

MATHS SESSION: MEASURING THE GAPS

Age range: 9–14 years

<p>Outline</p> <p>Learners will explore the numbers of medals and athletes of countries that participated in the London 2012 Olympic Games. They will investigate the way medals are distributed when countries are grouped according to income (as well as looking at which groups of countries win the most medals for particular sports), and consider other possible factors that might affect how many medals a country achieves. Learners will then consider the meaning of in-country inequality and order countries on a scale according to how fair or unfair they are.</p>	
<p>Learning objectives</p> <ul style="list-style-type: none"> • To interpret data in tables and use percentages to compare amounts. • To present data in a bar chart. • To understand that the countries taking part in the Olympic Games don't have an equal chance of winning medals and to recognise that country income, along with other factors, may affect the number of medals that a country wins. • To know that inequality can also exist within countries and to order and mark numbers on a scale to show the "fairness scores" of different countries. 	<p>Learning outcomes</p> <ul style="list-style-type: none"> • Learners will interpret tabulated data to compare the percentages of countries in different income groups that win at least one Olympic medal. • Learners will present data in a bar chart to compare the percentages of countries in different income groups that win Olympic medals in different Olympic sports. • Learners will order countries on a scale according to a "fairness score" that shows the level of inequality in each country.
<p>Key questions</p> <ul style="list-style-type: none"> • What factors might affect how many athletes a country has and how many medals it wins (if any)? • Which sporting events do you think might have few or no athletes from lower-income countries taking part and winning medals? Why do you think this? • Which sporting events do you think might have more athletes from lower-income countries taking part? Why do you think this? 	<p>Resources</p> <ul style="list-style-type: none"> • <i>A sporting chance?</i> Maths slideshow: slides 1–18 • Resource sheets: <ol style="list-style-type: none"> 1. <i>Medals and athletes</i> 2. <i>Mean number of medals per athlete – complete</i> • Activity sheets: <ol style="list-style-type: none"> 1. <i>Mean number of medals per athlete – blank</i> 2. <i>Low-income countries</i> 3. <i>Lower-middle-income countries</i> 4. <i>Upper-middle-income-countries</i> 5. <i>High-income countries</i> 6. <i>Olympic sports – open to all?</i> 7. <i>Bar chart A</i> 8. <i>Bar chart B</i> 9. <i>Fairness score scale A</i> 10. <i>Fairness score scale B</i>

Curriculum links		
<p>England <i>Pupils should be taught to:</i> KS2 Mathematics Ratio and proportion</p> <ul style="list-style-type: none"> Solve problems involving the calculation of percentages and the use of percentages for comparison. <p>Statistics</p> <ul style="list-style-type: none"> Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts. Complete, read and interpret information in tables. <p>KS3 Mathematics Number</p> <ul style="list-style-type: none"> Express one quantity as a percentage of another and compare two quantities using percentages. <p>Statistics</p> <ul style="list-style-type: none"> Construct and interpret appropriate tables, charts, and diagrams, including bar charts, for ungrouped and grouped numerical data. 	<p>Wales KS2 & KS3 Mathematics Developing numerical reasoning:</p> <ul style="list-style-type: none"> KS2: Review: draw conclusions from data and recognise that some conclusions may be misleading or uncertain KS3: Review: explain and justify strategies, methods, reasoning and conclusions in a variety of different ways, including orally, graphically, in writing (both in mathematical notation and without), and using appropriate digital literacy equipment <p>Using number skills</p> <ul style="list-style-type: none"> Fractions, decimals, percentages and ratio <p>Using data skills</p> <ul style="list-style-type: none"> Collect and record data Present and analyse data Interpret results 	<p>Scotland Numeracy and mathematics Percentages, ratio and proportion:</p> <ul style="list-style-type: none"> I can solve problems by carrying out calculations with a wide range of fractions, decimal fractions and percentages, using my answers to make comparisons and informed choices for real-life situations. MNU 2 and 3-07a <p>Data and analysis:</p> <ul style="list-style-type: none"> I can work collaboratively, making appropriate use of technology, to source information presented in a range of ways, interpret what it conveys and discuss whether I believe the information to be robust, vague or misleading. MNU 2 and 3-20a I can display data in a clear way, choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology. MTH 2, 3-21a <p>Mathematics – its impact on the world</p> <ul style="list-style-type: none"> I have discussed the importance of mathematics in the real world. MTH 2-4,12a

Note: For this session, learners will need an understanding of the term “inequality”, introduced in the Introductory slideshow. You might also like to consult the Teachers’ Overview.

Activity 1 (20 min)

Counting up the medals and athletes

- Use slide 3 to share some key facts about the Rio 2016 Olympic Games. Explain that 10,500 athletes from 206 nations* will be taking part. During the 17 days of the games there will be 306 medal events. For each event, three medals will be awarded – gold, silver and bronze. Ask learners to use this information to calculate or estimate the answers to the following questions:
 - *How many medals will be awarded in total during the games?*
 - *If each nation participated in every single sporting event and had an equal chance of winning a medal, approximately how many medals would each nation expect to win?*

**Note: Most of these nations are countries but a small number are states and territories that are not formally recognised as countries, such as the British Virgin Islands.*

- Ask learners whether they think that in reality each nation will end up with the same number of medals. Encourage them to give reasons for their answers.
- Ask learners where and when the last Olympic Games took place (London, in 2012). Explain that 204 nations took part in the London 2012 Olympic Games and 85 of these won at least one medal. Show slide 4 and say that these are the flags of some of these 85 nations. Ask learners which flags they can identify. *Note: The correct answers are provided in the slide notes.*
- Now ask learners which nations they think won the most medals at the London 2012 Olympics and discuss their reasons for their ideas. For example, their ideas might be based on knowledge or assumptions about particular countries or what they remember from watching coverage of the London 2012 Olympic Games.
- Explain that in order for an athlete to take part in an Olympic sporting event, they need to qualify by meeting the standard needed. Point out that not all of the participating nations will have athletes who qualify to participate in every sporting event.
- Show slide 5 and ask learners to order the countries according to how many athletes took part from each of these countries in the London 2012 Olympics. Encourage them to give reasons for their ideas. Click forward on the slide to show the number of athletes for each nation and discuss learners’ responses to the data.
- Organise learners into pairs and distribute copies of *Medals and athletes* (Resource sheet 1). Explain that this table shows the number of participating athletes and the total number of medals (gold, silver or bronze) awarded to each of the 85 countries who achieved at least one medal in the London 2012 Olympic Games.
- Ask learners to look at the table and think about the following questions:
 - *Which country was awarded the highest number of medals? (Answer: United States)*
 - *Which of these countries had the highest number of athletes participating? (Answer: UK)*
 - *Which of these countries had the lowest number of athletes participating? (Answer: Botswana)*

- Choose two countries. What is the difference between their medal totals? Repeat this for other pairs of countries.
- Choose two countries. What is the difference between the numbers of participating athletes from each country? Repeat this for other pairs of countries.
- Are you surprised by which countries won the most medals or is this what you expected?
- Are there any countries you expected to get a medal which are missing from the table? Which ones and why did you think this?
- Discuss the following questions. Use the question “Why?” repeatedly to help develop learners’ thinking.
 - What factors might affect how many athletes a country has and how many medals it wins (if any)? Possible suggestions might include population size, the resources and training facilities available, star Olympic athletes and the popularity of Olympic sports in the country.
 - Do you think it is fair that some countries have so many athletes and others have so few? For example, for every one athlete from Sierra Leone, there were 128 athletes from the UK. Point out that all these athletes from all these countries will have trained very hard to take part in the Olympics. Nevertheless where you come from may affect your overall chances of taking part and winning a medal.
- Explain that in the next activity, learners are going to be investigating some of the possible reasons why some nations achieve more Olympic medals than others.
- Finish the activity by discussing whether or not learners think that winning medals is the most important thing about taking part in the Olympics. Show slide 6 and draw out the point that the Olympics aren’t just about winning medals; more importantly they are about taking part and the Olympic and Paralympic values of Friendship, Respect, Excellence, Determination, Inspiration, Courage and Equality.

Differentiation

- *Make it harder:*
 - Explain that learners are going to work collaboratively to calculate the mean number of medals per athlete for each of the 85 countries.
 - Organise learners into pairs and give each pair a copy of Mean number of medals per athlete – blank (Activity sheet 1). Ask each pair to calculate the mean number of medals per athlete for five or six countries. Learners should record their answers to two decimal places.
 - Then collate the data and ask learners to calculate which of the countries has the highest mean number of medals per athlete (the answer is Botswana with 0.25 medals per athlete).
 - A completed version of the table with the mean number of medals per athlete for each country is provided in Mean number of medals per athlete – complete (Resource sheet 2).

Activity 2 (25 min)

Income and medal inequalities

- Remind learners that in the last activity they found out that some nations participating in the London 2012 Olympic Games achieved many more medals than others, and they began to think

about possible reasons for this. Explain that in this activity learners are going to investigate whether there might be a link between the average income per person of a country and the number of Olympic medals it wins.

- Explain that there are huge differences between the incomes of countries. An organisation called The World Bank pays close attention to this. It lends money to different countries, and calculates countries' "income", which they work out as an average per person, to be able to compare countries with more or fewer people. To calculate it they add up the total amount of money being made in that country over the year. They then divide this by the number of people in the country. They do this calculation in dollars so they can compare all countries fairly. The World Bank then sorts countries into different groups depending on their income.
- Show slide 7 and ask learners which income group they think each of the countries shown is in. Discuss learners' ideas and their reasons for them. Click forward on the slide to reveal the correct answers and discuss learners' responses. *Are they surprised by any of the answers? Which ones and why? Note: The average income per person for each of these countries is provided in the slide notes.*
- Organise learners into pairs or groups of three and give each group a copy of one of the following activity sheets: *Low-income countries* (Activity sheet 2), *Lower-middle-income countries* (Activity sheet 3), *Upper-middle-income countries* (Activity sheet 4) or *High-income countries* (Activity sheet 5).
- Ask learners to look at the data in the table and calculate the following:
 - *Total number of countries*
 - *Total number of medals*
 - *Number of countries winning at least one medal*
 - *Percentage of countries winning at least one medal*
- Bring learners back together at the end to share their findings. Discuss the following questions (also provided on slide 8).
 - *Which group of countries has the highest percentage of countries winning at least one medal?*
 - *Which group of countries has the lowest percentage of countries winning at least one medal?*
 - *Why do you think the percentage of countries winning at least one medal is greater in the higher-income country groups than in the lower-income country groups?*
 - *According to these data, which group of countries is the most likely to contain a country that wins at least one medal? Which group of countries is the least likely to contain a country that wins at least one medal?*
 - *What other factors might affect the chances a country has of winning at least one medal?* Possible suggestions might include the population size, the resources and training facilities available, star Olympic athletes and the popularity of a sport in the country.

Differentiation

- *Make it easier:* Give learners copies of Low-income countries (Activity sheet 2) or Lower-middle-income countries (Activity sheet 3).
- *Make it harder:* Give learners copies of Upper-middle-income countries (Activity sheet 4) or High-income countries (Activity sheet 5).

Activity 3 (40 min)

Olympic sports – open to all?

- Remind learners that in the last activity they compared the medal totals of countries in different income groups. Explain that in this activity, learners are going to investigate the medal totals of countries in different income groups for different sporting events.
- Ask learners to name as many Olympic sporting events as they can. Some examples are provided on slide 9 and a list of the Olympic sports in the Rio 2016 Olympic Games is available here: www.rio2016.com/en/sports

Alternatively you might like to do this as a board race, with learners organised into groups of four to six. A board race is run like a relay, with the person at the front of each team running up to the board or piece of paper and writing something related to the question or topic. As soon as they have written something they run back to their team and hand the pen to the next person in line and then go to the back of the queue. The next person then has a go but they must not repeat anything that is already written on their group's piece of paper or section of the board. The process is repeated until the time is up. At the end of the race, ask learners to sit down, then count the number of answers for each team.

- Now discuss the following questions (also provided on slide 10):
 - *Which sporting events do you think might have few or no athletes from lower-income countries taking part and winning medals? Why do you think this?*
 - *Which sporting events do you think might have more athletes from lower-income countries taking part? Why do you think this?*
 - *How could you investigate this?*
- Explain that learners are going to investigate this by looking at the medal totals of the four different groups of countries for some different sporting events. Organise learners into pairs and give each pair a copy of *Olympic sports – open to all?* (Activity sheet 6).
- Ask learners to draw a bar chart to represent the data (see below for differentiation). Templates are provided in *Bar chart A* (Activity sheet 7) and *Bar chart B* (Activity sheet 8).
- Finally, ask learners to discuss and answer the following questions in their pairs (these questions are also provided on Activity sheet 6).
 - *In which of these sports do you think a country's income is not so important for winning a medal? Why do you think this is?* You may need to point out that these are sports where countries from a range of income groups won medals.
 - *In which of these sports do you think country income is very important for winning a medal? Why do you think this is?* You may need to point out that these are sports where countries from only the highest-income groups won medals.

- *Do you think this inequality is fair? Why do you think this?*
- Remind learners that there are other factors besides income which may affect whether a country wins a medal in a particular sport. As discussed in the previous activities, possible factors include the size of a country's population, the resources and training facilities available, star Olympic athletes and the popularity of a sport in the country.

Differentiation

- *Make it easier: Ask learners to use Bar chart A (Activity sheet 7) to draw a bar chart to show the medal totals by country income group for one of the Olympic sports.*
- *Make it harder: Ask learners to use Bar chart B (Activity sheet 8) to draw a grouped bar chart to show the medal totals by country income group for all 10 Olympic sports.*

Activity 4 (30 min)

In-country gaps

- Explain that in the last activities, learners explored the differences in income and medal totals between countries. Show slide 11 and say that these are examples of between-country inequalities. Some countries are wealthy while others are extremely poor.
- Show slide 12 and explain that there is also often inequality within countries, meaning that some people in that country have only a little and others have a lot. Draw out the point that each country's average income per person is just that, an average, and there will be some people with much higher incomes and some people with incomes that are much lower.
- Show slide 13 and explain that this in-country inequality exists in many countries around the world, including the UK. For example, in 2014, Oxfam found that the five richest families in the UK were wealthier than the bottom 20% of the population. That's just five households with more money than 12.6 million people. Discuss learners' responses to this statistic. *Do you think this inequality fair?*
- Explain that there are different ways of measuring in-country inequality. One way is called the Gini index or ratio. We can think of this as a type of fairness score which shows how equal or unequal a country is.
- Show slide 14 and explain that a fairness score of 0 would mean that everyone in the country had exactly the same amount of money; there was no income inequality. In reality, no countries are like this. Discuss learners' thoughts about this possibility. *Would it be fair if everyone earned the same amount of money?* There might be reasons why some people should earn more. For example, some people will have more senior positions of responsibility in the workplace, or want to work for less time because they want or need to spend time with their families or doing other things.
- Show slide 15 and explain that a fairness score of 100 would mean that the country was completely unequal. In reality, no country is like this either. Discuss learners' thoughts about this possibility. *Do you think this is fair? Would you like to be considerably richer than everyone else? Would you like to be on the other side, with no money at all?*
- Show slide 16 and explain that all countries are actually somewhere in the middle of 0 and 100. More equal countries are closer to 0 and more unequal countries are closer to 100. Click forward

on the slide to show the fairness scores for the UK and Brazil.

- Give each learner a copy of *Fairness score scale A* (Activity sheet 9) or *Fairness score scale B* (Activity sheet 10) and ask them to mark the countries on the scale according to their fairness score. In *Fairness score scale A* the divisions on the scale are labelled to support learners. In *Fairness score scale B*, the divisions on the scale are unlabelled and learners also have to read the scale to find the fairness scores for some of the countries.
- Discuss which of these countries, according to these data, is the most equal (Ukraine) and which is the most unequal (South Africa). Show slide 17 and explain that this world map shows how the countries of the world compare on income inequality according to the Gini index. Countries that are more equal are shaded in green. Countries that are more unequal are shaded in pink, orange and red. Discuss learners' responses to the map. *According to this map, which countries are the most unequal? Which countries are the most equal?*
- Point out that the Gini index is only one way of measuring in-country inequality and explain that there are other methods. Say that some people also think that it is more important to measure other things about a country, such as how happy people are or how equal (or unequal) life is for women and men.
- Finish by showing slide 18 and make the point that inequality isn't just about how money is shared out between or within countries. Inequality also affects the opportunities that people have. For example in sport, some athletes have access to better facilities and training than others. Ask learners to think about other ways in which people's lives and opportunities might be unequal.

Differentiation

- *Make it easier:* Give learners Fairness score scale A (Activity sheet 9) to complete.
- *Make it harder:* Give learners Fairness score scale B (Activity sheet 10) to complete.

Further ideas

- Play *Olympic Trumps* to investigate other inequalities between some of the countries participating in the London 2012 Olympic Games. See the *A Sporting Chance?* geography session.
- Explore the flags of the different nations participating in the Olympic Games. *What patterns can you see? What 2-D shapes and types of angles are there? Which flags have lines of symmetry?*
- Investigate the number of qualifying athletes and medal totals from the nations that participated in the London 2012 Paralympic Games. Consider possible reasons why some nations have many more athletes and medals than others. Compare these data to the athlete and medal totals from the Olympic Games in London in 2012. *What similarities and differences are there between the data?*
 - For a list of participating athletes by nation in the London 2012 Olympic Games, see: www.theguardian.com/sport/datablog/2012/jul/27/london-olympic-athletes-full-list
 - For details of the Olympic medal totals by nation, see: www.olympic.org/olympic-results
 - For a list of medal totals and numbers of participating Paralympic athletes by nation, see:



www.paralympic.org/results/historical

- For resized world maps according to the numbers of participating Olympic and Paralympic athletes from each country, see: www.viewsoftheworld.net/?p=2541
- Research the numbers of male and female athletes from different nations competing in the Olympic Games. Compare different nations and think critically about why some nations might have more men participating than women. Investigate data from previous Olympic Games to explore how the participation of women has changed over time.
 - For further information about women in the Olympic movement see: www.olympic.org/Documents/Reference_documents/Factsheets/Women_in_Olympic_Movement.pdf
- Learn more about the causes of inequality and explore potential consequences for the lives of young people in different parts of the world, including the UK.
 - See Oxfam's *Everyone Counts* maths resource for learners aged 8–12: www.oxfam.org.uk/education/resources/everyone-counts
 - See Oxfam's *More or Less Equal?* maths resource for learners aged 11–16: www.oxfam.org.uk/education/resources/more-or-less-equal-maths

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Medals and athletes

Resource sheet 1

Country	Number of athletes	Medal total	Country	Number of athletes	Medal total	Country	Number of athletes	Medal total
United States	531	103	Sweden	140	8	Estonia	33	2
China	371	88	Ethiopia	35	7	Greece	105	2
Russian Federation	435	82	Georgia	35	7	Indonesia	22	2
United Kingdom	556	65	Mexico	106	7	Latvia	46	2
Germany	395	44	Croatia	110	6	Malaysia	30	2
Japan	303	38	India	83	6	Moldova	22	2
Australia	413	35	North Korea	55	6	Puerto Rico	25	2
France	335	35	South Africa	133	6	Qatar	12	2
Italy	281	28	Ireland	66	5	Singapore	23	2
South Korea	255	28	Lithuania	62	5	Taiwan	44	2
Netherlands	182	20	Mongolia	29	5	Afghanistan	6	1
Ukraine	236	20	Turkey	114	5	Algeria	39	1
Canada	279	18	Argentina	142	4	Bahamas	26	1
Hungary	158	18	Norway	65	4	Bahrain	12	1
Brazil	266	17	Serbia	116	4	Botswana	4	1
Spain	289	17	Slovakia	46	4	Cyprus	13	1
Cuba	110	14	Slovenia	68	4	Gabon	28	1
Kazakhstan	115	13	Switzerland	106	4	Grenada	10	1
New Zealand	196	13	Trinidad and Tobago	31	4	Guatemala	19	1
Belarus	172	12	Armenia	25	3	Hong Kong	42	1
Iran	53	12	Belgium	118	3	Kuwait	10	1
Jamaica	50	12	Finland	56	3	Montenegro	34	1
Kenya	50	11	Thailand	37	3	Morocco	72	1
Azerbaijan	53	10	Tunisia	84	3	Portugal	80	1
Czech Republic	133	10	Uzbekistan	54	3	Saudi Arabia	19	1
Poland	217	10	Bulgaria	63	2	Tajikistan	16	1
Denmark	115	9	Dominican Republic	35	2	Uganda	16	1
Romania	103	9	Egypt	116	2	Venezuela	69	1
Colombia	109	8						

Data source: *Olympics 2012: the alternative medals table* (Simon Rogers, The Guardian, 2012) www.theguardian.com/sport/datablog/2012/jul/30/olympics-2012-alternative-medal-table#data; International Olympic Committee, www.olympic.org/olympic-results

Mean number of medals per athlete – blank

Activity sheet 1

Country	Number of athletes	Medal total	Mean number of medals per athlete (to 2 decimal places)	Country	Number of athletes	Medal total	Mean number of medals per athlete (to 2 decimal places)	Country	Number of athletes	Medal total	Mean number of medals per athlete (to 2 decimal places)
United States	531	103		Sweden	140	8		Estonia	33	2	
China	371	88		Ethiopia	35	7		Greece	105	2	
Russian Federation	435	82		Georgia	35	7		Indonesia	22	2	
United Kingdom	556	65		Mexico	106	7		Latvia	46	2	
Germany	395	44		Croatia	110	6		Malaysia	30	2	
Japan	303	38		India	83	6		Moldova	22	2	
Australia	413	35		North Korea	55	6		Puerto Rico	25	2	
France	335	35		South Africa	133	6		Qatar	12	2	
Italy	281	28		Ireland	66	5		Singapore	23	2	
South Korea	255	28		Lithuania	62	5		Taiwan	44	2	
Netherlands	182	20		Mongolia	29	5		Afghanistan	6	1	
Ukraine	236	20		Turkey	114	5		Algeria	39	1	
Canada	279	18		Argentina	142	4		Bahamas	26	1	
Hungary	158	18		Norway	65	4		Bahrain	12	1	
Brazil	266	17		Serbia	116	4		Botswana	4	1	
Spain	289	17		Slovakia	46	4		Cyprus	13	1	
Cuba	110	14		Slovenia	68	4		Gabon	28	1	
Kazakhstan	115	13		Switzerland	106	4		Grenada	10	1	
New Zealand	196	13		Trinidad and Tobago	31	4		Guatemala	19	1	
Belarus	172	12		Armenia	25	3		Hong Kong	42	1	
Iran	53	12		Belgium	118	3		Kuwait	10	1	
Jamaica	50	12		Finland	56	3		Montenegro	34	1	
Kenya	50	11		Thailand	37	3		Morocco	72	1	
Azerbaijan	53	10		Tunisia	84	3		Portugal	80	1	
Czech Republic	133	10		Uzbekistan	54	3		Saudi Arabia	19	1	
Poland	217	10		Bulgaria	63	2		Tajikistan	16	1	
Denmark	115	9		Dominican Republic	35	2		Uganda	16	1	
Romania	103	9		Egypt	116	2		Venezuela	69	1	
Colombia	109	8									

Olympics 2012: the alternative medals table (Simon Rogers, The Guardian, 2012) www.theguardian.com/sport/datablog/2012/jul/30/olympics-2012-alternative-medal-table#data; International Olympic Committee, www.olympic.org/olympic-results

Mean number of medals per athlete – complete

Resource sheet 2

Country	Number of athletes	Medal total	Mean number of medals per athlete (to 2 decimal places)	Country	Number of athletes	Medal total	Mean number of medals per athlete (to 2 decimal places)	Country	Number of athletes	Medal total	Mean number of medals per athlete (to 2 decimal places)
United States	531	103	0.20	Sweden	140	8	0.06	Estonia	33	2	0.06
China	371	88	0.24	Ethiopia	35	7	0.20	Greece	105	2	0.02
Russian Federation	435	82	0.19	Georgia	35	7	0.20	Indonesia	22	2	0.09
United Kingdom	556	65	0.12	Mexico	106	7	0.07	Latvia	46	2	0.04
Germany	395	44	0.11	Croatia	110	6	0.05	Malaysia	30	2	0.07
Japan	303	38	0.13	India	83	6	0.07	Moldova	22	2	0.09
Australia	413	35	0.08	North Korea	55	6	0.11	Puerto Rico	25	2	0.08
France	335	35	0.10	South Africa	133	6	0.05	Qatar	12	2	0.17
Italy	281	28	0.10	Ireland	66	5	0.08	Singapore	23	2	0.09
South Korea	255	28	0.11	Lithuania	62	5	0.08	Taiwan	44	2	0.05
Netherlands	182	20	0.11	Mongolia	29	5	0.17	Afghanistan	6	1	0.17
Ukraine	236	20	0.08	Turkey	114	5	0.04	Algeria	39	1	0.03
Canada	279	18	0.06	Argentina	142	4	0.03	Bahamas	26	1	0.04
Hungary	158	18	0.11	Norway	65	4	0.06	Bahrain	12	1	0.08
Brazil	266	17	0.06	Serbia	116	4	0.03	Botswana	4	1	0.25
Spain	289	17	0.06	Slovakia	46	4	0.09	Cyprus	13	1	0.08
Cuba	110	14	0.13	Slovenia	68	4	0.06	Gabon	28	1	0.04
Kazakhstan	115	13	0.11	Switzerland	106	4	0.04	Grenada	10	1	0.10
New Zealand	196	13	0.07	Trinidad and Tobago	31	4	0.13	Guatemala	19	1	0.05
Belarus	172	12	0.07	Armenia	25	3	0.12	Hong Kong	42	1	0.02
Iran	53	12	0.23	Belgium	118	3	0.03	Kuwait	10	1	0.10
Jamaica	50	12	0.24	Finland	56	3	0.05	Montenegro	34	1	0.03
Kenya	50	11	0.22	Thailand	37	3	0.08	Morocco	72	1	0.01
Azerbaijan	53	10	0.19	Tunisia	84	3	0.04	Portugal	80	1	0.01
Czech Republic	133	10	0.08	Uzbekistan	54	3	0.06	Saudi Arabia	19	1	0.05
Poland	217	10	0.05	Bulgaria	63	2	0.03	Tajikistan	16	1	0.06
Denmark	115	9	0.08	Dominican Republic	35	2	0.06	Uganda	16	1	0.06
Romania	103	9	0.09	Egypt	116	2	0.02	Venezuela	69	1	0.01
Colombia	109	8	0.07								

Data source: *Olympics 2012: the alternative medals table* (Simon Rogers, The Guardian, 2012) www.theguardian.com/sport/datablog/2012/jul/30/olympics-2012-alternative-medal-table#data; International Olympic Committee, www.olympic.org/olympic-results

Low-income countries

Activity sheet 2

Country	London 2012 Olympics medal total
Afghanistan	1
Benin	0
Burkina Faso	0
Burundi	0
Cambodia	0
Central African Republic	0
Chad	0
Comoros	0
Democratic Republic of Congo	0
Eritrea	0
Ethiopia	7
Gambia	0
Guinea	0
Guinea-Bissau	0
Haiti	0
Liberia	0
Madagascar	0
Malawi	0
Mali	0
Mozambique	0
Nepal	0
Niger	0
North Korea	6
Rwanda	0
Sierra Leone	0
Somalia	0
Tanzania	0
Togo	0
Uganda	1
Zimbabwe	0

Total number of countries:

Total number of medals:

Number of countries winning at least one medal:

Percentage of countries winning at least one medal:

Data sources:

Country and lending groups: World Bank, 2016, data.worldbank.org/about/country-and-lending-groups

Olympic medal totals: International Olympic Committee, www.olympic.org/olympic-results

Lower- middle-income countries

Activity sheet 3

Country	Medal total	Country	Medal total
Armenia	3	Moldova	2
Bangladesh	0	Morocco	1
Bhutan	0	Myanmar	0
Bolivia	0	Nicaragua	0
Cameroon	0	Nigeria	0
Cape Verde	0	Occupied Palestinian Territories	0
Congo-Brazzaville	0	Pakistan	0
Djibouti	0	Papua New Guinea	0
East Timor	0	Philippines	0
Egypt	2	Samoa	0
El Salvador	0	São Tomé and Príncipe	0
Georgia	7	Senegal	0
Ghana	0	Solomon Islands	0
Guatemala	1	Sri Lanka	0
Guyana	0	Sudan	0
Honduras	0	Swaziland	0
India	6	Syria	0
Indonesia	2	Tajikistan	1
Ivory Coast	0	Ukraine	20
Kenya	11	Uzbekistan	3
Kiribati	0	Vanuatu	0
Kyrgyz Republic	0	Viet Nam	0
Laos	0	Yemen	0
Lesotho	0	Zambia	0
Mauritania	0		
Micronesia	0		

Total number of countries: _____

Total number of medals: _____

Number of countries winning at least one medal: _____

Percentage of countries winning at least one medal: _____

Data sources:

Country and lending groups: World Bank, 2016, data.worldbank.org/about/country-and-lending-groups

Olympic medal totals: International Olympic Committee, www.olympic.org/olympic-results

Upper-middle-income countries

Activity sheet 4

Country	Medal total	Country	Medal total
Albania	0	Libya	0
Algeria	1	Macedonia	0
American Samoa	0	Malaysia	2
Angola	0	Maldives	0
Azerbaijan	10	Marshall Islands	0
Belarus	12	Mauritius	0
Belize	0	Mexico	7
Bosnia and Herzegovina	0	Mongolia	5
Botswana	1	Montenegro	1
Brazil	17	Namibia	0
Bulgaria	2	Palau	0
China	88	Panama	0
Colombia	8	Paraguay	0
Costa Rica	0	Peru	0
Cuba	14	Romania	9
Dominica	0	Serbia	4
Dominican Republic	2	South Africa	6
Ecuador	0	St. Lucia	0
Fiji	0	St. Vincent and the Grenadines	0
Gabon	1	Suriname	0
Grenada	1	Thailand	3
Iran	12	Tonga	0
Iraq	0	Tunisia	3
Jamaica	12	Turkey	5
Jordan	0	Turkmenistan	0
Kazakhstan	13	Tuvalu	0
Lebanon	0		

Total number of countries: _____

Total number of medals: _____

Number of countries winning at least one medal: _____

Percentage of countries winning at least one medal: _____

Data sources:

Country and lending groups: World Bank, 2016, data.worldbank.org/about/country-and-lending-groups

Olympic medal totals: International Olympic Committee, www.olympic.org/olympic-results

High-income countries

Activity sheet 5

Country	Medal total	Country	Medal total	Country	Medal total
Andorra	0	Germany	44	Puerto Rico	2
Antigua & Barbuda	0	Greece	2	Qatar	2
Argentina	4	Guam	0	Russian Federation	82
Aruba	0	Hong Kong	1	San Marino	0
Australia	35	Hungary	18	Saudi Arabia	1
Austria	0	Iceland	0	Seychelles	0
Bahamas	1	Ireland	5	Singapore	2
Bahrain	1	Israel	0	Slovakia	4
Barbados	0	Italy	28	Slovenia	4
Belgium	3	Japan	38	South Korea	28
Bermuda	0	Kuwait	1	Spain	17
Brunei	0	Latvia	2	St. Kitts and Nevis	0
Canada	18	Liechtenstein	0	Sweden	8
Cayman Islands	0	Lithuania	5	Switzerland	4
Chile	0	Luxembourg	0	Taiwan	2
Croatia	6	Malta	0	Trinidad and Tobago	4
Cyprus	1	Monaco	0	United Arab Emirates	0
Czech Republic	10	Netherlands	20	United Kingdom	65
Denmark	9	New Zealand	13	United States	103
Equatorial Guinea	0	Norway	4	Uruguay	0
Estonia	2	Oman	0	Venezuela	1
Finland	3	Poland	10	Virgin Islands (US)	0
France	35	Portugal	1		

Total number of countries: _____

Total number of medals: _____

Number of countries winning at least one medal: _____

Percentage of countries winning at least one medal: _____

Data sources:

Country and lending groups: World Bank, 2016, data.worldbank.org/about/country-and-lending-groups

Olympic medal totals: International Olympic Committee, www.olympic.org/olympic-results



Olympic sports – open to all?

Activity sheet 6

Country income group	Athletics	Cycling-track	Equestrian	Gymnastics – artistic	Rowing	Sailing	Shooting	Swimming	Tennis	Wrestling
Low-income countries	8	0	0	0	0	0	0	0	0	1
Lower-middle-income countries	16	0	0	1	1	0	4	0	0	13
Upper-middle-income countries	32	3	0	12	2	2	12	19	2	23
High-income countries	85	28	18	29	39	28	29	83	13	35

In which of these sports do you think a country’s income is not so important for winning a medal? Why do you think this is?

In which of these sports do you think a country’s income is very important for winning a medal? Why do you think this is?

Do you think this inequality is fair? Why do you think this?

Data sources:

Country and lending groups: World Bank, 2016, data.worldbank.org/about/country-and-lending-groups

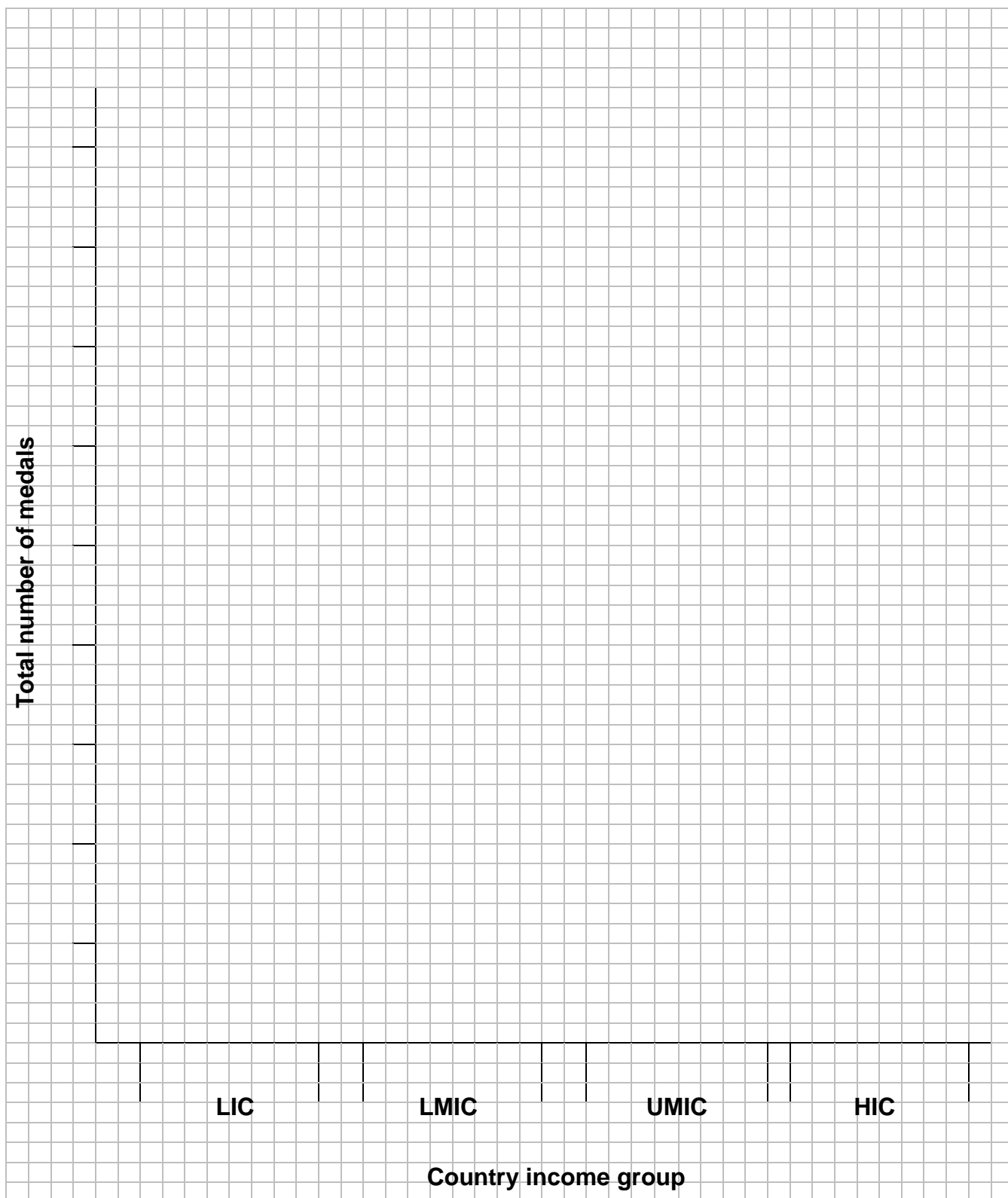
Olympic medal totals: International Olympic Committee, 2012, www.olympic.org/london-2012-summer-olympics



Bar chart A

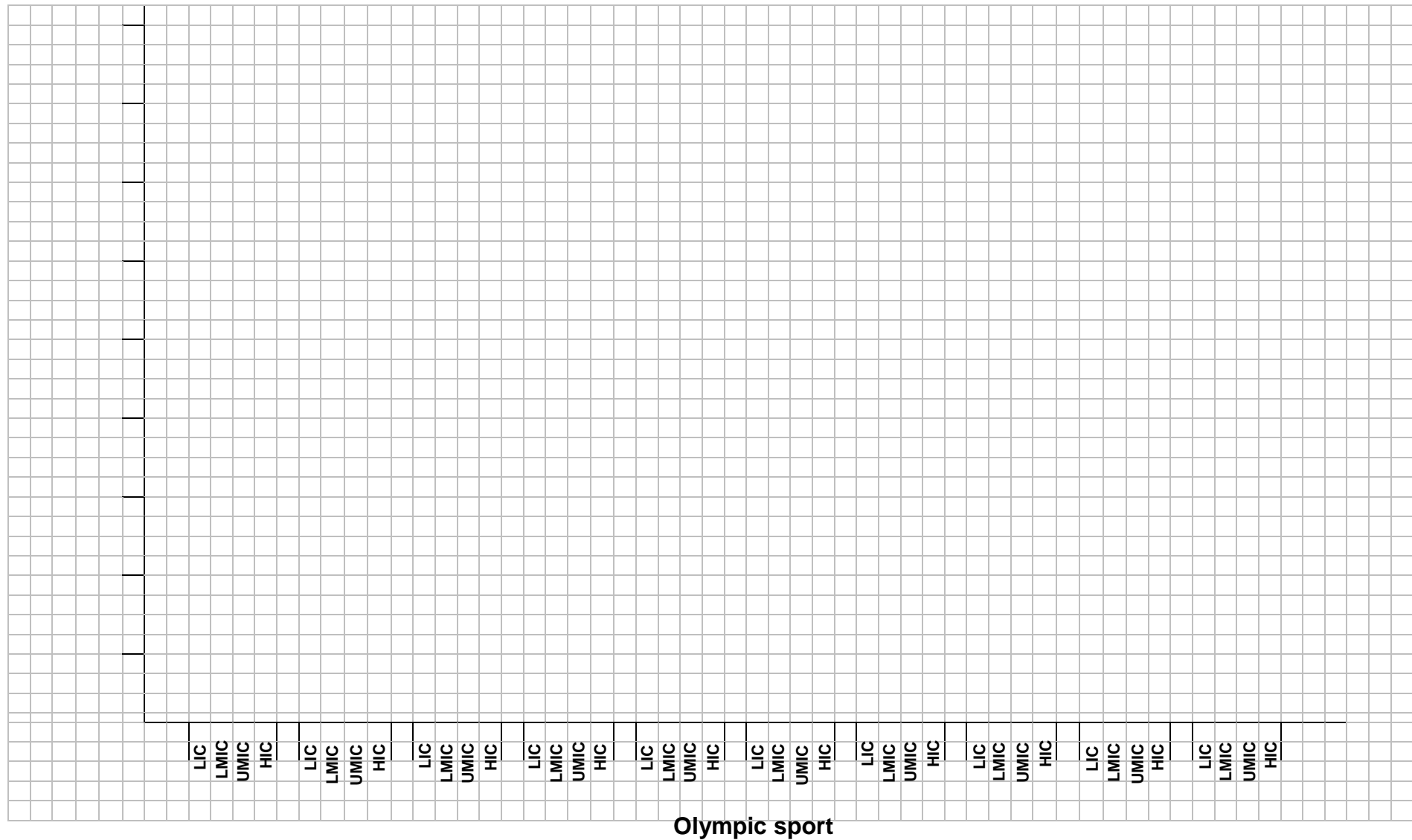
Activity sheet 7

Olympic sport: _____



Bar chart B

Activity sheet 8

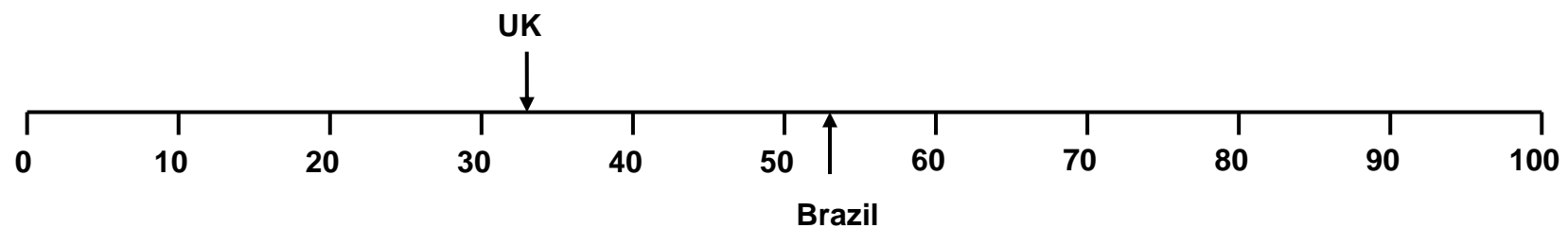


Fairness score scale A

Activity sheet 9

Country	Fairness score
Australia	35
Bolivia	48
Brazil	53
Bulgaria	36
China	42
Ethiopia	33
India	34
Jamaica	46

Country	Fairness score
Malawi	46
Nepal	33
Russian Federation	42
South Africa	63
Ukraine	25
United Kingdom	33
United States	41
Yemen, Rep.	36



Fairness score scale B

Activity sheet 10

Country	Fairness score
Australia	35
Bolivia	
Brazil	
Bulgaria	36
China	
Ethiopia	33
India	34
Jamaica	46

Country	Fairness score
Malawi	
Nepal	33
Russian Federation	42
South Africa	63
Ukraine	
United Kingdom	
United States	41
Yemen, Rep.	36

