

Table 4.3: Growth and development during adolescence

Aspects of Growth Spurt	Girls	Boys
Age	Approximately 10–12 years	Approximately 12–14 years
Bone growth	<ul style="list-style-type: none"> • Height increases by about 6–8cms per year • Broad pelvis and hips • Arm and leg length increases • Limbs remain slender • Leg length shorter and trunk length longer than opposite sex 	<ul style="list-style-type: none"> • Height increases by about 7–9cms per year • Narrow pelvis and hips • Broad shoulders • Leg length longer and trunk length shorter than opposite sex
Percentage of body fat	Increases from approximately 17% (aged 8 years) to 24–26% (aged 17 years)	Decreases from approximately 16% (aged 8 years) to approximately 12–15% (aged 17 years)
Percentage of muscle mass	Increases from about 40% to 45% of body mass (5–13 years) and decreases to 35–38% of body mass after puberty	Increases from about 42% to 54% of body mass between ages of 5–17 years
Arm-muscle width	Approximately half the magnitude of boys'	Approximately twice the magnitude of girls'
Strength development	Increases linearly with chronological age until approximately 15 years with no clear evidence of an adolescent growth spurt	Increases linearly with chronological age until approximately 13 or 14 years when there is a marked increase through the adolescent growth spurt
Peak strength reached	During the adolescent growth spurt	A year after the adolescent growth spurt
Flexibility	Greater than boys. The difference is greatest during the adolescent growth spurt and sexual maturation	Less than girls. The difference is greatest during the adolescent growth spurt
Development of peak VO ₂ max	Increases with chronological age and reaches its highest level between 10–12 years after which there is a progressive decline with age	Remains consistent throughout childhood and increases dramatically at puberty
Blood composition	Lower levels of muscle glycogen, muscle enzymes and blood lactate than adults	Lower levels of muscle glycogen, muscle enzymes and blood lactate than adults



Learning Activity 8 – Cardiovascular Exercise (*planning a personal programme*)

Learning objectives/intentions

Pupils are learning to plan a CV exercise programme for a specific purpose.

Success criteria

Pupils can:

- decide what they would like to achieve from being more physically active
- explain FITT recommendations for achieving health benefits of CV exercise
- monitor and evaluate their current participation in CV exercise.

Task 1

Practical: CV exercise planning game

The teacher explains:

This game provides a reminder of Learning Activities 4–7 and the achievable benefits of regular participation in appropriate CV exercise, and gives details of how these can be achieved. The information will help you plan a specific personal CV exercise programme.

The game is a relay race. Pupils are divided into teams of equal size (eg three or four). Each team places a mat at one end of the working space and lines up at the other end. A stack of CV planning cards is placed on each mat (Circuit Card 108 cut into 17 pieces). Members of each team take turns to run to the mat and collect one planning card. When the team has collected all 17 cards, pupils organise them into a logical pattern.

The solution to the CV exercise planning game is as follows (Circuit Card 109):

What Do I Want to Achieve?	How Can I Achieve It?	
To develop CV fitness for health	Frequency	Every day
	Intensity	At least moderate
	Time	At least 60 minutes
	Type	Playing games/sports, dancing, swimming, brisk walking, skateboarding, aerobics, circuits
To achieve energy balance	Frequency	As often as possible
	Intensity	Light to moderate
	Time	Long duration
	Type	Steady-paced sustainable activity (eg walking, cycling, swimming, exercising to music, jogging)
To shift difficult feelings/emotions	Frequency	Whenever you need to shift difficult feelings/emotions
	Intensity	Light/moderate or vigorous – depending on what you want to achieve
	Time	As long as it takes for you to feel better
	Type	Activities appropriate for shifting specific difficult feelings and emotions (eg yoga might shift stress, dancing depression and playing sport aggression)

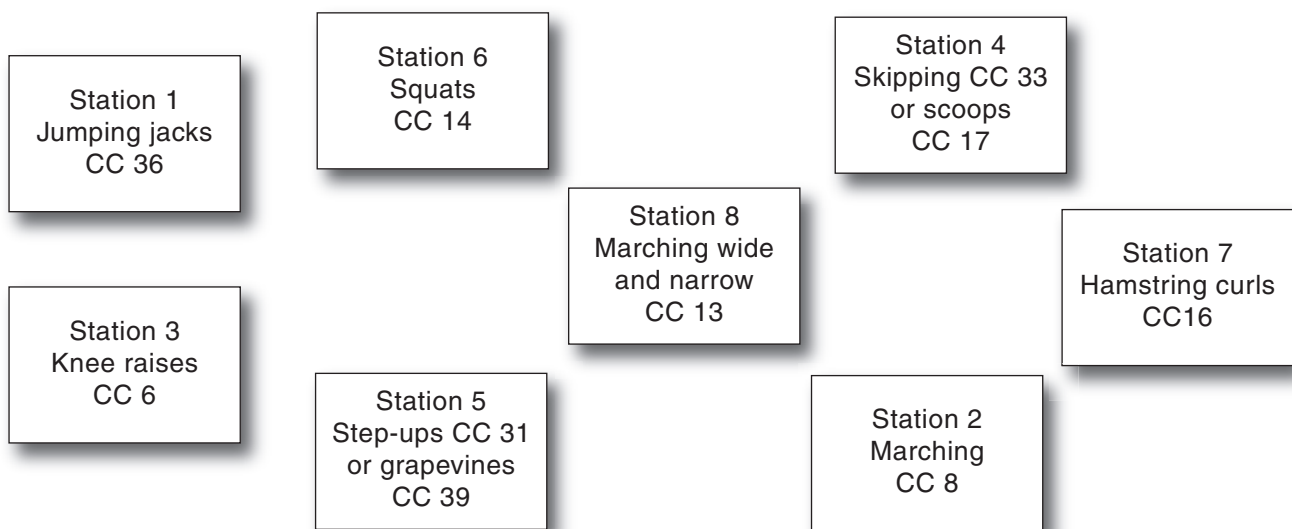
Task 2

Practical: 60 minutes-a-day circuit

The teacher explains:

This task will explore in more detail FITT recommendations for developing CV fitness for health.

An eight-station circuit is set up as shown. Stations are placed randomly in the room. At each station there is one circuit card illustrating the exercise to be performed and an activity card (Circuit Cards 110–117).



Pupils are allocated different stations to start the circuit. They perform exercises at each station for 45–60 seconds or until the teacher stops the music. Pupils are asked to perform each exercise so it feels *moderate* intensity.

They read the activity card at each station and brisk walk or jog anywhere in the space until the teacher tells them to go to the next station.

This process is repeated until pupils have visited all eight stations.

Activity Cards – for templates see Circuits Cards 110–117

Activity Card Station 1 Skateboarding 10 minutes Score 10 points	Activity Card Station 2 Watch DVD 90 minutes Score 0 points	Activity Card Station 3 Dance mat – three favourite tracks 10 minutes Score 10 points	Activity Card Station 4 Cycle to local shop 10 minutes Score 10 points
Activity Card Station 5 Walk to school 15 minutes Score 15 points	Activity Card Station 6 Play computer game 45 minutes Score 0 points	Activity Card Station 7 Play football at break time 15 minutes Score 15 points	Activity Card Station 8 Text on mobile 30 minutes Score 0 points

Aerobics

CV exercise programme – staying committed

Pupil Task Sheet 10a

Sensible progression – mini CV workout

What to do:

- Perform the sequence below for two minutes.
- Keep the activities continuous.
- Decide on your own transitions between exercises.
- Monitor how the exercise feels (Circuit Card 101).
- Decide one way of changing the sequence to make it more intense for the CV system.
- Try out your new sequence and monitor how the exercise feels (Circuit Card 101).
- Answer the questions.

Exercises	Card	Teaching Points
Alternate knee raises (low impact, hands on hips)	6	<ul style="list-style-type: none"> • Supporting knee slightly bent • Hips level and facing forwards • Stand tall with tummy pulled in
March four steps forwards and four backwards (small steps and arm movements)	8	<ul style="list-style-type: none"> • Avoid stamping • Lift knees up high • Stand tall with tummy pulled in
Alternate hamstring curls (low impact, hands on hips)	16	<ul style="list-style-type: none"> • Stand tall with tummy pulled in • Supporting knee slightly bent • Hips level and facing forwards throughout
Grapevines (small steps, hands on hips)	39	<ul style="list-style-type: none"> • Hips and knees facing forwards throughout • Look straight ahead • Stand tall with tummy pulled in

Questions

1. What does progression of an exercise programme mean?
2. Describe how progression was achieved.
3. Can you think of other ways of progressing a CV workout?
4. What might happen if a person progressed two or more elements of their sequence every time they exercised (eg if they increased time and intensity)?
5. Why is it important to progress a personal exercise programme?
6. What advice would you give about progression and staying committed to a CV exercise programme?