

ENRICH Mathematics Trial resources

Follow link to survey to provide feedback at [ENRICH feedback](#) by the 16th September.

L3 Olympic Winners



Introduction:

These mathematics activities are designed initially for use in an **Inquiry-Based Learning** approach to teaching mathematics. They will, however, serve a traditional approach to teaching just as effectively. They are designed with the following things in mind:

- Mixed ability groups;
- The idea that students develop their own solution strategies;
- The intention that a wide range of strategies are developed across the class;
- The expectation that students present, discuss, explain and mathematically justify their solutions;
- Everybody learning and participating so that *every* group member can present and explain a group's solution.

Note: For these activities access to calculators is *not* recommended. The intention is that students create their own strategies for solving the problems, even when quite large numbers may be involved, as this encourages increased mathematical skills and further brain development.**

Mathematics Goal: to use a range of additive and multiplicative strategies with whole numbers to gather, sort and display data using simple graphing techniques.

Literacy Goal: Present information using oral, visual and written language making sure your presentations are appropriate for the intended audience.

Vocabulary: presentation, predict, prediction, official, medalist, historical, determine, trends, summary, funding, recommendation, visually appealing

Task 1 purpose:

- to find information on previous Olympic winners and use this information to make a future prediction.
- Use oral and visual language features to create an easy to follow PowerPoint or goggle slides presentation.

Task 1 Olympic Winners

A. Prepare a presentation on the winning history of a specific Olympic event.

Each group is to create a presentation for the rest of the class in either PowerPoint or Goggle Slides.

B. Select an Olympic event, either mens or womens. Using the www.olympics.org/sports site and find the winners information for your chosen sport for the past 5 Olympic Games.

Your presentation must include:

- your graph showing times/distances for the winners in your chosen event;
- your prediction for the event in Rio 2016 and the process you went through to work it out.

How to gather the information for your chosen event.

- 1) Put the web address www.olympics.org/sports into your web browser. Depending on your

C. **Create** a graph to display the winning times/distances for your chosen Olympic event.

D. **Predict** the winning time/distance for this event at the Rio 2016 Olympic Games.

E. **Present and explain** your groups graph and prediction to the rest of your class. **Be prepared** to answer questions about your graph and prediction.

F. **Check** the winning time/distance against your prediction, after your chosen event has been held. How accurate were you?

Make sure you keep track of your working out for each of these tasks.



browser this will either take you to the sport page of the Official Olympic web site or to the home page. If you end up on the home page select the sports tab at the top of the page.

- 2) Select your preferred sport, e.g. swimming
- 3) Now chose the specific event within that sport, e.g. woman's 400 metres freestyle. On this page you will see the three medallist from the London 2012 games. Just underneath that will be the link for all medallist in your chosen event click on this and you will have all the information you need.

How to make a prediction based on historical information.

- Gather the historical information and create a graph
- Use the graph to determine general trends.
A trend is created when over time the winning times/distances get shorter or longer or stay about the same.
- Now make a prediction as to what you think might happen at this year's Olympic Games.

(Note: this is not simply making a random guess. Rather you are making an informed prediction based on historical information.

Useful Websites

<http://www.olympic.org>

This web-site is the official site for the Olympic movement and on here you will find an icon that will take you to a site which will give you information about the Rio 2016 games as well as other games and athletes both past and present.

http://hpsnz.org.nz/sites/all/modules/filemanager/files/HPSNZ_Investment_Decisions_Final_-_2015.pdf

High Performance Sport New Zealand's web address for funding information from the past 4 years.

<http://www.olympic.org/sports>

This web-site will give you access to the whole range of sports at the 2016 Rio Olympic Games and will allow you to trace winners from the entire modern Olympic Games.

<http://www.rio2016.com/en/olympic-games>

This web-site is the official web-site of the 2016 Rio Olympic Games and will give you news, lists of sports, and other general information about the 2016 Olympic Games.

https://en.wikipedia.org/wiki/2012_Summer_Olympics

Use this website for information on the London 2012 Olympic Games.

<http://www.bbc.com/sport/olympics/2012/medals/countries>

Medal information for the London 2012 Olympic Games.

Task 2 Purpose:

- To find out the number of medals, countries and athletes there were at the London 2012 Olympics and calculate each countries equal share.
- Prepare an information poster showing medal information from the London 2012 Olympic Games

Task 2:

Medals, Medals, Medals



Medals from the 2012 London Olympic Games.

A. Prepare a Medal Information Poster

- B. To **Calculate the number** of medals in total (Gold, Silver, and Bronze) that were awarded at the London 2012 Olympics Games, find out how many separate events there were. Now multiply that number by 3, one each for gold, silver and bronze.
- C. **Work out** how many medals New Zealand would have won if each competing country got the same number of medals (i.e. an equal proportion),
- D. **Research** New Zealand's medal progress from the 2012 London Olympic Games. Did we get our share? Why, or why not?
- E. Now **think about** this in terms of how many competitors there were in total at the London Olympic Games. Does this give you a different way of thinking about how many medals New Zealand won? If this is used as the criteria did we get less than, equal to, or more than our share?

a. Your poster should include:

- The number of medals in total (Gold, Silver, & Bronze) awarded at the London 2012 Olympic Games
- The calculated New Zealand share of the medals
- The actual medals New Zealand won.
- An explanation of why these numbers might be different.
- Title, pictures, borders etc. to make your poster visually appealing.

<p>Complete the following two sentence stems using your calculations from the activities above to describe the proportions of medals New Zealand won. Include these sentences on your poster:</p> <p>In proportion to the number of countries participating New Zealand</p> <p>In proportion to the number of athletes competing New Zealand</p>	
--	--

<p>Task 3 Purpose:</p> <ul style="list-style-type: none"> - Find and graph New Zealand’s historical medal results in track cycling and use this as the basis for predicting the 2016 results. - To creatively use text and visual language features to clearly present information. 	
--	--

<p>Task 3:</p> <p style="text-align: center;">On your bike!</p> <p>A. New Zealand has been having a lot of success in track cycling over the past few years.</p> <ul style="list-style-type: none"> - Research our medal success in this sport over the last 3 Olympic Games. - Create a graph showing the results of your findings. - Use this information to help you predict how many medals New Zealand will win in Track Cycling at the 2016 Rio Olympics. - Decide whether your prediction would change if you looked at the results from the last 5 Olympic Games. - Examine the information you have gathered. Do you see any trends emerging from this data. <p>B. Write a brief summary of your findings in the cycling medal task.</p> <p>C. Using your summary from activity B as a basis write a report to the CEO of Cycling New Zealand, either supporting the current coaching and planning work they are doing, if it seems to be improving our results or suggesting alternatives if you think we could be doing better.</p>	<p>To find out how many Olympic cycling medals New Zealand has won:</p> <p>Put the web address www.olympics.org/sports into your web browser. Depending on your browser this will either take you to the sport page of the Official Olympic web site or to the home page. If you end up on the home page select the sports tab at the top of the page.</p> <p>Now Select cycling and track through the past 3 Olympic Games, recording New Zealand’s Track Cycling medal total for each.</p> <p>Your summary should include:</p> <ul style="list-style-type: none"> - The graph you have created. - An explanation of what the graph shows. - Your conclusions and recommendations.
---	---



Task 4 Purpose:

- To calculate funding totals and percentages
- To write a recommendation based on and using numerical data

Task 4

A. Olympic Funding

- How much money did the government give to Olympic sports last year?
- How many different sports got government funding?
- How much would each sport get if the total amount was spread evenly across each sport?
- Look at Track Cycling and any two other sports you choose and determine how much government spending went on each sport.
- If the number of Olympic medals New Zealand wins at Rio 2016 is used as the criteria for success did the government get good value for money?
- How much did each medal 'cost' in terms of government funding?
- Did the sports that got the most money win the most medals?
- If you were Prime Minister would you continue to give this amount of money to sport? Why or why not?

B. Recommendations

- Write a recommendation to the Prime Minister about future funding for Olympic sports. You will need to write in a format suitable for convincing your audience to accept your position. You will need to have well thought out reasons to support the existing system or for any changes you recommend.

As an introduction to financial literacy and to better understand this activity, you may want to complete the activity 'Can you afford a pet' (p.1-5) in **Figure It Out** L2-3 Financial Literacy, The real cost of pets

- To find this out visit the High Performance Sport web page listed above.
- Find the total amount given to Olympic Sports.
- Divide this total by the number of sports. This will give you an even share for each sport.
- Now divide the total funding by the number of medals New Zealand won at the 2016 Rio Olympic Games.

Your recommendation should include the mathematical totals you calculated for total amount, cost per medal, an even share total and a total per sport based on the number of medals won.

	Your recommendation should have a clear statement of what you are proposing and at least 3 supporting reasons for your recommendation.
<p>For those who want a bit more...</p> <ul style="list-style-type: none"> – Take the total funding given to Olympic sports and divide that by the number of people who live in New Zealand. Does this give you a different perspective than you got looking at just the number of medals won? – Select three of the sports which received higher amounts of government funding. Use the www.olympics.org/sports and track those sports medal tallies over the past 3 Olympic Games. Display this data on a time series graph. Determine what trends, if any, appear from this graph. – Use the information gathered so far to determine the probability that the trends will continue if these sports retain the same level of funding. – Choose one of these three sports and divide the level of funding they received by the number of medals they won. Use this information to create a simple algebraic expression that determines level of funding per medal. – Use this algebraic expression to determine the level of funding required to double this sports medal count. 	
<p>How effective was I in meeting my mathematics goals?</p> <p>What did I do well?</p> <p>What do I still need to work on?</p>	<p>Was I able to create a graph of winning times/distances?</p> <p>Was I able to make a reasonable prediction of the winning time/distance?</p>
<p>How effective was I in meeting my Literacy goal?</p> <p>What did I do well?</p> <p>What do I still need to work on?</p>	<p>Was I able to write a report using historical factual information and make a recommendation based on that historical information.</p>