Reaction Times
Lesson 4: Defend Phase

Australian Curriculum: Mathematics (Year 5)

ACMSP120: Describe and interpret different data sets in context

Lesson abstract

Students defend their conclusions about reaction times. In inquiry, the evidence triangle helps students to connect conclusions they make to the inquiry question posed, and to the mathematical evidence they collect. Students consider the findings presented by others and offer their own interpretations of data sets in context, as part of the reflection process. The unit is reviewed along with the 4D inquiry phases.

Mathematical purpose (for students)

Generalisations about data are supported by evidence, including data displays.

Mathematical purpose (for teachers)

Data displays are evidence that supports the answer to the inquiry question. Interpretations of data sets can lead to generalisations about data in context. Students need to be wary of over-generalisation from small data sets.

At the end of the Develop phase, students will be able to:

- Defend interpretations and generalisations they make about reaction times
- Describe and interpret different data sets about reaction times.

Lesson Length 60 minutes

Vocabulary Encountered

- generalisations, interpret
- defend
- evidence

Lesson Materials

- all work from previous lesson
- Student Sheet 1 - Reflection Sheet (one per student)
- clipboards (optional)
- markers, poster paper (one per group, optional)
- Evidence Triangle poster (optional, from lesson 1 and the *Mathematical Inquiry into Authentic Problems Teachers Guide*)

We value your feedback after these lessons via https://www.surveymonkey.com/r/CV2TXTT

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Who Has the Best Reaction Time?

Finalising and viewing presentations

1. Students will defend their findings, developed throughout the inquiry process. Remind students that their presentations need to include:
    - The inquiry question
    - An explanation of the test method (probably with photos or diagrams)
    - The raw data collected
    - The organised data (tables, graphs and displays)
    - Generalisations linked to evidence and the inquiry question

2. Allow groups to review their presentation and create a display or a poster that can stand alone to communicate their ideas to the audience. Share some successful ideas about presentation such as the use of headings or highlighting key ideas.

3. Organise a large space for students to display their presentations to the class. Allow time for students to independently view the presentations.

4. To conclude, ask a small number of students to share:
    - A positive comment about how one display supports the answer to the inquiry question. Encourage feedback that connects the inquiry question to the evidence collected and the answer. Example: *"I can clearly see why you think musicians have a better reaction time because I can see more red dots (representing musicians) closer to 200 ms in your data display."*
    - Feedback on ways to improve connections between the inquiry question, the evidence and the answer presented. Encourage the student providing the feedback to explain how the change will improve the presentation. For example, *"I would be more convinced about your conclusion that students in Year One have a better reaction time than students in Year Five, if you had collected more data. You have only tested 5 different students.*
    - Further questions or generalisations, not covered by a presentation. For instance, a student might want to know what would happen if a group tested their participant's reaction time *very early* in the morning. Another student might notice how a group's data illustrates reaction times slowing down, so ask if reaction times get faster or slower, the more times a student is tested.

Reviewing generalisations

5. After students have had time to view the presentations, and have shared some feedback, explain that they will now be looking very carefully at some of the data on display.

6. Select a presentation where the students have a well justified generalisation. Highlight how the question, the evidence and the conclusion link, as shown in The Evidence Triangle. For example:

    This group made the generalisation: "We think that musicians in Year 5 have a faster reaction time than athletes in Year 5." This answers the question on their display. They only collected data from Year 5 students their generalisation is only about Year 5. I can see that this group used the ruler drop test to measure the reaction times. The display shows that 12 musicians, but only 5 athletes were in the short reaction time group" They tested the same number of musicians and athletes.

7. Hand out Student Sheet 1 - Reflection Sheet to each student. Students choose two presentations to study (not their own). Instruct students to independently interpret data sets on display, and explain the links between any generalisation/s made, the inquiry question and the evidence collected. It may be useful for students to use clipboards to hold their reflection sheet so that they can move around the room to record their ideas. Use this time to sit with different students to encourage them to verbalise what they see.

8. Review the reflection sheets and then the inquiry unit as a whole, including the 4D phases for inquiry.

re(Solve) MATHS BY INQUIRY

Reflection Sheet

Name: _____

View two presentations others have made and reflect on their generalisation.

Presentation 1	Presentation 2
Inquiry question presented:	**Inquiry question presented:**
A generalisation this group made about the data is	**A generalisation this group made about the data is**
Describe how the presentation provides *evidence* to support this *generalisation*	**Describe how the presentation provides *evidence* to support this *generalisation***

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