Manchester United Museum & Tour

Education Sessions Key Stage 2

Numeracy: Data Handling.

Numeracy: Data Handling
FOLLOW-UP LESSONS

Year group: KS2	**Time:** 1 hour
Curriculum area: Numeracy	**Unit of work:** Data Handling (lesson 1)

Learning Objective(s):

- Describe the occurrence of familiar events using the language of chance or likelihood.

ADAPTED FROM YEAR 6 UNIT PLANS.

Mental/Oral

Give the class a quick test of mental arithmetic/times table questions. Get the children to mark each other's work.

Divide the class into small groups and give them a set of cards with words: likely, certain, impossible, unlikely and certain. Ask groups to put words into sentences to explain their meanings. Read out several statements to the class and ask them to choose a card to determine its likelihood.

Differentiation: lower ability to work with likely or unlikely only.

Main activity

Introduce events which have two equally likely outcomes:

- a new baby is equally likely to be a boy or a girl.

- if I roll a dice, it is equally likely to be an odd or even number. Discuss. Highlight associated language. Q. What does 'fair' as in a 'fair game' mean? Establish that a probability of 1 means certain, 0 means impossible and ½ means 1 in 2 chance (even chance). Put two different coloured bricks in a bag. What is the probability that the first brick pulled out will be e.g. green?

Differentiation:

More able chn – what if I then pull out a blue after a green? Discuss. How would this change if 2 blue and 2 green bricks were put in the bag? Discuss.

Plenary

Q. When rolling a fair dice numbered one to six, what is the probability of getting a two; one or two; three or six; an even number? Ask pupils to discuss their answer in pairs using appropriate vocab.

Draw up probability scale and encourage pupils to use it to express their answers.

NC/NLS references: New Framework Year 5 Block C. New Framework Year 6 Block C.	**Cross-curricular links:** Literacy – understanding fair and biased statements. Citizenship – working in pairs/groups.
Assesssment against the learning objective(s):	**Notes to inform future planning:**

Numeracy: Data Handling
FOLLOW-UP LESSONS

Year group: KS2	**Time:** 1 hour
Curriculum area: Numeracy	**Unit of work:** Data Handling (lesson 2)

Learning Objective(s):

- Find and interpret the mode of a set of data
- Describe and interpret results and solutions to problems using the mode, range, median and mean.

ADAPTED FROM YEAR 6 UNIT PLANS.

Mental/Oral

Show **Resource sheet 1** which is a line graph with both axes unmarked. Children will work in small groups to decide on appropriate scales for the axes. In pairs, prepare data to match graph. Highlight important features on graph.

Main activity

Q. What is the range of each set of data? Ask children to work in pairs to think how to organise the data.

Discuss definitions of mean, median and mode.

Differentiation:

More able children will attempt to work out the mean of both sets of data. How can they work this out quickly and effectively? Teacher to support more able children. Less able children will simply find the range by finding the smallest and largest amounts.

Plenary

How could we put the data about the tables test into a bar chart? Discuss. What would the axes be labelled?

What values would be needed? As a class, create a bar chart of the results.

NC/NLS references: New Framework Year 5 Block C. New Framework Year 6 Block C.	**Cross-curricular links:** Literacy – understanding fair and biased statements. Citizenship – working in pairs/groups.
Assesssment against the learning objective(s):	**Notes to inform future planning:**

Numeracy: Data Handling
FOLLOW-UP LESSONS

Year group: KS2	**Time:** 1 hour
Curriculum area: Numeracy	**Unit of work:** Data Handling (lesson 3)

Learning Objective(s):

- Construct and interpret frequency tables, bar charts with grouped discrete data, and line graphs; interpret pie charts.

ADAPTED FROM YEAR 6 UNIT PLANS.

Mental/Oral
Select a three-digit even number and ask pupils to keep halving it as far as they can go.
Practice finding halves of tenths, hundredths etc.
Ask pupils to state equivalences between simple fractions and percentages:
½ is 50%, ¼ is 25%, 1/10 is 10% and 1/100 is 1%.

Main activity
Show **Resource sheet 4** and explain that the data is represented by bars on the chart. What is the total number of drinks bought?
Q. What could the bars represent?
Q. What could the scales on the axes be?
Explain that the bar chart represents different drinks bought on a matchday. Now reveal the values of the drinks.
How should the scale on the axes be shown? Discuss.
Resource sheet 3 about ages of team. Ask questions about data, proportions etc.

Plenary
Discuss the pupils' observations. Invite groups to ask the class one of their questions.
Encourage development of questions that make inferences from the data.
Summarise key points in interpretation of simple pie charts.

NC/NLS references: New Framework Year 5 Block C. New Framework Year 6 Block C.	**Cross-curricular links:** Literacy – understanding fair and biased statements. Citizenship – working in pairs/groups.
Assesssment against the learning objective(s):	**Notes to inform future planning:**

Numeracy: Data Handling
FOLLOW-UP LESSONS

Year group: KS2	**Time:** 1 hour
Curriculum area: Numeracy	**Unit of work:** Data Handling (lesson 4)

Learning Objective(s):

- Describe and interpret results and solutions to problems using the mode, range, median and mean.

ADAPTED FROM YEAR 6 UNIT PLANS.

Mental/Oral

Show the class **Resource sheet 1** which shows a bar chart on which both axes are unmarked. Say that the graph represents the results from rolling a dice. Tell pupils that shortest bar represents times 4 rolled.
Q. What does the longest bar represent?
Most common = mode.
Ask children to suggest a scale for the graph. Does this help them to interpret the information more easily?
Differentiation: more able think of other contexts for graph.

Main activity

Show the class **Resource sheet 3** which shows the number of appearances, age and nationalities of Manchester United matchday football squad. Discuss and establish how to work out the mode of each type of data. Discuss how to work out range.
Children will then work out the answers to the questions on the sheet given. They may want to work in pairs or small groups.
Differentiation: Teacher to support more able and ask them to attempt to work out the mean (average). Discuss.
Ask children to find the mean shoe size for the class.

Plenary

Summarise the meanings of the range, median and the mean.
Demonstrate to the rest of the class how to work out the mean shoe size.
Ask them to find the mean shoe size for the class.

NC/NLS references: New Framework Year 5 Block C. New Framework Year 6 Block C.	**Cross-curricular links:** Literacy – understanding fair and biased statements. Citizenship – working in pairs/groups.
Assesssment against the learning objective(s):	**Notes to inform future planning:**

Numeracy: Data Handling
FOLLOW-UP LESSONS

Year group: KS2	**Time:** 1 hour
Curriculum area: Numeracy	**Unit of work:** Data Handling (lesson 5)

Learning Objective(s):

- Read and interpret scales on a range of measuring instruments, recognising that the measurement made is approximate and recording results to a required degree of accuracy; compare readings on different scales, for example when using different instruments.

ADAPTED FROM YEAR 6 UNIT PLANS.

Mental/Oral

Review different measures e.g. cm, m, mm, km, l, ml. Quick-fire questioning with children – ask how many e.g. mm in a cm. Teacher to ask questions, children to write down on whiteboards and show. Teacher to discuss and correct any misconceptions.

Main activity

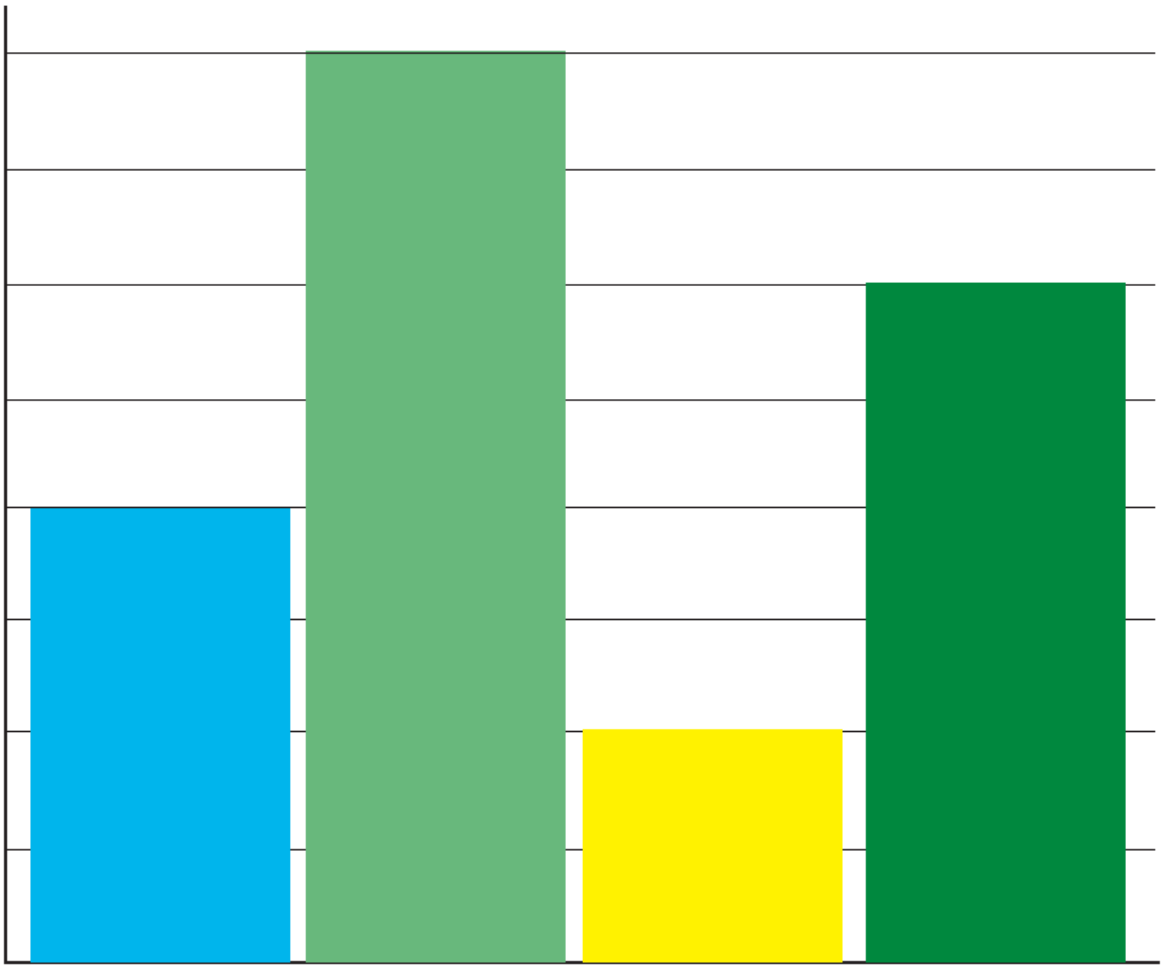
Write on the board e.g. Swinton to Manchester 5km. Show how to convert 5km into metres
Q. How do we convert 35 metres into km? Discuss responses.
Ask pupils which would be the furthest, 38km or 30000metres?
Pupils to work in pairs on a whiteboard.
Select 5 different km and work out equivalence in metres.
Discuss with their partner their method of interpretation.
Differentiation: Higher ability to convert centimetres in Km more accurately using decimals.

Plenary

Explain to pupils that temperature has two scales:
Centigrade and Fahrenheit.
Ask children to estimate which they think is larger, 26 degrees centigrade or 75 degrees Fahrenheit? Why? Explain that conversion data might not support their estimations.

NC/NLS references: New Framework Year 5 Block C. New Framework Year 6 Block C.	**Cross-curricular links:** Literacy – understanding fair and biased statements. Citizenship – working in pairs/groups.
Assesssment against the learning objective(s):	**Notes to inform future planning:**

Name: _____



NAME: _____

2010/2011 Goalscorers

Total number of goals scored = 120
Own goals = 3
Number of goals scored by players = 117
Number of goalscorers = 18

Player's Name	Estimated Number of Goals	Actual Number of Goals
Antonio Valencia		
Dimitar Berbatov		
Ryan Giggs		
Wayne Rooney		
Darren Fletcher		
Ashley Young		
Michael Owen		
Javier Hernandez		
Federico Macheda		
Danny Welbeck		
Ji Sung Park		
Luis Nani		
Paul Scholes		
Anderson		
Michael Carrick		
Phil Jones		
Chris Smalling		
Jonny Evans		
Own Goals	3	3

ANSWERS

2010/2011 Goalscorers

Total number of goals scored = 120
Own goals = 3
Number of goals scored by players = 117
Number of goalscorers = 18

Player's Name	Estimated Number of Goals	Actual Number of Goals
Antonio Valencia		6
Dimitar Berbatov		9
Ryan Giggs		4
Wayne Rooney		34
Darren Fletcher		2
Ashley Young		8
Michael Owen		3
Javier Hernandez		12
Federico Macheda		1
Danny Welbeck		12
Ji Sung Park		3
Luis Nani		10
Paul Scholes		4
Anderson		2
Michael Carrick		2
Phil Jones		2
Chris Smalling		2
Jonny Evans		1
Own Goals	3	3

Mean, Median, Mode and Range at Manchester United

Hey diddle diddle the median's the middle
You add then divide for the mean
The mode is the one you see the most
And the range is the difference between.

Find the **mode** nationality:

Find the **range** of the number of appearances:

Player	Nationality	Number of appearances
D. de Gea	Spain	8
P. Evra	France	254
P. Jones	England	10
R. Ferdinand	England	366
J. Evans	Northern Ireland	94
M. Owen	England	50
Anderson	Brazil	138
D. Berbatov	Bulgaria	134
W. Rooney	England	330
R. Giggs	Wales	884
C. Smalling	England	40
J.S. Park	South Korea	183
J. Hernandez	Mexico	52
N. Vidic	Serbia	235
M. Carrick	England	238
L. Nani	Portugal	165
A. Young	England	8
D. Welbeck	England	32
F. da Silva	Brazil	42
R. da Silva	Brazil	73
T. Cleverley	England	5
D. Fletcher	Scotland	296
A. Valencia	Ecuador	75
F. Macheda	Italy	28
T. Kuszczak	Poland	61
M. Diouf	Senegal	7
A. Lindegaard	Denmark	4
B. Amos	England	4
P. Pogba	France	1
R. Morrison	England	1

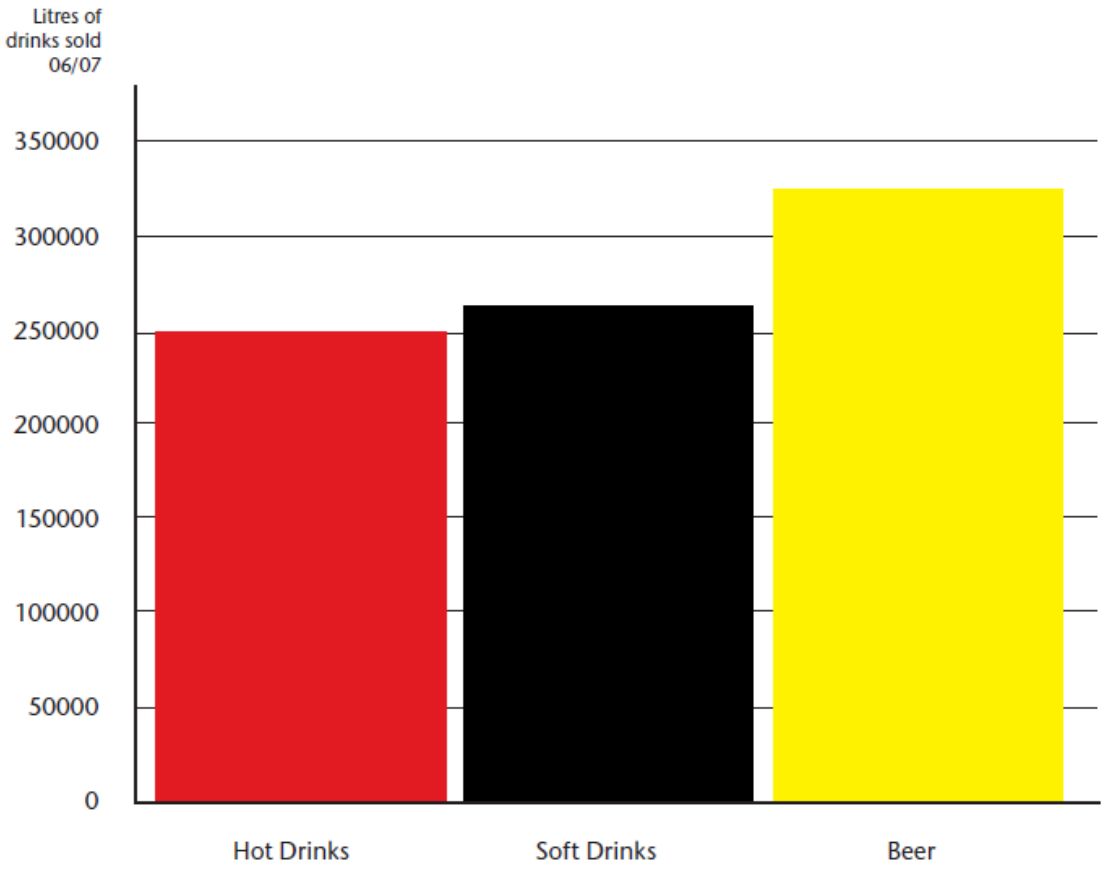
Find the mean age:

First Team Squad vs Norwich 1st October 2011

Name	Age
A. Lindegaard	27
A. Valencia	26
P. Jones	19
J. Evans	23
P. Evra	30
D. Fletcher	27
Anderson	23
L. Nani	24
J. S. Park	30
W. Rooney	25
J. Hernandez	23
Subs	
M. Owen	31
R. Ferdinand	32
M. Carrick	30
R. Giggs	37
D. Berbatov	30
D. Welbeck	20
D. de Gea	20

Mode nationality = England (11 players)
Range of appearances = 883 (884-1)
Mean age of starting 11 = 25.2
Mean age of matchday squad = 26.5

What could we find the **median** of?

Name: _____

Graph to show litres of drinks sold during the 2006/7 season at MUFC