



**SISFFIT015 Collaborate with medical
and allied health professionals in a
fitness context**

**SISFFIT018 Promote functional
movement capacity**

**SISFFIT020 Instruct exercise
programs for body composition goals**

**SISFFIT021 Instruct personal training
programs**

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ASSESSMENT FOR SISFFIT015, SISFFIT018, SISFFIT020 & SISFFIT021

Student name	
Date of assessment submission	Click here to enter a date.
Trainer/Assessor's name	
Date of assessment marking	Click here to enter a date.
Outcome for units	☐ Competent ☐ Not Yet Competent

TASK INSTRUCTIONS

- The assessment for these units of competency consists of the following:
 - **Quiz:** You are required to complete a series of multiple choice questions to demonstrate your knowledge and skills.
 - **Short answer activities:** You are required to provide short written responses to a series of activities to demonstrate your knowledge and skills.
 - **Case studies:** You are required to provide written responses to a series of case study scenarios to demonstrate your knowledge and skills.
 - **Practical tasks:** You will be required to put your knowledge and skills into practice, through observed tasks and work experience.
- At times, you will be provided with a specific context to which you must respond, otherwise it is anticipated that you will use a scenario of your choosing to provide context to the task.

QUIZ

QUESTIONS	CORRECT																		
1. Identify whether the following fitness components are either health related or skill related. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #d3d3d3;"> <th style="text-align: left; padding: 5px;">Fitness component</th> <th style="text-align: center; padding: 5px;">Health</th> <th style="text-align: center; padding: 5px;">Skill</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Body composition</td> <td style="text-align: center; padding: 5px;">☒</td> <td style="text-align: center; padding: 5px;">☐</td> </tr> <tr> <td style="padding: 5px;">Balance</td> <td style="text-align: center; padding: 5px;">☐</td> <td style="text-align: center; padding: 5px;">☒</td> </tr> <tr> <td style="padding: 5px;">Coordination</td> <td style="text-align: center; padding: 5px;">☐</td> <td style="text-align: center; padding: 5px;">☒</td> </tr> <tr> <td style="padding: 5px;">Muscle endurance</td> <td style="text-align: center; padding: 5px;">☒</td> <td style="text-align: center; padding: 5px;">☐</td> </tr> <tr> <td style="padding: 5px;">Reaction time</td> <td style="text-align: center; padding: 5px;">☐</td> <td style="text-align: center; padding: 5px;">☒</td> </tr> </tbody> </table>	Fitness component	Health	Skill	Body composition	☒	☐	Balance	☐	☒	Coordination	☐	☒	Muscle endurance	☒	☐	Reaction time	☐	☒	☐
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3. Which stage in the new Adult Pre-Exercise Screening System can be self-administered and evaluated? Note: It is also the only compulsory stage and contains seven basic questions. ☒ Stage 1 ☐ Stage 2 ☐ Stage 3	☐																		
4. What is the name of the organisation responsible for consumer protection? Select your response. ☒ Australian Competition and Consumer Commission ☐ Fair Work Australia ☐ Scam Watch	☐																		
5. True or False: Metabolism is the process by which your body converts what you eat and drink into energy. ☒ True ☐ False	☐																		

6. Order the following twelve (12) fitness test in the order they should be carried out on a client.

☐

Order	Fitness test
6	Body fat
2	Informed consent
7	Body-girth measurement
9	Postural assessment
8	Waist-hip ratio
5	Resting heart rate
10	Sub-maximal cardiovascular testing
4	Blood pressure
11	Flexibility testing
3	Height and weight
12	Muscular strength testing
1	Pre-screening questionnaire

Outcome for Quiz

- ☐ Satisfactory
☐ Not satisfactory

Trainer/Assessor comments

SHORT ANSWER ACTIVITIES

ACTIVITY 1

Reflect on the ways that you consider clients' needs.

- a) Name three (3) client considerations and needs to be taken into account when planning a personal training session.
- b) Give one (1) example of a long term goal and one (1) example of a short term goal that a client may have regarding body composition.
- c) Explain the following terms as they are used to determine whether a client is classified as 'obese':
 - BMI
 - Waist to Hip Ratio
 - Waist Circumference
- d) List four (4) factors that can affect one's 'weight' on scales?
- e) Describe the following learning styles and provide an example of how you would address a client with each preferred learning style:
 - Visual
 - Auditory
 - Kinaesthetic
- f) Briefly explain each of the following motivational techniques you can use with a client. Provide an example of each.
- g) Identify two (2) reasons why a fitness trainer would monitor a client's response to progress in their exercise program.
- h) List at least one (1) advantage and one (1) limitation for using the following ways to monitor client responses to exercise:
 - Talk Test
 - Rate of Perceived Exertion (RPE)
 - Heart Rate Monitoring
- i) Name at least two (2) common barriers to exercise participation.
- j) List two (2) reasons why you might modify a personal training plan for a client.
- k) Identify at least three (3) signs of overtraining.
- l) List three (3) strategies you might use to increase a client's exercise adherence.
- m) Consider the role of Medical Practitioners and Allied Health Professionals:
 - List six (6) signs and symptoms of exercise intolerance or medical conditions requiring referral to a medical practitioner and/or Allied Health Professional. Name the appropriate Medical or Allied Health Professionals you would refer to for each sign/symptom.
 - Using examples, explain the role of such professionals in supporting clients to reach their body composition goals and body composition programming.
 - Identify two advantages that fitness trainers can acquire from working with medical and allied health professionals.

Client considerations and needs

- Client details
- Fitness levels and goals
- Training history
- Targeted adaptations
- Anticipated rate of client adaptation
- Number and nature of session programs
- Equipment requirements
- Facility requirements
- Review dates
- Training schedule
- Likes and dislikes

• Financial constraints • Specific responses to questionnaire • Religious restrictions • Injuries • Medical and exercise history • Functional limitations
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Goals	
Long term	To begin implementing healthy eating habits on a daily basis that will increase my overall health.
Short term	To lose 2% body fat within 6 months.

Obesity considerations	
BMI	Relationship of weight to height
Waist to Hip Ratio	Ratio of one's waist circumference to the hip circumference
Waist Circumference	High measurement associated with chronic disease e.g., heart disease, diabetes, etc. Men at risk if waist >102cm; women at risk if waist >88cm

Factors affecting 'weight'
• Lean body mass • Water • Fat • Clothing

Learning styles	
Visual	Prefer using pictures, images, and spatial understanding, Example- show the how to do the exercise
Auditory	Prefer using sound and music. Example: tell them how to do the exercise
Kinaesthetic	Prefer using your body, hands and sense of touch. Example: with their permission, take their body through the motion, let them 'feel' the exercise before doing it on their own

Motivational techniques	
Extrinsic motivation	Occurs where the motivating factors are external to the person. Examples: • Encourage the client to identify a reward that they will receive if they meet specific fitness goals. • Prepare a contract with the client to carry out specific fitness activities. • Provide incentives for ongoing adherence to a fitness program. • Calling your client prior to the session to see how he/she is going • Putting variety into the workout such as partner training, music, new exercises, etc.
Intrinsic motivation	Where the motivating factors emanate from within the person. Examples: • Provide supportive positive feedback on a person's progress. • Provide choice in what and how a client participates in physical activity and exercise. • Promote fun and excitement in the fitness program. Include games and

	variety in the program. Makes sure the program does not become boring or just the same old thing all the time. • Teach the value of physical activity to health and quality of life to clients. • Encourage the client to focus on the doing of the activity, to live for the moment of the exercise
Goal setting	Where the client establishes something he/she wants to achieve using the SMART principle (Specific, Measureable, Achievable, Realistic, and has a time frame. • Example: After the 12-week fitness program, I will have lost 3 kilos
Establishment of habits	Where you replace a non-supporting routine towards the goal with a habit that supports the goals. • Example, if the client had routine to go to the pub after work, you can replace that habit with having the personal training session during that time.
Positive reinforcement	Involves the addition of a reinforcing stimulus following a behaviour that makes it more likely that the behaviour will occur again in the future. • Example: Verbal or physical reward

Monitoring client response

- Identify barriers that impede progress towards goal achievement
- Recognise signs and symptoms of declining health status
- Ensure the exercise program developed in achieving results
- Apply the progressive overload principles
- Prevent overtraining and/or injuries
- Confirm that the exercise routine is not interfering with the client's health condition or medication.

Monitoring methods

Method	Advantages	Disadvantages
Talk Test	• Adequate and inexpensive method to suggest an appropriate intensity to base training on	• Underestimates the level of actual training intensity determined by respiratory gas exchange analysis • If a more accurate training intensity is required, than the Talk Test is not recommended
Rate of Perceived Exertion (RPE)	• It provides a double check on whether the training zone heart rate is appropriate. • It can be performed without stopping the activity to measure heart rate. • No equipment is required.	• Test- retest reliability of the RPE scale when used to monitor subjective estimates of exercise intensity in progressive (or graded) exercise tests has been questioned
Heart Rate Monitoring	• Keeps intensity in check • Heart Rate-Power And Heart Rate-Pace Relationships Provide Very Useful Information	• Heart Rate Is Not A Super-Reliable Metric Of Exercise Intensity • Heart Rate Training Formulas Are inconsistent • Useless at very high intensities

Barriers

- Perceived versus actual barriers
- Initial low fitness level
- Time and access to facilities
- Self-consciousness in client

Modifying a personal training plan

- Technical requirements
- Changing needs due to fitness adaptations
- Changing goals
- Client needs, objectives, likes and dislikes
- Technical difficulty adjustments of exercises

Signs of overtraining

- Decrease in performance not caused by a change in training stimulus
- Irritability
- Fatigue
- Depression
- Increased illness and infections
- Lethargy
- Increased muscle soreness
- Loss of appetite
- Sleeping disorders

Increasing exercise adherence

- Technical requirements
- Changing needs due to fitness adaptations
- Setting appropriate goals and changing goals as necessary
- Client needs, objectives, likes and dislikes
- Technical difficulty adjustments of exercises
- Using intrinsic and extrinsic motivation
- Establishing habits
- Positive reinforcement

Medical and Allied Health Professionals

	Exercise intolerance or medical condition signs/symptoms	Appropriate Medical or Allied Health Professional
1	• Assessor's discretion. May include: • Chest pain at rest or during activity • Severe breathlessness/feeling faint/dizziness/loss of balance • Unusual fatigue or shortness of breath • Asthma aggravation/attack • Significant muscle, bone or joint pain (beyond what is normally expected during exercise) • Recent rapid weight change • Frequent or persistent headaches • Visual problems such as diplopia or visual aura • Balance or coordination deficit	• Assessor's discretion. May include: • General practitioner • Exercise physiologist • Physiotherapist • Occupational therapist • Accredited practising dietician • Osteopath or Chiropractor • Sports physician or doctor • Podiatrist. • Remedial massage therapist • Psychologist/counsellor • Diabetes educator • Aboriginal health worker

	A situation whereby the fitness professional makes a judgement that continuing the session is beyond their professional capabilities and scope of practice, and could potentially compromise client health and safety.	
2	Assessor's discretion. May include: - Pain upon presentation to initial session/induction - History of uncontrolled/unresolved pain - Abnormal/inconsistent pain patterns which may point towards a pathology - Pain during movement or exercise - Static postural deviations - An inability to correct static or dynamic posture - Restricted joint range of movement, strength imbalance or balance, stability or coordination concern that is limiting function - A diagnosed muscle, bone or joint problem with medical or allied health advice that the problem could be made worse by participating in physical activity/exercise - Identified through industry endorsed pre-exercise screening and risk stratification.	
3		
4		
5		
6		
Body composition	- Sports physician/sports doctor – if working with an athlete, identify any physical ailments that could affect eating habits. - General practitioner – overall health impacts - Physiotherapist – if overweight, impact on functional movement / injury - Accredited exercise physiologist – any further testing with regards to cardio, etc. - Occupational therapist – any activities that should be used eliminated that could impact body composition - Remedial massage therapist – no direct role; assists in muscle recovery from training sessions - Chiropractor / osteopath -functional stability/alignment - Accredited practising dietician - dietary plan	

	• Psychologist / counsellor – body image issues • Aboriginal health worker – any issues specific to the indigineous client • Diabetes educator – directly works with client who has diabetes or possible diabetes • Podiatrist – any foot problems that could have an effect on the type of programming used, especially with obese / overweight clients.
Advantages of working with them	• The development of new insights • Practice in creating a shared outcome • The development of professional relationships and networks • An enhanced reputation within the MAAHP network

Outcome for Activity 1	☐ Satisfactory ☐ Not satisfactory
Trainer/Assessor comments	

ACTIVITY 2

Consider the impact of organisational and legal requirements on your practices, as well as guidance from authoritative bodies.

- a) Name at least six (6) organisational policies and procedures you must consider when instructing personal training sessions.
- b) What is informed consent? What components should be considered when compiling an informed consent?
- c) Provide six (6) examples of professional records you would want to maintain and store about a client.
- d) Identify the steps a personal trainer can take to protect their client's personal information, including the appropriate collection and storage of the information.
- e) Identify where you would find information on the following legislation online:
 - Privacy Act
 - Work Health and Safety Act
 - Anti-Discrimination Acts for both Federal and State jurisdictions
- f) Identify the considerations and official processes required (i.e. permits laws) for conducting fitness sessions in a public place.
- g) A personal trainer must abide by a Code of Ethics. Name the peak body organisation which sets the guidelines for personal trainers with regards to professional ethics in the industry and list its website URL. Briefly summarise the Code of Ethics.
- h) Refer to the National Heart Foundation of Australia to determine the blood pressure ranges for each of the listed classifications.
- i) Fill in the BMI ranges for each of the classifications listed.
- j) According to Fitness Australia, what are the seven (7) essential components of successful referrals?
- k) Explain the concept of 'duty of care'. As a personal trainer what is considered your duty of care for a client? What happens if you are found to have breached that duty?
 - Explain your responses in the context of exercise planning for body composition goals.
- l) What elements must be present to be considered legally 'negligent'?

Organisational policies and procedures

- Ventilation and/or climate control
- Hygiene
- Emergency
- Industry endorsed risk management protocols, exercise implications and referral requirements
- Standards of personal presentation
- Participant clothing and footwear
- Use, care and maintenance of equipment
- Client supervision
- Communication protocols
- Records management and security
- Confidentiality and privacy
- Recording client information

Informed consent

An agreement to ensure the client has full understanding or knowledge of what is going to be carried out.

Components:

- A general statement of the background and objectives of the program
- An explanation of the procedures to be followed
- An explanation of all the risks that may be experienced

- A description of the reasonably expected benefits
- An offer to answer any questions the client may have
- An instruction that the client is free to withdraw consent and discontinue participation in the exercise program at any time, and without prejudice
- An explanation of the procedures to be carried out to ensure client confidentiality of all information attained from the client

Professional records

- Parental or guardian consent, if relevant
- Pre-exercise screening results
- Other client health information
- Client informed consent
- Documented guidance provided by medical or allied health professional
- Clinical test results, as required
- Fitness test results, as required
- Exercise program
- Client participation

Protecting client information

- Only collect information you need.
- Don't collect personal information about an individual just because you think that information may come in handy later.
- Tell people how you are going to handle the personal information you collect about them.
- Think about using personal information for a particular purpose.
- Think before disclosing personal information.
- If people ask, give them access to the personal information you hold about them.
- Keep personal information secure.
- Don't keep information you no longer need or that you no longer need to retain.
- Keep personal information accurate and up to date.
- Consider making someone in your organisation or agency responsible for privacy.
- Ensure the information is stored in a secured place and that only those who have authority can access the information.

Legislation

Privacy Act	https://www.oaic.gov.au/privacy-law/privacy-act/
Work Health and Safety Act	http://www.safeworkaustralia.gov.au/ http://www.legislation.qld.gov.au
Federal anti-discrimination Acts	Australian Human Rights Commission: https://www.humanrights.gov.au/
State anti-discrimination Act	http://www.legislation.qld.gov.au

Public spaces

Considerations – climate, location, competition, client ability, safe ground, coverage, other people, traffic, familiarity with area, client clothing and footwear, weather, children

<https://brisbane.qld.gov.au/facilities-recreation/parks-venues/parks/using-council-parks/personal-training>

Code of Ethics	
Peak body name and URL	Fitness Australia http://fitness.org.au/articles/policies-guidelines/fitness-australia-code-of-ethics/26/73/20
Summary of Code of Ethics	The Fitness Australia Code of Ethics of Registered Exercise Professionals and their practice requires its members to discharge their duties and responsibilities, at all times, in a manner which professionally, ethically, and morally compromises no individual with whom they have professional contact, irrespective of that person's position, situation or condition in society.

Blood pressure		
Systolic	Diastolic	Classification
< 120	< 80	Optimal
120 - 129	80 - 84	Normal
130 - 139	85 - 89	High Normal
140 - 159	90 - 99	Grade 1 (mild) hypertension
160 - 179	100 - 109	Grade 2 (moderate) hypertension
≥ 180	≥ 110	Grade 3 (severe) hypertension

BMI ranges	
BMI (kg/m ² range)	Classification
< 18.5	Underweight
18.5 - 24.9	Normal range
25.0 - 29.9	Pre-obese / Overweight
30.0 - 34.9	Obesity Class 1
35.0 - 39.9	Obesity Class 2
≥ 40.0	Obesity Class 3

Successful referrals
• Screen and Assess: Identify client health risks and determine your client needs • Evaluate: Know your scope of practice and evaluate whether you require guidance from a health professional to meet your client needs • Decide: Decide what expertise you require to develop and manage your client's exercise program • Prepare: Compile relevant, accurate and concise information for the referral • Consent: Involve your client in the process and gain informed consent to share their health information • Connect: Plan ahead and ensure your referral actions are appropriate, professional and effective • Commit: Commit to ongoing dialogue and feedback to achieve a positive health outcome for your client

Duty of care
You have a legal and moral responsibility to keep your clients safe from harm whilst they are using a service. The responsibility or the legal obligation of a person or organization to avoid acts or omissions (which can be reasonably foreseen) to be likely to cause harm to others. Personal trainers have a duty of care to provide a safe environment, ensure safety in all

activities and exercises that are performed in and out of a gym, etc. If a PT is found to have breached that duty of care, he/she could be found negligent if the other three factors have been met – there was a duty, there was proximate cause, and there was injury.

Negligence

- (1) A duty of care must be established between the plaintiff and defendant,
- (2) There must have been a breach of that duty by the defendant
- (3) The damage (injury) must have been the result of the breach, or caused by the breach of duty

Outcome for Activity 2

- ☐ Satisfactory
☐ Not satisfactory

Trainer/Assessor comments

ACTIVITY 3

Consider the knowledge and processes used when designing and implementing training programs:

- a) Identify the aims of Stage 1, Stage 2, and Stage 3 of the Pre-Exercise Screening system.
- b) Identify the four (4) standard measurements conducted in any health or pre-exercise screening.
- c) Identify at least one (1) benefit and one (1) limitation for the listed body composition appraisal methods listed below.
- d) What are three keys to increasing assessment reliability?
- e) Name and explain at least two (2) methods for measuring exercise intensity.
- f) Consider the nature of energy expenditure:
 - List and describe the three (3) main components of energy expenditure.
 - Explain the three (3) main factors that determine energy expenditure in activity.
 - Identify the three (3) most common forms of energy expenditure
- g) Name five (5) program design factors and variables you consider to be relevant to the combination of health and skill related components of fitness in the client's program.
- h) Briefly explain the relationship between healthy eating, exercise and health.
- i) Name the four (4) factors that influence adaptations to aerobic training.
- j) What is the main role/aim of plyometric training? Name at least two (2) safety and preparation considerations to make when using plyometric training with your client.
- k) For each of the following sources of external resistance, provide two (2) examples of resistance training exercises.
- l) Both the hip joint and shoulder joint are ball and socket types of synovial joint; however, the shoulder joint is more likely to be injured during movement. Identify two (2) reasons why the shoulder joint is more prone to injury.
- m) Describe what constitutes ideal postural alignment (when standing erect).
- n) Consider the importance of posture:
 - Describe three (3) benefits of having good posture.
 - Identify three (3) causes of poor posture.
 - Identify eight (8) common structural or functional postural variances you may witness with someone with a musculoskeletal condition.
- o) Explain the difference between Lordosis, Kyphosis and Scoliosis.
- p) Explain the difference between an anterior pelvic tilt and a posterior pelvic tilt.
- q) Identify three (3) exercises that can improve posture.
- r) Identify five (5) reasons that can cause a change to one's centre of gravity.
- s) Name four (4) characteristics of coordination and agility.
- t) Consider the importance of functional movement:
 - What is the key purpose of assessing a person's functional movement?
 - How does an understanding of functional movement contribute to safe/optimum technique and skill development?
 - Identify two (2) strategies you can recommend to your client to promote functional movement and reduce the likelihood of injury.
 - Identify the seven exercises that can be used to test a client's functional movement patterns.
- u) What is thermogenesis and why is it important for weight loss? What is 'adaptive thermogenesis'?
- v) Briefly discuss the exercise programming principles for the following (100-150 words per topic):
 - Muscle hypertrophy
 - Fat loss
 - Lean body mass

Pre-Exercise Screening System	
Stage 1	To identify individuals who may be at a higher risk of an adverse event during physical activity.
Stage 2	To identify individuals with risk factors or other conditions that are important to know when prescribing physical activities
Stage 3	To obtain pre-exercise baseline measurements of other recognised cardiovascular and metabolic risk factors.

Screening measurements
• Height • Body mass (weight) • Resting heart rate • Resting blood pressure

Body composition appraisal methods		
Method	Benefits	Limitations
Bioelectrical impedance	• Inexpensive, portable, simple, safe	• Population specific, poor accuracy in individuals and groups
Skinfold measurement	• A lot simpler than hydrostatic weighing and many of the other body composition techniques.	• Not a valid predictor of percent body fat, however they can be used as a monitoring device to indicate changes in body composition over time • Some subjects may feel uncomfortable stripping down in front of the tester • The reliability of skinfold measurements can vary from tester to tester depending on their skill and experience
Girth measurement	• Good measure of proportionality • Low costs involved in the testing procedure, and for many sites the measurement can be self-administered.	• Not a valid predictor of body fat • Reliability can be compromised due to changes to the testers, constant and even tension on the tape, and correct landmarking.
Body weight	• Quick and easy measurement when testing large groups, with minimal costs.	• If not measured under the same conditions, body weight can vary • Does not take into account changes in lean body mass
Hydrostatic weighting	• Most widely used test of body density • Was the criterion measure for other indirect measures.	• Expensive • Not easy access for the general population. • May underestimate body fat percentage of athletes as they tend to have denser bones and muscles than non-athletes, and may overestimate body fat

		percentage of elderly patients suffering from osteoporosis
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Assessment reliability

- Follow the standard procedures
- Offer clear instructions to your client
- Assess in the same way each time

Measuring exercise intensity

- Heart rate response – heart rate response is measuring the client's heart rate to see if it is within the relevant zone.
- Respiration rate response - respiration rate response is measuring the client's respiration rate to see if it is within the relevant zone. At rest, your respiratory rate is about 14 per minute but can increase to 32 per minute during exercise. The increased respiration rate allows more oxygen to reach the lungs and blood to be delivered to the muscles.
- Rate of perceived exertion - used to measure the intensity of your exercise. The RPE scale runs from 0 – 10. The numbers below relate to phrases used to rate how easy or difficult you find an activity.
- Work output - work output during can be measured by a cycle ergometer. The other condition involves measurement of work output during normal daily activities over prolonged periods of time, such as 24-hour period. Other various devices, such as small pedometers or accelerometers attached to the body, detect motion throughout the day and provide an approximation of daily work output.

Energy expenditure

Components	• Resting Energy Expenditure: The energy expended while the body is at rest, which includes basic physiological functions such as heartbeat, muscle contraction, respiration, and so on • Thermic Effect of Food: The energy expended to digest, metabolize, and store ingested macronutrients. • Physical Activity: The increase in metabolic rate caused by any movement of skeletal muscles
Factors	• Activity duration • Activity type (e.g., walking, running, or typing) • Activity intensity. Energy output increases the longer you perform an activity, the greater your use of large muscle groups (type of activity), and the more intensely you perform the activity.
Forms	• Basal metabolic rate (BMR): The resting metabolic rate (RMR), which accounts for the largest portion of a person's energy expenditure at 60% to 75%, is responsible for maintaining normal body functions and homeostasis. Cardiovascular functioning (heartbeat and moving blood through the veins and arteries), pulmonary functioning (breathing), and central nervous system functioning (blinking, sleeping, and moving) are examples that fall under the RMR. The RMR is influenced by Age, Gender, Lean body mass (LBM), Body composition and genetic factors • Thermic effect of food - a key aspect of energy expenditure; Increase in energy expenditure above the RMR that can be measured for several hours after a meal; Average client's TEF 7%-10% of total ingested calories and may last more than 3 hours • Thermal effect of physical activity: The most variable contributor to

	energy expenditure is the thermic effect of physical activity. This accounts for energy that is expended on top of the RMR and TEF, including voluntary exercise, shivering, postural control, and voluntary movement.
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Program design and variables

- Muscle actions
- Loads and volumes
- Exercise selection and order
- Rest periods
- Repetition velocity
- Frequency

Relationship between eating, exercise and health

The three are inter-related. By practicing healthy eating habits, you will have a better opportunity of performing exercise at an optimum level which then in turns leads to increased overall health.

Aerobic training influences

- Specificity (types of activity person engages in)
- Genetics
- Sex / gender
- Age

Plyometric training

Aim	The main role of plyometric training is to facilitate strength and speed development, thereby improving power. Additionally, it is to develop explosive movement.
Safety and preparation considerations	Safety and preparation • Focus on quality versus quantity • Critical that the client has a sound weight training background • Session should not leave the client out of breath and ample rest time between sets is required • Allow only three maximum plyometric sessions per week with only 120 ground contact per session per muscle group. • Need careful supervision to ensure technique • Uncommon to be prescribed in a fitness centre

Source of external resistance	Resistance training exercises
Gravity	Many exist, for example, standing shoulder press, free weight bench press, lat pulldown, angled bench press
Inertia	Power clean, snatch
Fluid	Pneumatic (compressed air) resistance exercises
Elasticity	Rubber tubing exercises
Electronically controlled	Isokinetic-based rehabilitation machines

Shoulder injury

Answer must include 2 of the following:

- Socket not as deep in shoulder joint, making the joint design not as stable
- Ball of humerus is bigger than the width of the socket on the scapula (humerus does not sit inside scapula – instead it rolls in and out during movement)
- Ligaments are smaller and don't surround the joint completely

Ideal postural alignment

- Normal spinal curves
- Straight line running through:
 - Ear lobe
 - Anterior shoulder joint
 - Vertebral bodies of L1-5
 - Posterior hip joint
 - Anterior knee joint
 - Anterior ankle joint
 - Transverse abdominus
 - Pelvic floor muscles

Posture

Benefits of good posture	• Proper alignment for the vertebral column • Improved balance within joint structures • Better overall muscular balance • A safer body alignment while moving • Improved daily and activity performance • Increased self-confidence
Poor posture causes	• Congenital abnormalities of the musculoskeletal system • Poor muscle strength • Muscle imbalance • Lack of mobility • Damage to bony structures • Damage to connective tissue including ligaments, cartilage • Biomechanics • Changes to line of gravity caused by pregnancy, inappropriate footwear, behaviours, work practices, sport/leisure activities
Postural variances	• Forward head position • Kyphosis • Rounded shoulders • Winging of scapula • Scoliosis • Increased lordosis • Decreased lordosis • Excessive posterior pelvic tilt • Excessive anterior pelvic tilt • Genu varum (bow legs) • Genu valgum (knock knees) • Increased pronation of foot/ankle complex • Increased supination of foot/ankle complex • Hyperextension of knees • Lateral tilt of pelvis • Lateral tilt of head • Rotated patella

Spine curvature	
Lordosis	Increase in curvature of the spine usually in the lumbar area but can also be seen in the cervical and thoracic area as well
Kyphosis	Increased posterior curvature of the spine, usually in the thoracic area; can be structural or functional
Scoliosis	Vertebrae with a lateral curve or deviation; affected section will also present with lateral flexion and rotation of the vertebrae; C curve and S curve

Pelvic tilt	
Anterior	Refers to a position in which the ASIS is forward (anterior) to the vertical plane.
Posterior	Refers to a position in which the ASIS is posterior to the vertical plane – decreased lumbar lordosis

Improving posture	
• Planks • Crunch with twist • Dumbbell Side Bends • Back extension • Pilates swimming • Reverse dumbbell flye • Seated dumbbell flye • Shoulder rolls • Seated twist • Kneeling stretch	

Centre of gravity	
• Pregnancy • Overweight • Inappropriate footwear • Behaviours • Work practices • Sport or leisure activities	

Coordination and agility	
• Fine motor skills • Gross motor skills • Hand-eye skills • Progression of coordination or agility exercises	

Functional movement	
Purpose	To identify imbalances, faults and instability

Understanding	Individuals perform high-level activities even though they are inefficient in their fundamental movements; without knowing it, these individuals are putting fitness on dysfunction. These individuals create poor movement patterns, train around a pre-existing problem or simply do not train their weakness during their strength and conditioning programs. The idea is to individualize each workout program based on the person's weak link. This weak link is a physical or functional limitation. In order to isolate the weak link, the body's fundamental movement patterns should be considered. By looking at the movement patterns and not just one area, a weak link can be identified. If this weak link is not identified, the body will compensate, causing inefficient movements. It is this type of inefficiency that can cause a decrease in performance and an increase in injuries. By identifying the weak link in the movement pattern and then assigning exercises to correct it, the individual will have greater movement efficiency, which will lead to improved performance and hopefully a decrease in injury potential.
Promotion	• Flexibility • Functional strength training • Proprioception development • Education to develop correct exercise techniques or daily living postures
Testing	• Deep squat • Hurdle Step • In-Line Lunge • Active Straight-Leg Raise • Trunk Stability Push-up • Shoulder mobility • Rotary mobility

Thermogenesis	
Definition	Thermogenesis is the increase in energy expenditure above basal metabolic rate; it is heat production in organisms.
Importance for weight loss	The main weight loss benefit of thermogenesis is that it uses up stored energy. For our bodies to generate heat they need to burn calories.
Adaptive thermogenesis	Adaptive thermogenesis is the decrease in energy expenditure beyond what could be predicted from body weight or its components (fat-free mass and fat mass) under conditions of standardized physical activity in response to a decrease in energy intake. Energy expenditure, be it in the resting or the active state, was significantly more decreased compared with what was predicted by morphological changes.

Exercise programming principles	
Muscle hypertrophy	
Muscle hypertrophy (enhancement of muscle size). According to the ACSM, the following guidelines (and example of a program) should be followed: • Load: 70-85% 1RM for novice to intermediate; 70-100% for advanced • Volume: 1-3 sets of 8-12 repetitions for novice to intermediate; 3-6 sets of 1-12 repetitions for advanced • Rest period: 2-3 min for higher intense exercises that use heavier loads; 1-2 minutes between the lower intense exercises with light loads	
Fat loss	
• Only the net calorie expenditure can be counted towards fat loss; resting calories expenditure should not be counted towards fat loss. • Exercise is critical • Weight loss -- 150-250 minutes/week of moderate-intensity physical activity provides only modest weight loss. Greater amounts (ie. >250) provide clinically significant weight loss. • For weight maintenance after weight loss -- There is some evidence that >250 minutes/week of moderate-intensity physical activity will prevent weight re-gain.	
Lean body mass	
• Volume of training as a significant predictor of LBM. • Higher volumes of resistance exercise are associated with greater increases in LBM; therefore any program should include high volumes. • ACSM recommendations for resistance exercise (i.e. 8-10 exercises for 1-2 sets of full body RE)	

Outcome for Activity 3	☐ Satisfactory ☐ Not satisfactory
Trainer/Assessor comments	

ACTIVITY 4

Match the following programs/systems with their associated definitions listed below:

- Circuit training
- Compound / Tri-set system
- Matrix
- Plyometrics
- Pre-fatigue
- Pyramid system
- One-set system
- Supersetting

Program/System	Definitions
Supersetting	Several sets of two exercises performed one after the other with little or no rest
One-set system	Complete one set to failure
Circuit training	Client moves from one station to the next with limited rest breaks
Matrix	Based on use of partial movements to stimulate muscle tissue growth
Compound / Tri-set system	2-3 exercises for the same body part with little or no rest between
Pre-fatigue	Create fatigue in the prime mover of a compound exercise to effectively recruit assistors
Pyramid system	Light to heavy system; heavy to light system
Plyometrics	Rapid eccentric lengthening of a muscle followed immediately by rapid concentric contraction of that muscle to produce a forceful explosive movement

Outcome for Activity 4	☐ Satisfactory ☐ Not satisfactory
Trainer/Assessor comments	

ACTIVITY 5

Match the following health and skill related components of fitness with their associated definitions listed below:

- Agility
- Balance
- Body composition
- Cardiovascular endurance
- Coordination
- Flexibility
- Muscle endurance
- Muscle strength
- Power
- Proprioception
- Reaction time
- Speed

Components	Definitions
Muscle endurance	Ability of a muscle or group of muscles to repeatedly exert force against resistance
Power	The rate of performing work: <i>force x velocity</i>
Flexibility	The range of motion in a joint or group of joints or the ability to move joints effectively through a complete range of motion
Body composition	Refers to the proportion of fat and fat-free mass in the body
Reaction time	Measure of the quickness an organism responds to some sort of stimulus
Speed	The ability to move quickly across the ground or move limbs rapidly to grab or throw
Coordination	The ability to stay in control of body movement
Muscle strength	The ability to carry out work against a resistance
Proprioception	The ability to sense stimuli arising within the body regarding position, motion, and equilibrium
Balance	The ability to stay upright
Agility	The ability to quickly change body position or direction of the body
Cardiovascular endurance	The ability to exercise continuously for extended periods without tiring

Outcome for Activity 5	☐ Satisfactory ☐ Not satisfactory
Trainer/Assessor comments	

ACTIVITY 6

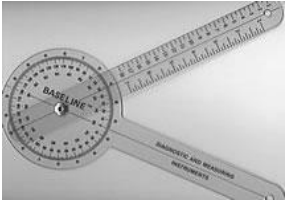
Identify the meaning of each of the acronyms listed in the table below, as they relate to fitness/exercise prescription.

Acronym	Meaning
ACSM	American College of Sports Medicine
AIHW	Australian Institute of Health and Welfare
APSS	Adult Pre-exercise Screening System
BMI	Body mass index (weight in kilograms/ height in metres squared)
BP	Blood pressure
CHD	Coronary heart disease
COPD	Chronic obstructive pulmonary disease
CDC	Centres for Disease Control and Prevention
CVD	Cardiovascular disease
DBP	Diastolic blood pressure
ESSA	Exercise and Sports Science Australia
HDL	High density lipoproteins
LDL	Low density lipoproteins
MET	Metabolic equivalents (this is a measure of the multiples of resting metabolic rate)
MI	Myocardial infarction
PA	Physical Activity
PBS	Pharmaceutical Benefits Scheme
RPE	Rating of perceived exertion
SBP	Systolic Blood Pressure
SMA	Sports Medicine Australia
VLDL	Very low density lipoproteins
WHO	World Health Organisation

Outcome for Activity 6	☐ Satisfactory ☐ Not satisfactory
Trainer/Assessor comments	

ACTIVITY 7

Name the functional movement measurement tools shown below.

		
Plumb line	Flexometer	Goniometer

		
Plurimeter	Tape measure	Pressure biofeedback unit

Outcome for Activity 7	☐ Satisfactory ☐ Not satisfactory
Trainer/Assessor comments	

CASE STUDIES

CASE STUDY 1

For each of the following clients, determine the level of risk in working with them and complete an appropriate referral letter to an Allied Health Professional:

- a) Jennifer: Aged 65. Has just started to complain of joint soreness and balance issues. She has been previously diagnosed with kyphosis.
- b) Frank: Has noticed lately that he is frequently short of breath and dizzy when walking up stairs. This has prompted him to join the gym.
- c) Steven: Has had trouble maintaining his weight. Plays football but has dropped weight rapidly since the end of his last season.
- d) Sally: An aspiring fitness model. Trains twice a day at your gym, but is looking for some guidance to help her become a professional. Frequently skips meals, as she is wary of putting on body fat.
- e) Virginia: A factory worker who undertakes a lot of manual handling in her role. She has joined the gym to improve her flexibility and core strength as she is often experiencing pain in her lower back during the work day.

	Level of risk
a)	Med-high risk Send to GP, physio, exercise physiologist
b)	High risk Send to GP
c)	Med-low risk Send to dietician, nutritionist, GP
d)	Med-low risk Send to dietician, nutritionist, GP
e)	Low Send to GP, Physiotherapist

Outcome for Case Study 1	☐ Satisfactory ☐ Not satisfactory
Trainer/Assessor comments	

PRACTICAL TASKS

You are required to have a suitable observer verify your ability to complete the following tasks. These tasks may be simulated or real.

TASKS	VERIFIED
A. Download and complete the form/s required by your local council to get permission to use public spaces for individual and group personal training. Note: You do not need to submit the forms to the council unless you actually want to conduct personal training in a public space.	☐
B. Download and complete the form/s required by your state government to be able to work with children. Note: You do not need to submit the forms to the government unless you actually intend to work with children.	☐
C. Using the Health Professional Resource File template, compile a contact list for the medical and Allied Health Professionals in the area where your client base is located.	☐
D. Work with five (5) clients including beginners, intermediate and advanced participants for both low and high impact. Commit at least two (2) hours to each client to complete the following: - Obtain documented informed consent - Submit a Par-Q, as required by Fitness Australia - Complete a referral letter to a medical or Allied Health Professional - In response to the advice from the medical or Allied Health Professional, plan, document, implement and evaluate their personal training plan to meet their specific needs and goals, considering – - Measurements for body composition, including weight, height, hip circumference, waist circumference, skin folds, bioelectrical impedance analysis, BMI - Results for anthropometric testing, postural assessment, functional movement (using flexometer, goniometer, plumb line, grid, plurimeter, tape measure) - Application of anthropometric standards – somatotypes, skin fold indices, BMI, waist hip ratios, health weight range charts - Conduct at least two (2) sessions to develop the client's skill, agility, proprioception, balance, coordination, reaction time and controlled power movements. The sessions must individually or cumulatively incorporate a variety of indoor and outdoor training environments, methods and equipment, including – - Gaining permission for use of public spaces, as required - Ensuring promotion of sustainability and environment and providing choices of resources to minimise environmental impact - Implementing of a range of training techniques of suitable duration, intensity and volume – ensuring activation of good muscle function of core abdominals, glutes, hamstrings, hip flexors, rotator cuff, chest and back muscles - Flexibility training – dynamic, static and proprioceptive neuromuscular facilitation - Resistance training – free weights, gym equipment, body weight resistance only - Cardiovascular training techniques – continuous, interval - Aerobic and anaerobic training methods	☐

○ Providing demonstration, explanation and instruction of exercises ○ Monitoring the client, using photographic technology and video analysis ▪ Observing the following movements – push, pull, squat, lunge, rotate, overhead press, overhead pull ▪ Looking for signs and symptoms of exercise intolerance ○ Using injury prevention strategies specific to client needs and program ○ Using appropriate and motivating instructional techniques to increase exercise adherence and positive health and fitness habits – goal setting, intrinsic and extrinsic motivation, establishment of habits, positive reinforcement ○ Implementing a proper recovery rate goal for the session ● Modify personal training plans for client, addressing at least three (3) of the following – ○ Technical requirements ○ Changing needs due to fitness adaptations ○ Changing goals ○ Client needs, objectives, likes and dislikes ○ Technical difficulty adjustment of exercises ● After delivering the exercise program, write a response letter to the medical or Allied Health Professional, providing ongoing clear and constructive feedback – including the following details: ○ Client health and fitness status ○ Program progress ○ Questions and concerns, if any ○ Client response to exercise ○ Client goals ● Write a reflection on your experiences with the client, noting – ○ Motivation levels for yourself and the client ○ Any difficulties ○ Any successes ○ One (1) modification you would make if you were to train the client again Throughout this task, demonstrate appropriate leadership and communication through – ● Professional personal presentation and appearance ● Sound and appropriate communication skills ● Appropriate storage and filing of all client information according to confidentiality policies and procedures ● Employing safe practices – including checking equipment and ensuring sufficient space for the sessions	
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Outcome for Practical Tasks	☐ Satisfactory ☐ Not satisfactory
Trainer/Assessor comments	