



香港城市大學

City University of Hong Kong

Innovating into the Future

Student Development Services (PE)

Physical Fitness Training

(updated on 26 May 2025)

What is Physical Fitness (PF)?

Physical fitness refers to:

- The ability of your body systems to work together efficiently (being efficient means doing daily activities with the least effort possible)
- To allow you to be healthy and perform activities of daily living

Summary of American College of Sports Medicine (ACSM) Position Stands



1. Exercise and Cardiovascular Health

Recommendations for aerobic and resistance training to improve cardiovascular health.

2. Physical Activity for Weight Management

Strategies for using exercise to support weight loss and maintenance.

3. Physical Activity and Mental Health

Impact of exercise on mood, anxiety, and depression. Physical activity is recommended to use as part of mental health treatment plan.

How much Physical Activity (PA) is recommended?

- According to World Health Organization (WHO), one third (31%) of the world's adult population, 1.8 billion adults, are physically inactive.
- Adults should do at **least 150–300 minutes** of moderate-intensity aerobic physical activity; or
- **At least 75–150 minutes** of vigorous intensity aerobic physical activity.

References:

1. Physical Activity [Internet]. World Health Organisation. [cited 2025 Mar 25]. Available from: <https://www.who.int/news-room/fact-sheets/detail/physical-activity>
2. PHYSICAL ACTIVITY, SEDENTARY BEHAVIOUR. WHO GUIDELINES ON [Internet]. World Health Organisation. [cited 2025 Mar 25]. Available from: <https://iris.who.int/bitstream/handle/10665/336656/9789240015128-eng.pdf?sequence=1>
3. Physical Activity Guidelines [Internet]. ACSM. American College of Sports Medicine; 2024 [cited 2025 Mar 25]. Available from: <https://acsm.org/education-resources/trending-topics-resources/physical-activity-guidelines/>
6. Change for Health: Physical Activity Guideline to Adults (aged 18-64 years) [Internet]. Department of Health, HKSAR. [cited 2025 Mar 27]. Available from: https://www.change4health.gov.hk/en/physical_activity/guidelines/adults/index.html

How much Physical Activity (PA) is recommended?

- An equivalent combination of moderate- and vigorous-intensity activity throughout the week.
- Adults should perform activities that maintain or increase muscular strength and endurance for a minimum of **two days per week**.

References:

2. PHYSICAL ACTIVITY, SEDENTARY BEHAVIOUR. WHO GUIDELINES ON [Internet]. World Health Organisation. [cited 2025 Mar 25]. Available from: <https://iris.who.int/bitstream/handle/10665/336656/9789240015128-eng.pdf?sequence=1>
3. Physical Activity Guidelines [Internet]. ACSM. American College of Sports Medicine; 2024 [cited 2025 Mar 25]. Available from: <https://acsm.org/education-resources/trending-topics-resources/physical-activity-guidelines/>
6. Change for Health: Physical Activity Guideline to Adults (aged 18-64 years) [Internet]. Department of Health, HKSAR. [cited 2025 Mar 27]. Available from: https://www.change4health.gov.hk/en/physical_activity/guidelines/adults/index.html

WHO Guidelines on Physical Activity and Sedentary Behaviour



WHO guidelines on physical activity and sedentary behaviour (2020).

For more information, visit: www.who.int/health-topics/physical-activity

ACSM/ Centers for Disease Control and Prevention (CDC) Recommendation



- All healthy Adults ages 18 to 65 need moderate-intensity aerobic exercise for at least 30 minutes 5 days/week.
- Or 20 minutes vigorous intensity aerobic exercise 3 days/week + at least 2 days/week of muscular/resistance training.

References:

3. Physical Activity Guidelines [Internet]. ACSM. American College of Sports Medicine; 2024 [cited 2025 Mar 25]. Available from: <https://acsm.org/education-resources/trending-topics-resources/physical-activity-guidelines/>

What we will cover

1. Proper Use of Equipment

- Cardio Exercise Training
- Weight Training

2. Stretching and Conditioning Exercise

3. Reminder on Access to Fitness Centre

- Proper sports attire
- DO NOT drop weight!

How to improve Physical Fitness

- Understand the concept of Fitness
- Emphasize all 4 components of fitness in your exercise program
- Use “FITT” exercise prescription guidelines to design your exercise program

Classification of Physical Fitness

| Health Related PF | Sports Related PF | |
|---|---|--------------|
| Aim : to maintain health, and prevention of chronic diseases | Aim : to enhance Sports/Skills Performance | |
| Components : | Components : | |
| 1.Cardiorespiratory fitness | Speed | Agility |
| 2a.Muscular strength | Balance | Power |
| 2b.Muscular endurance | Reaction time | Coordination |
| 3.Body composition | Health-related Physical Fitness Components | |
| 4.Flexibility | | |

References:

- American College of Sports Medicine. [cited 2025 Mar 27]. Available from: <https://acsm.org/wp-content/uploads/2025/01/acsm-complete-guide-fitness-health-sample-download.pdf>
- Farley JB, Barrett LM, Keogh JWL, Woods CT, Milne N. The relationship between physical fitness attributes and sports injury in female, team ball sport players: a systematic review. Sports Med Open [Internet]. 2020;6(1):45. Available from: <http://dx.doi.org/10.1186/s40798-020-00264-9>

The “FITT” Formula Exercise Prescription Guideline

The “FITT” Formula Guideline

F = Frequency (how often)

I = Intensity (how hard)

T = Type (what kind)

T = Time/ Duration (how long)

The F.I.T.T.

- Frequency: 2-5 Times/week
- Intensity: light, mild, moderate, high, vigorous (using heart rate)
- Types: Running, Cycling, Swimming, Rowing, Dancing...etc
- Time (Duration): ≥ 20 minutes

The “FITT” formula Exercise Prescription Guideline

I = Intensity

| | Maximum Heart Rate (MHR) & Target Heart Rate (THR) | Metabolic equivalents (METs) |
|--------------------------------|---|---|
| Cardio/ Aerobic exercise | <p>MHR: 220 minus age in years with standard deviation of +/-15 beats per minute (bpm)</p> <p>THR Zone: 50-80% of the MHR :</p> <p>Lower Limit : (220-Age) x 50 % = ___ bpm Upper Limit : (220-Age) x 80 % = ___ bpm E.g. Age 20: (220-20) x 50%-80%=100-160bpm</p> | <p>- 1 MET = Exercise intensity of resting stage (3.5ml/kg/min)</p> <p>- 3 to 6 METs : moderate intensity</p> <p>- > 6 METs : vigorous intensity</p> |

Rating of Perceived Exertion (RPE)

- It is to used “**Sense of difficulty**” to **guide your exertion level** during the exercise, you may adjust your own pace if you are feeling too far away from the estimated range. To improve the cardio-respiratory fitness, the most effective and safe intensity is ranging from 4 to 7.

| 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------|-----------------|-----------|------|----------|-----------------|--------|---|-------------|---|---|----------------|
| Nothing at all | Very, very weak | Very weak | Weak | Moderate | Somewhat strong | Strong | | Very strong | | | Maximum Effort |

References:

7. Mahaffey K. The rate of perceived exertion (RPE) scale explained [Internet]. National Academy of Sports Medicine. [cited 2025 Apr 23]. Available from: <https://blog.nasm.org/rate-of-perceived-exertion>

Training Zone of Your Maximum Heart Rate

- 50-60% of MHR: good for *beginners*; improve overall health **(100-120bpm)**
- 60-70% of MHR: Improve heart ability; oxygen metabolism; endurance; *burning more fat* and *kcal* **(120-140bpm)**
- 70-80% of MHR: Exercise for fitness zone; the fastest pace you can maintain for long period of time; *Benefits of Zone 2*; Using *more total kcal* during and after the exercise **(140-160bpm)**
- 80-100% of MHR: Performance Enhancement Zone (Hard Training for Athletes) **(160bpm or higher)**

Principles of Fitness Training for Maximum Training Effect

| | |
|--|--|
| 1. Appropriate Progressive overload | <p>Weight Training:</p> <ol style="list-style-type: none"> 1. Weight +/- 2. Tempo/ Rhythm 2-2-2/ 2-1-2/ 1-1-1 3. Set/ Reps +/- <p>Cardio Training:</p> <ol style="list-style-type: none"> 1. Speed 2. Incline 3. RPM 4. Frequency |
| 2. Specificity | <p>Goal? What is your goal?</p> <ul style="list-style-type: none"> • Cardio Pulmonary (walking up the stairs without short of breath) • Conditioning (Muscle balance and strength) |
| 3. Full Range of Motion | <ul style="list-style-type: none"> • Improve efficiency • Fully strengthen the muscles |
| 4. Breathing Rhythm | <ol style="list-style-type: none"> 1. Inhale while lowering weight; 2. Exhale while lifting weight; 3. Don't hold your breath during weight-lifting. |
| 5. Balance Musculature | <ul style="list-style-type: none"> • Muscle groups of flexion and extension in the specific part are suggested to be trained equally. |
| 6. Reversibility | <ul style="list-style-type: none"> • Training should be continuous, otherwise detraining occurs |

What is Repetition Maximum (RM)

Repetition Maximum refers to:

- the maximum weight a person can lift in a given rep range for a specified exercise.
- 1 repetition maximum (1RM) is the heaviest you can lift for only 1 repetition with correct technique.

Determination of RM

| Training Goal | Relative Loading | Repetition Range | No. of Sets | Rest between Sets |
|----------------------|---------------------------|------------------|-------------|-------------------|
| Muscular Endurance | Light (50-60% of 1 RM) | 12-20 RM | 2-3 | 15-30s |
| General Conditioning | Moderate (60-70% of 1 RM) | 8-12 RM | 2-3 | 30-90s |

The Three Phases of Exercises

| | Purpose | Types of activities | Intensity |
|---------------------------|--|--|--|
| Warm up Phase | <ul style="list-style-type: none"> • activate body's responses • increase flexibility and prevent injury | <ul style="list-style-type: none"> • Stretching • Jogging/ Fast Walking | <ul style="list-style-type: none"> • Heart rate: 110-120bpm |
| Conditioning Phase | <ul style="list-style-type: none"> • Fitness maintenance/ enhancement | <ul style="list-style-type: none"> • Muscular fitness - weight training • Cardio-respiratory fitness training—running; cycling; rowing.etc | <ul style="list-style-type: none"> • Heart rate: rise above 120bpm and within your target heart rate zone |
| Cool down Phase | <ul style="list-style-type: none"> • allow body to cool down • resume resting state & improve recovery time • To aid in the removal of metabolic wastes | <ul style="list-style-type: none"> • same activity in conditioning phrase with lower intensity • static stretching | <ul style="list-style-type: none"> • Heart rate: below 120bpm |

Circuit Training

- Employs a series of exercise stations that consist of various combinations of weight training, flexibility, calisthenics and brief aerobic exercises.
- Effective way for improving strength and flexibility. If the pace or the time interval between stations is rapid and if workload is maintained at a high level of intensity, the cardiorespiratory system will certainly be benefited from the circuit.
- The series of resistance training exercise are performed one after the other with minimal rest (15 - 30 seconds) between exercise.
- Approximately 10 to 15 repetitions of each exercise per circuit at a resistance of 40% to 60% of a 1RM.

Safety Guidelines for Using Free-weights

- Secure collars of both ends of the bar before exercising.
- Beginners are strongly advised to use light weights to master all techniques.
- To work in pairs, (with partner spotting) when lifting heavy weights.
- Do not drop the weights to the floor after lifting.
- All equipment must be returned to their appropriate places after use.

Practicum: The Proper Use of the Resistance Training Equipment

Read the Instruction before start

Safety Check (3 steps)

- 1) Inspect pulley, cables and adjustment pins are in good condition
- 2) Choose the weight that can comfortably handled
- 3) Check if the adjustment pins are properly inserted

• Athletes) (160bpm or higher)

Practicum

Proper Posture and Movement

- The *Tempo*: (The Speed of Movement) :
2-2-2; 2-1-2; 1-1-1 (second)
- *Neutral* Posture (3 points)
- *Inhale* and *Exhale*
- *Don't* hold the breath
- Athletes) (160bpm or higher)

Practicum

1. The Proper Use of the Aerobic Equipment

1.1 Treadmill

1.2 Bike

1.3 Elliptical Trainer / Cross Trainer

1.4 Rowing Machines

2. The Proper Use of the Resistance Training Machine

Stretching *warm up and cool down* Exercise

Lower Extremities

- Calf
- Thigh (Hamstring; Quadriceps)
- Hips (Gluteus; Piriformis; IT Band)
- Lumbo-Pelvic Hip Complex stretch

Upper Extremities

- Pectoralis
- Biceps and Triceps
- Abdominals
- Back (Deltoid, Latissimus Dorsi)
- Neck (Scalene)

What we have covered

- What is Physical Fitness
- WHO PA recommendation
- Proper Use of Fitness Equipment
- F.I.T.T.
- Heart Rate Training Zone
- Principles of Fitness Training for Maximum Training Effect
- Repetition Maximum (RM)
- Three Phases of Exercises
- Circuit Training
- Safety Measures
- Practicum
- Stretching and Conditioning exercise

References



1. Physical Activity [Internet]. World Health Organisation. [cited 2025 Mar 25]. Available from: <https://www.who.int/news-room/fact-sheets/detail/physical-activity>
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3. Physical Activity Guidelines [Internet]. ACSM. American College of Sports Medicine; 2024 [cited 2025 Mar 25]. Available from: <https://acsm.org/education-resources/trending-topics-resources/physical-activity-guidelines/>
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8. Repetition Maximum Guide (what is a rep max & how to use it) [Internet]. Kalibre Fitness. 2021. Available from: <https://kalibrefitness.com/repetition-maximum-guide/>
9. CORBIN C, LE MASURIER G. What Is Physical Fitness? [Internet]. Human Kinetics. 2022. Available from: <https://us.humankinetics.com/blogs/excerpt/what-is-physical-fitness>