Exercise walk-through

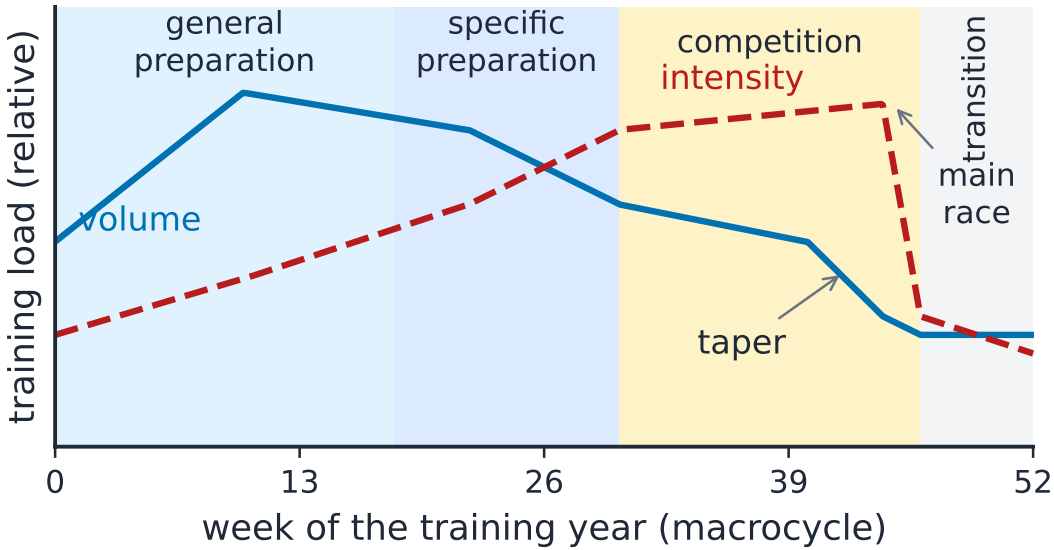
3.2 Training principles and adaptations

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Principles of training

Principle	Meaning
Specificity	Adaptations match the training
Progressive overload	Load rises gradually
Reversibility	Unused fitness is lost
Individual differences	People respond differently

A periodised year



> Plan load around aims and monitor the response.

Endurance or resistance adaptations

endurance (aerobic) training

more and larger mitochondria
more myoglobin
more capillaries
greater fat use at a given load

resistance and sprint training

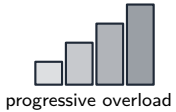
fibre hypertrophy, mainly type II
more PCr and glycolytic capacity
greater strength and power
neural recruitment improves

the stimulus decides the adaptation (specificity)

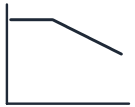
> Adaptations match the training

Exercises 2.1·2.2

2.1 Define progressive overload and reversibility. [2]



progressive overload



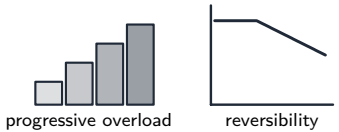
reversibility

2.2 An 18-year-old has a resting heart rate of 60 beats min^{-1}. Use the Karvonen method to calculate her training heart rate at 70% intensity. [3]



Exercises 2.1·2.2

2.1 Define progressive overload and reversibility. [2]



2.1

progressive overload: gradually increasing the training load so the body keeps adapting; reversibility: fitness gains are lost when training stops or is reduced

2.2 An 18-year-old has a resting heart rate of 60 beats min^{-1}. Use the Karvonen method to calculate her training heart rate at 70% intensity. [3]



2.2

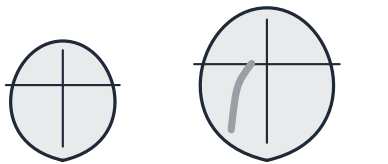
$\text{HR}_{\text{max}} = 220 - 18 = 202$; $(202 - 60) \times 0.70 + 60 \approx \mathbf{159}$ beats min^{-1}

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Exercise 3.1 (a)

3.1 After six months of endurance training, a runner's resting heart rate falls from 72 to 58 beats min^{-1}.

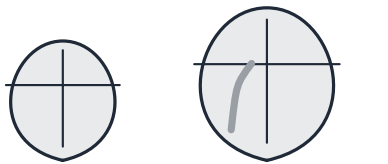
(a) Explain why resting heart rate falls. [2]



Exercise 3.1 (a)

3.1 After six months of endurance training, a runner's resting heart rate falls from 72 to 58 beats min^{-1}.

(a) Explain why resting heart rate falls. [2]



(a) the heart muscle (left ventricle) gets larger and stronger, so stroke volume rises; the same resting cardiac output is reached with fewer beats

Exercise 3.1 (b)

3.1 After six months of endurance training, a runner's resting heart rate falls from 72 to 58 beats min^{-1}.

(b) State **two** other adaptations to endurance training. [2]

Exercise 3.1 (b)

3.1 After six months of endurance training, a runner's resting heart rate falls from 72 to 58 beats min^{-1}.

(b) State **two** other adaptations to endurance training. [2]

(b) any two: more capillaries; more mitochondria; more myoglobin; higher $\dot{V}\text{O}_2\text{max}$; higher lactate threshold; more blood plasma and haemoglobin

Exercise 3.2 (a)

3.2 The diagram shows a swimmer's training year.

(a) Outline the purpose of a taper. [2]

Exercise 3.2 (a)

3.2 The diagram shows a swimmer's training year.

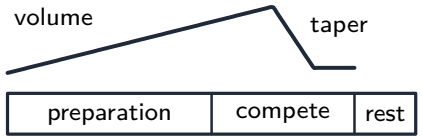
(a) Outline the purpose of a taper. [2]

(a) training volume is reduced before a main competition while intensity is kept; so the body recovers fully and performance peaks on the day

Exercise 3.2 (b)

3.2 The diagram shows a swimmer's training year.

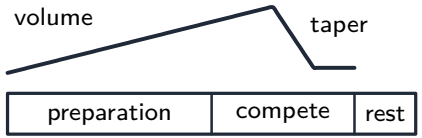
(b) Explain how periodization helps to avoid overtraining. [3]



Exercise 3.2 (b)

3.2 The diagram shows a swimmer's training year.

(b) Explain how periodization helps to avoid overtraining. [3]



(b) it plans hard and easy periods, so load rises gradually; recovery weeks and a transition phase allow adaptation (supercompensation); load can be monitored and adjusted, so fatigue does not build up over many weeks