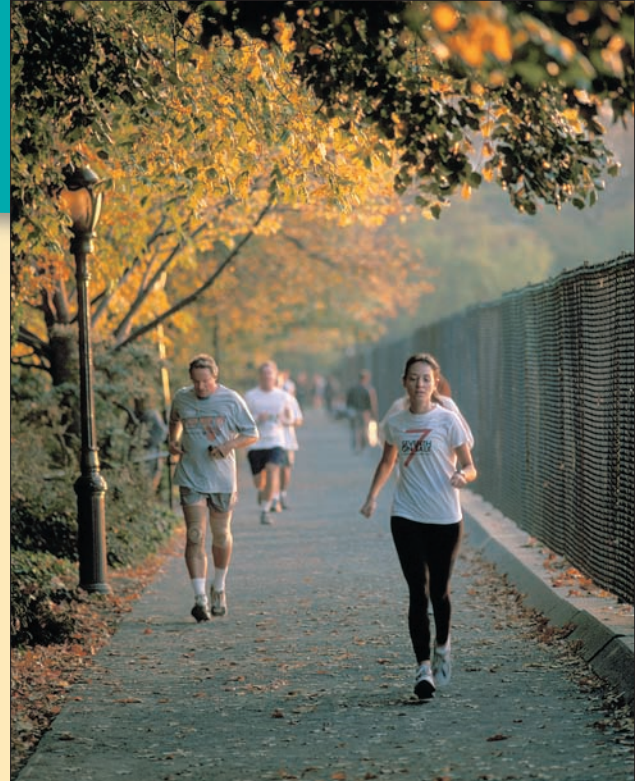


# 8

## Putting Together a Complete Fitness Program



### LOOKING AHEAD

After reading this chapter, you should be able to

- Explain the steps for putting together a successful personal fitness program
- Describe strategies that can help you maintain a fitness program over the long term
- Tailor a fitness program to accommodate special health concerns and different life stages

### TEST YOUR KNOWLEDGE

1. Falling asleep in a boring class means a person needs more sleep.  
True or false?
2. Exercise is not recommended for people with asthma or diabetes.  
True or false?
3. Participation at a moderate level will burn more calories during which activity?
  - a. Soccer
  - b. Rope skipping
  - c. Swimming

#### ANSWERS

1. TRUE. A fully rested person may become bored during an uninteresting or monotonous event but will not fall asleep. Daytime sleepiness is a sign of inadequate sleep, which negatively affects health and athletic performance.
2. FALSE. Although special precautions may be needed, people with many types of chronic conditions can exercise safely and obtain significant health benefits. Regular exercise reduces the risks of acute asthma attacks and improves insulin sensitivity.
3. B. Moderate rope skipping burns more calories per minute than soccer or swimming. At a vigorous level of participation, all three are comparable.

**WW** Fit and Well Online Learning Centre [www.mcgrawhill.ca/olc/fahey](http://www.mcgrawhill.ca/olc/fahey)

Visit the *Fit and Well* Online Learning Centre for study aids, online labs, additional information about putting together a complete fitness program, links, Internet activities that explore fitness, consumer resources, and much more.

Understanding the physiological basis and wellness benefits of health-related physical fitness, as explained in Chapters 1–7, is the first step toward creating a well-rounded exercise program. The next challenge is to combine activities into a program that develops all the fitness components and maintains motivation.

This chapter presents a step-by-step procedure for creating and maintaining a well-rounded program. Following the chapter, you'll find sample programs based on popular activities. The structure these programs provide can be helpful if you're beginning an exercise program for the first time.

## DEVELOPING A PERSONAL FITNESS PLAN

If you're ready to create a complete fitness program based around the activities you enjoy most, begin by preparing the program plan and contract in Lab 8.1. By carefully developing your plan and signing a contract, you'll increase your chances of success. The step-by-step procedure outlined here (adapted from *Your Guide to Getting Fit*, by Ivan Kusnitz and Morton Fine) will guide you through the steps of Lab 8.1 to the creation of an exercise program that's right for you. Refer to Figure 8.1 for a sample personal fitness program plan and contract.

If you'd like additional help in setting up your program, choose one of the sample programs at the end of this chapter. Sample programs are provided for walking/jogging/running, cycling, swimming, and inline skating; they include detailed instructions for starting a program and developing and maintaining fitness.

### 1. Set Goals

Setting goals to reach through exercise is a crucial first step. Ask yourself, "What do I want from my fitness program?" Develop different types of goals—general and specific, long term and short term. General or long-term goals might include things like lowering your risk for chronic disease, improving posture, having more energy, and improving the fit of your clothes. It's a good idea to also develop some specific, short-term goals based on measurable factors. Specific goals might be raising  $\dot{V}O_{2\max}$  by 10%, reducing the time it takes you to jog 5 kilometres from 22 minutes to 19 minutes, increasing the number of push-ups you can do from 15 to 25, and lowering BMI from 26 to 24.5. Having specific goals will allow you to track your progress and enjoy the measurable changes brought about by your fitness program.

Physical fitness assessment tests are essential to determining your goals. They help you decide which types of exercise you should emphasize, and they help you understand the relative difficulty of attaining specific goals. If you have health problems, such as high blood pressure, heart disease, obesity, or serious joint or muscle disabilities,



Weight training does little to develop cardiorespiratory endurance but is excellent for developing muscular strength and endurance. An overall fitness program includes exercises to develop all the components of physical fitness.

see your physician before taking assessment tests. Measure your progress by taking these tests about every 3 months.

You'll find it easier to stick with your program if you choose goals that are both important to you and realistic. Remember that heredity, your current fitness level, and other individual factors influence the amount of improvement and the ultimate level of fitness you can expect to obtain through physical training. Fitness improves most quickly during the first 6 months of an exercise program. After that, gains come more slowly and usually require a higher-intensity program. So don't expect to improve indefinitely. Improve your fitness to a reasonable target level, and then train consistently to maintain it. Sometimes you may lose fitness—due to illness, injury, missed workouts, or a vacation—so you must begin again at a lower level. Developing fitness is a dynamic process that involves gains and losses. Even if you lose ground occasionally, stay with your program, and you'll be able to achieve your goals.

Think carefully about your reasons for exercising, and then fill in the goals portion of your plan in Lab 8.1.

### 2. Select Activities

If you have already chosen activities and created separate program plans for different fitness components in

- A. I Tracie Kaufman (name) am contracting with myself to follow a physical fitness program to work toward the following goals:
- Specific or short-term goals
- Improving cardiorespiratory fitness by raising my  $\dot{V}O_{2max}$  from 34 to 37 ml/kg/min
  - Improving upper body muscular strength and endurance rating from fair to good
  - Improving body composition (from 28% to 25% body fat)
  - Improving my tennis game (hitting 20 playable shots in a row against the ball machine)
- General or long-term goals
- Developing a more positive attitude about myself
  - Improving the fit of my clothes
  - Building and maintaining bone mass to reduce my risk of osteoporosis
  - Increasing my life expectancy and reducing my risk for diabetes and heart disease

B. My program plan is as follows:

Activities	Components (Check <input checked="" type="checkbox"/> )							Frequency (Check <input checked="" type="checkbox"/> )	Intensity*	Time				
	CRE	MS	ME	F	BC	M	Tu				W	Th	F	Sa
Swimming	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	140-170 bpm	35min
Tennis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RPE i 13-16	90min
Weight training	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	see Lab 4-3	30min
Stretching	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	25min

\*List your target heart rate range or an RPE value if appropriate.

C. My program will begin on Sept. 21. My program includes the following schedule of mini-goals. For each step in my program, I will give myself the reward listed.

<u>Completing 2 full weeks of program</u> (mini-goal 1)	<u>Oct 5</u> (date)	<u>movie with friends</u> (reward)
<u><math>\dot{V}O_{2max}</math> of 35 ml/kg/min</u> (mini-goal 2)	<u>Nov 2</u> (date)	<u>new CD</u> (reward)
<u>Completing 10 full weeks of program</u> (mini-goal 3)	<u>Nov 30</u> (date)	<u>new sweater</u> (reward)
<u>Percent body fat of 27%</u> (mini-goal 4)	<u>Dec 22</u> (date)	<u>weekend away</u> (reward)
<u><math>\dot{V}O_{2max}</math> of 36 ml/kg/min</u> (mini-goal 5)	<u>Jan 18</u> (date)	<u>new CD</u> (reward)

D. My program will include the addition of physical activity to my daily routine (such as climbing stairs or walking to class):

- Walking to and from campus job
- Taking the stairs to residence room instead of elevator
- Bicycling to the library instead of driving
- Doing one active chore a day
- 

E. I will use the following tools to monitor my program and my progress toward my goals: I'll use a chart that lists the number of laps and minutes I swim and the charts for strength and flexibility from Labs 4-3 & 5-2.

I sign this contract as an indication of my personal commitment to reach my goal.

Tracie Kaufman (your signature) Sept 10 (date)

I have recruited a helper who will witness my contract and

swim with me three days per week  
(list any way your helper will participate in your program)

Danell Walker (witness's signature) Sept 10 (date)

Figure 8.1 A sample personal fitness program plan and contract.

Table 8.1

## A Summary of Sports and Fitness Activities

Activity	Energy Expenditure (calories/min/kg)	Activity	Energy Expenditure (calories/min/kg)
Racquetball (recreational)	0.07	Cycling (light, <16 km/h)	0.12
Kayaking (leisure)	0.04	Cycling (light-moderate, 16–19 km/h)	0.10
Dancing (general)	0.08	Cycling (moderate, 19.1–22 km/h)	0.14
Golf (walking + bag)	0.09	Cycling (hard, 22.1–25 km/h)	0.18
Running (7:30 min/km)	0.12	Cycling (v. hard, 25.1–30 km/h)	0.21
Running (6:50 min/km)	0.14	Cycling (stationary, 50W)	0.05
Running (6:15 min/km)	0.16	Cycling (stationary, 100W)	0.09
Running (5:50 min/km)	0.19	Cycling (stationary, 150W)	0.12
Running (5:00 min/km)	0.22	Cycling (stationary, 200W)	0.18
Running (4:25 min/km)	0.24	Cycling (stationary, 250W)	0.22
Running (3:45 min/km)	0.28	Calisthenics (push-ups, etc.)	0.08
Chopping Wood	0.09	Circuit Training	0.14
Mowing Lawn (walking, power)	0.08	Weight Training (light)	0.05
Raking Leaves	0.07	Weight Training (hard)	0.10
Trimming (manual)	0.07	Rowing (50W)	0.06
Weeding/Gardening	0.07	Rowing (100W)	0.12
Sitting Activities (very light)	0.03	Rowing (150W)	0.15
Standing (very light)	0.04	Rowing (200W)	0.21
Walking (12:30 min/km)	0.06	Stretching/Yoga	0.06
Walking (10:45 min/km)	0.07	Aerobics (low impact)	0.09
Walking (9:20 min/km)	0.08	Aerobics (high impact)	0.12
Sweeping	0.05	Volleyball (recreational)	0.05
Washing Car	0.07	Bathing/Dressing	0.04
House Cleaning	0.06	Sexual Activity (kissing, hugs)	0.02
Washing Dishes/Ironing	0.04	Sexual Activity (active)	0.03
Cooking Food	0.04	Swimming (light)	0.10
Carrying Groceries (light)	0.07	Swimming (moderate)	0.14
Laundry Folding/Making Bed	0.04	Sleeping	0.02
Playing with Kids (sitting)	0.04	Child Care (sitting)	0.05
Playing with Kids (standing)	0.05	Child Care (standing)	0.06

Adapted from McArdle, W., Katch, F., & Katch, V. (2001). *Exercise Physiology: Energy, Nutrition, and Human Performance* (5th Ed.). Philadelphia: Lippincott Williams & Wilkins.

SOURCE: [http://www.acefitness.org/updateable/update\\_display.aspx?pageID=593](http://www.acefitness.org/updateable/update_display.aspx?pageID=593)

Chapters 3, 4, and 5, you can put those plans together into a single program. It's usually best to include exercises to develop each of the health-related components of fitness.

- Cardiorespiratory endurance is developed by activities such as walking, cycling, and aerobic dance that involve continuous rhythmic movements of large-muscle groups like those in the legs (see Chapter 3).
- Muscular strength and endurance are developed by training against resistance (see Chapter 4).

- Flexibility is developed by stretching the major muscle groups (see Chapter 5).
- Healthy body composition can be developed by combining a sensible diet and a program of regular exercise, including cardiorespiratory endurance exercise to burn calories and resistance training to build muscle mass (see Chapter 6).

Table 8.1 rates many popular activities for their energy expenditures. Check the ratings of the activities you're considering to make sure the program you put together will help you achieve your goals. One strategy is to select one activity for each component of fitness—bicycling, weight training, and stretching, for example. Another strategy applies the principle of **cross-training**, using several different activities to develop a particular fitness component—aerobics classes, swimming, and volleyball for



**cross-training** Alternating two or more activities to improve a single component of fitness.

**Table 8.2**

**Popular Recreational Activities of Canadians**

Activity	Reported by % of Sample
Walking for exercise	69%
Gardening, yard work	48%
Home exercise	29%
Swimming	24%
Bicycling	24%
Social dancing	22%

SOURCE: Canadian Fitness and Lifestyle Research Institute, 2001. Physical Activity Monitor.

cardiorespiratory endurance, for example. Cross-training is discussed in the next section.

If you select activities that support your commitment rather than activities that turn exercise into a chore, the right program will be its own incentive for continuing. Consider the following factors in making your choices.

- *Fun and interest.* Your fitness program is much more likely to be successful if you choose activities that you enjoy doing. Start by considering any activities you currently engage in and enjoy. Often you can modify your current activities to fit your fitness program. As you consider new activities, ask yourself, “Is this activity fun?” “Will it hold my interest over time?” For new activities, it is a good idea to undertake a trial period before making a final choice. Table 8.2 shows a number of popular recreational activities you may enjoy.

- *Your current skill and fitness level.* Although many activities are appropriate for beginners, some sports and activities require participants to have a moderate level of skill to obtain fitness benefits. For example, a beginning tennis player will probably not be able to sustain rallies long enough to develop cardiorespiratory endurance. If your current skill level is minimal you may want to begin your program with a different activity. For example, a beginning tennis player may be better off with a walking program while improving his or her tennis game—or practising with a ball machine to guarantee steady activity. To build skill for a particular activity, consider taking a class or getting some instruction from a coach or fellow participant.

Your current fitness level may also limit the activities that are appropriate for your program. For example, if you have been inactive, a walking program would be more appropriate than a jogging program. Activities in which participants control the intensity of effort—walking, cycling, and swimming, for example—are more appropriate for a beginning fitness program than sports and activities that are primarily “other paced”—soccer, basketball, and tennis, for example. However, staying active is the most important thing. If you like to play tennis but don’t like to take walks or jog, then play tennis.

- *Time and convenience.* Unless exercise fits easily into your daily schedule, you are unlikely to maintain your program over the long term. As you consider activities, think about whether a special location or facility is required. Can you participate in the activity close to your residence, school, or job? Are the necessary facilities open and available at times convenient to you (see Lab 8.2)? Do you need a partner or a team to play? Can you participate in the activity year-round, or will you need to find an alternative during the summer or winter? Would a home treadmill make you more likely to exercise regularly?

- *Cost.* Some sports and activities require equipment, fees, or some type of membership investment. If you are on a tight budget, limit your choices to activities that are inexpensive or free. Investigate the facilities on your campus, which you may be able to use at little or no cost. Many activities require no equipment beyond an appropriate pair of shoes (see the box “Choosing Exercise Footwear” for more information). Refer back to Chapters 2 and 3 for consumer guidelines for evaluating exercise equipment and facilities.

- *Special health needs.* If you have special exercise needs due to a particular health problem, choose activities that will conform to your needs and enhance your ability to cope. If necessary, consult your physician about how best to tailor an exercise program to your particular needs and goals. Guidelines and safety tips for exercisers with common chronic conditions are provided later in the chapter.

**MOTIVATION FOR CHANGE!** To add variety and enjoyment to your workouts and to boost your motivation, try exercising to music. Researchers have found that working out to music can boost mood and even keep people working out longer and harder without feeling like they are expending extra effort. Just make sure that music provides a safe distraction and doesn’t increase your risk of injury; for example, don’t wear headphones while walking or jogging on the street.

### 3. Set a Target Frequency, Intensity, and Time (Duration) for Each Activity

The next step is to apply the FITT principle and set a starting frequency, intensity, and time (duration) for each type of activity you’ve chosen (see the sample in Figure 8.1). Refer to the calculations and plans you completed in Chapters 3, 4, and 5.

**Cardiorespiratory Endurance Exercise** An appropriate frequency for cardiorespiratory endurance exercise is 4–7 times per week. For intensity, note your target heart rate zone or RPE value. Your target total workout time (duration) should be about 20–30 minutes, depending on



Footwear is perhaps the most important item of equipment for almost any activity. Shoes protect and support your feet and improve your traction. When you jump or run, you place as much as six times more force on your feet than when you stand still. Shoes can help cushion against the stress that this additional force places on your lower legs, thereby preventing injuries. Some athletic shoes are also designed to help prevent ankle rollover, another common source of injury.

### General Guidelines

When choosing athletic shoes, first consider the activity you've chosen for your exercise program. Shoes appropriate for different activities have very different characteristics. For example, running shoes typically have highly cushioned midsoles, rubber outsoles with elevated heels, and a great deal of flexibility in the forefoot. The heels of walking shoes tend to be lower, less padded, and more bevelled than those designed for running. For aerobic dance, shoes must be flexible in the forefoot and have straight, nonflared heels to allow for safe and easy lateral movements. Court shoes also provide substantial support for lateral movements; they typically have outsoles made from white rubber that will not damage court surfaces.

Also consider the location and intensity of your workouts. If you plan to walk or run on trails, you should choose shoes with water-resistant, highly durable uppers and more outsole traction. If you work out intensely or have a relatively high body weight, you'll need thick, firm midsoles to avoid bottoming-out the cushioning system of your shoes.

Foot type is another important consideration. If your feet tend to roll inward excessively, you may need shoes with additional stability features on the inner side of the shoe to counteract this movement. If your feet tend to roll outward excessively, you may need highly flexible and cushioned shoes that promote foot motion. For aerobic dancers with feet that tend to roll inward or outward, mid-cut to high-cut shoes may be more appropriate than low-cut aerobic shoes or cross-trainers (shoes designed to be worn for several different activities). Compared with men, women have narrower feet overall and narrower heels relative to the forefoot. Most women will get a better fit if they choose shoes that are specifically designed for women's feet rather than those that are downsized versions of men's shoes.

### Successful Shopping

For successful shoe shopping, keep the following strategies in mind:

- Shop at an athletic shoe or specialty store that has personnel trained to fit athletic shoes and a large selection of styles and sizes.
- Shop late in the day or, ideally, following a workout. Your foot size increases over the course of the day and as a result of exercise.



- Wear socks like those you plan to wear during exercise. If you have an old pair of athletic shoes, bring them with you. The wear pattern on your old shoes can help you select a pair with extra support or cushioning in the places you need it the most.
- Ask for help. Trained salespeople know which shoes are designed for your foot type and your level of activity. They can also help fit your shoes properly.
- Don't insist on buying shoes in what you consider to be your typical shoe size. Sizes vary from shoe to shoe. In addition, foot sizes change over time, and many people have one foot that is larger or wider than the other. Try several sizes in several widths, if necessary. Don't buy shoes that are too small.
- Try on both shoes and wear them around for 10 or more minutes. Try walking on a noncarpeted surface. Approximate the movements of your activity: walk, jog, run, jump, and so on.
- Check the fit and style carefully:
  - Is the toe box roomy enough? Your toes will spread out when your foot hits the ground or you push off. There should be at least one thumb's width of space from the longest toe to the end of the toe box.
  - Do the shoes have enough cushioning? Do your feet feel supported when you bounce up and down? Try bouncing on your toes and on your heels.
  - Do your heels fit snugly into the shoe? Do they stay put when you walk, or do they rise up?
  - Are the arches of your feet right on top of the shoes' arch supports?
  - Do the shoes feel stable when you twist and turn on the balls of your feet? Try twisting from side to side while standing on one foot.
  - Do you feel any pressure points?
- If the shoes are not comfortable in the store, don't buy them. Don't expect athletic shoes to stretch over time in order to fit your feet properly.
- Replace athletic shoes about every 3 months or 800 km of jogging or walking.

Name Tracie Kaufman

Enter time, distance, or another factor to track your progress.

Activity/Date	M	Tu	W	Th	F	S	S	Weekly Total	M	Tu	W	Th	F	S	S	Weekly Total
<sup>1</sup> Swimming	800 m		725 m		800 m			2325 m	800 m		800 m		850 m			2450 m
<sup>2</sup> Tennis						90 min		90 min						95 min		95 min
<sup>3</sup> Weight Training		✓		✓		✓				✓		✓		✓	✓	
<sup>4</sup> Stretching	✓		✓		✓	✓			✓			✓	✓	✓	✓	

Figure 8.2 A sample program log.

the intensity of the activity (shorter durations are appropriate for high-intensity activities, longer durations for activities of more moderate intensity). You can exercise in a single session or in multiple sessions of 10 or more minutes. One way to check whether the total duration you've set is appropriate is to use **calorie costs** (calories per minute per kg of body weight). Your goal should be to work up to burning about 300 calories per workout; beginners should start with a calorie cost of about 100–150 calories per workout. Walking at a moderate pace burns about 0.029 calorie per minute per pound of body weight. A person weighing 150 pounds could begin her exercise program by walking for 30 minutes, burning about 130 calories. Once her fitness improves, she might choose to start cycling for her cardiorespiratory endurance workouts. Cycling at a moderate pace has a higher calorie cost than walking (0.049 calorie per minute per pound), and if she cycled for 40 minutes, she would burn the target 300 calories during her workout.

**Muscular Strength and Endurance Training** A frequency of 2–4 days per week for strength training is recommended. As described in Chapter 4, a general fitness strength training program includes 1 or more sets of 8–12 repetitions of 8–10 exercises that work all major muscle groups. For intensity, choose a weight that is heavy enough to fatigue your muscles but not so heavy that you cannot complete the full number of repetitions with proper form.

**Flexibility Training** Stretches should be performed when muscles are warm 4–7 days per week. Stretches should be performed for all major muscle groups. For each exercise, stretch to the point of slight tension or mild discomfort and hold the stretch for 10–30 seconds; do at least 4 repetitions of each exercise.

#### 4. Set Up a System of Mini-Goals and Rewards

To keep your program on track, it is important to set up a system of goals and rewards. Break your specific

goals into several steps, and set a target date for each step. For example, if one of the goals of an 18-year-old male student's program is to improve upper-body strength and endurance, he could use the push-up test in Lab 4.2 to set intermediate goals. If he can currently perform 15 push-ups (for a rating of "very poor"), he might set intermediate goals of 17, 20, 25, and 30 push-ups (for a final rating of "fair"). By allowing several weeks between mini-goals and specifying rewards, he'll be able to track his progress and reward himself as he moves toward his final goal. Reaching a series of small goals is more satisfying than working toward a single, more challenging goal that may take months to achieve. Realistic goals, broken into achievable mini-goals, can boost your chances of success. For more on choosing appropriate rewards, refer to page 15 in Chapter 1 and Activity 4 in the Behaviour Change Workbook at the end of the text.

#### 5. Include Lifestyle Physical Activity in Your Program

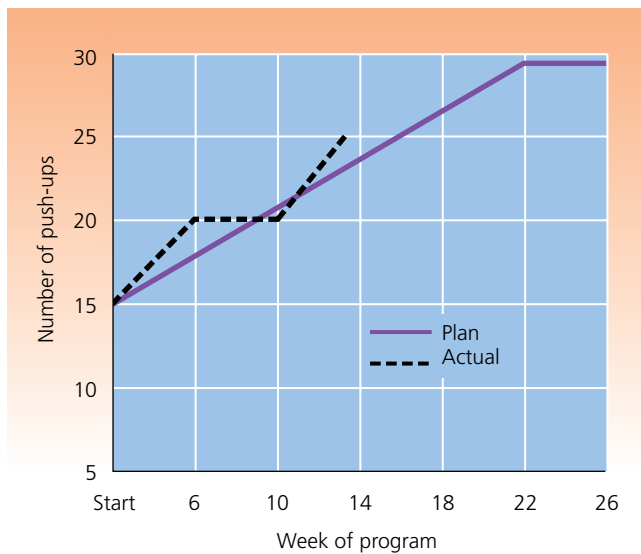
As described in Chapter 2, daily physical activity is an important part of a fit and well lifestyle. As part of your fitness program plan, specify ways to be more active during your daily routine. You may find it helpful to first use your health journal to track your activities for several days. Review the records in your journal, identify routine opportunities to be more active, and add these to your program plan in Lab 8.1.

#### 6. Develop Tools for Monitoring Your Progress

A record that tracks your daily progress will help remind you of your ongoing commitment to your program and give you a sense of accomplishment. Figure 8.2 shows

**calorie cost** The amount of energy used to perform a particular activity, usually expressed in calories per minute per kilogram of body weight.





**Figure 8.3** A sample program progress chart.

you how to create a general program log and record the activity type, frequency, and times (durations). Or if you wish, complete specific activity logs like those in Labs 3.2, 4.3, and 5.2 in addition to, or instead of, a general log. Post your log in a place where you'll see it often as a reminder and as an incentive for improvement. If you have specific, measurable goals, you can also graph your weekly or monthly progress toward your goal (Figure 8.3). To monitor the overall progress of your fitness program, you may choose to reassess your cardiorespiratory endurance, muscular strength and endurance, flexibility, and body composition every 3 months or so during the improvement phase of your program. Because the results of different fitness tests vary, be sure to compare results for the same assessments over time.

## 7. Make a Commitment

Your final step in planning your program is to make a commitment by signing a contract. Find a witness for your contract—preferably one who will be actively involved in your program. Keep your contract in a visible spot to remind you of your commitment.

## PUTTING YOUR PLAN INTO ACTION

Once you've developed a detailed plan and signed your contract, you are ready to begin your fitness program. Refer to the specific training suggestions provided in Chapters 2–5 for advice on beginning and maintaining your program. Many people find it easier to plan a program than to put their plan into action and stick with it over time. For that reason, adherence to healthy lifestyle programs has become an important area of study for psychologists and health researchers. The guidelines

below and in the next section reflect research into strategies that help people succeed in sticking with an exercise program:

- *Start slowly and increase fitness gradually.* Overzealous exercising can result in discouraging discomforts and injuries. Your program is meant to last a lifetime. The important first step is to break your established pattern of inactivity. Be patient and realistic. Once your body has adjusted to your starting level of exercise, slowly increase the amount of overload. Small increases are the key—achieving a large number of small improvements will eventually result in substantial gains in fitness. It's usually best to increase duration and frequency before increasing intensity.

- *Find an exercise buddy.* The social side of exercise is an important factor for many regular exercisers. Working out with a friend will make exercise more enjoyable and increase your chances of sticking with your program. Find an exercise partner who shares your goals and general fitness level.

- *Vary your activities.* You can make your program more fun over the long term if you participate in a variety of different activities that you enjoy. You can also add interest by strategies such as varying the routes you take when walking, running, biking, or in-line skating; finding a new tennis or racquetball partner; changing your music for aerobic dance; or switching to a new volleyball or basketball court.

Varying your activities, a strategy known as cross-training, has other benefits. It can help you develop balanced, total body fitness. For example, by alternating running with swimming, you build both upper- and lower-body strength. Cross-training can thus prepare you for a wider range of activities and physical challenges. It can also reduce the risk of injury and overtraining because the same muscles, bones, and joints are not continuously subjected to the stresses of the same activity. Cross-training can be done either by choosing different activities on different days or by alternating activities within a single workout.

- *Cycle the volume and intensity of your workouts.* Olympic athletes use a training technique called periodization of training, meaning that they vary the volume and intensity of their workouts. Sometimes they exercise very intensely; at other times they train lightly or rest. You can use the same technique to improve fitness faster and make your training program more varied and enjoyable. For example, if your program consists of walking, weight training, and stretching, pick one day a week for each activity to train a little harder or longer than you normally do. If you usually walk 3 km in 10 minutes per kilometre, increase the pace to 9 minutes per km once a week. If you lift weights twice a week, train more intensely during one of the workouts by using more resistance or performing multiple sets.





Lapses are a normal part of any behaviour change program. The important point is to move on and avoid becoming discouraged. Try again, and keep trying. Know that continued effort will lead to success.

- Don't judge yourself harshly. Focus on the improvements you've already obtained from your program and how good you feel after exercise—both physically and mentally.
- Visualize what it will be like to reach your goals. Keep these pictures in your mind as an incentive to stick with your program.
- Use your exercise journal to identify thoughts and behaviours that are causing noncompliance. Devise strategies to combat these problematic patterns. If needed, make additional changes in your environment or obtain more social support. Call a friend to walk with you. Put your exercise clothes in your car or backpack.

- *Adapt to changing environments and schedules.* Most people are creatures of habit and have trouble adjusting to change. Don't use wet weather or a new job as excuses to give up your exercise program. If you walk in the summer, put on a warm coat and walk in the winter. If you can't go out because of darkness, join a gym and walk on a treadmill. Changes in your job or family situation can also affect your exercise program. Taking a job with a longer commute or having a new baby can rob you of the time you used to spend exercising. Remember that physical activity is important for your energy level, self-esteem, and well-being. You owe it to yourself to include physical activity in your day. Try to exercise before going to work or do some physical activity during your lunch hour—even if it's only a short walk or a few trips up and down the stairs.

- *Expect fluctuations and lapses.* On some days, your progress will be excellent, but on others, you'll barely be able to drag yourself through your scheduled activities. Don't let off-days or lapses discourage you or make you feel guilty. Instead, feel a renewed commitment for your fitness program (see the box "Getting Your Fitness Program Back on Track" above).

**MOTIVATION FOR CHANGE!** In addition to tracking the basic progress of your fitness program, you may find that directly monitoring some of your program's benefits can help keep you motivated and on track. For example, try tracking your energy level. Develop a point scale (1–10 or 1–20), record a value for your energy level each day, and graph the results. Most people find that increasing physical activity quickly boosts their energy level.

- Make changes in your plan and reward system to help renew your enthusiasm and commitment to your program. Try changing fitness activities or your exercise schedule. Build in more opportunities to reward yourself.
- Plan ahead for difficult situations. Think about what circumstances might make it tough to keep up your fitness routine. Develop strategies to increase your chances of sticking with your program. For example, devise strategies for your program during vacation, travel, bad weather, and so on.
- If you're in a bad mood or just don't feel like exercising, remind yourself that physical activity is probably the one thing you can do that will make you feel better. Even if you can only do half your scheduled workout, you'll boost your energy, improve your mood, and help keep your program on track.

## MAINTAINING YOUR PROGRAM: FIT FOR LIFE

Exercise should not be something you do just during January and February to satisfy a New Year's resolution—or during a class to satisfy a course requirement. You must make it a permanent part of your life. Choose activities you enjoy and make them part of your daily routine, just like sleeping, eating, brushing your teeth, and going to school and work. Scientists gather more evidence every year that regular exercise is the most important activity you can do to contribute to wellness. It is not a frill or a treat—it is a necessity. You will be a healthier, more vital person if you make physical activity a habit. The following strategies can help keep you active for life:

- *Be safe.* Minimize the risk of injury or problems from activity by following safety guidelines, using proper technique and equipment, respecting signals from your body that something may be wrong, and treating any injuries that occur. Warm up, cool down, and drink plenty of fluids before and after exercise.
- *Have several exercise options.* Don't depend on a single location, activity, or person to be active. Cultivate many enjoyable activities that can be done in all seasons and circumstances. Take up a new sport or activity to keep your program fresh and enjoyable. And don't forget to include lifestyle physical activity in your daily routine.
- *Keep an exercise journal.* A journal can help keep your program on track, identify sources of problems, and give you a continuing sense of accomplishment.
- *Reward yourself.* Don't stop rewarding yourself once you reach your fitness goals. Continue to give yourself regular rewards for sticking with your program.



If you could do something simple, safe, and free to dramatically improve your mental, physical, and psychological health, would you do it? The opportunity is yours starting tonight—all you have to do is go to bed earlier! Many North Americans suffer from chronic sleep deprivation. Most of us get between one-half and two fewer hours of sleep each night than we need in order to be fully alert during the day. One hundred years ago, we slept on average one and a half more hours each night than we do now. With the advent of electric lights, sleep times decreased dramatically.

Many people view sleep as a luxury or a waste of time, but sleep is absolutely essential for life and health. Humans and other animals who are deprived of sleep for many days will become ill and even die. Less extreme sleep deprivation over a long period of time makes us vulnerable to a wide variety of illnesses including CVD, diabetes, high blood pressure, and psychological disorders such as anxiety and depression. Inadequate sleep also depresses the immune system, making people more likely to become ill with infectious diseases. Inadequate sleep affects learning, memory, and attention span, all critical to academic performance. Athletes who fail to get sufficient sleep cannot perform at their peak because fatigue slows reaction time and lessens endurance. Every aspect of life is easier and more pleasurable when you are well rested.

Sleep deprivation also takes a huge toll on society. The National Sleep Foundation estimates that sleepy employees cost businesses billions every year in lost productivity alone. The costs are much higher if you factor in mistakes, accidents, and health problems caused by lack of sleep. Drowsiness is a factor in at least one-third of all auto crashes; it impairs driving ability as much as alcohol use. Many of us think that no matter how tired we may be, we can force ourselves to be alert. Researchers have found that people who are sleep deprived may think they are wide awake but often fall asleep at the wheel for brief periods without even realizing it.

- *Choose other healthy lifestyle behaviours.* Exercise provides huge benefits for your health, but other behaviours are also important. Choose a nutritious diet and avoid harmful habits like smoking and overconsumption of alcohol. Don't skimp on sleep, which has a mutually beneficial relationship with exercise. Physical activity improves sleep, and adequate sleep can improve physical performance (see the box "Sleep").

## EXERCISE GUIDELINES FOR PEOPLE WITH SPECIAL HEALTH CONCERNS

Regular, appropriate exercise is safe and beneficial for many people with chronic conditions or other special health concerns. For example, people with heart disease

University and college students are particularly vulnerable to sleep deprivation and poor quality of sleep. Most students lead hectic lives as they juggle studies, work, socializing, and family obligations. Students who live in residences are often awakened by nighttime noise. Partying, especially if alcohol and other drugs are used, further disrupts sleep. To make matters worse, teens and young adults actually need more sleep than older individuals—more than 9 hours of sleep a night—to be well rested.

Financial necessity dictates that many students work part time or even full time. Realistically, there are only so many hours in the day, and many working students find it nearly impossible to get enough sleep to function well in school or at work. What can you do if you are faced with this dilemma? Cut back on work hours if at all possible. Obtaining financial aid or a loan or taking an extra year to get your degree may be worth it to preserve your health and happiness.

How do you know if you're getting enough sleep? If you need an alarm to get yourself up every morning, rather than awakening naturally at the appropriate time, chances are you are significantly sleep deprived. Another clue is if you fall asleep within just a few minutes of getting into bed, or if you fall asleep during the day when you don't intend to, such as during lectures or while reading or watching TV. Sleep you need but don't get is referred to as "sleep debt." Whenever you get less sleep than your body requires, you add to your sleep debt. Week after week, sleep debt can build, leaving you chronically groggy. If you have a large sleep debt, sleeping in a few extra hours on the weekends won't solve the problem, although it can help a bit. The real solution is to make sleep a priority in your daily life. Remember that the time you spend sleeping will pay for itself in increased productivity. For example, if you go to bed one hour earlier instead of trying to study when you're half awake, you are likely to get the work done in a fraction of the time when you're more alert the next day. Knowing that the quality of your life depends on getting adequate sleep, make sleep a priority part of your wellness lifestyle.

or hypertension who exercise may lower their blood pressure and improve their cholesterol levels. For people with diabetes, exercise can improve insulin sensitivity and body composition. For people with asthma, regular exercise may reduce the risk of acute attacks during exertion. For many people with special health concerns, the risks associated with *not* exercising are far greater than those associated with a moderate program of regular exercise.

The fitness recommendations for the general population presented in this text can serve as a general guideline for any exercise program. However, for people with special health concerns, certain precautions and monitoring may be required. Anyone with special health concerns should consult a physician before beginning an exercise program. Guidelines and cautions for some common conditions are described on the following pages.

## Arthritis

- Begin an exercise program as early as possible in the course of the disease.
- Warm up thoroughly before each workout to loosen stiff muscles and lower the risk of injury.
- For cardiorespiratory endurance exercise, avoid high-impact activities that may damage arthritic joints; consider swimming, water walking, or another type of exercise in a warm pool.
- Strength train the whole body; pay special attention to muscles that support and protect affected joints (for example, build quadriceps, hamstring, and calf strength for the knee). Start with small loads and build intensity gradually.
- Perform flexibility exercises regularly to maintain joint mobility.

## Asthma

- Exercise regularly. Acute attacks are more likely if you exercise only occasionally.
- Carry medication during workouts and avoid exercising alone. Use your inhaler before exercise, if recommended by your physician.
- Warm up and cool down slowly to reduce the risk of acute attacks.
- When starting an exercise program, choose self-paced endurance activities, especially those involving **interval training** (short bouts of exercise followed by a rest period). Increase the intensity of cardiorespiratory endurance exercise gradually.
- Educate yourself about circumstances that may trigger an asthma attack, and act accordingly. For example, cold, dry air can trigger or worsen an attack. Pollen, dust, and polluted air can also trigger an attack. To avoid attacks in dry air, drink water before, during, and after a workout to moisten your airways. In cold weather, cover your mouth with a mask or scarf to warm and humidify the air you breathe. Also, avoid outdoor activities during pollen season or when the air is polluted or dusty.

## Diabetes

- Don't begin an exercise program unless your diabetes is under control and you have checked about exercise safety with your physician. Because people with diabetes have an increased risk for heart disease, an exercise stress test may be recommended.
- Don't exercise alone. Wear a bracelet identifying yourself as having diabetes.
- If you are taking insulin or another medication, you may need to adjust the timing and amount of

each dose. Work with your physician and check your blood sugar levels regularly so you can learn to balance your energy intake and output and your medication dosage.

- To prevent abnormally rapid absorption of injected insulin, inject it over a muscle that won't be exercised and wait at least an hour before exercising.
- Check blood sugar levels before, during, and after exercise and adjust your diet or insulin dosage if needed. Carry high-carbohydrate foods during a workout. Avoid exercises if your blood sugar level is above 250 mg/dl and ingest carbohydrates prior to exercise if your blood sugar level is below 100 mg/dl.
- Don't lift heavy weights. Straining can damage blood vessels.
- If you have poor circulation or numbness in your extremities, check your skin regularly for blisters and abrasions, especially on your feet. Avoid high-impact activities and wear comfortable shoes.
- For maximum benefit and minimum risk, choose low-to-moderate-intensity activities.

## Heart Disease and Hypertension

- Check with your physician about exercise safety before increasing your activity level.
- Exercise at a moderate rather than a high intensity. Keep your heart rate below the level at which abnormalities appear on an exercise stress test.
- Warm-up and cool-down sessions should be gradual and last at least 10 minutes.
- Monitor your heart rate during exercise and stop if you experience dizziness or chest pain.
- If your physician has prescribed it, carry nitroglycerin with you during exercise. If you are taking beta-blockers for hypertension, use RPE rather than heart rate to monitor exercise intensity (beta-blockers reduce heart rate). Exercise at an RPE level of "somewhat hard"; your breathing should be unlaboured, and you should be able to talk.
- Don't hold your breath when exercising. Doing so can cause sudden, steep increases in blood pressure. Take special care during weight training; don't lift extremely heavy loads.
- Increase exercise frequency, intensity, and time very gradually.

**interval training** A training technique that alternates exercise intervals with rest intervals or intense exercise intervals with low to moderate intervals.

Terms  
Ww



Low-impact activities like walking are a good choice for people who are overweight because they can provide a good workout and are less likely than high-impact activities to cause joint problems or injuries. This man lost 40 kilograms in the year after this photo was taken.

## Obesity

- For maximum benefit and minimum risk, begin by choosing low-to-moderate-intensity activities. Increase intensity slowly as your fitness improves. Studies of overweight people show that exercising at moderate to high intensities causes more fat loss than training at low intensities.
- The National Academies and the World Health Organization recommend that people who want to lose weight or maintain lost weight exercise moderately 60 minutes or more every day. To get the benefit of 60 minutes of exercise, you can exercise all at once or divide your total activity time into sessions of 10, 20, or 30 minutes.
- Choose non- or low-weight-bearing activities such as swimming, water exercises, cycling, or walking. Low-impact activities are less likely to lead to joint problems or injuries.
- Stay alert for symptoms of heat-related problems during exercise (see Chapter 3). People who are obese are particularly vulnerable to problems with heat intolerance.
- Ease into an exercise program and increase overload gradually. Increase time and frequency of exercise before increasing intensity.
- Include strength training in your fitness program to build or maintain muscle mass.
- Try to include as much lifestyle physical activity in your daily routine as possible.

## Osteoporosis

- For cardiorespiratory endurance activities, exercise at the maximum intensity that causes no significant discomfort. If possible, choose low-impact weight-bearing activities to help safely maintain bone density (see Chapter 9 for more strategies for building and maintaining bone density).
- To prevent fractures, avoid any activity or movement that stresses the back or carries a risk of falling.
- Include weight training in your exercise program to improve strength and balance and reduce the risk of falls and fractures. Avoid lifting heavy loads.

Exercise guidelines for people with disabilities are discussed in Chapter 2 and for people with low-back pain, in Chapter 5.

**MOTIVATION FOR CHANGE!** If you have a special health concern and have hesitated becoming more active, one helpful strategy is to take a class or join an exercise group specifically designed for your condition. Many health centres and support groups sponsor specially tailored activity programs. Such a class can provide you with both expert advice and exercise partners who share your concerns and goals.

## EXERCISE GUIDELINES FOR LIFE STAGES

A fitness program may also need to be adjusted to accommodate the requirements of different life stages.

### Children and Adolescents

About 56% of all Canadian youth aged 12–19 are physically inactive and as many as 82% may not be active enough to meet international guidelines for optimal growth and development. This lack of physical activity has led to alarming increases in overweight and obesity in children and adolescents. If you have children or are in a position to influence children, keep these guidelines in mind:

- Provide opportunities for children and adolescents to exercise every day. Minimize sedentary activities, such as watching television and playing video games. Children and adolescents should aim for 60 minutes of moderate activity most, but preferably all, days.
- During family outings, choose dynamic activities. For example, go for a walk, park away from a mall and then walk to the stores, and take the stairs instead of the escalator.
- For children younger than 12 years, emphasize skill development and fitness rather than excellence in competitive sports. For adolescents, combine participation and training in lifetime sports with traditional, competitive sports.

- Make sure children are developmentally capable of participating in an activity. For example, catching skills are difficult for young children because their nervous system is not developed enough to fully master the skill. When teaching a child to catch a ball, start with a large ball and throw it from a short range. Gradually increase the complexity of the skill once the child has mastered the simpler skill.
- Make sure children get plenty of water when exercising in the heat. Make sure they are dressed properly when doing sports in the cold.

## Pregnant Women

Exercise is important during pregnancy, but women should be cautious because some types of exercise can pose increased risk to the mother and the unborn child. Pregnant women should consider these guidelines when exercising.

- See your physician about possible modifications needed for your particular pregnancy.
- Continue mild-to-moderate exercise routines at least three times a week. Avoid exercising vigorously or to exhaustion, especially in the third trimester. Monitor exercise intensity by assessing how you feel rather than by monitoring your heart rate.
- Favour non- or low-weight-bearing exercises such as swimming or cycling over weight-bearing exercises, which can carry increased risk of injury.
- Avoid exercise in a supine position—lying on your back—after the first trimester. Research indicates that this position restricts blood flow to the uterus. Also avoid prolonged periods of motionless standing.
- Avoid exercise that could cause loss of balance, especially in the third trimester, and exercise that might injure the abdomen, stress the joints, or carry a risk of falling (such as contact sports, vigorous racquet sports, skiing, and in-line skating).
- Avoid activities involving extremes in altitude—for example, scuba diving and mountain climbing.
- Especially during the first trimester, drink plenty of fluids and exercise in well-ventilated areas to avoid heat stress.
- Do 3–5 sets of 10 Kegel exercises daily. These exercises involve tightening the muscles of the pelvic floor for 5–15 seconds. Kegel exercises are thought to help prevent incontinence (involuntary loss of urine) and speed recovery after giving birth.
- After giving birth, resume prepregnancy exercise routines gradually, based on how you feel.

## Older Adults

Older people readily adapt to endurance exercise and strength training. Exercise principles are the same as for younger people, but some specific guidelines apply:

- Include the three basic types of exercise—resistance, endurance, and flexibility.
- For strength training, it is recommended that older adults use a lighter weight and perform more (10–15) repetitions than recommended for young adults.
- Drink plenty of water and avoid exercising in excessively hot or cold environments. (Older people sometimes have a decreased ability to regulate body temperature during exercise.) Wear clothes that speed heat loss in warm environments and that prevent heat loss in cold environments.
- Warm up slowly and carefully. Increase intensity and duration of exercise gradually.
- Cool down slowly, continuing very light exercise until the heart rate is below 100 beats per minute.
- To help prevent soft tissue pain, do static stretching after a normal workout.

Sample fitness programs begin on p. 226.

### Tips for Today

A complete fitness program includes activities to build and maintain cardiorespiratory endurance, muscular strength and endurance, and flexibility. It takes time, energy, and commitment to begin and maintain a fitness program, but the many benefits are well worth the effort. Begin today, and you'll be on your way to enjoying fitness and wellness for the rest of your life.

#### Right now you can

- Obtain a journal to track your daily physical activity and exercise routine.
- Put away your remote control devices—every bit of physical activity can benefit your health.
- Put the clothes and equipment for your next workout in a convenient and obvious location.
- Set a firm time for your next workout with your training partner (buddy).
- Plan to go to bed 15 minutes earlier than usual.
- Make a list of situations such as bad weather that may challenge your ability to stick with your fitness program. develop a strategy for dealing with each one.

## SUMMARY

- Steps for putting together a complete fitness program include (1) setting realistic goals; (2) selecting activities to develop all the health-related components of fitness; (3) setting a target frequency, intensity, and time (duration) for each activity; (4) setting up a system of mini-goals and rewards; (5) making lifestyle physical activity

## COMMON QUESTIONS ANSWERED

**Should I exercise every day?** Some daily exercise is beneficial, and health experts recommend that you engage in at least 30 minutes of moderate physical activity over the course of every day. Back experts suggest that you also do back pain prevention exercises daily. However, if you train intensely every day without giving yourself a rest, you will likely get injured or become overtrained. When strength training, for example, rest at least 48 hours between workouts before exercising the same muscle group. For cardiorespiratory endurance exercise, rest or exercise lightly the day after an intense or long-duration workout. Balancing the proper amount of rest and exercise will help you feel better and improve your fitness faster.

**I'm just starting an exercise program. How much activity should I do at first?** Be conservative. Walking is a good way to begin almost any fitness program. At first, walk for approximately 10 minutes, and then increase the distance and pace. After several weeks, you can progress to something more vigorous. Let your body be your guide. If the intensity and duration of a workout seem easy, increase them a little the next time. The key is to be progressive; don't try to achieve physical fitness in one or two workouts. Build your fitness gradually.

**What are kickboxing and Tae Bo? Are they effective forms of exercise?** Kickboxing and Tae Bo are group fitness workouts that combine martial arts manoeuvres, boxing moves, and traditional group exercise activities. Participants in martial arts workouts repetitively execute a variety of punches and kicks, building movement combinations that involve the entire

body. Workouts are often choreographed to moderately paced popular music and are continuous. Although more research is needed to clarify the actual training effects, the workouts certainly develop cardiovascular endurance, muscular endurance, and flexibility. Because of the potential for injury, classes should be led either by a certified fitness professional who has had ancillary training in teaching martial arts skills or a martial artist with qualifications as a fitness instructor. Other key safety elements include precise skill modelling and verbal instruction, moderate pacing, and an emphasis on health-related fitness development.

**I'm concerned about my safety when I go for a jog or walk. What can I do to make sure that my training sessions are safe and enjoyable?** A person exercising alone in the park at night can be a tempting target for criminals. Don't exercise alone. You are much safer training in a group or with a partner. Another alternative is to take an exercise class. Classes are fun and much safer than exercising by yourself. If you must train alone, try to exercise where there are plenty of people. A good bet is the local high school or university track.

Make sure you're wearing proper safety equipment. If you're riding a bike, wear a helmet. If you're playing racquetball or handball, wear eye protectors. Don't go in-line skating unless you're wearing the proper pads and protective equipment. If you are jogging at night, wear reflective clothing that can be seen easily.

Refer to Appendix A for more on personal safety.

a part of the daily routine; (6) developing tools for monitoring progress; and (7) making a commitment.

- In selecting activities, consider fun and interest, your current skill and fitness levels, time and convenience, cost, and any special health concerns.
- Keys to beginning and maintaining a successful program include starting slowly, increasing intensity and duration gradually, finding a buddy, varying the activities and intensity of the program, and expecting fluctuations and lapses.
- Regular exercise is appropriate and highly beneficial for people with special health concerns or in particular stages of life; program modifications may be necessary to maximize safety.

### FOR FURTHER EXPLORATION

 **Fit and Well Online Learning Centre**  
([www.mcgrawhill.ca/olc/fahey](http://www.mcgrawhill.ca/olc/fahey))

Use the learning objectives, study guide questions, and glossary flashcards to review key terms and concepts and prepare for exams. You can extend your knowledge of personal fitness and gain experience in using the Internet as a resource by completing

the activities and checking out the Web links for the topics in Chapter 8 marked with the World Wide Web icon. For this chapter, Internet activities explore fitness activities and strategies for creating a complete fitness program; there are also helpful Web links for chapter topics.

### Daily Fitness and Nutrition Journal

Complete the program plan and fitness contract, and begin your program. Use the journal to record your activities and track your progress. Please go to the text's Online Learning Centre at [www.mcgrawhill.ca/olc/fahey](http://www.mcgrawhill.ca/olc/fahey) and download the Daily Nutrition Journal to complete this exercise.

### HealthQuest

Use the Fitness Wizard in the HealthQuest Activities section on the Online Learning Centre at [www.mcgrawhill.ca/olc/fahey](http://www.mcgrawhill.ca/olc/fahey) to create a schedule for your complete fitness program; select the Fitness Wizard option from the Fitness Planner portion of the Wellness Activities in the Fitness module. Once in the Fitness Wizard, choose the Physical Fitness Program option to build a program that includes activities to build all the health-related fitness components.

### Books, Organizations, and Web Sites

See the listings for Chapters 2–8.

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## SAMPLE PROGRAMS FOR POPULAR ACTIVITIES

Sample programs based on four different types of cardiorespiratory activities—walking/jogging/running, bicycling, swimming, and in-line skating—are presented below. Each sample program includes regular cardiorespiratory endurance exercise, resistance training, and stretching. To choose a sample program, first compare your fitness goals with the benefits of the different types of endurance exercise. Identify the programs that meet your fitness needs. Next, read through the descriptions of the programs you're considering, and decide which will work best for you based on your present routine, the potential for

enjoyment, and adaptability to your lifestyle. If you choose one of these programs, complete the personal fitness program plan in Lab 8.1, just as if you had created a program from scratch.

No program will produce enormous changes in your fitness level in the first few weeks. Give your program a good chance. Follow the specifics of the program for 3–4 weeks. Then if the exercise program doesn't seem suitable, make adjustments to adapt it to your particular needs. But retain the basic elements of the program that make it effective for developing fitness.

### GENERAL GUIDELINES

The following guidelines can help make the activity programs more effective for you.

- *Frequency and time.* To experience training effects, you should exercise for 20–30 minutes at least four times a week.
- *Intensity.* To work effectively for cardiorespiratory endurance training or to improve body composition, you must raise your heart rate into its target zone. Monitor your pulse or use rates of perceived exertion to monitor your intensity.  
If you've been sedentary, begin very slowly. Give your muscles a chance to adjust to their increased workload. It's probably best to keep your heart rate below target until your body has had time to adjust to new demands. At first you may not need to work very hard to keep your heart rate in its target zone, but as your cardiorespiratory endurance improves, you will probably need to increase intensity.
- *Interval training.* Some of the sample programs involve continuous activity. Others rely on interval training,

which calls for alternating a relief interval with exercise (walking after jogging, for example, or coasting after biking uphill). Interval training is an effective way to achieve progressive overload: When your heart rate gets too high, slow down to lower your pulse rate until you're at the low end of your target zone. Interval training can also prolong the total time you spend in exercise and delay the onset of fatigue.

- *Warm-up and cool-down.* Begin each exercise session with a 10-minute warm-up. Begin your activity at a slow pace and work up gradually to your target heart rate. Always slow down gradually at the end of your exercise session to bring your system back to its normal state. It's a good idea to do stretching exercises to increase your flexibility after cardiorespiratory exercise or strength training because your muscles will be warm and ready to stretch.
- *Record keeping.* After each exercise session, record your daily distance or time on a progress chart.

### WALKING/JOGGING/RUNNING SAMPLE PROGRAM

Walking, jogging, and running are the most popular forms of training for people who want to improve cardiorespiratory endurance; they also improve body composition and muscular endurance of the legs. It's not always easy to distinguish among these three endurance activities. For clarity and consistency, we'll consider walking to be any on-foot exercise of less than 8 km per hour, jogging any pace between 8 and 12 km per hour, and running any pace faster than that. Table 1 divides walking, jogging, and running into nine categories, with rates of speed (in both km per hour and minutes per km) and calorie costs for each. The faster your pace or the longer you exercise, the more calories you burn. The greater the number of calories burned, the higher the potential training effects of these activities. Tables 2 and 3 contain sample walking/jogging programs by time and distance.

#### Equipment and Technique

These activities require no special skills, expensive equipment, or unusual facilities. Comfortable clothing, well-fitted walking or running shoes, and a stopwatch or ordinary watch with a second hand are all you need.

#### Developing Cardiorespiratory Endurance

The four variations of the basic walking/jogging/running sample program that follow are designed to help you regulate the intensity, duration, and frequency of your program. Use the following guidelines to choose the variation that is right for you.

- *Variation 1: Walking (Starting).* Choose this program if you have medical restrictions, are recovering from illness or surgery, tire easily after short walks, are obese, or have a sedentary lifestyle, and if you want to prepare for the advanced walking program to improve cardiorespiratory endurance, body composition, and muscular endurance.
- *Variation 2: Advanced Walking.* Choose this program if you already can walk comfortably for 30 minutes and if you want to develop and maintain cardiorespiratory fitness, a lean body, and muscular endurance.
- *Variation 3: Preparing for a Jogging Program.* Choose this program if you already can walk comfortably for 30 minutes and if you want to prepare for the jogging/running program to improve cardiorespiratory endurance, body composition, and muscular endurance.



**SAMPLE PROGRAM TABLE 1** *Calorie Costs for Walking/Jogging/Running*

This table gives the calorie costs of walking, jogging, and running for slow, moderate, and fast paces. Calculations for calorie costs are approximate and assume a level terrain. A hilly terrain would result in higher calorie costs. To get an estimate of the number of calories you burn, multiply your weight by the calories per minute per pound for the speed at which you're doing the activity, and then multiply that by the number of minutes you exercise.

Activity	SPEED		Calories per Minute per Pound
	Kilometres per Hour	Minutes: Seconds per Kilometre	
<b>Walking</b>			
Slow	2.0	30:00	.020
	2.5	24:00	.023
Moderate	3.0	20:00	.026
	3.5	17:08	.029
Fast	4.0	15:00	.037
	4.5	13:20	.048
<b>Jogging</b>			
Slow	5.0	12:00	.060
	5.5	11:00	.074
Moderate	6.0	10:00	.081
	6.5	9:00	.088
Fast	7.0	8:35	.092
	7.5	8:00	.099
<b>Running</b>			
Slow	8.5	7:00	.111
Moderate	9.0	6:40	.116
Fast	10.0	6:00	.129
	11.0	5:30	.141

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**SAMPLE PROGRAM TABLE 2** *Walking/Jogging Progression by Time*

This table is based on a walking interval of 6 km per hour, measured in seconds, and a jogging interval of 8 km per hour, measured in minutes:seconds. The combination of the two intervals equals a single set. In the Number of Sets column, the higher figure represents the maximum number of sets to be completed.

	Walk Interval (sec)	Jog Interval (min:sec)	Number of Sets	Total Distance (km)	Total Time (min:sec)
Stage 1	:60	:30	10–15	1.6–2.7	15:00–22:30
Stage 2	:60	:60	8–13	1.9–3.2	16:00–26:00
Stage 3	:60	2:00	5–19	2.1–3.7	15:00–27:00
Stage 4	:60	3:00	5–7	2.6–3.8	16:00–28:00
Stage 5	:60	4:00	3–6	2.4–4.3	15:00–30:00

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**SAMPLE PROGRAM TABLE 3** *Walking/Jogging Progression by Distance*

This table is based on a walking interval of 6 km per hour, measured in yards, and a jogging interval of 8 km per hour, also measured in yards. The combination of the two intervals equals a single set. (One lap around a typical track is 440 metres.)

	Walk Interval (m)	Jog Interval (m)	Number of Sets	Total Distance (km)	Total Time (min:sec)
Stage 1	100	50	11–21	1.6–3.2	15:00–28:12
Stage 2	100	100	16	3.2	26:56
Stage 3	100	200	11	3.2	26:02
Stage 4	100	300	8	3.2	24:24
Stage 5	100	400	7	3.5	26:05
Stage 6	100	400	8	4.0	29:49

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- **Variation 4: Jogging/Running.** Choose this program if you already can jog comfortably without muscular discomfort, if you already can jog for 15 minutes without stopping or 30 minutes with brief walking intervals within your target heart rate range, and if you want to develop and maintain a high level of cardiorespiratory fitness, a lean body, and muscular endurance.

#### **Variation 1: Walking (Starting)**

**FIT—frequency, intensity, and time:** Walk at first for 15 minutes at a pace that keeps your heart rate below your target zone. Gradually increase to 30-minute sessions. The distance you travel will probably be 2–4 km. At the beginning, walk every other day. You can gradually increase to daily walking if you want to burn more calories (helpful if you want to change body composition).

**Calorie cost:** Work up to using 90–135 calories in each session (see Table 1). To increase calorie costs to the target level, walk for a longer time or for a longer distance rather than sharply increasing speed.

**At the beginning:** Start at whatever level is most comfortable. Maintain a normal, easy pace, and stop to rest as often as you need to. Never prolong a walk past the point of comfort. When walking with a friend (a good motivation), let a comfortable conversation be your guide to pace.

**As you progress:** Once your muscles have become adjusted to the exercise program, increase the duration of your sessions—but by no more than 10% each week. Increase your intensity only enough to keep your heart rate just below your target. When you're able to walk 2.5 km in 30 minutes, using 90–135 calories per session, you should consider moving on to variation 2 or 3. Don't be discouraged by lack of immediate progress and don't try to speed things up by overdoing. Remember that pace and heart rate can vary with the terrain, the weather, and other factors.

#### **Variation 2: Advanced Walking**

**FIT—frequency, intensity, and time:** Start at a pace at the lower end of your target heart rate zone and begin soon afterward to increase your pace. This might boost your heart rate into the upper levels of your target zone, which is fine for brief periods.

But don't overdo the intervals of fast walking. Slow down after a short time to drop your pulse rate. Vary your pattern to allow for intervals of slow, medium, and fast walking. Walk at first for 30 minutes and gradually increase your walking time until eventually you reach 60 minutes, all the while maintaining your target heart rate. The distance you walk will probably be 3–6.5 km. Walk at least every other day.

**Calorie cost:** Work up to using about 200–350 calories in each session (see Table 1).

**At the beginning:** Begin by walking somewhat faster than you did in Variation 1. Check your pulse to make sure you keep your heart rate within your target zone. Slow down when necessary to lower your heart rate when going up hills or when extending the duration of your walks.

**As you progress:** As your heart rate adjusts to the increased workload, gradually increase your pace and your total walking time. Gradually lengthen the periods of fast walking and shorten the relief intervals of slow walking, always maintaining target heart rate. Eventually, you will reach the fitness level you would like to maintain. And to maintain that level of fitness, continue to burn the same amount of calories in each session.

Vary your program by changing the pace and distance walked, or by walking routes with different terrains and views. Gauge your progress toward whatever calorie goal you've set by using Table 1.

#### **Variation 3: Preparing for a Jogging Program**

**FIT—frequency, intensity, and time:** Start by walking at a moderate pace (5–6.5 km per hour or 15–20 minutes per km). Staying within your target heart rate zone, begin to add brief intervals of slow jogging (8–9.5 km per hour or 6–8 minutes per kilometre). Keep the walking intervals constant at 60 seconds or at 100 m, but gradually increase the jogging intervals until eventually you jog 4 minutes for each minute of walking. You'll probably cover between 2.5 and 4 km. Each exercise session should last 15–30 minutes. Exercise every other day. If your goals include changing body composition and you want to exercise more frequently, walk on days you're not jogging.

**Calorie cost:** Work up to using 200–350 calories in each session (see Table 1).

**At the beginning:** Start slowly. Until your muscles adjust to jogging, you may need to exercise at less than your target heart rate. At the outset, expect to do two to four times as much walking as jogging, even more if you're relatively inexperienced. Be guided by how comfortable you feel—and by your heart rate—in setting the pace for your progress. Follow the guidelines presented in Chapter 3 for exercising in hot or cold weather. Drink enough liquids to stay adequately hydrated, particularly in hot weather. In addition, use the proper running technique, described below.

- Run with your back straight and your head up. Look straight ahead, not at your feet. Shift your pelvis forward and tuck your buttocks in.
- Hold your arms slightly away from your body. Your elbows should be bent so that your forearms are parallel to the ground. You may cup your hands, but do not clench your fists. Allow your arms to swing loosely and rhythmically with each stride.
- Your heel should hit the ground first in each stride. Then roll forward onto the ball of your foot and push off for the next stride. If you find this difficult, you can try a more flat-footed style, but don't land on the balls of your feet.
- Keep your steps short by allowing your foot to strike the ground in line with your knee. Keep your knees bent at all times.
- Breathe deeply through your mouth. Try to use your abdominal muscles rather than just your chest muscles to take deep breaths.
- Stay relaxed.

**As you progress:** Adjust your ratio of walking to jogging to keep within your target heart rate zone as much as possible. When you have progressed to the point where most of your 30-minute session is spent jogging, consider moving on to Variation 4. To find a walking/jogging progression that suits you, refer to Tables 2 and 3 (one uses time, the other distance). Which one you choose will depend, to some extent, on where you work out. If you have access to a track or can use a measured distance with easily visible landmarks to indicate yardage covered, you may find it convenient to use distance as your organizing principle. If you'll be using parks, streets, or woods, time intervals (measured with a watch) would probably work better. The progressions in Tables 2 and 3 are not meant to be rigid; they are guidelines to help you develop your own rate of progress. Let your progress be guided by your heart rate and increase your intensity and duration only to achieve your target zone.

#### **Variation 4: Jogging/Running**

**FIT—frequency, intensity, and time:** The key is to exercise within your target heart rate zone. Most people who sustain a continuous jog/run program will find that they can stay within their target heart rate zone with a speed of 9–12 km (5.5–7.5 miles) per hour (5–7 minutes per km (8–11 minutes per mile)). Start by jogging steadily for 15 minutes. Gradually increase your jog/run session to a regular 30–60 minutes (or about 4–11 km (2.5–7 miles)). Exercise at least every other day. Increasing frequency by doing other activities on alternate days will place less stress on the weight-bearing parts of your lower body than will a daily program of jogging/running.

**Calorie cost:** Use about 300–750 calories in each session (see Table 1).

**At the beginning:** The greater number of calories you burn per minute makes this program less time-consuming for altering body composition than the three other variations in the walking/jogging/running program.

**As you progress:** If you choose this variation, you probably already have a moderate-to-high level of cardiorespiratory fitness. To stay within your target heart rate zone, increase your distance or both pace and distance as needed. Add variety to your workouts by varying your route, intensity, and duration. Alternate short runs with long ones. If you run for 60 minutes one day, try running for 30 minutes the next session. Or try doing sets that alternate hard and easy intervals—even walking, if you feel like it. You can also try a road race now and then, but be careful not to do too much too soon.

#### **Developing Muscular Strength and Endurance**

Walking, jogging, and running provide muscular endurance workouts for your lower body; they also develop muscular strength of the lower body to a lesser degree. To develop muscular strength and endurance of the upper body, and to make greater and more rapid gains in lower-body strength, you need to include resistance training in your fitness program. Use the general wellness weight training program from Chapter 4, or tailor one to fit your personal fitness goals. If you'd like to increase your running speed and performance, you might want to focus your program on lower-body exercises. (Don't neglect upper-body strength, however; it is important for overall wellness.) Regardless of the strength training exercises you choose, it is recommended that you follow the Guidelines for Successful Strength and Endurance Training:

- Train 2–3 days per week.
- Perform 1 or more sets of 8–12 repetitions of 8–10 exercises.
- Include exercises that work all the major muscle groups: neck, shoulders, chest, arms, upper and lower back, abdomen, thighs, and calves.

Depending on the amount of time you are able to set aside for exercise, you may find it more convenient to alternate between your cardiorespiratory endurance workouts and your muscular strength and endurance workouts. In other words, walk or jog one day and strength train the next day.

#### **Developing Flexibility**

To round out your fitness program, you also need to include exercises that develop flexibility. The best time for a flexibility workout is when your muscles are warm, as they are immediately following cardiorespiratory endurance exercise or strength training. Perform the stretching routine presented in Chapter 5 or one that you have created to meet your own goals and preferences. Be sure to pay special attention to the hamstrings and quadriceps, which are not worked through their complete range of motion during walking or jogging. As you put your program together, remember the basic structure of a successful flexibility program:

- Stretch 4–7 days per week, preferably when muscles are warm.
- Stretch all the major muscle groups.
- Stretch to the point of mild discomfort and hold for 10–30 seconds.
- Repeat each stretch at least 4 times.

Bicycling can also lead to large gains in physical fitness. For many people, cycling is a pleasant and economical alternative to driving and a convenient way to build fitness.

### Equipment and Technique

Cycling has its own special array of equipment, including headgear, lighting, safety pennants, and special shoes. The bike is the most expensive item, ranging from about \$100 to well over \$1000. Avoid making a large investment until you're sure you'll use your bike regularly. While investigating what the marketplace has to offer, rent or borrow a bike. Consider your intended use of the bike. Most cyclists who are interested primarily in fitness are best served by a sturdy 10-speed rather than a mountain bike or sport bike. Stationary cycles are good for rainy days and areas that have harsh winters.

Clothing for bike riding shouldn't be restrictive or binding, nor should it be so loose-fitting or so long that it might get caught in the chain. Clothing worn on the upper body should be comfortable but not so loose that it catches the wind and slows you down. Always wear a helmet to help prevent injury in case of a fall or crash. Wearing glasses or goggles can protect the eyes from dirt, small objects, and irritation from wind.

To avoid saddle soreness and injury, choose a soft or padded saddle and adjust it to a height that allows your legs to almost reach full extension while pedalling. Make certain the saddle doesn't put too much pressure on sensitive areas. Wear a pair of well-padded gloves if your hands tend to become numb while riding or if you begin to develop blisters or calluses. To prevent backache and neck strain, warm up thoroughly and periodically shift the position of your hands on the handlebars and your body in the saddle. Keep your arms relaxed and don't lock your elbows. To protect your knees from strain, pedal with your feet pointed straight ahead or very slightly inward and don't pedal in high gear for long periods.

Bike riding requires a number of precise skills that practice makes automatic. If you've never ridden before, consider taking a course. In fact, many courses are not just for beginners. They'll help you develop skills in braking, shifting, and handling emergencies, as well as teach you ways of caring for and repairing your bike. For safe cycling, follow these rules:

- Always wear a helmet. Most provinces in Canada have provincial and/or local helmet laws. British Columbia, Nova Scotia, New Brunswick, and Prince Edward Island have laws requiring people of all ages to wear helmets when bicycle riding. Ontario and Alberta mandate that those under 18 must wear helmets. In Quebec, certain suburbs have municipal laws requiring the use of helmets.
- Keep on the correct side of the road. Bicycling against traffic is usually illegal and always dangerous.
- Obey all traffic signs and signals.
- On public roads, ride in single file, except in low-traffic areas (if the law permits). Ride in a straight line; don't swerve or weave in traffic.
- Be alert; anticipate the movements of other traffic and pedestrians. Listen for approaching traffic that is out of your line of vision.
- Slow down at street crossings. Check both ways before crossing.

- Use hand signals—the same as for car drivers—if you intend to stop or turn. Use audible signals to warn those in your path.
- Maintain full control. Avoid anything that interferes with your vision. Don't jeopardize your ability to steer by carrying anything (including people) on the handlebars.
- Keep your bicycle in good shape. Brakes, gears, saddle, wheels, and tires should always be in good condition.
- See and be seen. Use a headlight at night and equip your bike with rear reflectors. Use side reflectors on pedals, front and rear. Wear light-coloured clothing or use reflective tape at night; wear bright colours or use fluorescent tape by day.
- Be courteous to other road users. Anticipate the worst and practise preventive cycling.
- Use a rear-view mirror.

### Developing Cardiorespiratory Endurance

Cycling is an excellent way to develop and maintain cardiorespiratory endurance and a healthy body composition.

**FIT—frequency, intensity, and time:** If you've been inactive for a long time, begin your cycling program at a heart rate that is 10–20% below your target zone. Beginning cyclists should pedal at about 80–100 revolutions per minute; adjust the gear so that you can pedal at that rate easily. Your bicycle may display different types of useful information, including speed, distance traveled, heart rate, altitude, and revolutions per minute, and it may provide a cadence signal to help you maintain your pace. Once you feel at home on your bike, try 1 or 2 kilometres at a comfortable speed, and then stop and check your heart rate. Increase your speed gradually until you can cycle at 20–25 km per hour (2–3 minutes per km), a speed fast enough to bring most new cyclists' heart rate into their target zone. Allow your pulse rate to be your guide: More highly fit individuals may need to ride faster to achieve their target heart rate. Cycling for at least 20 minutes three times a week will improve your fitness.

**Calorie cost:** Use Table 4 to determine the number of calories you burn during each outing. You can increase the number of calories burned by cycling faster or for a longer time (it's usually better to increase distance rather than to add speed).

**At the beginning:** It may require several outings to get the muscles and joints of your legs and hips adjusted to this new activity. Begin each outing with a 10-minute warm-up that includes stretches for your hamstrings and your back and neck muscles. Until you become a skilled cyclist, select routes with the fewest hazards and avoid heavy traffic.

**As you progress:** Interval training is also effective with bicycling. Simply increase your speed for periods of 4–8 minutes or for specific distances, such as 2–3 km. Then coast for 2–3 minutes. Alternate the speed intervals and slow intervals for a total of 20–60 minutes, depending on your level of fitness. Hilly terrain is also a form of interval training.

Regardless of the strength training exercises you choose, you should follow the Guidelines for Developing Strength and Endurance Training and Developing Flexibility as outlined in the Walking/Jogging/Running sample program on page 226.

#### SAMPLE PROGRAM TABLE 4 *Calorie Costs for Bicycling*

This table gives the approximate calorie costs per pound of body weight for cycling from 5 to 60 minutes for distances of 0.80 km (0.5 mile) up to 24 km (15 miles) on a level terrain. To use the table, find on the horizontal line the time most closely approximating the number of minutes you cycle. Next, locate on the vertical column the approximate distance in km you cover. The figure at the intersection represents an estimate of the calories used per minute per pound of body weight. Multiply this figure by your own body weight. Then multiply the product of these two figures by the number of minutes you cycle to get the total number of calories burned. For example, assuming you weigh 154 pounds and cycle 9.6 km in 40 minutes, you would burn 260 calories:  $154 \times .042$  (calories per pound, from table)  $= 6.5 \times 40$  (minutes)  $= 260$  calories burned.

Distance (km)	TIME (MIN)											
	5	10	15	20	25	30	35	40	45	50	55	60
0.80	.032											
1.6	.062	.032										
2.4		.042	.032									
3.2		.062	.039	.032								
4.8			.062	.042	.036	.032						
6.4				.062	.044	.039	.035	.032				
8.0				.097	.062	.045	.041	.037	.035	.032		
9.6					.088	.062	.047	.042	.039	.036	.034	.032
11.2						.081	.062	.049	.043	.040	.038	.036
12.8							.078	.062	.050	.044	.041	.039
14.4								.076	.062	.051	.045	.042
16.0								.097	.074	.062	.051	.045
17.6									.093	.073	.062	.052
19.2										.088	.072	.062
20.8											.084	.071
22.4												.081
24.0												.097

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### SWIMMING SAMPLE PROGRAM

Swimming is excellent for developing all-around fitness. Because water supports the body weight of the swimmer, swimming places less stress than weight-bearing activities on joints, ligaments, and tendons and tends to cause fewer injuries.

#### Equipment and Safety Guidelines

Aside from having access to a swimming pool, the only equipment required for a swimming program is a swimsuit and a pair of swimming goggles (that fit and do not leak) to protect the eyes from irritation in chlorinated pools. Following these few simple rules can help keep you safe and healthy during your swimming sessions:

- Swim only in a pool with a qualified lifeguard on duty.
- Always walk carefully on wet surfaces.
- Dry your ears well after swimming. If you experience the symptoms of swimmer's ear (itching, discharge, or even a partial hearing loss), consult your physician. If you swim while recovering from swimmer's ear, protect your ears with a few drops of lanolin on a wad of lamb's wool.
- To avoid back pain, try not to arch your back excessively when you swim.
- Be courteous to others in the pool.

If you swim in a setting other than a pool with a lifeguard, remember the following important rules:

- Don't swim beyond your skill and endurance limits.
- Avoid being chilled: don't swim in water colder than 16°C.
- Never drink alcohol before going swimming.
- Never swim alone.

#### Developing Cardiorespiratory Endurance

Any one or any combination of common swimming strokes—front crawl stroke, breaststroke, backstroke, butterfly stroke, sidestroke, or elementary backstroke—can help develop and maintain cardiorespiratory fitness. (Swimming may not be as helpful as walking, jogging, or cycling for body fat loss.)

**FIT—frequency, intensity, and time:** Because swimming is not a weight-bearing activity and is not done in an upright position, it elicits a lower heart rate per minute. Therefore, you need to adjust your target heart rate zone. To calculate your target heart rate for swimming, use this formula:

$$\begin{aligned} \text{Maximum swimming heart rate (MSHR)} &= 205 - \text{age} \\ \text{Target heart rate zone} &= 65 - 90\% \text{ of MSHR} \end{aligned}$$

### SAMPLE PROGRAM TABLE 5 *Calorie Costs for Swimming*

To use this table, find on the top horizontal row the distance in yards that most closely approximates the distance you swim. Next, locate on the appropriate vertical column (below the distance in metres and yards) the time it takes you to swim the distance. Then locate in the first column on the left the approximate number of calories burned per minute per pound for the time and distance. To find the total number of calories burned, multiply your weight by the calories per minute per pound. Then multiply the product of these two numbers by the time it takes you to swim the distance (minutes: seconds). For example, assuming you weigh 130 pounds and swim 500 yards in 20 minutes, you would burn 106 calories:  $130 \times .041$  (calories per pound, from table) =  $5.33 \times 20$  (minutes) = 106 calories burned.

Calories per Minute per Pound	DISTANCE (m/yd)					
	23	91	137	228	457	686
.033	1:15	5:00	7:30	12:30	25:00	30:30
.041	1:00	4:00	6:00	10:00	20:00	30:00
.049	0:50	3:20	5:00	8:20	18:40	25:00
.057	0:43	2:52	4:18	7:10	17:20	21:30
.065	0:37.5	2:30	3:45	6:15	10:00	
.073	0:33	2:13	3:20	5:30	8:50	
.081	0:30	2:00	3:00	5:00	8:00	
.090	0:27	1:48	2:42	4:30	7:12	
.097	0:25	1:40	2:30	4:10	6:30	

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For example, a 19-year-old would calculate her target heart rate zone for swimming as follows:

$$\begin{aligned} \text{MSHR} &= 205 - 19 = 186 \text{ bpm} \\ 65\% \text{ intensity} &: 0.65 \times 186 = 121 \text{ bpm} \\ 90\% \text{ intensity} &: 0.90 \times 186 = 167 \text{ bpm} \end{aligned}$$

Base your duration of swimming on your intensity and target calorie costs. Swim at least four times a week.

**Calorie cost:** Calories burned while swimming are the result of the pace: how far you swim and how fast (see Table 5). Work up to using at least 300 calories per session.

**At the beginning:** If you are an inexperienced swimmer, invest the time and money for instruction. You'll make more rapid gains in fitness if you learn correct swimming technique. If you've been sedentary and haven't done any swimming for a long time, begin your program with 2–3 weeks, three times a week, of leisurely swimming at a pace that keeps your heart rate 10–20% below your target zone. Start swimming laps of the width of the pool if you can't swim the length. To keep your heart rate below target, take rest intervals as needed. Swim one lap, then rest 15–90 seconds as needed. Start with 10 minutes of swim/rest intervals and work up to 20 minutes. How long it takes will depend on your swimming skills and muscular fitness.

**As you progress:** Gradually increase the duration, or the intensity, or both duration and intensity of your swimming to raise your heart rate to a comfortable level within your target zone. Gradually increase your swimming intervals and decrease your rest intervals as you progress. Once you can swim the length of the pool at a pace that keeps your heart rate on target, continue swim/rest intervals for 20 minutes. Your rest intervals should be 30–45 seconds. You may find it helpful to get out of the pool during your rest intervals and walk until you've lowered your heart rate. Next, swim two laps of the pool length per swim interval and continue swim/rest intervals for 30 minutes. For the 30-second rest interval, walk (or rest) until you've lowered your heart rate. Gradually increase the number of laps you swim consecutively and the total duration of your session until you reach your target calorie expenditure and fitness level. But take care not to swim at too fast a pace: It can raise your heart rate too high and limit your ability to sustain your swimming. Alternating strokes can rest your muscles and help prolong your swimming time. A variety of strokes will also let you work more muscle groups. You can also vary your program by incorporating kick boards, pull-buoys, hand paddles, or fins into some of your workouts.

Regardless of the strength training exercises you choose, you should follow the Guidelines for Developing Strength and Endurance Training and Developing Flexibility as outlined in the Walking/Jogging/Running sample program on page 226.

### IN-LINE SKATING SAMPLE PROGRAM

In-line skating is convenient and inexpensive (after the initial outlay for equipment); it can be done on city streets, on paved bike paths and trails, and in parks. If done intensively enough,

skating can provide a cardiorespiratory endurance workout comparable to the workouts provided by jogging and cycling. Studies indicate that skating consumes about as many calories

as jogging. An advantage of skating over jogging is that skating is low impact, so it is less harmful to the knees and ankles. An advantage of skating over bicycling is that it works the hamstring muscle in the back of the thigh. Skating develops lower-body strength and endurance, working all the muscles of the leg and hip and strengthening the muscles and connective tissues surrounding the ankles, knees, and hips.

## Equipment

To skate safely and enjoyably, you will need a pair of comfortable, sturdy, quality skates and adequate safety equipment. The skate consists of a hard polyurethane shell or outer boot; a padded foam liner; and a frame or chassis that holds the wheels, bearings, spacers, and brake. If you want to try out the sport before making a commitment, rent your skates and equipment from a skate shop. If you are buying, plan to spend about \$110–\$200 for skates that meet the basic needs of most recreational skaters. Shop for the best combination of price, quality, comfort, and service.

Essential safety equipment includes a helmet, elbow pads, knee pads, and wrist guards. (Wrist injuries are the most common in-line skating injury.) You may want to put reflective tape on your skates for those occasions when you don't get home before dark. Carry moleskin or adhesive bandages with you in case you start to develop a blister while skating. (For more on safety, see Appendix A.)

## Technique

In-line skating uses many of the skills and techniques of ice skating, roller skating, and skiing, so if you have ever participated in any of those activities, you will probably take to in-line skating fairly readily. Many people begin without instruction, but instruction will allow you to progress more quickly.

To begin, centre your weight equally over both skates, bend your knees slightly so your nose, knees, and toes are all in the same line, and look straight ahead. Keep your weight forward over the balls of your feet; don't lean back.

To skate, use a stroke, glide, stroke, glide rhythm (rather than a series of quick, short strokes). Push with one leg while gliding with the other. Shift your body weight back and forth so it is always centred over the gliding skate.

To stop, use your brake, located on the back of the right skate in most skates. With knees bent and arms extended in front of your body, move the right foot forward, shift your weight to your left leg, and lift your right toe until the brake pad touches the ground and stops you. An alternative stop is the T-stop, in which you drag one skate behind the other at a 90-degree angle to the direction of your forward motion.

If you lose your balance and are about to fall, lower your centre of gravity by bending at the waist and putting your hands on your knees. If you can't regain your balance, try to fall forward, directing the impact to your wrist guards and knee pads. Try not to fall backward.

Again, instruction can help you learn many moves and techniques that will make the sport safer and more enjoyable.

## Developing Cardiorespiratory Endurance

Studies have shown that in-line skaters raise their heart rates and oxygen consumption comparably to joggers, bicyclers, and walkers. Skaters reached 60–75% of  $\dot{V}O_{2\max}$  by skating

**SAMPLE PROGRAM TABLE 6** *Calorie Costs for In-Line Skating*

To estimate the number of calories you burn, first determine your approximate speed (use the Minutes:Seconds per Km/Mile column if necessary), multiply the calories per minute per pound by your weight, and then multiply that figure by the number of minutes you skate. For example, assuming you weigh 145 pounds and skate at 10 mph for 30 minutes, you would burn 273 calories:  $145 \times .063$  (calories per pound, from table) =  $9.1 \times 30$  (minutes) = 273 calories burned. Calculations are approximate.

SPEED		
Miles per Hour	Minutes:Seconds per Miles	Calories per Minute per Pound
12.8	4:40	.041
14.4	4:10	.053
16	3:45	.063
17.6	3:25	.072
19.2	3:08	.084
20.8	2:55	.095
22.4	2:40	.105
24	2:30	.115

SOURCES: Adapted from International Inline Skating Association. 1999. *Health Benefits of Inline Skating* (<http://www.iisa.org/numbers/health.htm>, retrieved April 7, 2000); Wallick, M. E., et al. 1995. Physiological responses to in-line skating compared to treadmill running. *Medicine and Science in Sports and Exercise* 27(2): 242–248.

continuously (not pushing off and gliding for several seconds) at 17–20 km/hr (10.6–12.5 mph) for 20–30 minutes. It may be difficult for recreational skaters to safely skate this fast for this long, however, given the typical constraints of city and suburban streets. Experts suggest skating uphill as much as possible to reach the level of intensity that builds cardiorespiratory endurance. If you can reach and maintain higher speeds in parks or on paved paths, do so, but always skate safely.

**FIT—frequency, intensity, and time:** Start your early skating sessions at a pace that keeps your heart rate about 10–20% below your target zone. Skate for 5–10 minutes, and then check your heart rate. Increase your speed gradually until you can skate at about 16 km (10 miles) per hour at 3.75 min/km (6 minutes per mile). Use your pulse as a guide to speed, aiming for 65% of your target heart rate zone. To achieve cardiorespiratory benefits, you will have to skate at a continuous and relatively intense pace for at least 20 minutes three times a week. The more fit you are, the more intensively you will need to skate to reach your target heart rate.

**Calorie cost:** Use Table 6 to determine the approximate number of calories you burn during each outing. You can increase the number of calories burned by skating faster, for a longer time, or uphill.

**At the beginning:** If you are a beginner, practise skating in an empty schoolyard or a parking lot. As you become confident with the basic techniques, you can move on to streets, parks,

and paved bike trails. Maintain an easy pace, alternating stroking and gliding.

Begin each outing with a 5- to 10-minute warm-up of walking, jogging, or even slow skating. Once your muscles are warm, you can do some stretches to help loosen and warm up the primary muscles used during skating. These muscles include the quadriceps, hamstrings, buttocks, hips, groin, ankles, calves, and lower back. You can also save the stretches for the end of the workout.

To launch an in-line skating fitness program, aim for slow, long-distance workouts at first. Start by skating for 15 minutes and gradually increase your sessions to 20–30 minutes of continuous skating (about 5.6–8 km). Try to skate about 32 km a week, or 8 km a day (about 30 minutes) 4 days a week.

**As you progress:** After the first week or two, add about km/mile a day, up to 64 km (40 miles) per week (60 minutes a day). To increase intensity, add some hills, sprints (bursts of short, rapid striding), and interval training (periods of intensive exercise at your target heart rate alternating with timed rest periods when your heart rate drops below your target zone). Try to skate 30–60 minutes a day four or more times a week.

The harder and faster you skate, the more intensive your workout will be and the more your cardiorespiratory endurance and muscular strength will improve. The longer and more often you skate, the more your endurance will increase.

Regardless of the strength training exercises you choose, you should follow the Guidelines for Developing Strength and Endurance Training and Developing Flexibility as outlined in the Walking/Jogging/Running sample program on page 226.





## LAB 8.1 A Personal Fitness Program Plan and Contract



A. I, \_\_\_\_\_, am contracting with myself to follow a physical fitness program to work toward the following goals:

(name)

Specific or short-term goals (include current status for each)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

General or long-term goals

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

B. My program plan is as follows:

Activities	Components (Check ✓)					Frequency (Check ✓)							Intensity*	Time (duration)	
	CRE	MS	ME	F	BC	M	Tu	W	Th	F	Sa	Su			

\*Conduct activities for achieving CRE goals in your target range for heart rate or RPE.

C. My program will begin on \_\_\_\_\_, My program includes the following schedule of mini-goals. For each step in my program, I will give myself the reward listed.

(date)

_____	_____	_____
(mini-goal 1)	(date)	(reward)
_____	_____	_____
(mini-goal 2)	(date)	(reward)
_____	_____	_____
(mini-goal 3)	(date)	(reward)
_____	_____	_____
(mini-goal 4)	(date)	(reward)
_____	_____	_____
(mini-goal 5)	(date)	(reward)

D. My program will include the addition of physical activity to my daily routine (such as climbing stairs or walking to class):

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

E. I will use the following tools to monitor my program and my progress toward my goals:

\_\_\_\_\_

(list any charts, graphs, or journals you plan to use)

\_\_\_\_\_

\_\_\_\_\_

I sign this contract as an indication of my personal commitment to reach my goal.

\_\_\_\_\_

(your signature)

\_\_\_\_\_

(date)

I have recruited a helper who will witness my contract and \_\_\_\_\_

\_\_\_\_\_

(list any way your helper will participate in your program)

\_\_\_\_\_

\_\_\_\_\_

(witness's signature)

\_\_\_\_\_

(date)



## LAB 8.2 *Getting to Know Your Fitness Facility*



To help create a successful training program, take time out to learn more about the fitness facility you plan to use.

### Basic Information

Name and location of facility: \_\_\_\_\_

Hours of operation: \_\_\_\_\_

Times available for general use: \_\_\_\_\_

Times most convenient for your schedule: \_\_\_\_\_

Can you obtain an initial session or consultation with a trainer to help you create a program? \_\_\_\_\_ yes \_\_\_\_\_ no

If so, what does the initial planning session involve? \_\_\_\_\_

\_\_\_\_\_

Are any of the staff certified? Do any have special training? If yes, list/describe: \_\_\_\_\_

\_\_\_\_\_

What types of equipment are available for the development of cardiorespiratory endurance? Briefly list/describe:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Are any group activities or classes available? If so, briefly describe: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What types of weight training equipment are available for use? \_\_\_\_\_

\_\_\_\_\_

**Yes**      **No**

\_\_\_\_\_      \_\_\_\_\_      Is there a fee for using the facility? If so, how much? \$ \_\_\_\_\_

\_\_\_\_\_      \_\_\_\_\_      Is a student ID required for access to the facility?

\_\_\_\_\_      \_\_\_\_\_      Do you need to sign up in advance to use the facility or any of the equipment?

\_\_\_\_\_      \_\_\_\_\_      Is there typically a line or wait to use the equipment during the times you use the facility?

\_\_\_\_\_      \_\_\_\_\_      Is there a separate area with mats for stretching and/or cool-down?

\_\_\_\_\_      \_\_\_\_\_      Do you need to bring your own towel?

\_\_\_\_\_      \_\_\_\_\_      Are lockers available? If so, do you need to bring your own lock? \_\_\_\_\_ yes \_\_\_\_\_ no

\_\_\_\_\_      \_\_\_\_\_      Are showers available? If so, do you need to bring your own soap and shampoo? \_\_\_\_\_ yes \_\_\_\_\_ no

\_\_\_\_\_      \_\_\_\_\_      Is drinking water available? (If not, be sure to bring your own bottle of water.)

Describe any other amenities, such as vending machines or saunas, that are available at the facility.

\_\_\_\_\_

\_\_\_\_\_

### Information About Equipment

Fill in the specific equipment and exercise(s) that you can use to develop cardiorespiratory endurance and each of the major muscle groups. For cardiorespiratory endurance, list the type(s) of equipment and a sample starting workout: frequency, intensity, time, and other pertinent information (such as a setting for resistance or speed). For muscular strength and endurance, list the equipment, exercises, and finally indicate the order in which you'll complete them during a workout session (see p. 92 for suggestions on order of weight training exercises).

### Cardiorespiratory Endurance Equipment

Equipment	Sample Starting Workout

### Muscular Strength and Endurance Equipment

Order	Muscle Groups	Equipment	Exercises(s)
	Neck		
	Chest		
	Shoulders		
	Upper back		
	Front of arms		
	Back of arms		
	Buttocks		
	Abdomen		
	Lower back		
	Front of thighs		
	Back of thighs		
	Calves		
	<i>Other:</i>		
	<i>Other:</i>		