

Lesson Plans: Lesson 1 A Fair Comparison

GOALS OF LESSON

- To raise awareness of the battles women have had to compete in many Olympic events and to develop the focus of the case – *Are women improving faster than men?*
- To begin to consider how improvements in athletic performance can be compared.
- To identify what a 'fair' comparison of events might be.
- To understand how to work through an enquiry and what are the features of a high quality enquiry.

FEATURES OF THE LESSON

- Pupils will become aware of past beliefs about women's limitations and later debate about whether or not they may one day surpass men.
- Pupils will choose an event and begin to consider whether or not women have improved faster than men for their event through a basic comparison.
- Pupils will then consider how they might complete a 'fair' comparison of men's and women's improvements.
- Pupils will then consider how they might go about a complete formal enquiry into the Case question. To do this they will look at sample enquiry reports to identify the features that make up a high quality enquiry.

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SUMMARY

Part 1: Engaging pupils in the issue

A brief discussion of some Olympic data to open up the issue and provide the focus for the investigation. (10 minutes).



Part 2: An initial comparison

Pupils begin to analyse the data for a specific event on which to focus for the remainder of the Case. They do this without teacher input as to how they might handle the data. (15 minutes).



Part 3: A fair comparison

Pupils reflect on their initial method of analysis with a focus on finding a 'fair' comparison of men's and women's improvements. (15 minutes).



Part 4: The notion of a maths enquiry

Pupils reflect on what is meant by an enquiry in maths and begin to consider the features of a good enquiry. (10 minutes).

PREREQUISITES

- Basic knowledge of Olympic Games

PREPARATION

- A way of showing the Year of first participation for some Olympic events.
- Photocopies of **Detailed list of performances in the six selected events**, **Enquiry process** and **Sample enquiries**.
- Become familiar with background reading on women's past participation, the debate on whether women have been improving faster than men, the different pieces of Teacher advice and how to use the **800 m data**.
- Each pupil should have a LOG BOOK (small exercise book) in which to perform calculations, record notes, carry out rough drafts of work etc. Work which will be submitted can be transferred onto an appropriate medium later.
- Pupils will need a calculator regularly throughout the entire case.

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PRIOR LEARNING FOR LESSON ONE

Pupils should be familiar with the concept of absolute difference – the total change in a variable.

Part 1: Engaging pupils in the issue

Pupils are confronted with past thinking about the inadequacies of women and the much later debate about whether or not women are improving faster than men. (10 Minutes).

Activities	Teaching and Learning Notes
<p>1. Show the table Year of first participation – some Olympic events and ask what the thinking might have been that meant women’s participation was limited to so few events.</p> <p>Key Issue:</p> <ul style="list-style-type: none"> <i>Women were regarded as physically inferior.</i> 	<p>For decades women were considered incapable of competing in many events. Details are provided in the background article The changing role of women in the Olympic games. A brief summary is provided in:</p> <p>TL1: Biased reporting of the first women’s 800m.</p> <p>Use these to relate how prejudice and a 1928 reporter’s account allowed Olympic officials to ban women from this event for 32 more years.</p> <p>Some teachers have collected some clips of Olympic bloopers to provide an engaging initial context.</p>
<p>2. Open up the issue that more recently there has been debate about whether or not women are actually improving faster than men. Present this as the focus of an investigation that is to take the next three lessons.</p> <p>Key Question:</p> <ul style="list-style-type: none"> <i>Have women improved faster than men?</i> 	<p>You have now fast forwarded to the 1990s. There has been considerable debate on this issue that is summarized in the teacher resource Women of the future are on track to run faster than men. This article should not be given to pupils at this point as it tends to pre-empt the investigation. At this stage pupils should come up with their own opinions. They can be shown the document later. Direct pupils’ attention to the focus of the case, <i>“Olympics: Have women improved faster than men?”</i> Have some pupils provide their gut reaction, with reasons if possible.</p>

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Part 2: An initial comparison

With the focus clear, pupils have a first attempt, deliberately without specific direction, at addressing the question "How can improvements in performance can be compared?" (15 minutes).

Activities	Teaching and Learning Notes
<p>3. Pupils choose a specific event to focus on for the remainder of the Case and begin analysing the data by completing some basic comparisons of men's and women's improvements.</p> <p>Key Questions:</p> <ul style="list-style-type: none"> • <i>Have women improved faster than men?</i> • <i>How can we best answer this?</i> • <i>What issues emerge as we make our first attempts?</i> 	<p>Organise pupils into groups. Note that there are data for six events as well as the 800m which you will use as a model, it is preferable, but not essential that all six events are analysed, however for lesson 2 to work it is necessary that most of them are analysed. Tell pupils that the first key aim of this Case is to develop a detailed, justified answer to this question. Have women improved faster than men? Each group will choose one event to work with. The events which pupils may choose from include 100m track, 400m track, shot put, javelin, long jump and 100m freestyle. Give out <u>Detailed list of performances in the six selected events</u>; this is the data the pupils will use.</p> <p>Provide pupils with the opportunity to consider the data for their events and make a start on producing an answer to the Case question.</p> <p>After a short period, have groups provide their methods for how they have attempted to answer the Case question. Different groups are likely to vary in how quickly they recognize the issues of making a fair comparison and you will need to be prepared to respond flexibly to what they come up with.</p> <p>(See TL 2: They may see the need for percentages immediately)</p> <p>If needed, direct pupils' attention to the concept of absolute difference from first performance to most recent performance (which will be critiqued in the next stage) and model this with the 800m track event.</p>

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<p>4. Teachers use the 800m data as a particular example different from that which the pupils investigate. If and how teachers use this data with pupils will depend on how much guidance pupils need. It may be used to guide particular individuals or a group of pupils through the preliminary investigation.</p>	<p>(See TL3: Basic comparison for 800m for further advice on this). It is to important avoid being too directive if pupils are seriously to engage with ideas about how they might handle the data.</p> <p>(See TL 4: The issue of independent thinking)</p> <p>After this discussion, allow groups time to complete these initial calculations for their event.</p>
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Part 3: A fair comparison

The teacher uses pupil's initial responses to build meaning for what a 'fair' comparison of events might be. (15 minutes).

Activities	Teaching and Learning Notes
<p>5. Encourage pupils to identify reasons why comparing absolute difference from first performance to most recent performance is not a fair comparison. (See TL6 and TL7 for issues to discuss.)</p> <p>Key Question:</p> <ul style="list-style-type: none"> · <i>"Is this a fair comparison?"</i> 	<p>For background details of why these six events were chosen and how they differ in terms of relative improvement, (See TL5: Key features in the improvements of selected events)</p> <p>Set pupils the challenge of identifying how they may complete a 'fair' comparison of improvements in their event and allow them to discuss this with their group.</p> <p>One issue is that the comparison should be comparing like with like. (See TL 6: Comparing Like with Like).</p> <p>Another issue is that many of the 1896 Olympics events were run in ways very different to later years and the results are major outliers. Pupils may notice this themselves or you may need to direct their attention to this. Reasons for this are given in:</p> <p>TL7: 1896 - A major outlier.</p>

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<p>6. After a short period, get pupils to provide possible techniques for completing a fair comparison. See TL6 for possible options.</p>	<p>Allow pupils to select the method they would like to use to complete an enquiry into the Case question.</p> <p>Reflect briefly with the class about the key points they learnt through identifying a 'fair' comparison. See TL6 for key points.</p>
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Part 4: The notion of a Maths Enquiry

Pupils focus on what will be expected of them in completing a good enquiry by building an understanding of how to work through an enquiry and the components of a high quality enquiry. (10 minutes).

Activities	Teaching and Learning Notes
<p>7. As a guide for pupils for working through an enquiry and how they should present their work, provide pupils with the 'enquiry process' handout describing the elements of an enquiry and discuss.</p> <p>8. Provide pupils with three sample enquiries; one of which is high quality, one is of medium quality and one is of low quality.</p> <p>Key Questions For Homework:</p> <ul style="list-style-type: none"> · <i>What are the components of an Enquiry report?</i> · <i>Put the three example enquiry reports in order from best to worst, and explain why you ranked them in this way.</i> 	<p>Possible solutions shown in Enquiry process solutions. Do not give this to pupils at this stage. You can use this to help shape the discussion of the homework at the start of Lesson 2.</p> <p>These sample enquiries answer the question using the calculations pupils have just completed. For the homework task, it is not intended that pupils complete a full enquiry answering the same question or using the calculations they have just completed. However by lesson 2 they do need to have completed what they regard as a fair comparison for their event.</p>

Homework:

For homework pupils are asked to put the sample enquiries in order and identify what makes a high quality enquiry and record these features in the final column on their '**enquiry process**' handout. If necessary they finish their calculations for their event.