



2016 specification
first exams in 2017

Activity Pack for BTEC Nationals in Sport

Unit 5: Application of Fitness Testing

For Pearson BTEC Level 3 National:
Extended Certificate in Sport (601/7218/6)
Foundation Diploma in Sport (601/7220/4)
National Diploma in Sport (603/0460/1)
National Extended Diploma in Sport (603/0459/5)
National Diploma in Fitness Services (601/7215/0)

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Teacher's Introduction

This pack provides activities, which can be used to test and aid the learning of information that is delivered in Unit 5: Application of Fitness Testing of BTEC Nationals (Level 3) in Sport.

The resource follows the specification in the order provided. The activity cross-reference table provided at the beginning of the resource is a useful tool for locating the learning aims that are covered in each activity and identifying the type of activity that is used.

A range of activities is used in this pack, which are designed to be completed individually, in pairs and in large groups / class groups as well as activities which are designed to be completed during practical classes. The type of activity can be identified by the icon in the top right-hand corner of each activity:



= individual activity



= pairs activity



= group activity

Note that some activities are suitable for varying numbers of participants. This information can be found in the activity cross-reference table.

These activities are designed to be completed by the students with little input from the teacher required. However, where relevant, teacher's notes have been provided in order to aid the delivery of the activity.

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* resulting from minor specification changes, suggestions from teachers and peer reviews, or occasional errors reported by customers

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Specification Reference

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Activity No.	Specification Reference		Title
1	A1	Validity of fitness tests	Testing Athletes
2	A2	Reliability of fitness tests	How Reliable?
3	A3	Practicality and suitability of fitness tests	Team Research
4	A4	Ethical issues associated with fitness screening	Ethics
5	B1	Fitness tests: flexibility	Snap That
6	B1	Fitness tests: strength	How Strong?
7	B1	Fitness tests: aerobic endurance	The Five Tests (Aerobic Endurance Testing)
8	B1	Fitness tests: speed	Are You the Next Bolt?
9	B1	Fitness tests: muscular endurance	How Long is 60 Seconds?
10	B1	Fitness tests: body composition	Group Debate
11	B2	Skill-related fitness: agility	How Agile Are You?
12	B2	Skill-related fitness: balance	New and Improved
13	B2	Skill-related fitness: coordination	Importance of Procedures
14	B2	Skill-related fitness: power	Match up
15	B2	Skill-related fitness: reaction time	Dragon's Den
16	B1 and B2	Exploring fitness tests for different components of fitness	What Would You Choose?
17	A3, B1, B2	Exploring fitness tests for different components of fitness	How Practical?
18	B3	Planning of tests	Reminder
19	B4	Administration of tests	Thirty Seconds
20	C1	Produce a fitness programme	What's Your Status?
21	C2	Providing feedback	You've Got Mail!

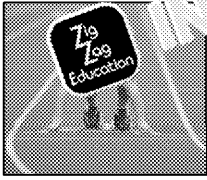



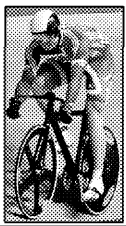
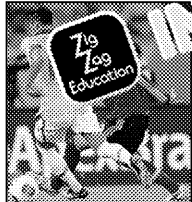
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Activity 1 — Testing Athletes

In pairs, fill out the following worksheet. First, explain what validity is and then for each athlete state one fitness test that is most valid for testing and improving the most important physical quality for their sport.

Validity is:

Performer	Sport	Justification
Sprinter 		
Weightlifter 		
Marathon runner 		
Goalkeeper 		
Sprint cyclist 		
Footballer 		

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Activity 2 — How Reliable?

As well as validity, it is important to consider reliability for all types of tests.

Outline what reliability is and then complete the table below; highlighting the potential ways reliability of fitness testing can be compromised. Highlight how each factor can affect reliability of a fitness test, and then state how this can be overcome to improve reliability.

Reliability is:

.....

Possible compromise	How this can affect reliability	
Time of the day		
Skill of the tester		
Equipment used for timing/measuring		
Athlete's experience of testing		
The sport the athlete does		
Existing injury/injuries		
Having people spectate at the test		
Quality of equipment being used for the testing		
The athlete not warming up prior to being tested		
The athlete being tired		
The athlete's technique during the test		

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Activity 3 – Team Research

Some fitness tests may seem like a good idea, but are they practical for your situation? Are the fitness tests conducted with elite sportsmen and women being different compared to the general population. Additionally, tests may not always be suitable. You need to consider the location and the fitness levels, to make sure you select the most suitable test.

Working with a partner, you are going to research the practicality and suitability of a fitness test by filling in the rest of this worksheet.

- i) The fitness test we have chosen is the _____ test
- ii) The sport we have chosen to apply this fitness test to is _____
- iii) There is one athlete / more than one athlete to test and they are novice

Test practicality:

Time taken to conduct the test		
Equipment required for the test (and why this is practical for your chosen scenario)	Equipment:	Practical because:
Facility required to conduct the test		
Cost of the test (calculate everything required for the test, how much is it in a hall, how much to pay staff?)	Total equipment cost	
	Facility hire cost	
	Staff cost	
	Other costs	

Test suitability:

Is this test suitable for your chosen sport? (what key components of fitness are required for your sport?)	
Is this test suitable for the performer? (what position do they play? Are there any limitations?)	
Is this test suitable for the performer's fitness levels?	

Evaluation Statement: I believe that the _____ test IS / IS NOT practical

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Activity 4 – Ethics

Before conducting a test involving participants, you may need to get ethical clearance. Part of the ethics involves writing to potential participants, with the aim of obtaining their participation. You are going to work in pairs and create your **informed consent** form for your 'ethics committee'.

Consider the following:

- an **explanation** of ethical clearance
- an **explanation** of the test / what you will require your participant to do – include their **welfare** (i.e. warm-ups, exercise beforehand, hydration, warm-ups)
- **selection criteria** for the participant
- an explanation that even after signing this form, they have the **right to withdraw** without having to provide a reason.
- **answers** to questions that they may have
- how their **data** will be recorded, used and stored (including confidentiality)
- finally, a section for their **written consent**, signed and dated.

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Informed Consent form

Explanation of ethical clearance goes here...

Fitness tests to be undertaken	Requirements/preparation
	

Further wording regarding data protection and ensuring welfare of participant to go here

Include information/wording for participant to sign and date...



Include information/wording for physician/tester to sign and date...



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Activity 5 — Snap That (Flexibility Testing)

Your friend wants to know about the different types of flexibility tests available. Send them the protocol of each test below. Aim to include the type of equipment required for the test and the uses for each test. Also, consider one athlete this test would best suit. Once done, consider the positives and limitations of each test.

Sit and reach test

Unit of measurement:

Performer most suited to:

Positives

Limitations

Positives

Limitations

Calf muscle flexibility test

Unit of measurement:

Performer most suited to:

Positives

Limitations

Positives

Limitations

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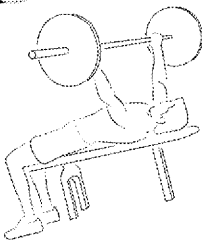


Activity 6 — How Strong? (Strength Testing)

Strength is a component of fitness, defined as the ability of a muscle or a group of muscles to overcome the presented resistance.

There are three fitness tests used to assess strength. Fill in each card below, explain the test, then assess the advantages and disadvantages of each test.

1 REP MAX



Advantages:

Disadvantages:

GRIP DYNAMOMETER

Advantages:


Disadvantages:

SEVEN-STAGE ABDOMINAL STRENGTH TEST

Advantages:

Disadvantages:

No feet should be flat on the ground.



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Activity 7 — The Five Tests (Aerobic Endurance Testing)

Aerobic endurance is a component of fitness, defined as the capability of the cardiorespiratory system to supply oxygen to the muscles. There are five tests that can be conducted to measure a person's aerobic endurance. Fill out the worksheet.

Rockport walk test	Harvard step test	Multistage fitness test
<p>How? (Procedures)</p>	<p>How? (Procedures)</p>	<p>How? (Procedures)</p>
<p>Who? (Suitability)</p>	<p>Who? (Suitability)</p>	<p>Who? (Suitability)</p>
<p>Equipment?</p>	<p>Equipment?</p>	<p>Equipment?</p>
<p>Drawbacks?</p>	<p>Drawbacks?</p>	<p>Drawbacks?</p>

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Activity 8 — Are You the Next Bolt? (Speed Testing)

Students are going to sprint each distance indicated below:

- 20 m
- 30 m
- 40 m
- 50 m
- 60 m

They will have three attempts at each distance; their quickest speed per distance where they will find their best times.

Notes:

- Ensure the distances are correctly marked out; you can use cones to indicate.
- Ensure that all participants have completed a warm-up, including appropriate stretching.
- Class should get into pairs; one is going to time how long it takes their partner to complete each distance. Then, they will switch (this can be included as recovery time for the other runs).
- Multiple students can run each distance, as long as it is not too crowded and timing to spot their partner.
- In between each attempt and distance, there should be a period of adequate rest where students can catch their breath, stretch and drink some water.

When each student has run each distance, collect all data (each person's best time) and write each time on a whiteboard so that it is visible for all students to see. They will then work out the averages, such as the mean, median, mode and range. If this is not possible, time available, ask the class to write down each member's best time per distance as a homework task.

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Activity 8 — Are You the Next Bolt? (Speed Testing)

Speed is a component of fitness, which can be tested by conducting sprint tests, where the participant sprints over distances of 20 metres, 30 metres, 40 metres, 50 metres and 60 metres. For this exercise, you are all going to be the participant.

You are going to sprint each distance indicated below, of which you will have three attempts at each distance. Your quickest speed per distance will be used for class (see below).

Ensure the following:

- You have warmed up and stretched appropriately for at least 10 minutes.
- The distances have been correctly marked.
- You have a partner, who is going to record your time and you will record their time.
- You have a stopwatch (test that it works).
- You have a pen to record your results.
- You have adequate rest time in between each attempt.
- If you feel you cannot continue, please do stop.

Speed can be defined as:

Speed is important for sports and events including:

My data collection:

Name:	20 m time	30 m time	40 m time	50 m time	60 m time
1st attempt					
2nd attempt					
3rd attempt					

Now that you have collected your data, along with the rest of the class, write down (on a board if possible) for each of the distances, so that you can use the data to calculate class averages. If there is a lack of time, you may do this as a homework task.

Class averages:

Distance	Mean	Median	Mode	Range
20 m				
30 m				
40 m				
50 m				
60 m				

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Activity 9 — How Long is 60 Seconds? (Muscular Endurance)

Working in pairs, students are going to take part in each muscular endurance test:

- one-minute press-up test
- one-minute sit-up test
- wall-sit test

Notes:

- Ensure that all participants have completed a warm-up, for at least 10 minutes
- Class should get into pairs. One is going to time, the other is going to participate
- There should be clearly marked areas for each test, with the right equipment, i.e. mats
- There should be a period of adequate rest, where students can catch their breath and drink water.

After all students have completed each test, they are going to identify limitations they have, take part in, and then they are going to design their own. This is an opportunity to

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Activity 9 – How Long Is 60 Seconds? (Muscular Endurance)

Muscular endurance is a component of fitness, tested by three methods: the **one-minute sit-up test** and the **wall-sit test**. For this exercise, you are all going to be

Working in pairs, you are going to take part in each muscular endurance test; make a test to ensure the tests are reliable.

The one-minute press-up test:

Brief procedure of fitness test	Suitable for	My
		


The one-minute sit-up test:

Brief procedure of fitness test	Suitable for	My

The wall-sit test:

Brief procedure of fitness test	Suitable for	My

As with all research tests, there are limitations. Identify any limitations of each

Test	The limitations that I identified
One-minute press-up 	
One-minute sit-up test	
Wall-sit test	

To overcome your identified limitations, design a new muscular endurance test based on



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Activity 10 – Group Debate

Split the class into groups of four; each group is going to be given a fitness test for

Body composition fitness tests:

- skinfold calipers
- bioelectrical impedance analysis
- body mass index (BMI)
- girth measurements

Each group is going to research their test and come up with an argument as to why measuring body composition. One at a time, each group is going to debate with the rest of the class. The best test is the best.

At the end, the class is to decide which method is best for assessing body composition. They are to give their answers based on the evidence provided.

During the debate, allow time for students to present their case, before opening it up to discussion (particularly the limitations other students may identify). Give students 5–10 minutes for each test. Approximately 30 minutes to research and note down their points on the worksheet.

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Activity 10 — Group Debate (Body Composition)



You are going to be split into four groups; each group is going to be given a test for

Body composition fitness tests:

- skinfold calipers
- bioelectrical impedance analysis
- body mass index (BMI)
- girth measurements

Each group is going to research their test and come up with an argument as to why measuring body composition. One at a time, each group is going to debate with the space below. Write the notes of your research. You may also want to research other competing with. You may also use this space to write key facts that you would like to use in your argument. Additionally, you may wish to discuss the purpose of measuring body composition. To decide which test is best, so ensure that you have a well-prepared debate!

Notes:

<p>Research on my given body composition test</p>  <p>INSPECTION COPY</p>	<p>Other body composition tests</p>
<p>Key facts to highlight</p>  <p>INSPECTION COPY</p>	<p>Reasons for measuring body composition</p>

When listening to other groups' presentations, consider the limitations of their test and the time to ask questions and present your limitations to the presenting group at the

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Activity 11 – How Agile are You? (Agility Testing)

In groups (three or four), students are each going to lay out and complete the three tests (each test is explained on their worksheet). Therefore, they will need to be in each group with the necessary equipment required, such as cones, stopwatches, PE kit.

Do ensure the following:

- Ensure that everyone has warmed up (at least 10 minutes).
- Ensure that everyone has a turn at each test.
- Ensure that everyone has a 5 minute rest in between each activity to improve recovery.

Outline of Test



Illinois agility run test:

1. The participant starts by lying on their front with their hands by their sides.
2. On the 'GO', or blow of a whistle from the assistant/timer, they get up as quickly as possible and touch the top cone.
3. The participant then completes the course as quickly as possible without knocking any cones over past the finish line.

T-test:

1. As quickly as possible, on the 'GO' command, the athlete runs from cone A to cone B (touching the cone with their right hand).
2. The athlete then sidesteps to touch cone C and touches the bottom of the cone with their left hand.
3. The athlete then sidesteps to touch cone D (past Cone B) and touches the bottom of the cone with their right hand.
4. They then sidestep back to cone B and then run back towards to cone A, where they touch the cone with their left hand.

Sidestep test:

1. The athlete starts at the centre line and jumps 30 cm to one side to touch a cone.
2. The athlete jumps back to the centre and jumps 30 cm to the other side and touches a cone.
3. The athlete completes as many cycles in one minute as they can.



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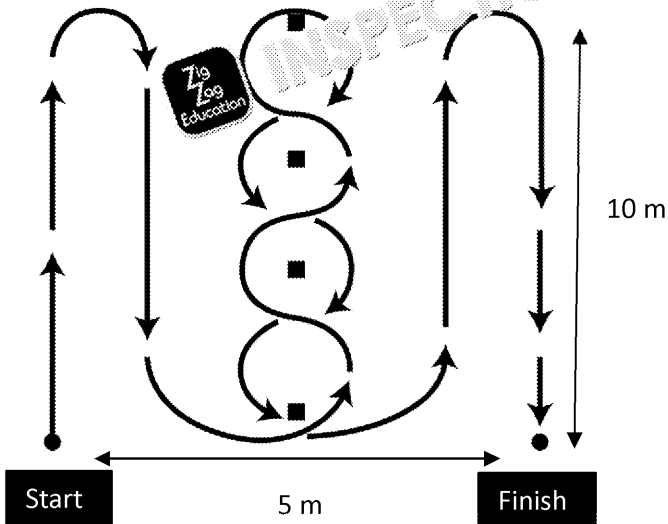


Activity 11 –How Agile are You?

In groups, you are each going to lay out and complete the three tests that measure the ability to change direction at speed.

Use this worksheet to help guide you in how to set up each test and to record your results between each test. Decide in your group how each test may be suited to different

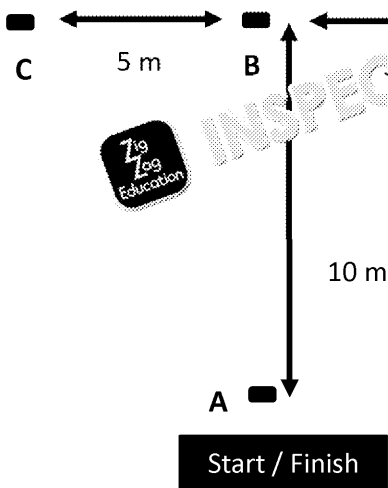
Illinois agility run test:



My

Notes

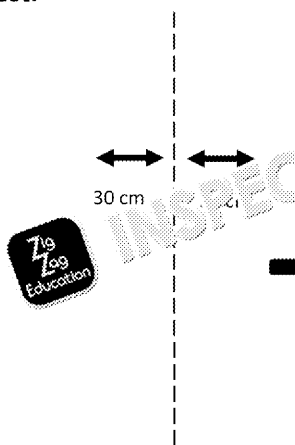
T-test:



My

Notes

Sidestep test:



My

Notes

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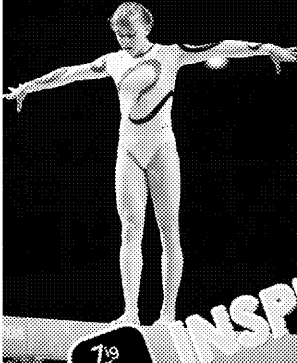
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Activity 12 — Balance: New and Improved

Balance is a component of fitness, defined as the ability to maintain stability while standing. Therefore, balance can be either dynamic (while moving), or static (stationary). The **stork stand test** and the **beam walk test**.

For each test, explain its procedure and identify any limitations.

Stork balance test	Procedure and limitations
	
Beam walk test	Procedure and limitations
	

To overcome the limitations of the two balance tests, create your own balance test that includes another component of fitness, such as **balance with speed** or **balance with agility** for sports.

<p>Illustrate your test:</p> 	<p>Describe and explain your test:</p>
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Activity 13 – The Importance of Procedures (Coordination)

Students are to get into pairs; they are going to conduct the wall-toss test.

Then, they are going to experiment and add or remove different factors of the test following a set procedure.

Ensure the following:

- Students have warmed up (for at least 10 minutes).
- Students will need a ball and an area of space not to disturb other pairs.
- Share ideas on how the tester can change a different factor for their test.
- Discuss the importance of following a test's procedure on results, including variables.

Correct wall-toss test procedure:

1. The athlete stands 2 metres from the wall.
2. The athlete throws the ball from one hand (e.g. left) to the wall (underarm).
3. The athlete catches the ball with the opposite hand (e.g. right).
4. The athlete re-throws the ball using the catching hand (e.g. right).
5. The athlete catches the ball with the opposite hand (e.g. left).
6. The athlete completes as many throws as they can in 30 seconds.

Factors that could be changed within this activity (accept any others):

- The size of the ball could be changed.
- The shape of the ball could be changed.
- The distance between the athlete and the wall could be changed.
- The tester may try to be distracting.
- The athlete may try to catch and throw the wall-toss with the same hand.

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Activity 13 — The Importance of Procedures (Coordination)

It is important that procedures are followed within fitness tests, to improve validity. To prove this, you are going to work in pairs and change an array of different factors or disprove the importance of procedures.

First, complete the wall-toss test following the standard procedure and record your results.

The standard procedure for the wall-toss test is:



My wall toss test result

Next, in your pairs, complete the wall-toss test but change one **factor per test** and record your results. For instance, you may wish to do this test with a different ball. You may change the distance to the wall, you may have your tester try and put you of the ball. You may wish to try with a different wall.

The factor that we changed	and it was...	My score

Explain what you noticed when you changed or added a factor in the procedure and record your findings.




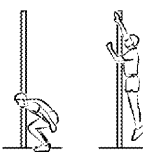

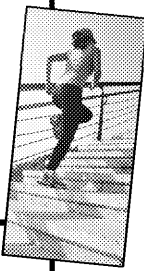



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Activity 14 — Power: Match Up

In pairs, outline the key differences between each fitness test that measures power with the athlete(s) to whom you think each test is most suited and give reasons for your choices.

<p>Vertical jump test</p> <p>Description:</p>  <p>Justification:</p> 	<p>Basketball player</p> <p>Triathlete</p> <p>Baseball player</p>
<p>Margaria-Kalamen power test</p> <p>Description:</p>  <p>Justification:</p> 	<p>Lacrosse player</p> <p>Pole vaulter</p> <p>Triple jumper</p> 
<p>Cricket ball throw test</p> <p>Description:</p>  <p>Justification:</p> 	<p>Gymnast</p> <p>Javelin thrower</p> <p>Wrestler</p> <p>Golfer</p>

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Activity 15 — Dragon's Den (Reaction Time Testing)

Working in groups, you are going to pitch a new idea to the 'dragons' (the rest of the class) to design for a new **reaction time test**. Within your pitch, you must explain what reaction time athletes need a high level of reaction time for their sport. Then, explain the **current** reaction time test, the **ruler drop test**, explain its **limitations** and why you are designing a new reaction time test. The class is to decide the winning group.

Use the space below to take notes and draw your new test.

Definition of reaction time:



Athletes who need a high level of reaction time:

The ruler drop test:



My new reaction time test:

Limitations of the ruler drop test:



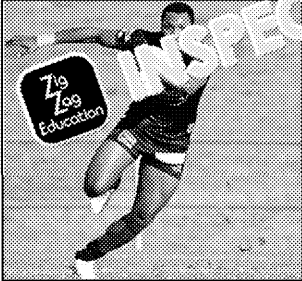
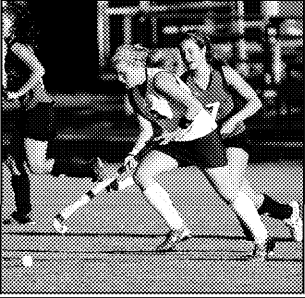
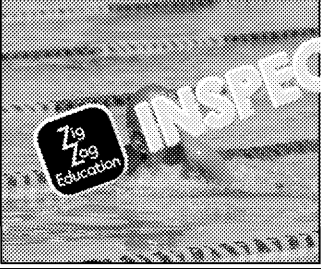
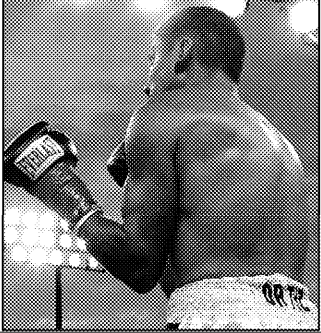
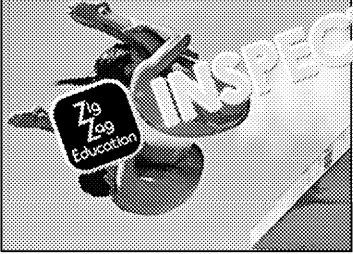
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Activity 16 – What Would You Choose?

Now that you have explored all the fitness tests for each component of fitness, you need to decide which tests are most suitable for each athlete listed below. Remember, most sports require a range of fitness; therefore, you may need to name more than one suitable fitness test to meet the specific requirements – justify your answers.

Athlete	Suggested fitness test/s
<p>Rugby player</p> 	
<p>Hockey player</p> 	
<p>Swimmer</p> 	
<p>Boxer</p> 	
<p>Diver</p> 	

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Activity 17 — How Practical?

Split the class into groups of four. They are going to assess the practicality of four tests) in terms of:

- cost
- time
- equipment
- facility required
- the appropriateness for the athlete (using scenarios)
- athlete's sport and their fitness levels (using scenarios)

Each group will be given one of the scenarios/cases outlined below. In their groups, they should choose one fitness test that could be used to support the given case study's goals. They should then work independently to assess each of the different fitness tests in their groups. They should then work independently to assess each fitness test they have chosen for their scenario. Students may wish to use the Internet to research each test in terms of the equipment required and the hiring of staff and facilities. They can use workbooks or on paper. It is fine if students choose a fitness test that isn't directly related to the scenario, as this will support them in assessing it as unpractical and unsuitable.

When they have finished, they should join back together in their groups and discuss which of their four tests are the least practical, and which tests are most practical (ranking them in order).

ZigZag United F.C. is an amateur football team that plays in the under 16s league in their local area. Last season they got promoted to a new league, where the pace of the game is much quicker than they were used to. Their coach has identified that a couple of their players have not been on form lately and have not been able to keep up with the intensity of play, often showing signs of fatigue by the end of the match. He has decided that he will run some fitness tests to assess his team's speed, aerobic endurance and muscular strength, in order to develop baseline levels of fitness that he can then use to compare them against at the end of the season.

Josef is a 27-year-old, elite 110 m hurdler who has recently been selected for team England for the next World Championships. However, recently in his training, he has been making a few mistakes and has been struggling to get over the hurdles cleanly. He has been wondering whether he is struggling with his hip flexibility or perhaps his leg power and decides to do some fitness tests to assess how he compares to normative data.

Jeff is a local squash coach and is looking to assess his team's fitness levels in order to improve their rankings. He oversees 16 squash players throughout the week for an hour each session. He is aware that the biggest challenges that most of his players have is the ability to change direction quickly to get to the ball, to use one or more body parts at the same time, smoothly and accurately, to make more effective shots and the ability to react quickly to the movement of the ball. He is looking for fitness tests that can be used to assess these components of fitness.

Note that the last scenario also requires students to recognise the fitness components. This scenario may be more suited to higher-ability students.




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Activity 17 – How Practical?

In groups (three or four), your challenge is to explore how practical each fitness test is in terms of **equipment, facility required, the appropriateness for the athlete, their sport and the cost** (you may wish to use the Internet to estimate **cost of each test** in terms of the **equipment and facilities** (make notes on paper). When you have finished each test, rank each test in terms of how practical.

Test: 	Cost	
	Time	
	Equipment	
	Facility	
	Appropriateness for athlete and sport	
	Appropriateness for fitness level	
Test:	Cost	
	Time	
	Equipment	
	Facility	
	Appropriateness for athlete and sport	
	Appropriateness for fitness level	
Test: 	Cost	
	Time	
	Equipment	
	Facility	
	Appropriateness for athlete and sport	
	Appropriateness for fitness level	
Test: 	Cost	
	Time	
	Equipment	
	Facility	
	Appropriateness for athlete and sport	
	Appropriateness for the sport	

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Activity 18 – Reminder (Planning Tests)

In pairs, you are going to design a poster that is going to inform others **how to** do them to remember all they need to know. Posters should be eye-catching; there are no abbreviations.

Include the following information in your posters:

- subject requirements (age, gender, fitness level)
- how to **choose** the correct test (validity, reliability, suitability, practicality, resources)
- test **procedure** (demonstration, instruction, practice)
- **health and safety** information (screening, consent forms, warm-ups)

Use the space below to help you plan your poster and how you will format each section.

Add catching title:

Subject requirements (table, list):

Choosing the correct test (e.g. infographic, paragraph, bulleted list):

Test procedure (list, step-by-step process, diagram):

Health and safety points:

Image/illustration

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Activity 19 – Thirty Seconds (Administration of Tests)

Working in pairs, you are going to discuss important topics when administering tests. You will discuss the **role of the tester, responsibilities of the tester and pre-check tests**. However, you only have 30 seconds to discuss each factor within each topic – you will need a stopwatch.

One partner is going to have 30 seconds to discuss each important factor below. The other partner is going to listen and write down key points made by the speaker. Once all topics have been discussed, you are going to switch roles.

Factors to discuss	Key answers
 Role of the tester: Organising equipment	
Role of the tester: Organising facility	
Role of the tester: Motivator	
Role of the tester: Preparing client for test	
 Role of the tester: Warm-ups	
Role of the tester: Client consultation	
Role of the tester: Pre-test procedures	
Role of the tester: Rapport with client	
 Role of the tester: Recording of results	

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Factors to discuss	Key answers
Responsibilities of tester: Observation of test	
Responsibilities of tester: Correct technique	
Responsibilities of tester: Client needs	
Responsibilities of tester: Suitable for age	
Responsibilities of tester: Sport and fitness level	
Pre-test check Equipment	
Pre-test checks: Client	
Pre-test checks: Recording documentation	





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Activity 20 — What's Your Status?

Choose your own data for one of the tests you have taken part in for the previous activity. You will then build your own social media profile based on your result, including your **name**, the **test** you took part in, your **results** and how your results compare against **peers** and **elite athletes**. You may have to do some research and discussion to compare results. When you have finished, you will have recommendations to yourself, on how you can improve your result within six weeks.

MYSOCIOFACE	
Date of birth: 	Status Update: Type your status here on how suitable you think you are for the test:
About me: 	
The sport I play: 	
Test taken and results: 	
Results against peers: 	
Results against elite athletes: 	Type your status here on how you think you are for six weeks' time:

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Activity 21 — You've Got Mail! (Providing Feedback)

It is important to provide feedback on results, which can be verbal or written. You are going to provide written feedback via email for **two different clients** (of your choice they can be famous), who took part in **two different fitness tests**. Make sure you include the following:

- Give the test results.
- Give the levels of fitness.
- Show strengths and areas of improvement.
- Suggest and justify recommendations on how to improve fitness components.

Email 1:




To: _____

From: _____

Subject: _____

Dear...



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Email 2:



To: _____

From: _____

Subject: _____

Dear...



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Answers

Activity 1 - Testing Athletes

Validity:

- Validity concerns whether what is meant to be measured is actually being measured.
- For instance, in the sprint test, what is being measured is the seconds it takes for the athlete to complete the distance. Furthermore, within fitness testing, it is important to ensure that the test is suitable for the athlete. For instance, you would not test a marathon runner's ability by conducting a sprint test, as their maximum speed is not essential for marathon running.

Sprinter – suitable test: Sprint test (any distance; 20 m, 30 m, 40 m, 50 m, 60 m)

Justification: Sprinters require high levels of speed in order to complete their respective events. Therefore, a sprint test is an appropriate test for an athlete in this field, as it will demonstrate how quickly they start and how quickly they finish. For instance, it may be recognised that the athlete slows their speed between 50 metres and 60 metres, so it may be important for a 100 m sprinter to work on this so that they do not slow down until the end of the race.

Weightlifter – suitable test: 1RM test

Justification: Weightlifters require high levels of strength in order to lift heavy weights. Therefore, a 1RM test is an appropriate test for an athlete in this field, as it will demonstrate the maximum weight they can lift. If an athlete is competing, they will be able to learn how much weight they need to lift to win.

Marathon runner – suitable test: Maximal oxygen consumption test (VO_2 max)

Justification: Marathon runners require high levels of aerobic endurance to complete long distances such as 26.2 miles (marathon) as quickly as they can. Therefore, a VO_2 max test is an appropriate test for an athlete in this field, as it measures the maximum volume of oxygen that can be consumed by the body during aerobic exercise.

Gymnast – suitable test: Sit-and-reach test

Justification: Gymnasts require high levels of flexibility in order to be able to perform the routines and body positions required within their respective event within gymnastics. Therefore, a sit-and-reach test is an appropriate test for an athlete in this field, as it tests several major muscle groups including the lower back and hamstrings.

Sprint cyclist – suitable test: Sprint test (40 m sprint cycling test)

Justification: A track cyclist competes within a velodrome in events that consist of bursts of speed to either get around, work with their team, or purely cycle as fast as possible to beat their opponents. Therefore, a sprint test is an important test for an athlete in this field, as it demonstrates their ability to sprint and sustain their sprints at a high level so that they can perform well in their event. The cycling test can be conducted on a cycle track, where the athlete's ability to sprint over a short distance and weak areas can be identified and worked upon.

Footballer – suitable test: Illinois agility test

Justification: Footballers require a high level of agility to be able to get around opponents and to pass the ball from teammates, while maintaining control of the ball. Therefore, the Illinois agility test is an appropriate test for an athlete in this field, as it determines the athlete's level of agility.

Accept any other suitable test for each performer, with relevant justification of the test components students identify as key components of fitness for the given sports.

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Activity 2 – How Reliable?

Answers may vary but students should be able to identify at least one way that each possible source of unreliability of the test, and the steps that can be taken to overcome this.

Reliability is how likely the same answers/results will be given if the test is repeated.

Time of the day:

- Time of the day can affect reliability as a result of tiredness (i.e. early morning or late afternoon). A participant who has had a long or busy day (e.g. full-time work) and then has to travel to the test may be affected by fatigue, which can affect reliability as the participant could be suffering from hungry, tired and dehydrated.
- To overcome this, the researcher should carefully select an appropriate time of the day when the participant can perform the test that best suits them.

Skill of the tester:

- If the tester has never done this test, or a particular test, before, this will affect the reliability of the test and increase the risk of an error.
- To overcome this, the tester can practise with or without a participant, so that they know what they have to do.

Equipment used for timing/measuring:

- Equipment can affect how reliable a test is, especially if the equipment is different. Differences in equipment used means that the test would be unfair to each participant in a difference test.
- To overcome this, it is imperative that equipment is thoroughly checked before the test and without using the participant. Additionally, it may be wise to have access to multiple pieces of equipment, should one break. It is important that equipment is the same, i.e. size, type and may also be calibrated.

Athlete's experience of testing:

- The participant may not have had any experience in testing before, which can affect their performance. Improper technique, are highly aroused or do something wrong. This highlights the importance of clear protocols.
- The researcher can overcome this by giving out the correct instructions to the participant and are clear about what is expected of them. They may also wish to provide the participant with an opportunity to have practice go before the real thing.

The sport that the athlete does:

- It is important to consider the participant that is being recruited for the test. For instance, a 100 m relay athlete to perform the VO₂ max test, as this is not only irrelevant to their performance but they will specialise in other fitness components that do not suit the test.
- To overcome this, the researcher should ensure that they are recruiting suitable participants for the test they are conducting.

Existing injuries:

- Existing injuries can result in the inability to complete the test itself. It may lead to a participant, or it may result in a lack of proper technique while performing.
- This can be overcome by asking participants to take the physical activity readiness questionnaire as part of the process, and by asking before the start of the test whether the participant has any existing injuries that they have made aware about, or that can hinder their ability to take part.

Having spectators:

- The addition of spectators may cause the participant to become over-aroused, which can affect their performance, especially if they are not used to performing in front of others.
- To overcome this, the researcher could ask about their performance history and whether they are used to performing in front of others. Alternatively, they could make this a private test.

Quality of equipment being used for testing:

- The quality of the equipment can affect reliability of the test. For example, if the equipment used for a test may have to be replaced by a different piece, meaning that different participants would be using different equipment throughout.
- To overcome this, equipment should be thoroughly checked before each test is conducted. Equipment from the same manufacturer and of the same size/shape should be considered suitable for the test.

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Lack of warm-up before test:

- A lack of warm-up increases the risk of injury, as the body is not fully physically or mentally prepared. An acute injury during a test would, therefore, result in the test being stopped and, therefore, the test being unreliable.
- Furthermore, warming up the body enables greater blood flow to the working muscles and unimportant areas (e.g. the digestive system) and vasodilation to more important areas (e.g. the heart and lungs used for exercise). This helps the muscles to become more pliable and allows the connective tissues and tendons, to become more flexible due to greater blood flow to the area, therefore, giving the athlete a better ability to participate.
- To overcome this, the researcher should make sure that an appropriate warm-up is carried out by the participant/participants, while informing them of the purposes of a warm-up before testing.

Athlete sickness:

- Sick athletes are likely to be unable to perform to their best, affecting the reliability of the test, as their energy levels may be low.
- To overcome this, athletes should be encouraged not to take part if they are feeling unwell.

Athlete's technique during test:

- The reliability of a test can be affected by the athlete's technique. For instance, an athlete who has not practiced a skill or movement before will not have the correct technique compared to someone who has. Likewise, tired athletes who have not had adequate rest will find that their technique is affected, which may result in injury.
- To overcome this, the researcher should ensure that they give demonstrations before the test to show the participant they think the participant is experienced or not. They may also wish to allow the participant to practice the test to allow them to get a better understanding of what's expected and how the test should be performed.



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Activity 3 – Team Research

Pairs should indicate which fitness test and sport they have chosen. They should also clearly assess the practicality and suitability of the test. See example below.

Working with a partner, you are going to assess the practicality and suitability of a fitness test of this worksheet.

- i) The fitness test we have chosen is the *sit and reach* test.
- ii) The sport that we have chosen to apply this fitness test is *gymnastics*.
- iii) There is one athlete / more than one athlete for test and they are novice level

Test practicality:

Time taken to conduct the test	approx. 15 minutes per person: 10 minutes for the warm-up, approx. 3 minutes for their practical test and 2 minutes to write scores	
Equipment required for the test (and why this is practical for your chosen scenario)	Equipment: <ul style="list-style-type: none"> pen and paper for the recording sit and reach box (or appropriate equivalent) measuring tape if not using sit and reach box 	Practicality: <input checked="" type="checkbox"/> Reliability: <input checked="" type="checkbox"/> Specificity: <input checked="" type="checkbox"/> Cost: <input checked="" type="checkbox"/>
Facility required to conduct the test	This can be conducted inside or outside (depending on weather). No specific facilities are required to complete the test.	
Cost of the test (calculate everything required for the test. How much is it to hire a hall, how much is it to pay staff?)	Total equipment cost	Specialist sit and reach box (~£80–150) Own-made box = ~£10, Pen = ~50p, Paper = ~10p Total min cost = ~£12 or ~£150
	Facility hire cost	Free
	Staff cost	No specialist staff needed; anyone can conduct the test
	Other costs	None

Test suitability:

Is this test suitable for your chosen sport? (links to fitness components required)	Yes, this test is suitable for gymnastics, as gymnastics requires flexibility particularly in the legs and back, in order to perform the positions.
Is this test suitable for the performer? (what position do they play? Are there any limitations?)	Yes, all gymnasts, no matter what discipline, need a high level of flexibility including the pommel horse, floor and rings. Therefore, this test is also safe for novice performers.
Is this test suitable for the performer's fitness levels?	A performer with higher levels of flexibility is anticipated to perform better than a performer with low levels of flexibility. However, it is a suitable standard measure of flexibility and is safe if conducted after a warm-up.

Evaluation statement: I believe that the *sit and reach* test **IS** practical and suitable because...

The test is **suitable** because it tests several muscles, such as the flexibility of the hamstrings and lower back muscles, all of which are important in gymnastics. It can be conducted with athletes of all levels, including novices.

It is **practical** because it is easy to administer and requires little equipment and/or space. It can be completed from multiple stations quickly and effectively.

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Activity 4 – Ethics

Students should be able to have the confidence to develop their own consent form from the field when working with human participants. Students should use the considerations when writing their form. Example sentences may include:

- Please note that even having signed this consent form, you may withdraw from the study at any time and provide a reason.
- Data will be collected so that we can identify individual participants when drawing conclusions. All data will be stored securely on a password-protected external drive, and this will be the only copy. All personal data will be destroyed according to the relevant regulations.

Activity 5 – Snap That (Flexibility Testing)

Students should be able to provide a clear drawing of each flexibility test. They should also clearly identify the muscles tested in each test.

Sit and reach test

- **Drawing to show:** The participant is required to reach forward on a box as far as possible while flexing their trunk towards it and testing the flexibility of the hamstrings group, hips and lower back muscles.
- **Units of measurement:** The number of centimetres reached is measured.
- **Performer test most suited to:** The test is most suited to gymnasts.
- **Positives:** It is easy to administer.
- **Limitations:** The number of participants depends on the number of boxes available.

Shoulder flex test

- **Drawing to show:** The participant is required to lift a stick up and overhead, moving their arms until the movement cannot be completed.
- **Units of measurement:** The number of centimetres between the hands is measured.
- **Performer test most suited to:** The test is most suited to javelin athletes.
- **Positives:** The equipment cost is cheap.
- **Limitations:** It only tests the flexibility of the shoulders.

Calf muscle flexibility test

- **Drawing to show:** The participant is to stand flat footed the maximum distance away from the wall with their heels touching the wall.
- **Units of measurement:** Centimetres between the foot and the wall are measured.
- **Performer test most suited to:** The test is most suited to hurdlers.
- **Positives:** Only a measuring tape required, so it is easy to administer, and lots of people can be done at one time.
- **Limitations:** It only tests the flexibility of the calf muscle, indirectly.

Trunk rotation test

- **Drawing to show:** The participant is to stand with their back against a wall, then twist their torso to touch their knees and touch the wall with their fingers.
- **Units of measurement:** The number of centimetres between the centre and their fingers is measured.
- **Performer test most suited to:** The test is most suited to discus throwers.
- **Positives:** It tests both the trunk and the shoulders; is cheap, easy to administer, and lots of people can be done at one time.
- **Limitations:** There is no sport or skill that requires this movement.

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Activity 6 – How Strong? (Strength Testing)

Students are to explain each strength test and identify the advantages and disadvantages (answers).

1RM test:

- **Description** – The bench press (or squat/deadlift) 1RM test consists of the participant lifting a weight, and then increasing the weight until they can no longer lift safely and confidently. The weight that is safely lifted for one repetition is recorded as the 1RM for that exercise.
- **Advantages** –
 - It can directly assess the strength of a specific muscle or group of muscles.
 - Most equipment is readily available in gyms (e.g. resistance machines / barbells).
 - It can be easily administered.
 - It can be done using free weights or resistance machines.
- **Disadvantages** –
 - Proper technique must be adopted, so this should be completed by those with good technique.
 - It only measures specific muscle strength, e.g. pectorals when performing 1RM bench press.
 - There is an increased likelihood of injuries due to overstraining muscles.
 - It may need another person to provide support (a spotter).

Grip Dynamometer test:

- **Description** – The grip dynamometer test consists of the participant gripping as hard as they can a grip dynamometer until no more force can be applied. The final reading is their maximum grip strength, which can then be compared to normative data for age and gender to assess rating.
- **Advantages** –
 - This test can be conducted at any location and can be performed where the athlete does not have to travel to a gym or other location.
 - It is easy to administer.
- **Disadvantages** –
 - This method only assesses the strength of the muscles in the forearm; it is not a measure of overall strength.
 - It may be unreliable, as the grip dynamometer needs to be calibrated regularly.
 - It requires adjustment of the equipment to suit varying hand sizes.

Seven-stage abdominal strength test:

- **Description** – The seven-stage abdominal strength test consists of the participant completing a set of sit-ups (of 8) as fast as possible (note that zero is a stage in this test). Each level gets increasingly heavier, with the final level involving 2.5 kg and 5 kg. The level the participants achieve is their reading.
- **Advantages** –
 - More than one athlete can be tested at once, i.e. a whole team or class.
 - Minimal equipment is required.
 - It is simple to complete.
- **Disadvantages** –
 - This method only assesses the strength of the abdominals.

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Activity 7 — The Five Tests (Aerobic Endurance Testing)**Rockport walk test:**

Procedure: The participant is to walk 1 mile as fast as possible, and then record their time as they finish. VO_2 max is then calculated using the following equation:

$$VO_2 \text{ max} = 132.853 - (0.0769 \times \text{weight in kgs}) - (0.3877 \times \text{age in years}) + (6.315 \times 1[\text{if male}]) - (0.1565 \times \text{heart rate in beats per minute})$$

Suitability: It is suitable for, for example, novices, etc., those who are unfit or new to sport and morbidly obese.

Equipment: A track or field in a park and a stopwatch and assistant.

Drawbacks: Not all places or people are going to have access to that amount of space (track).

Harvard step

Procedure: Recovery heart rate is assessed for this exercise. The participant is to step up (18 times per minute) for 5 minutes or until tired, heart rate is then assessed 1–1.5 minutes after finishing and 3–3.5 minutes after finishing. Therefore, heart rate is only assessed for 30–35 minutes. The score is calculated by:

$$\text{Score} = (100 \times \text{test duration in seconds}) \div (2 \times \text{total (sum) of heart beats in the recovery period})$$

Suitability: It is suitable for, for example, aerobic athletes, i.e. middle/long-distance runners (with quick aerobic recovery rates).

Equipment: A step or box is required, and a stopwatch, heart rate monitor and metronome.

Drawbacks: It can be costly to buy the equipment in order to do groups of people; an assistant is consuming if testing many participants.

Multistage fitness test:

Procedure: Participants run a 20 m distance against the beep that is provided on a set track. The distance before the next beep. The beeps get faster as the participants' pace needs to get faster. The score is the level they get to (1–10) before they don't make the distance before the next beep.

Suitability: It is suitable for, for example, basketball players.

Equipment: Sound equipment, a laptop and cones are needed.

Drawbacks: If there are no spotters, it often relies on participants being honest if they are not.

12-minute Cooper test:

Procedure: The participant is to cover as much ground as possible (running), typically around a track, in the dedicated 12-minute time frame. The score is the number of metres covered in 12 minutes.

Suitability: It is suitable for, for example, middle and long distance runners.

Equipment: A track or cones are needed to establish distance run, also a stopwatch and spotters.

Drawbacks: Not all places or people are going to have access to that amount of space (track).

Maximal oxygen consumption test (VO_2 max test):

Procedure: The participant is to run (on a treadmill) or cycle (cycle ergometre) at a moderate intensity, gradually up to a maximum intensity. A Douglas bag collects the oxygen and carbon dioxide. Ventilation rate and heart rate are measured using relevant equipment. VO_2 max is reached when oxygen uptake has plateaued, despite the increase in intensity.

Suitability: It is suitable for, for example, long distance runners.

Equipment: Oxygen and carbon dioxide analysers, a Douglas bag, a heart rate monitor and spotters are needed.

Drawbacks: There is lots of equipment and the equipment is expensive; it only tests the aerobic system.

Activity 8 — How Fast? (Speed Testing)

Speed is the ability to be able to move from A to B as quickly as possible.

It is **required** for sports and events such as the 200 m sprint, invasion games and long jump.

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Activity 9 – How Long is 60 Seconds? (Muscular Endurance)**One-minute press-up test:**

- **Procedure:** The participant is to complete as many press-ups in one minute as they physically can.
- **Suitable for:** Any sport that requires muscular endurance of the upper body (pectorals and triceps).
- **Limitations:** An assistant is required to count; they must ensure all press-ups are equal.

One-minute sit-up test:

- **Procedure:** The participant is to complete as many sit-ups in one minute as they physically can.
- **Suitable for:** Any sport that requires muscular endurance of the core/abdominals, especially in team sports.
- **Limitations:** An assistant is required to count; they must ensure all sit-ups are equal. It only tests the rectus abdominis muscles.

Wall-sit test:

- **Procedure:** The participant is to stand with their feet shoulder-width apart against a wall in a squat position with one foot off the ground until they put the foot back on the floor and then repeat. They must hold the position for 60 seconds.
- **Suitable for:** Sports that require muscular endurance of the legs, such as running, and team sports.
- **Limitations:** It is not sport or skill specific; it only tests endurance of the legs, specifically the quadriceps.

Activity 10 – Group Debate (Body Composition)

Students' answers will vary; students to learn, research and debate skills on their given topic.

Activity 11 – How Agile are You? (Agility Testing)

Practical activity – students to list their results and indicate how tests may be suitable for their sport. The side-step test is only applicable in sports that require the player to move side to side, as they would be moving forward at the same time.

Activity 12 – Balance: Nerves and Muscles**Stork balance test:**

Procedure: The participant is to place hands on hips, one foot to be placed on the inside of the other. The participant lifts the heel of the foot they are standing on, so that they are balancing on the ball of the foot. The test is scored as either a success or fail when hands are removed from the hips, or when the participant's foot comes away from the floor.

Limitations:

- It does not test dynamic balance.
- An assistant is required to measure the test.

Beam walk test:

Procedure: The participant is to walk across a beam or curb that is 10 cm wide and 6 metres long. They may fall off once. The test is scored as either a success or fail.

Limitations:

- It requires assessors to ensure reliability.
- Balance is only in one direction / linear, which isn't reflective of most sports.

Activity 13 – The Importance of Proprioception (Coordination)

Practical activity

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Activity 14 – Power: Match Up

Students to outline the key differences in the description of each and then match each test to the appropriate athlete. Multiple athletes may be categorised for more than one test.

Vertical jump test

- **Description:** The athlete stands next to a wall and reaches up as far as they can (feet with chalk to mark standing reach height). They then make a jump as far up as they can. The difference between the two marks (in cm) is measured. The best of three attempts is calculated.
- **Athlete(s) most likely:** A basketball player or triathlete would be most suited.
- **Justification:** Justification should be linked to the need for athletes to jump vertically. The power of the leg muscles. For example, a basketball player will need to leap to block a shot.

Standing long jump test

- **Description:** The athlete stands behind a marked line, then does a two-footed take-off and two-footed landing as far as possible (measured in cm). Three attempts can be made and the best recorded.
- **Athlete(s) most likely:** A basketball player, triple jumper, pole vaulter or gymnast would be most suited.
- **Justification:** This should be linked to the fact that these sports require jumping action for height/length or to perform, and it also measures power of the leg muscles, e.g. a triathlete's movements (jumping forward).

Margaria-Kalamen power test

- **Description:** The athlete's weight is determined in kg. The athlete marks a line, 6 m from the 3rd, 6th and 9th step. On the 'go' command (of the assistant), the athlete has to sprint (from the 6 m line), taking three steps at a time to help them sprint as fast as possible. The time between the 3rd and 9th step is recorded and measured in seconds. Three attempts can be taken and the best recorded. The following equation:

$$\text{Power (W)} = (\text{Athlete's weight (kg)} \times \text{vertical distance from 3rd to 9th step (m)}) \times 9.8 \div \text{time}$$

- **Athlete(s) most likely:** A basketball player or triathlete, lacrosse player, pole vaulter, or gymnast would be most suited.
- **Justification:** The link is that these sports require power in their sport, especially power for forward motion. For example, a pole vaulter needs leg power upwards and forward motion. A triathlete needs power for their quadric muscles.

Seated medicine ball throw test

- **Description:** The athlete should be sat on the floor, back against the wall and feet 60 cm apart. Both hands and forearms positioned parallel to the ground. The athlete throws the ball as far as they can with their back still remaining against the wall. The distance from the wall to where the ball lands is measured. The athlete has three attempts and the best score is used.
- **Athlete(s) most likely:** A basketball player, gymnast, javelin thrower, wrestler or golfer would be most suited.
- **Justification:** The test is linked to athletes requiring upper body strength for their sport. Athletes who have good upper body strength, particularly of the muscles surrounding the shoulder and elbow.

Cricket ball throw test

- **Description:** A line is marked where the athlete has to throw from, but they are allowed to step over the line. They are to throw as far as possible and may have two practice throws. Three attempts are made and the longest throw is measured (in metres).
- **Athlete(s) most likely:** A basketball player, baseball player, javelin thrower or golfer would be most suited.
- **Justification:** The test is linked to upper body power in sports that require a wide range of motion at the shoulder joint, e.g. a baseball player uses their arm to throw the ball in their sport, so will need power in their shoulder to throw the ball further when fielding.

Wingate test

- **Description:** The athlete is weighed in kg. The athlete is required to pedal as fast as possible on a cycle ergometer with a resistance manipulated by their weight $\times 0.08$.
- **Athlete(s) most likely:** A basketball player, triathlete, baseball player, lacrosse player or triathlete would be most suited.
- **Justification:** This test is a measure of anaerobic power of the leg muscles; the sports that require power in their sports, e.g. the baseball player will use anaerobic power for sprinting.

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Activity 15 – Dragon’s Den (Reaction Time Testing)

Students’ answers may vary, accept other suitable answers.

Reaction time is the time taken to respond to a stimulus, such as a start gun.

Procedure:

1. An assessor/assistant should hold the 1 m ruler at the top (end of the 100 cm line).
2. The participant, with a straight arm, hovers their hand (index finger and thumb) at the bottom of a 1 m ruler. The hand should be between thumb and forefinger.
3. The assistant should release the ruler without warning, once the participant is ready to catch it as soon as possible. The distance between the index finger and thumb of the dominant hand should be measured.
4. The average score should be taken.

Limitations:

- It requires an assistant to help.
- Reaction time could improve the more goes the participant has, due to learning to react.
- Not many sports require reaction time of just the index finger and thumb.

Athletes such as **sprinters** and **swimmers** would benefit from a good reaction time, as they need to respond to a gun (a stimulus) at the beginning of a race or event.

Activity 16 – What Would You Choose?

Students to recognise that more than one test is applicable to athletes, as their respective component of fitness. Different students will provide different levels of answer. Possible answers for each athlete are listed below.

Rugby player:

- **Sit and reach test** (flexibility for running and throwing, to allow full range of movement)
- **1RM test** (strength for power when throwing, running and lifting)
- **Multistage fitness test** (endurance for different types of play and burst of speed through sprints)
- **Sprint test** (speed for catching the ball, running from an opponent and scoring)
- **One-minute sit-up test** (endurance for being able to play at that high intensity for a whole game)
- **Side step test** (agility for getting away from players)
- **Beam walk** (balance in order to maintain control of movement)
- **Wall toss test** (coordination for running and passing, conversions)
- **Seated medicine ball throw** (power for passing the ball at a variety of distances, i.e. scrums)
- **Reaction time test** (reaction time to gain possession, defence and change of play)

Hockey player:

- **Shoulder flex test** (for reaching for and hitting the ball, full range of movement)
- **Grip dynamometer** (strength of the forearm required for holding and hitting hockey stick)
- **12-minute cooper test** (endurance required to cover ground for the duration)
- **Sprint test** (speed required for bursts of fast play, i.e. attacking)
- **Wall-sit test** (endurance required in the legs to maintain play for a whole game)
- **Illinois agility run test** (agility required for getting around opponents and getting to the ball)
- **Beam walk** (balance required when changing direction of play)
- **Wall toss test** (coordination required for receiving and passing the ball with stick)

Swimmer:

- **Shoulder flex test** (full range of movement required for all strokes)
- **Maximal oxygen consumption test** (depending on the distance, i.e. long distances require more oxygen)
- **Sprint test** (speed required for short distances, such as 50 m events, i.e. breaststroke)
- **One-minute sit-up test** (strong core required for all strokes)
- **Ruler drop test** (reaction time required to get out of the blocks and into the water)

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Boxer:

- **Seven-stage abdominal strength test** (core strength required for balance, and punch)
- **Speed test** (bursts of speed required for punching and getting out the way)
- **One-minute sit-up test** (endurance of the core required to make all the rounds)
- **Side step test** (agility required to dodge opponent)
- **Reaction time test** (reaction time required to know when to throw a punch and when to duck)

Diver:

- **Sit and reach test** (high level of flexibility required to allow full range of movement)
- **Shoulder flex test** (high level of flexibility required to allow full range of movement)
- **Trunk rotation test** (high level of flexibility required to allow full range of movement)
- **Coordination test** (coordination required, as arms and legs often do something different)



Activity 17 – Practical?

Students' answers will vary; students are to research and estimate the practicality of tests and should then argue which tests are most and least practical using the evidence they have gathered.

Possible fitness tests in line with each scenario (in probable order of suitability and practicality)

- **Football team:**
 - aerobic endurance: *multistage fitness test, 12-minute Cooper run test, Harvard maximal oxygen consumption test (VO₂ max)*
 - muscular endurance: *wall-sit test, one-minute sit-up test, one-minute press-up test*
 - speed: *sprint test (at any length – 20 m, 30 m, 40 m, 50 m, 60 m)*
- **Josef the hurdler:**
 - flexibility: *sit and reach test, trunk rotation test, calf muscle flexibility, shoulder flexibility*
 - power: *Margaria-Kalamen power test, Wingate test, standing long jump test, vertical ball throw*
- **Squash team:**
 - agility: *T-Test, Illinois agility run test, side step test*
 - coordination: *wall toss-test*
 - reaction time: *ruler drop test*



Activity 18 – Hurdler (Planning Tests)

Students are to design a poster that must include the aspects outlined on their worksheet using the planning guidance and then designed on the computer or on paper. These posters could be displayed in the classroom / sports hall to remind students of the important factors to remember when planning a test.



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Activity 19 – 30 Seconds (Administration of Tests)

Students should discuss each of the given factors for administering tests and be able to do each. The second student may have less to say if the first has said all there is to say.

Students may reference the following suggested answers as part of their discussions:

Factors to discuss	Key answers
Role of the tester: Organising equipment	<ul style="list-style-type: none"> The tester is to ensure equipment is clean. The tester should check the equipment, e.g. harmful equipment failed. The equipment is calibrated – to ensure the fitness test is accurate.
Role of the tester: Organising the room	<ul style="list-style-type: none"> The tester should ensure the room is safe. The tester may need to conduct a health and safety check. The tester should ensure the room is sufficient for the test.
Role of the tester: Motivator	<ul style="list-style-type: none"> The tester should help the athlete feel comfortable. The tester should encourage the athlete to do their best. The tester should help guide the athlete as best as possible.

Factors to discuss	Key answers
Role of the tester: Preparing client for test	<ul style="list-style-type: none"> The tester should ask the athlete to complete a written consent form. The tester should ask the athlete to complete a short questionnaire. The tester should explain the procedure.
Role of the tester: Warm-ups	<ul style="list-style-type: none"> The tester should ensure that the athlete is well hydrated. The tester should ensure the athlete has stretched. The tester may wish to allow the athlete to have a go at the test themselves.
Role of the tester: Client consultation	<ul style="list-style-type: none"> The tester should ask about any pre-existing injuries. The tester should ask about their level of experience. The tester may wish to discuss why they are taking the test and what they want to achieve.
Role of the tester: Pre-test procedures	<ul style="list-style-type: none"> The tester may wish to ensure that the athlete is wearing appropriate clothing. The tester may wish to check that the athlete is wearing appropriate footwear. The tester should correctly lay out any markings. The tester should check that the equipment is correct. The tester may wish to have a go at the test themselves.
Role of the tester: Support with client	<ul style="list-style-type: none"> The tester should be friendly and approachable. The tester should demonstrate their knowledge of the test. The tester should be open to answering any questions.
Role of the tester: Recording of results	<ul style="list-style-type: none"> The tester should be accurate in their recordings. The tester should be clear as to whose results are being recorded. The tester should record results in the same format.

Factors to discuss	Key answers
Responsibilities of tester: Observation of test	<ul style="list-style-type: none"> Check that any markings have not been manipulated. Check that participants have enough space to take the test. Check the correct procedure is being followed according to the test.
Responsibilities of tester: Correct technique	<ul style="list-style-type: none"> Check that the athlete is using the correct technique. Check that the athlete is starting and ending in the correct position. Check that the athlete is using equipment correctly.
Responsibilities of tester: Client needs	<ul style="list-style-type: none"> Check that the health and safety of the participant is being considered. Check that safety of the participant is a priority. Check that the needs are being met, e.g. disabled participants.
Responsibilities of tester: Suitable for age	<ul style="list-style-type: none"> Check that the procedure is adapted for older adults. Check that the procedure is adapted for younger participants. Ensure that children are not lifting heavy weights.
Responsibilities of tester: Sport and fitness level	<ul style="list-style-type: none"> Check that the test is suited to the fitness level of the participant. Ensure that the athlete is not exerting themselves too much. Ensure that the athlete is not going to give themselves an injury.

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Factors to discuss	Key answers
Pre-test checks: Equipment	<ul style="list-style-type: none"> • Equipment should be fully functioning. • Equipment should be equal for all participants. • Equipment should be safe to use. • Equipment should be correct for the test.
Pre-test checks: Client	<ul style="list-style-type: none"> • The client should not have injuries. • The client should be well prepared for the test. • The client should have done a warm-up. • The client should have a practice attempt first.
Pre-test checks: Recording documentation	<ul style="list-style-type: none"> • Data collection should be accurate. • Documentation should be clear. • Documentation should use the same metric.



Activity 20 – What’s Your Status? (Interpreting Results)

Students to choose data from tests that they have taken part in.

They should compare their data against their peers, i.e. mean scores and against normal computers or phones for research, and also calculators.

Activity 21 – You’ve Got Mail! (Providing Feedback)

Students’ answers will vary, due to the open nature of this activity. It is possible, if appropriate, to use results from a previous fitness test their peer has taken part in and write an email for them to be creative in their approach.

Emails should reference the following: test results, level of fitness, the identified strengths and weaknesses, and recommendations for developing the identified fitness component that was tested.



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