East Renfrewshire Council: Education Department
Practitioner Moderation Template

Prior to the moderation exercise, please complete the following information and submit it to your facilitator with assessment evidence from one learner that you judge to have successfully attained the Es and Os.

Practitioner Code	S24
Curriculum Area(s)	Numeracy and Mathematics & Literacy and English
Level	Second
Stage(s)	P7

Experiences and Outcomes:

Having discussed the variety of ways and range of media used to present data, I can interpret and draw conclusions from the information displayed, recognising that the presentation may be misleading.
MNU 2-20a

When listening and talking with others for different purposes, I can:
• share information, experiences and opinions
• explain processes and ideas
• identify issues raised and summarise main points or findings
• clarify points by asking questions or by asking others to say more. **LIT 2-09a**

Learning Intentions:

We are learning to draw conclusions on presented data through discussion.

We are learning to summarise the main ways that data can be misleading.

Success Criteria:

Please list SC and give brief detail on how learners were involved in their creation.

- Discuss ways that data can be displayed and used in real life.
- Draw conclusions from a variety of data and graphs.
- Suggest main issues that make data misleading.
- Summarise the impact misleading data can have in real life.
- Share a real example of when data has been misleading *(suggested by the children).*

Briefly outline the context and range of quality **learning experiences** that have been planned making reference to the chosen design principles. Make specific reference to **breadth, challenge & application**.

Context - The pupils were learning about data handling in Numeracy and Mathematics which coincided with 'Black Friday' sales, which the children were interested in, meaning there were many graphs and data appearing in the news (Relevance). As always, the children were involved in the planning of their learning working from the outcomes. They shared what they already knew through key questioning and a carousel activity. Afterwards, they selected areas where they would like to feel more confident – one of these areas was understanding how data could be misleading (Personalisation and Choice).

Breadth – The children will have the experience of discussing various types of graphs and data and listening to others' interpretations on data to give a breadth of understanding of how data handling is used in real life. The children clearly identified their previous learning and were beginning to use a broadening amount of detail in the explanations they gave.

Challenge – Our Mathematics lessons allows for and encourages children to independently select their own level of challenge every day – from the task they are engaged in to more in-depth challenges that may run the length of our unit of work (Personalisation and Choice). Two ongoing challenges ran for a fortnight. The **BIG CHALLENGE** encouraged pupils to research examples of misleading data online, summarising the (possibly negative) impact and feedback to class. The **NRich puzzle 'Match the Matches'** further encouraged children to collaborate and discuss together to draw conclusions from various data in a more complex challenge. **Higher order questioning** was pre-prepared and built into the lesson to encourage a better depth of conversation between pupils when listening and talking.

Application – Children were encouraged to relate what they were learning to real life situations and contexts. They were presented with the key question: '*Why would people present data in a misleading way?*' encouraging them to link learning to real life. Through our drama activity, children also explored how their skills in data handling and analysis could be applied in a range of careers (Developing the Young Workforce). By creating their own presentations to the class, children put their learning into their own words and lead the learning with the rest of the class.

Lesson 1

- Introduction: Pupils enter the class to Newspaper Figures challenge where they investigate real life examples of data graphs from newspapers and online print-outs. Pupils broadly discuss and note what the graphs are about and give each chart a title.
- Development: Teacher introduces idea of drawing conclusions from a variety of graphs and emphasises the importance of continuing to discuss ideas with one another. Discussion is important in Mathematics because we all interpret things differently. Watch and discuss YouCubed video: https://www.youcubed.org/resources/different-experiences-with-math-facts/
- In groups, pupils look at data presented on different data graphs and answer key questions.
- Challenge - Pupils write their own question that they think could be answered by the diagram.
- Plenary – Pupils create a short drama using prompt cards and prop box showing what career may use data handling and what they may use it for. Present for other pupils to guess the career and discuss.

Lesson 2

- Introduction: Teacher displayed a graph depicting Black Friday sales. Class discuss the graph, drawing conclusions and commenting on ways that presentation of the graph is clear. Teacher then shows a second graph (misleading data) and allows pupils to discuss again, using key questioning to introduce the idea that data can be 'misleading'. What could the impact of misleading data be?
- *Invite pupils who have completed any personal research from BIG CHALLENGE to lead learning with their findings so far – looking at real life examples of misleading data.*
- Development: In groups pupils analyse a broad range of graphs and charts and answer prompt questions orally. *(Is this data presented clearly? What makes this data clear? Are there any issues with the way this data is presented? Are there any issues with the way this data was gathered?)*
- After discussing, pupils identify a variety of ways in which data can be misleading and create a poster highlighting these issues.
- Plenary: Share posters with class in an art gallery style. As a class look at a graph on the previous prices of the PS4 – encourage children to draw conclusions, summarise the issue, explain why this is a problem and how the graph could be improved. *Continue to hear from more volunteer pupils from the BIG CHALLENGE.*

Lesson 3

- Introduction: Pupils enter to a variety of graphs/charts which they broadly explore. Pupils select one that they would like to consider in more depth.
- Development: Explain that each group is going to create a short presentation on misleading data. In groups discussions, pupils identify issues within the graph and summarise findings. Each pupil takes a role in the presentation, writing their summary on a talk card *(group roles: general conclusions from graph, what is making it misleading, what is the impact of this, how can it be improved).*
- Pupils feedback to class through a short presentation. Peers assess another group noting feedback against the success criteria on a pupil's 'Show Me' card.
- Plenary: Pupils discuss their 'Show Me' card comments from peers. Pupils reflect on learning, completing the card as self-assessment and writing a short learning statement. Children hot seat respond to HOTS questions (challenge)

Record the planned assessment that will be gathered to meet the success criteria (Say, Write, Make, and Do) considering **breadth, challenge and application**.

1. Discuss ways that data can be displayed and used in real life.
    - Newspaper Figures Challenge [SAY/WRITE]
    - Drama [DO/SAY]
2. Draw conclusions from a variety of data and graphs.
    - Graph Conclusions [SAY/WRITE]
    - NRich Challenge Match the Matches [SAY/WRITE]
3. Suggest main issues that makes data misleading.
    - Mini-poster [SAY/WRITE]
4. Summarise the impact misleading data can have in real life.
    - Poster [WRITE]
    - Talk Card for Presentation [SAY/WRITE]
    - Quotes from Discussion [SAY]
5. Give an example of when data has been data been misleading.
    - Presentation [SAY]
    - Big Challenge (Personal Research) [DO/WRITE]
    - 'Show Me' peer and self-assessment of learning card. [WRITE]

Briefly outline the oral/written **feedback** given to the pupil on progress and **next steps**, referring to the learning intention and success criteria.

You have a sound knowledge of ways data can be displayed and can successfully draw conclusions from a variety of graphs. *[Written in jotter work]*
In a variety of tasks and challenges, you were able to identify issues in graphs; summarising why they were misleading and how they could have an impact on the reader. During the NRich challenge, I particularly liked how you consulted everyone in your group to find out their opinions before discussing what they answer could be. *[Summary of oral feedback]*
You have engaged well in our tasks and discussions. Well done for completing your own research at home and posting it on our Google Classroom after talking to your parents about a graph printed on a leaflet for a local shop. *[Summary of oral feedback]*
Next Steps – Can you spot any other misleading data or graphs in real life and explain why they are misleading? Could it have a positive impact? Post a photo on our Google Classroom. *[Written in jotter work]*

Pupil Voice:
What have you learned? How did you learn? What skills have you developed?

"I have learned a lot about how graphs can be misleading. I had no idea that graphs could be misleading – I thought they always included facts – but I will now always try to figure out whether a graph is misleading or not. I also got to revise reading graphs so I feel a lot more confident with that now. I love being able to discuss Mathematics problems. Our teacher always encourages us to talk about the questions in front of us and share our strategies and opinions with our friends. I feel like I learn so much more from working with other people rather than thinking on my own in silence. I guess I am learning skills in Literacy as well as Maths – talking to other people and making summaries. Usually when I have a discussion with my friends, we all talk at the same time but in these tasks there were so many possibilities and issues that we had to really listen to everyone. I found it easier to write down the key points everyone brought up and use that to help. I know we are going to be preparing for our Lord Provost debate soon so I hope this has helped me to summarise what I am trying to say to help get my point across… I can sometimes ramble!"

Did the learner successfully attain the outcomes? **YES/NO**

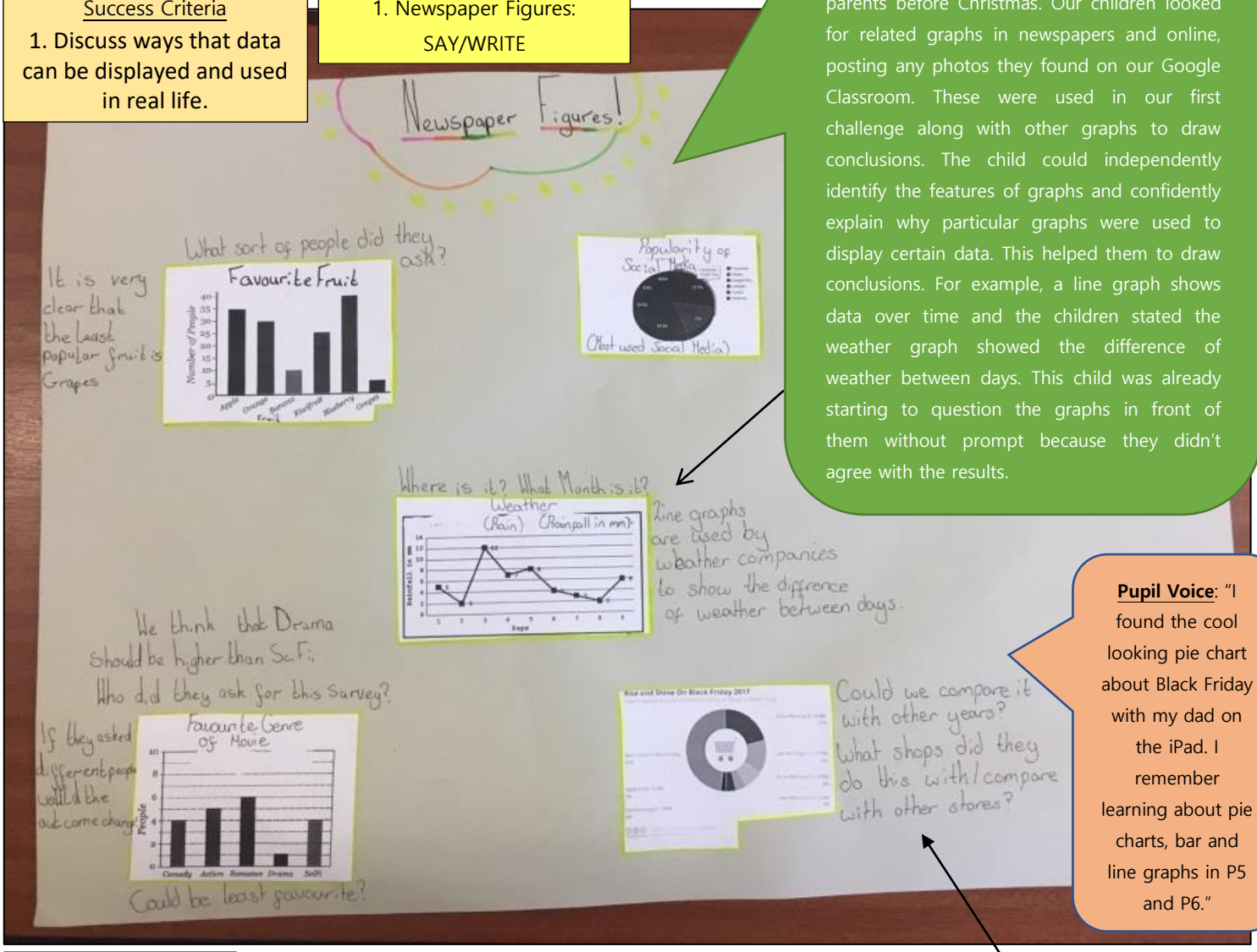
Moderation Learner Evidence

Learning Intention: We are learning to draw conclusions on presented data through discussion.

Success Criteria

1. Discuss ways that data can be displayed and used in real life.

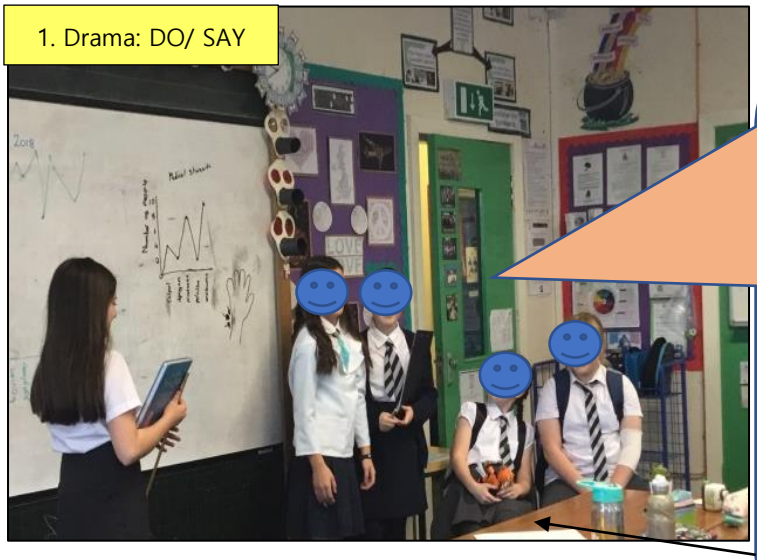
1. Newspaper Figures: SAY/WRITE



Teacher Voice: The children had taken a great interest in Black Friday and Cyber Monday since many were going to sales with their parents before Christmas. Our children looked for related graphs in newspapers and online, posting any photos they found on our Google Classroom. These were used in our first challenge along with other graphs to draw conclusions. The child could independently identify the features of graphs and confidently explain why particular graphs were used to display certain data. This helped them to draw conclusions. For example, a line graph shows data over time and the children stated the weather graph showed the difference of weather between days. This child was already starting to question the graphs in front of them without prompt because they didn't agree with the results.

Pupil Voice: "I found the cool looking pie chart about Black Friday with my dad on the iPad. I remember learning about pie charts, bar and line graphs in P5 and P6."

1. Drama: DO/ SAY

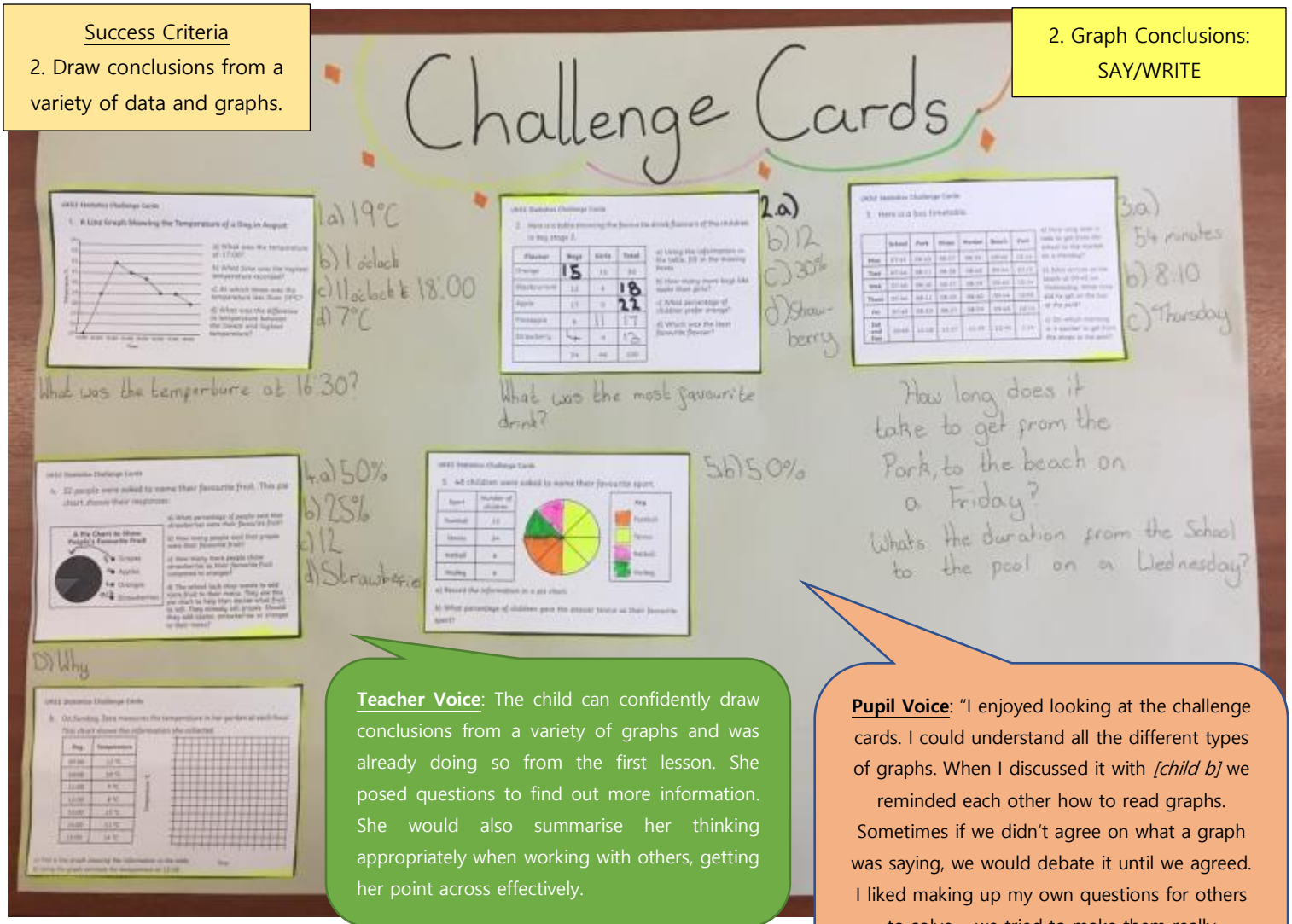


Pupil Voice: "Drawing a conclusion is just like understanding what a graph is talking about. It's quite simple to read some graphs because they clearly show you the most and least popular things. Others, like line graphs and pie charts, make you look a little closer. I like drawing conclusions from graphs because you can think about what it means in real life. I loved finding out what jobs would use data handing in real life because it was fun doing drama in Maths. We selected the '**Medical Scientists'** card for our drama who were studying new medicines because my friend's aunt works in a university studying new medicines. We **dressed up as scientists and used a line graph** to look at how our new medicine brought a temperature down over time. **The patient's temperature was fluctuating and then sharply dropped when we gave them our new medicine." (Also links to Success Criteria 2 below)**

Success Criteria

2. Draw conclusions from a variety of data and graphs.

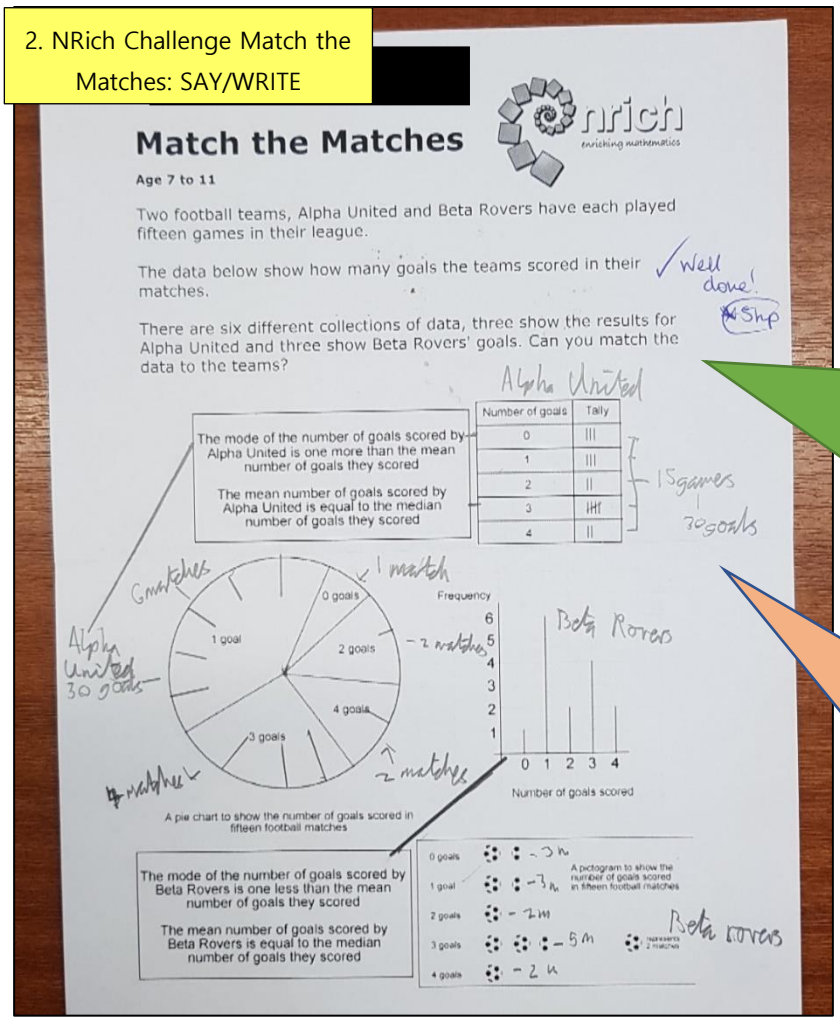
2. Graph Conclusions: SAY/WRITE



Teacher Voice: The child can confidently draw conclusions from a variety of graphs and was already doing so from the first lesson. She posed questions to find out more information. She would also summarise her thinking appropriately when working with others, getting her point across effectively.

Pupil Voice: "I enjoyed looking at the challenge cards. I could understand all the different types of graphs. When I discussed it with *[child b]* we reminded each other how to read graphs. Sometimes if we didn't agree on what a graph was saying, we would debate it until we agreed. I liked making up my own questions for others to solve – we tried to make them really challenging for other people!"

2. NRich Challenge Match the Matches: SAY/WRITE



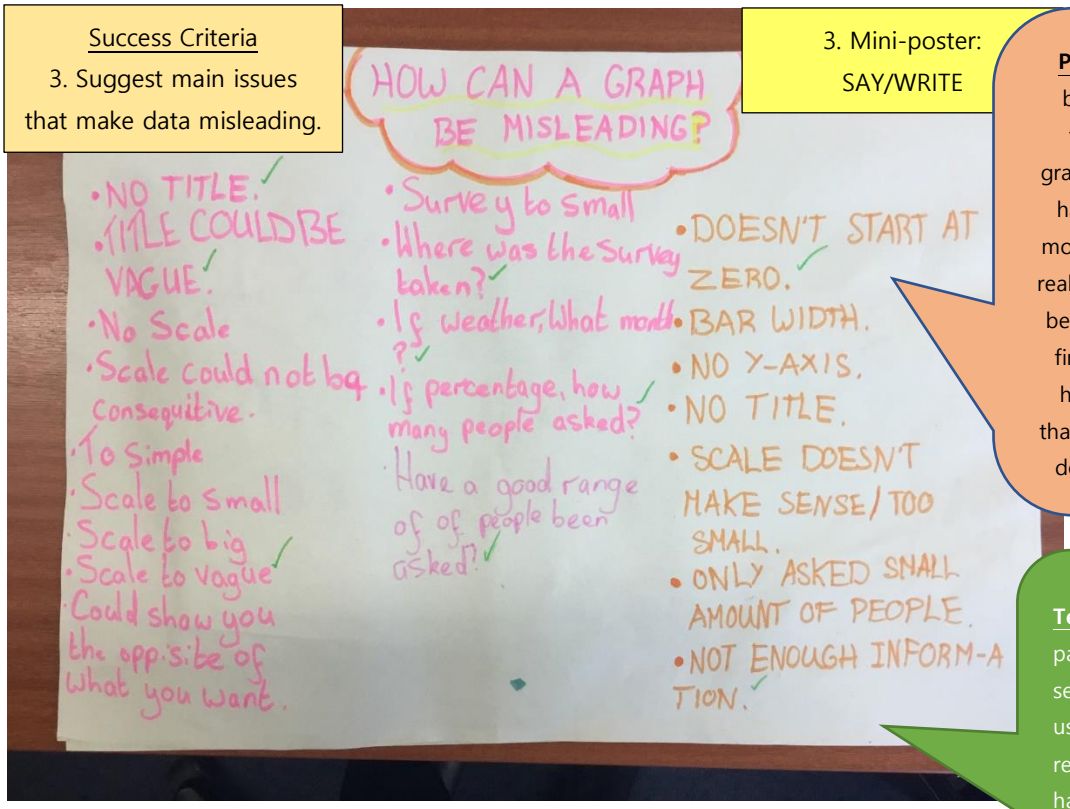
Teacher Voice: To provide further challenge and application, I presented the children with the choice of this NRich challenge. The pupils had to read and draw conclusions from a variety of data and graphs and figure out which graphs actually represented the same football teams. The child worked within a group of 3 to discuss the task. They persevered with this challenge during 2 Mathematics lessons. The children presented their findings to the class at the end of the week when a few other groups had finished, explaining their thinking clearly.

Pupil Voice: "I also took part in the NRich Challenge which was hard at first but we kept going. The data looked really different when it was displayed in different ways but when we worked out the number of games played and used the clues about the mode and median, we realised that 3 graphs were the same and represented the same football club. [*Child c]* noticed two of the graphs represented the same data first then I spotted the third!"

Learning Intention: We are learning to summarise the main ways that data can be misleading.

Success Criteria
3. Suggest main issues that make data misleading.

3. Mini-poster: SAY/WRITE

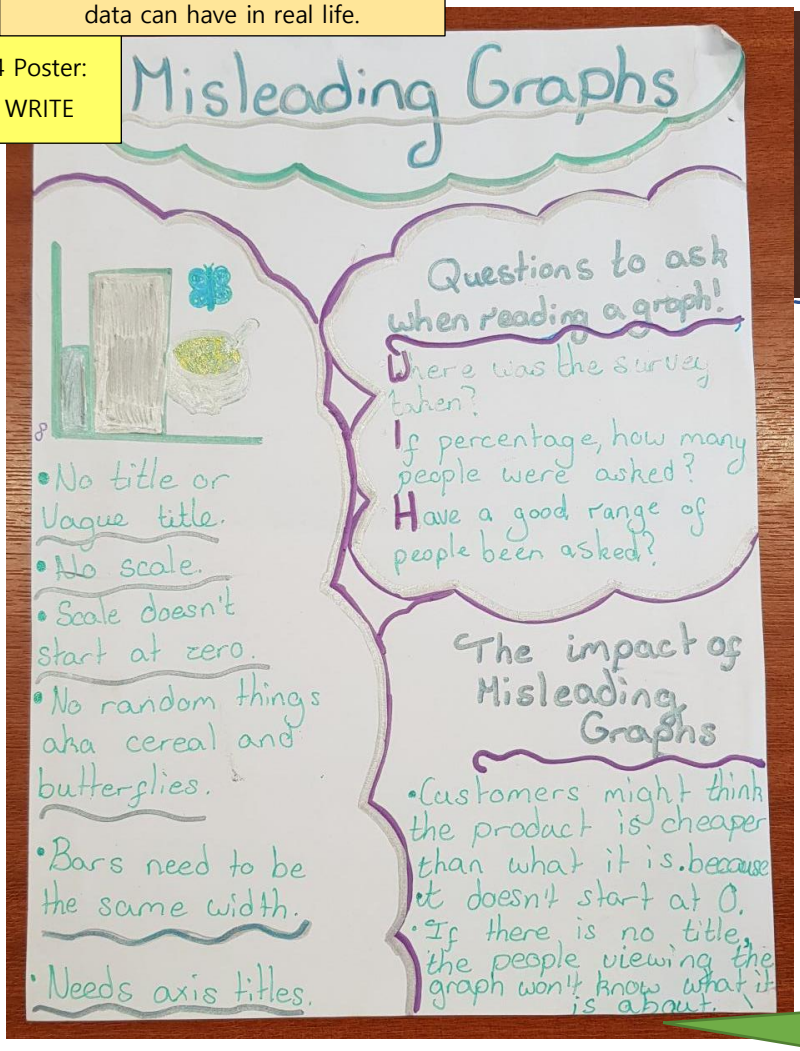


Pupil Voice: "From drawing graphs before, I could tell that there were things wrong with some of these graphs. They had titles missing or they had no axis titles. When I looked at more graphs with my friends in class, I realised that sometimes the scale could be misleading which I didn't notice at first! [Child b] and I couldn't believe how many graphs we found online that were misleading when we looked.I don't think that should be allowed."

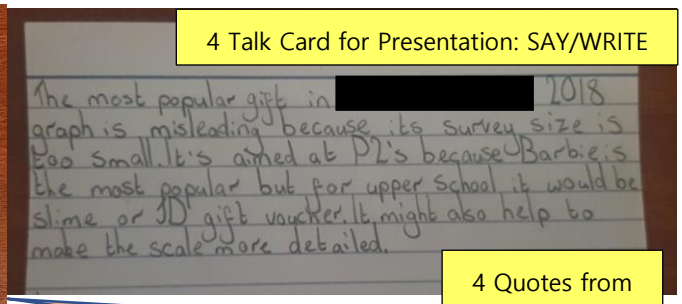
Teacher Voice: The use of sugar paper aided discussion between several different children and was used to jot notes. The children also reflected on the examples that they had studied to compile this list.

4. Summarise the impact misleading data can have in real life.

4 Poster: WRITE



4 Talk Card for Presentation: SAY/WRITE


The most popular gift in [redacted] 2018 graph is misleading because its survey size is too small. It's aimed at P2's because Barbie is the most popular but for upper school it would be slime or JD gift voucher. It might also help to make the scale more detailed.

4 Quotes from discussion: SAY

Pupil Voice – Quotes from Discussion Across Lessons

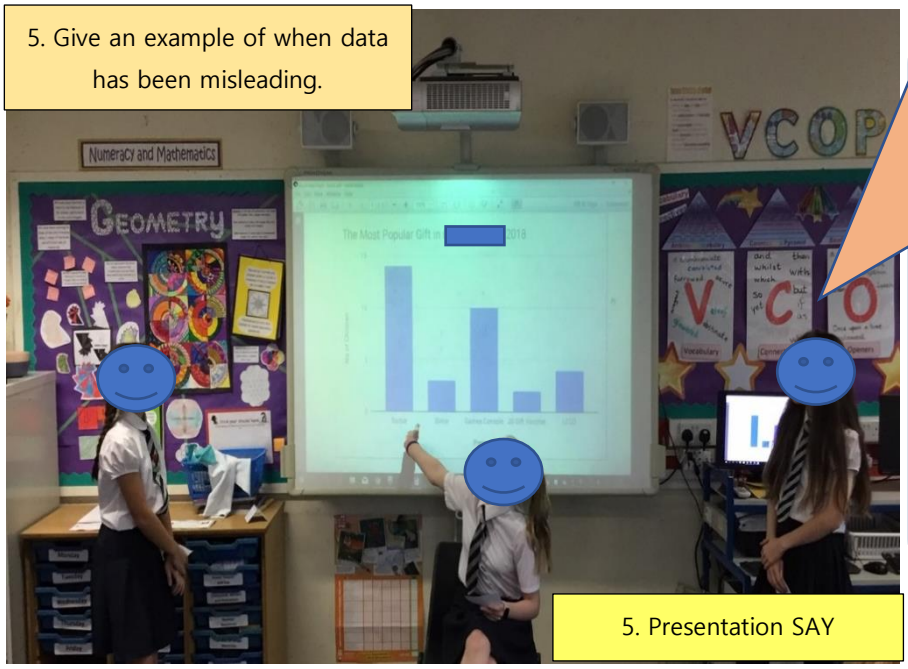
"Misleading data could make people make the wrong decision and that's not very fair. Graphs should show facts and be really clear rather than confuse people."

"Some of these graphs from Black Friday are so clever that I didn't even realise they were misleading at first! They make the deal seem really good when actually you are not saving much money! That's sneaky!"

"I feel like I am always going to look at graphs more closely now to see if they could be misleading. It's been fun picking out the issues with them – I like correcting them!"

Teacher Voice: The pupil has effectively summarised their thoughts on how the graphs could be misleading and the impact that could have on the reader. These issues have been put into their own words.

5. Give an example of when data has been misleading.



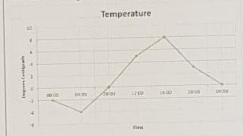
5. Presentation SAY

Pupil Voice: *"If a parent or anyone else who wanted to by us a Christmas gift looked at this graph, they would get the total wrong idea of what a P7 would want and we would end up getting the wrong present. I wouldn't want a Barbie! A JD Gift Card would be a better gift and I think loads of people in the class would agree."*

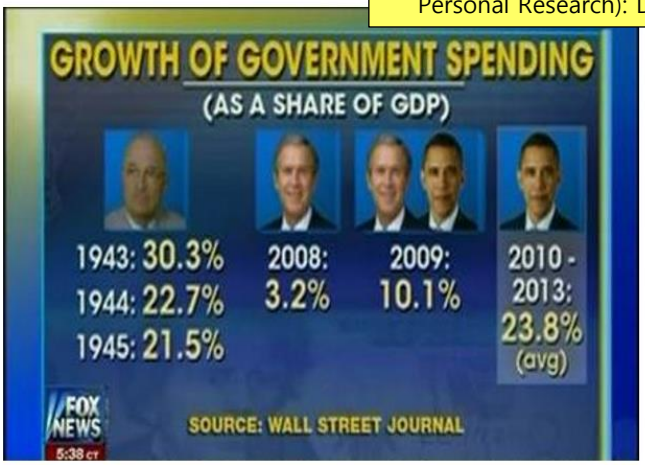
"In this graph, the survey size is far too small. You cannot say 'The Most Popular Gift of [school]' and then only ask one class. That's only 25 pupils out of nearly 300! That doesn't represent what everyone in the school thinks. If they changed the title, it might be less misleading."

5. Show Me Peer and Self-Assessment Card: WRITE

SHOW ME SELF AND PEER ASSESSMENT CARD

Success Criteria	Challenge	Show Me
Discuss ways that data can be displayed and used in real life.	List 5 ways data can be displayed: Can you think of a job that may use data handling? Weather Person	1. Pictograph 2. Bar graph 3. Pie chart 4. Line graph 5. Tally chart
Draw conclusions from a variety of data and graphs.	What is this graph telling you? 	Temperture over a day. 4am is lowest and 4pm is highest
Suggest main issues that makes data misleading.	Name at least 2 ways that a graph could be misleading through: a) presentation b) gathering of data	a) Scale not start at zero. b) Asking only a small amount of people
Summarise the impact misleading data can have.	*To be completed by a peer* You have told us how misleading data can make people make the wrong choice when they buy things.	
Share a real example of when data has been misleading.	*To be completed by a peer* You talked about Christmas presents in a graph and how the survey was too small so people might buy the wrong gifts for P7.	

5. Big Challenge (Children's Personal Research): DO/WRITE



The title of this post was ...

"Obama is Exploding Government Spending"

However this is a misleading chart because using the money could also be a good thing depending on the cause. Though the title makes it look like it's a bad thing (using the word exploding) so technically FOX NEWS isn`t really making a clear point whether Obama spending is doing a good thing or a bad thing.

Teacher Voice: The pupil could confidently complete their Show Me Card and was even giving suggestions of more possible answers. A peer that assessed the last 2 success criteria agreed with the teacher that this pupil could summarise the impact misleading data could have on readers. They also approved of the example the pupil gave. Additionally, the learner chose to complete the Big Challenge in their own time and uploaded the document above to our Google Classroom after conducting some research at home. The pupil thought the title was quite misleading to readers. The pupil was praised for finding such a good (and complex) example of misleading data.

Experiences and Outcomes.

Having discussed the variety of ways and range of media used to present data, I can interpret and draw conclusions from the information displayed, recognising that the presentation may be misleading. **MNU 2-20a**

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- explain processes and ideas
- identify issues raised and summarise main points or findings
- clarify points by asking questions or by asking others to say more. **LIT 2-09a**