, fats and proteins:

- Carbohydrates make your blood sugar level rise rapidly (you feel full and energetic) or fall rapidly (you feel hungry). This happens when you eat bread, cornflakes, Cruesli, muesli, etc. The more you have of this nutrient, the more your blood sugar level fluctuates and the more you eat because you feel hungry again and again. Feeling hungry can also manifest itself as feeling low on energy and listless.
- Proteins, on the other hand, are the building materials for your muscles and are digested slowly. This means that you constantly feel your body has energy – there are no ups and downs which means that your muscles recover more quickly and you have less sore muscles. In other words: include more protein meals in your diet and less carbohydrates.
- Try to take your proteins and carbohydrates separately – thus only proteins in one meal and only carbohydrates in another. The nutrients are absorbed better this way and your exercise will be more effective, while you will also feel more energetic during your day.
- Fats can be taken at both meals, although of course in small quantities and preferably unsaturated fats.

An example of a good and well-balanced nutrition schedule – for both losing weight and for gaining it (building muscle) can be found below. Remember, this schedule has to be adapted to each individual. If you exercise a lot, the main meals will have to be larger than if you exercise less.

Morning (proteins)
A bowl of low-fat quark (curd cheese) and a handful of unroasted nuts. This meal contains a great deal of protein, which gives your muscles the chance to replenish proteins and will also give you a full feeling.

Snack (carbohydrates)
2-3 slices of bread with a sweet spread (jam, honey, apple spread)

Lunch (protein)
A salad – an example of a good salad is:
A fried chicken filet, cucumber, tomato, lettuce, raw chicory and a boiled egg.
Of course you can include all sorts of ingredients, just so long as they are not carbohydrates such as pasta or potatoes.

Snack (carbohydrates)
1 piece of fruit – try to vary this and don't always have a banana for instance.

Evening meal (protein)
Vegetables with poultry or fish (thus no pasta, rice or potatoes).

Snack (protein)
A small bowl of low-fat quark without the unroasted nuts.

Tips for losing weight

Tip 1: Eat slowly – this is a proven method of feeling fuller more quickly. Take time for your meal and make it a nice occasion. Because you feel full more quickly, you'll eat less.

Tip 2: Always have breakfast – when you sleep your body goes into conservation mode where your metabolism rate slows down somewhat and your body is busy processing everything in it. This is why it is important to begin your breakfast with proteins, as whatever comes in first is stored and used immediately. Quark contains few or no carbohydrates and thus will not be stored as fat by your body but will mean that the muscles are replenished immediately and can work to optimum capacity.

Tip 3: Have 6 to 7 meals per day! When trying to lose weight, many people often eat less and eat less often. If your body does not receive enough nutrition, it goes into 'survival' mode, where it stores fat fearing that this is in short supply – thus eating less means that you will gain weight more easily than lose it. Of course if you manage to continue eating small amounts, your body will use what it has stored, leading to malnutrition. This is extremely dangerous!

Tip 4: Eat a lot of green vegetables as these contain many vitamins and minerals. They also contain a lot of fibre which is good for the metabolism.

Tip 5: Never do grocery shopping when you're feeling hungry – you will always buy more than you meant to and the products will be less healthy than what you meant to get.

11. Injuries, posture and general advise

Most of the time causes of injuries are among the following:

- *Not enough warming-up*
- *Technically not carrying out the exercises properly (wrong posture)*
- *Overtired / strained muscles because of wrong or too fast training build up*

Back injuries

About 80 % of the Dutch population faces back complaints in their lives. Generally speaking fitness/weight training is an effective method to keep the back muscles strong and thus to prevent back complaints. A condition is that the back exercises are built up properly and that they are technically correct in the way they are carried out. Too much, too heavy and wrong training can cause back injuries.

If you work with fixed or loose weights, always use your back with some sense. This means keep your back straight and never pull it extremely hollow. There are special belts on the market that support the lower back while you are doing exercises.

Fig. 10. Squat with a straight back

Knee injuries

Knee injuries are a common complaint, mostly because of overload of the cartilage and the sinews. A lot of it is easy to prevent, when one does not work with a sharp angle in the knees (around 90 degrees). It is extremely important to prevent over pulling the knees with heavy loads, in which the joint has to absorb all the traction (leg press).

Hand, elbow and foot injuries

The sinews and tendons of these relatively weak joints are extra sensitive for one-sided forms of training and/or insufficiently built up high loads. Sharp pain indicates overload. Relieve the complaint zone by changing the way the load is carried out or lower the load. When complaints persist, stop those exercises that strain the complaint zone. To relieve the sinews, it might help to vary the position of your hand (grip width, upper or lower grip).
Variations in the position of your feet are also very well possible. Work with the normal (for you customary) position of the feet, when you work with heavy weights. Then the freedom of movement will be best preserved. Wear proper shoes.

12a. General advise

1. Make sure you do an elaborate warming-up and keep your body warm during the training.
2. A warming-up can be done on cardio-equipment but also on fitness-equipment with a light weight and many repetitions.
3. Train all important muscle groups varyingly and in the right order (from larger muscle groups to the smaller muscle groups)
4. Make sure you carry out the exercise properly.
5. Do not make any wild or jerking movements, but see to flowing (symmetrical) movements.
6. Dose every new movement carefully. First practise the technique with light weights, only then make them heavier.
7. Work with a systematic build up of strength. First scope (more repetitions) followed by intensity (heavier weight) Do the exercises that are in your program. **The fitness centre is not a playground.**
8. Pain can indicate muscle injury. Adjust the way you carry out the exercise or cease the exercise.
9. Prevent pressing during heavy exercises.
10. Wear sturdy shoes, no slippers.
11. Check the material before you begin: are the dumb-bell / bar-bell sealers properly attached, is the pin put in far enough (in the weights)?
12. Train with partners. It is stimulating. Especially with heavy programs is increases the safety. Determining maximal power must never be done without a partner.
13. Do a cooling-down after the training.
14. No eccentric training with beginners. These are exercises in which you challenge the law of gravity. For example: pull yourself up and let yourself down again very slowly. The slowly lowering yourself is eccentric.

Note:
Do not start over fanatically or with weights that are too heavy. Muscles, bones, tendons and sinews can easily be overloaded and strained.

12b. Interesting websites:

www.fitness.pagina.nl
www.fitness-island.com
www.menshealth.nl
www.gezondheidsplein.nl
www.blessurevrij.nl
www.wvc.vlaanderen.be/gezondsporten
www.gssiweb.com
www.sport.nl
www.acsm.org
www.fitnessnet.nl
www.womenfitness.net
www.werkendlichaam.nl

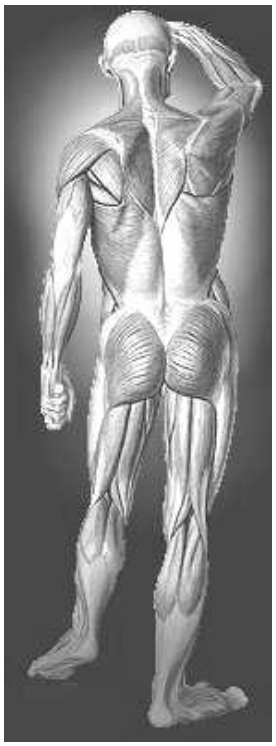


Fig.11. Torso

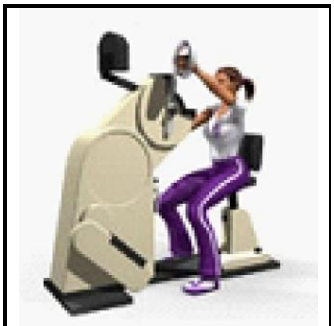
13. The introduction lessons

Introduction course, lesson 1 and 2

A. Cardio-work-out assignment:
Below two assignments on the bike are described to determine the training level. There is an assignment on the treadmill too, in which the goal is to get familiar with walking on a treadmill.

- Carry out the cardio-assignments in which you follow up the instructions and make a note of the results in the table.

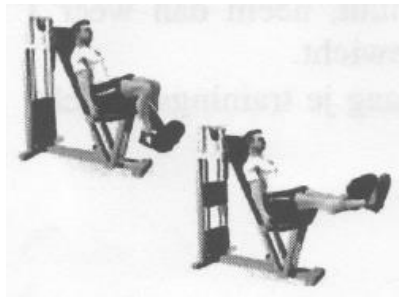
CARDIO	**Test training level**	**Bike test**
	Program **Bike test** **(RPM 70-80)** Result: Max:	Wet the sensors of the heartbeat band and wear the band at the height of your heart. When all is well, a heart should be flashing in the bottom left corner on the control panel. Take a seat on the bike; adjust the bike by putting the saddle on the right height so that it allows your knees to stay slightly bent when cycling. Sit still for a moment without cycling and make a note of your lowest heart rate. When using the bike 'techno bike race', use the button **'bike race test**'. When using the bike 'techno bike xt', then use the button **'test'**. Follow the instructions that go with the bike that you are using. At the end of the test the bike will indicate a level; write this down in your outline. This is the level on which you can train next time. When you only want to do the warming-up, divide it by two. Please clean the bike when you are done for the next person!
CARDIO	**Introduction**	**Crosstrainer life 9500+HF / 9100**
	Program **Manual** Time **10 min.** RPM **60-70**	Place yourself on the peddles and hold the screen. Follow the instructions on the screen and set up the cross trainer with the right training variables. Follow the **manual** program **(60-70 RPM)** If necessary change the handles and begin the training. Please clean the cross trainer when you are done for the next person!
CARDIO	**Introduction**	**Rowing concept II**
	Distance **2000 m** Time **8-10 min.** Level **3**	Place yourself on the seat of the rower and fasten your feet. Follow the instructions on the screen and set up the rower with the right training variables. Start rowing. ***To row properly, 1st straighten your legs, followed by bending your arms to your chest. Then 1st straighten your arms followed by bending your legs.*** Please clean the rower when you are done for the next person!

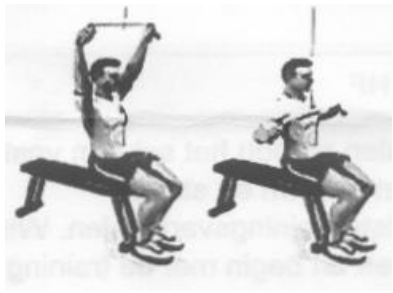
CARDIO	Introduction	Treadmill
	Program **Manual** Time **5 min.** Speed **5km/h**	Place yourself on the treadmill between the side braces and hold on to the brace in the front. Follow the instructions on the screen and choose **the menu Manual** to get used to walking on a treadmill. Start with an easy pace as soon as the treadmill starts to roll, build up the speed of the treadmill till **5km/h** with the + and – buttons. Stay between the braces while walking. Please clean the treadmill when you are done for the next person!
CARDIO	**Introduction**	**Arms techno**
	Program **Manual** Time **5 min.** RPM **50 - 60**	Adjust the seat and if necessary the handles on the right height and take a seat on the arm bike. Follow the instructions on the screen and set up the arm bike with the right training variables. Start arm cycling. Please clean the arm bike when you are done for the next person!

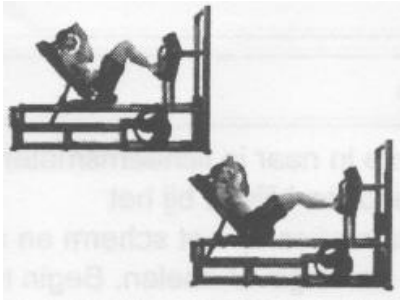
B. Weight-work-out assignment:

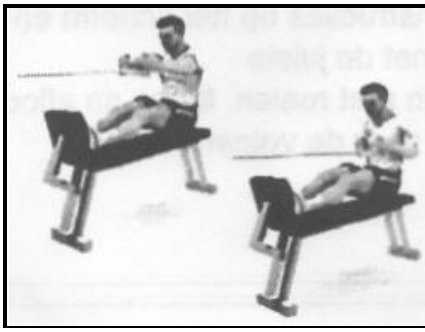
- Read the instructions
- Choose a training weight within the directed values in the exercise (see middle frame, for example; chest press: weight 5 to 20 kg). The aim is to choose a weight that allows you to do **easily 25 repetitions** in a technically perfect way.
- Take a one minute of rest.
- Increase the weight. Now try to carry out **easily 15 repetitions** in the same way and with the same movement speed. Make a
- Do the exercises maximum of 3 times

CHEST	Introductie	Pull over (Technogym)
	Weight: **15-30 *kg***	Adjust the machine to your body measurements. **Shoulders next to turning axle**. Hands above and in front of shoulder, then with arms straight rotate arms downwards till below the knees. Do not push the lower back against the back support. When returning arms upward, do not let them pass over your ears.
	Amount: 1e **x 25** 2e **x 15**	
	Pause: **30 - 60 sec.**	

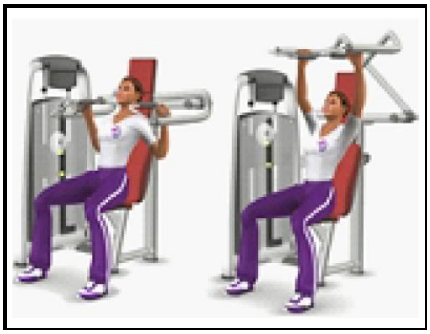
UPPER LEGS	Introductie	Leg extension
	Weight: **15-30 kg** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec.**	Adjust the machine to your body measurements. Place the roll just above your ankles. While holding the handles push your back and knees tight against cushions, then straighten the legs. ***The pivot point of the knees and machine must be the same.***

UPPER BACK	Introduction	Lat Mach, front
	Weight: **5-15 kg** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec.**	First, sit and lower rolls tightly down on knees. Then stand up, and pull bar down. Then, with knees locked under rolls, pull down bar with two hands holding black handles. While sitting, ensure your chest is out and the lower back slightly hollowed. Move the bar towards the top of the chest.

UPPER LEGS	Introductie	Leg press
	Weight: **bodyweight – 25 kg** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec.**	Adjust the machine to your body measurements. Place your feet hip width apart. With **your knees 90 degrees to hips and feet,** straighten your legs without locking your knees.

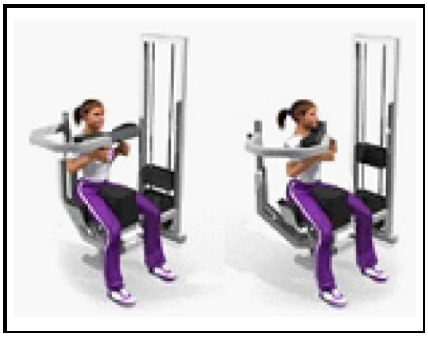
UPPER BACK	Introductie	Pulley, seated row
	Weight: **10-20 kg** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec**	Attach a triangle to the lower pulley. Sit on the bench, ***ensuring your chest is out and the lower back slightly hollowed***, with elbows alongside your body. The torso is not moved during this exercise.

CHEST	Introductie	Chest press wide grip
	Weight: **10-20 kg** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec**	Adjust the machine to your body measurements. With **upper arms parallel to the floor,** grab hold of the handles at chest height. Push the handles fully away from the body, without fully stretching the arms.

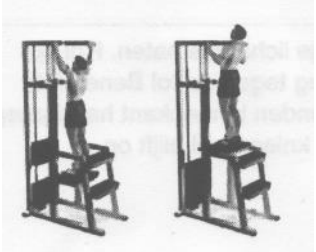
LOWER BACK	Introductie	Lower Back
	Weight: **5-20 kg** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec**	Sit on bench with equipment number set to 5. Adjust roll no higher then chest / shoulder blade level. Now set equipment number to 1. With both feet on bars and hands holding grey handles, push upper body backwards. When finished, reset equipment number to 5.
SHOULDERS	**Introductie**	**Shoulder press**
	Weight: **5-20 kg** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec**	Adjust the machine to your body measurements. Back against cushion, grab the indicated handles. Start with the **hands at ear height**. Push out until the arms are nearly stretched upwards.
Buttocks muscles	**Introductie**	**Multy Hip, standing Gluteus**
	Weight: **25-50 *kg*** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec**	Adjust the machine to your body measurements. **Hip on turning axle height** (of the machine). The roll lies in the back of the knee. Bring the leg almost stretched backward. While doing this turn the foot slightly outward.
UPPER LEGS	**Introductie**	**Multy Hip, standing abduction**
	Weight: **10-25 *kg*** Amount: 1e **x 25** 2e **x 15** Pause **30 - 60 sec.**	Adjust the machine to your body measurements. **Hip on turning axle height** (of the machine). Place one foot in the middle of the platform. Use the other leg to push the roll (which is located above the knee) to the side and down.
UPPER LEGS	**Introductie**	**Multy Hip, standing adduction**
	Weight: **10-25 *kg*** Amount: 1e **x 25** 2e **x 15** Pause: **30 - 60 sec.**	Adjust the machine to your body measurements. **Hip on turning axle height** (of the machine). Place one foot in the middle of the platform. Use the other leg to push the roll (which is located above the knee) to the side and down.

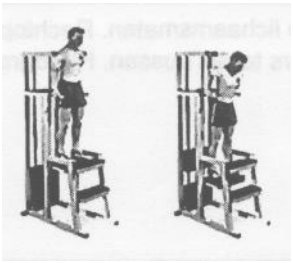
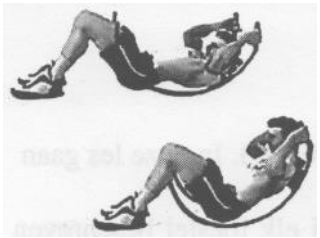
STOMACH	Introductie	TG Abdominal crunch
	Weight: **10-25 *kg***	Adjust the machine to your body measurements. **Lower back against the cushion.** Place the handle over your shoulders en bend forwards (nose towards knees).
	Amount: 1e **x 25** 2e **x 15**	
	Pause: **30 - 60 sec.**	

CHEST	Introductie	TG Pectoral machine
	Weight*:* **5-20 *kg***	Adjust seat of the machine according to the instructions. Adjust weight according to training schedule. Sit down, use 'easy-start' and place arms/elbows against the handles. Push the pads until they almost touch. Then let easily them go back to the starting position.
	Amount: 1e **x 25** 2e **x 15**	
	Pause: **30 - 60 sec**	

STOMACH	Introductie	TG Rotary torso
	Weight: **10-25 *kg***	Adjust the machine to your body measurements. **Lower back against the cushion.** Place the handle you're your shoulders and turn right or left. Use handle below the seat to adjust the direction of rotation.
	Amount: 1e **x 25** 2e **x 15**	
	Pause: **30 - 60 sec**	

UPPER LEGS	Introductie	Seated leg curl
	Weight: **10-25 *kg***	Adjust the machine to your body measurements. Sit down with your legs stretched out, put the cushions behind your enkles. Toes point up. Hold the handles. Bend the knees. Hollow of the knee (popliteal). Press the back of your knees against the cushion.
	Amount: 1e **x 25** 2e **x 15**	
	Pause: **30 - 60 sec.**	

UPPER BACK	Introduction	Easy Power station, chinning, front
	Weight: **bodyweight - 25 *kg***	Set up the weight that is needed to help in the movement. Place the hands on the handles. The palms of the hands point downwards. Pull the body up till the chin touches the bar.
	Amount: 1e **x 25** 2e **x 15**	
	Pause: **30 - 60 sec.**	

CHEST	Introductie	Bench press
	Weight: ***bar*** Amount: 1e **x 25** 2e **x 15** Pause: **30- 60 sec.**	Lie down on the flat bench, lower back tight against the bench. With elbows out, push the dumbbells up evenly. Then slowly lower them towards the chest again till the elbows are slightly beneath shoulder height.
Triceps	**Introductie**	**Easy Power station, dipping**
	Weight: **bodyweight - 25 *kg*** Amount: 1e **x 25** 2e **x 15** Pause: **30- 60 sec.**	Adjust the machine to your body measurements. Keep your lower back slightly hollow. Adjust the handles narrowly. Push the handles down. While doing this, keep your elbows close to your body.
LOWER BACK	**Introductie**	**Back Extensions**
	Weight: **body** Amount: 1e **x 15** 2e **x 15** Pause: **30- 60 sec.**	Adjust the machine such the top cushion lies under your hips. Anchor your feet under the bottom roll, legs straight. Arms can be either crossed over chest or above head. Bend forward at waist then raise body up and backwards, stopping before you hollow your lower back too much.
STOMACH	**Introductie**	**Horizontal crunch bench**
	Weight: **Body** Amount 1e **x 15** 2e **x 15** Pause: **30- 60 sec.**	Lay down on your back on the horizontal crunch bench. Put you upper legs between the cushions. Cross your arms in front of your chest of support your head with them. Strain your abdominal muscles and lift yourself up from the bench. Keep breathing. Slowly drop until your head nearly touches the bench. Repeat according to the instructions of your training schedule.
STOMACH	**Introduction**	**Ab-shaper**
	Weight: **Body** Amount 1e **x 25** 2e **x 25** Pause: **30- 60 sec.**	Place head on Ab-shaper cushion. While holding handles, elbows pointed out, roll slowly upwards and back.

Introduction course, lesson 3

This lesson is meant to close off the course and to supply everyone with an individual training outline.

A. Cardio-work-out assignment:

- Do a proper warming-up on a machine of your choice. When all is well, now you should know how each machine Works and how to set them up and adjust them. Do a cardio-vascular training on none of the machines for at least 15 minute.

B. Weight-work-out assignment:

In this lesson we will calculate the 65% value, the value on which we will train.

- Take a seat on a machine, read the directions that you find with each machine.
- You will start with a muscle specific warming-up; light weight, very easily make 20 repetitions in a technically perfect way.
- Take one minute rest.
- Now increase your training weight to the level with which you think you will be able to repeat between 10 and 15 repetitions.
- Try to do as many repetitions as possible during one minute (technically perfect). The weight must be moving continually.
- Look in the table of Chapter 9 to see which load percentage goes with the scored repetition amount.
- When things a well you should be between 65 and 75%, so 10 to 15 repetitions.
- Make a note of your 65% in the schedule.

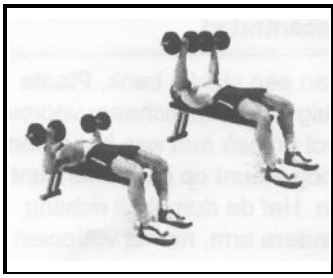
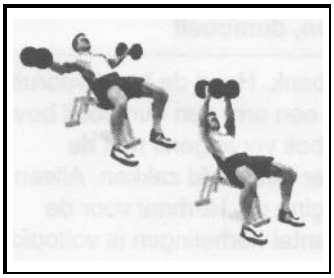
Fig. 13. The human body

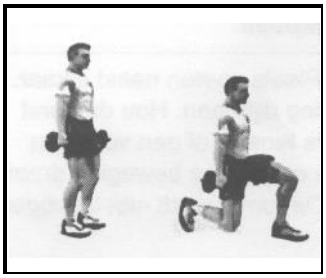
Introduction course, lesson 4

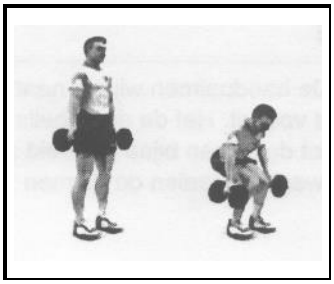
Free weight-work-out assignment:
In previous lessons we got to know the fixed machines. The aim of this lesson is to do the exercises that occur the most with dumbbells, barbells, ez-bars on a very low level. A correct instruction and way of carrying out the exercises is crucial here! So the purpose is not to train really hard, but to get to know the many possibilities of loose exercises.

- Work in pairs and check up each other on a correct way of carrying out the exercise.
- Choose an exercise that is described below. First read the directions carefully!
- Choose a very low training weight with which you can do two sets each of about 20 and 25 repetitions.
- Take a one minute pause between the sets, possibly the other person can do a set then.

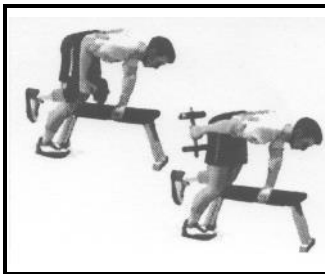
Fig. 15. Seated biceps curl, concentrated

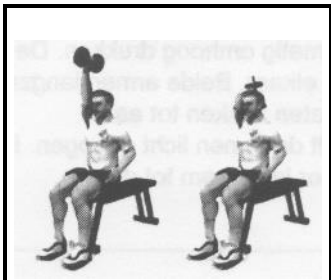
CHEST	**introductie**	**Dumbbell press**
		Lie down on the flat bench, lower back tight against the bench. With elbows out, push the dumbbells up evenly. Then slowly lower them towards the chest again till the elbows are slightly beneath shoulder height.
	Weight*:* **2-10** *(x2)* ***kg***	
	Amount: **2 x 20**	
	Pause: **30- 60 sec**	
CHEST	**introductie**	**Incline flies**
		Lie down on a incline bench, with the lower back flat against the bench. With arms extended horizontally, elbows slightly bent, raise the dumbbells up evenly. When totally raised, palms of hands point towards each other. Slowly and evenly lower both arms sideways till they reach a horizontal position.
	Weight*:* **2-6** *(x2)* ***kg***	
	Amount: **2 x 20-25**	
	Pause: **30- 60 sec.**	

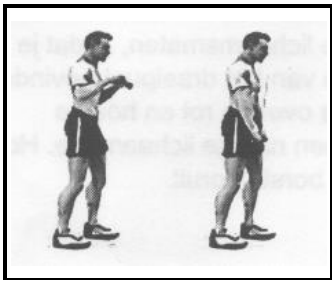
UPPER LEGS	introductie	Lunges, dumbbells
	Weight: **4-10***(x2)* ***kg*** Amount: **2 x 20** Pause: **30- 60 sec.**	Take two dumbbells. Hold the chest out and the lower back slightly hollowed. Step forward with one leg and then bend both knees till about 90 degrees. Do not let your front knee go past your toes. Come up and repeat the movement. Repeat for the other leg, after the amount of repetitions is completed.

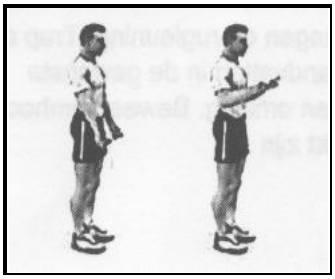
UPPER LEGS	introductie	Squat, dumbbells
	Weight: **4-10***(x2)* ***kg*** Amount: **2 x 20** Pause: **30- 60 sec.**	Place your feet hip width apart or slightly wider. Hold the chest out and the lower back slightly hollowed. Palms of the hands point toward the body. Slowly sag through your knees so that the upper part of the body moves forward and the buttocks point back. It is important that **the lower back does not move.**

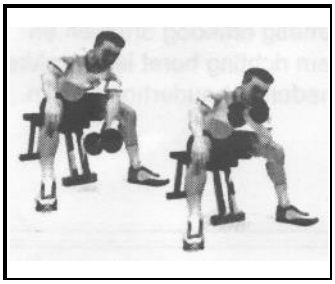
UPPER LEGS	introductie	Squat,
	Weight: **Bar** Amount: **2 x 20** Pause: **30- 60 sec.**	Place your feet hip width apart or slightly wider. Hold the chest out and the lower back slightly hollowed. Palms of the hands point toward the body. Slowly sag through your knees so that the upper part of the body moves forward and the buttocks point back. It is important that **the lower back does not move.**

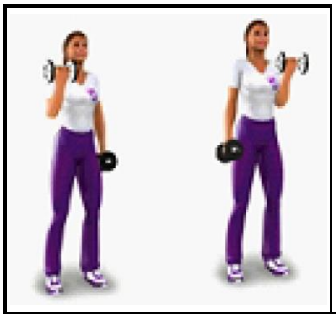
TRICEPS	introductie	Kick backs, dumbbell
	Weight: **1-6 *kg*** Amount: **2 x 20** Pause: **30- 60 sec.**	Place knee and same side hand on bench. With lower back slightly hollowed, place dumbbell in hanging arm. Set elbow against body (hip) and raise dumbbell backwards and upwards.

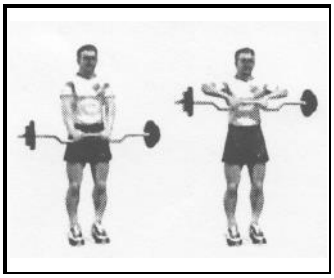
TRICEPS	introductie	Seated triceps extension, dumbbell
	Weight: **1-6 *kg*** Amount: **2 x 20** Pause: **30- 60 sec.**	Sit down on a flat bench. Hold the chest out and the back straight. Lift a dumbbell above the head with one arm. Then bending at the elbow, lower the dumbbell behind the head. Raise the dumbbell by straighten the elbow. Repeat for the other arm, after the amount of repetitions is complete. (You may use your other hand on the upper arm to fixate the arm.)

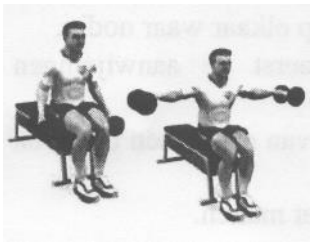
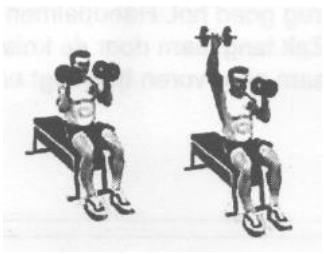
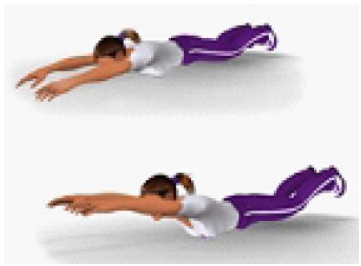
TRICEPS	introductie	Triceps pull down
	Weight: **5-15 *kg***	Attach a bar to the upper side of a pulley. Place your feet slightly wider then hip width. Hold the legs slightly bended, the chest out and the lower back slightly hollow. Bend slightly forward. Keep the upper arms against the upper part of the body. The lower arms are stretched downward in front of the body. The torso is not moved during this exercise.
	Amount: **2 x 20**	
	Pause: **30-60 sec.**	

BICEPS	introductie	Standing biceps curl, pulley
	Weight: **5-15 kg**	Attach a short biceps bar to the lower side of a pulley. Place your feet slightly wider then hip width. Hold the legs slightly bended, the chest out. Place the elbows against the body and lift the biceps bar towards the chest. The torso is not moved during this exercise.
	Amount: **2 x 20**	
	Pause: **30- 60 sec.**	

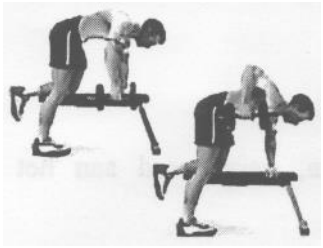
BICEPS	introductie	Seated biceps curl, concentrated
	Weight*:* **2-8 *kg***	Sit down on the end of a flat bench. Place the feet far apart. Bend the upper part of the body face down, hold the lower back slightly hollow and grab hold of a dumbbell with one hand. The elbow finds support on the inside of the accompanying knee. Lift the dumbbell towards the chest. Repeat for the other arm, after completing the amount of repetitions.
	Amount: **2 x 20**	
	Pause: **30-60 sec.**	

BICEPS	introductie	Dumbbell curl, standing
	Weight*:* **2-6 *kg***	Grab the dumbbells. Place feet slightly wider than your hip. Palms of your hands point towards thighbones. Keep chest forward en lower back slightly hollow during the movement. Don't swing your body. Bend arms one by one towards your chest, while turning your thumbs outside. Don't swing. Let the dumbbells drop one after another towards starting position.
	Amount: **2 x 20**	
	Pause: **30-60 sec.**	

SHOULDERS	introductie	Upright rowing, ez-bar
	Weight*:* ***E-Bar***	Place feet slightly wider then hip width. Grab the narrow handle and lift the ez-bar. Keep the legs slightly bent, or place one leg in front of the other one. Chest out. Lift the ez-bar straight up in front of the body till it reaches chin height.
	Amount: **2 x 20**	
	Pause: **30-60 sec.**	

SHOULDERS	introductie	Front raise, standing
	Weight: **1-4** (x2) ***kg*** Amount: **2 x 20** Pause: **30-60 sec.**	Place feet slightly wider then hip width. The palms of the hands point towards the front of your upper legs. Keep the legs slightly bent, chest out. Tighten your stomach and buttock muscles. Lift the dumbbells evenly or one by one with slightly bent arms forward to shoulder height. Do not sway or rock. While moving down hold out the chest properly.
SHOULDERS	**Introduction**	**Lateral raise, seated**
	Weight: **1-4** (x2) ***kg*** Amount: **2 x 20** Pause: **30-60 sec.**	Sit down on a flat bench. Holding two dumbbells, arms hanging by side and palms of hands pointing towards each other. Then with chest out, raise the dumbbells sideways and evenly with elbows slightly bent until arms are at shoulder height. Do not sway. Chest out while making the downward movement.
SHOULDERS	**Introduction**	**Dumbbell press, seated**
	Weight: **2-6** (2x) ***kg*** Amount: **2 x 20** Pause: **30-60 sec.**	Sit down on a flat bench. Hold the dumbbells at face height, elbows bent and palms of hands pointing towards each other. Chest out. Lift the dumbbells evenly or one by one above the head. The thumbs turn inward during the upward movement.
Lower Back	**Introduction**	**Lying total hyper extension on floor**
	Weight: ***Body*** Amount: **2 x 20** Pause: **30-60 sec.**	Lay down on your stomach. Lift your arms and legs at the same time.
STOMACH	**Introduction**	**Crunch**
	Weight: **Body** Amount **2 x 20** Pause: **30-60 sec.**	Lay flat on the floor. Keep lower back slightly hollow. You could roll your towel to support your lower back. Support your head with your hands. Elbows point up. **Don't pull your head.**

UPPER BACK	Introduction	Cable rowing, one arm
	Weight: **5-15 kg** Amount: **2 x 20** Pause: **30-60 sec**	Drop the roll. Attach a grip to the pulley block. Grab the handle with your right hand. Stand with your left foot in front of you (see picture). Bow upper body the front. First your back pulls the weight towards you, then pull your arm towards you.

UPPER BACK	Introduction	One arm row
	Weight: **5-15 kg** Amount: **2 x 20** Pause: **30-60 sec.**	Find support for your right knee and hand on a flat bench. Your lower back is slightly hollow. Lower your left shoulder and grab hold of the dumbbell. Lift the dumbbell till it reaches the chest. The torso does not move in this exercise. Then swap sides.

Buttocks muscles	Introduction	Step up, dumbbells
	Weight: **4-10 kg** Amount: **2 x 20** Pause: **30-60 sec**	Stand before a step or something alike. Grab two dumbbells. Place on feet on the step. Point chest forward keep your lower back slightly hollow. Step up. Then the other leg. Repeat this.

STOMACH	Introduction	Side bend, dumbbell
	Weight: **Body** Amount **2 x 20** Pause: **30-60 sec.**	Place your feet slightly wider then hip with. Push your chest forward and keep your lower back slightly hollow. Take dumbbell in left hand and move the upper body as far as possible sideways and left. Lower body calm as possible, legs don't bend.

STOMACH	Introduction	Leg Cross
	Weight: **Body** Amount **2 x 20** Pause: **30-60 sec.**	Lay flat on the floor. Keep lower back slightly hollow. You could roll your towel to support your lower back. Lift legs a little. Cross legs. Don't touch the ground until the whole exercise is finished.

Introduction course, lesson 5

This lesson is meant to close off the course and to supply everyone with an individual training outline.

Cardio-work-out assignment:

- Do a proper warming-up on a machine of your choice. When all is well, now you should know how each machine Works and how to set them up and adjust them. Do a cardio-vascular training o none of the machines.

Weight-work-out assignment:

- Draw up an individual outline in consultation with the fitness instructor, related to the training goal that you wish to achieve.