re(Solve) MATHS BY INQUIRY What's in a Name?

Y7

Summary of learning goals

- Students examine trends in the names of students in the class, as well as trends in popular names from 2017 and 1957. They look at data associated with these names and explore the use and significance of the mode as a measure of central tendency.

Australian Curriculum: Mathematics (Year 7)

ACMSP171: Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data.

ACMSP172: Describe and interpret data displays using median, mean and range.

Summary of lessons

Who is this sequence for?

- This sequence is for students who are familiar with measures of central tendency, including mean, median and mode. Students should be able to use statistics to creatively interpret data.

Lesson 1: How Popular Are We?

Students review the 100 most popular boys' and girls' baby names for 2017, use spreadsheets to analyse these names, and compare their findings to the names of students in the class or school. There is a focus on finding meaningful ways to evaluate the datasets, as students use modal values to develop new representative 'composite' names.

Lesson 2: How Popular Were They?

Students compare datasets of popular names in 2017 and 1957 to see how the popularity of names has changed over time. They hypothesise about the reasons for these changes.

reSolve: Mathematics by Inquiry is funded by the Australian Government and is managed by the Australian Academy of Science.

Reflection on this sequence

Rationale

The sequence of lessons provides a personal context in which to examine and determine measures of central tendency. There are opportunities for students to be creative when designing a 'composite' class name, and for them to develop hypotheses to explain why names become more or less popular over time. There are opportunities for open exploration of data to identify interesting trends.

reSolve mathematics is purposeful

- This sequence uses real data to develop concepts associated with measures of central tendency.
- Students examine when a particular measure may or may not be appropriate.

reSolve tasks are inclusive and challenging

- All students are included through the collaborative use of each student's name to generate data for examination.
- The 'create a composite name' task has a low floor and high ceiling. Students determine their own method for completing the task based on their own skills and understanding, making this activity a useful assessment tool.
- The lessons make extensive use of spreadsheets, allowing students who are ready to learn sophisticated techniques to devise their own strategies and formulas.

reSolve classrooms have a knowledge-building culture

- Students share their unique strategies and reasoning for creating their composite names and learn from each other's strategies.
- Students are provided with opportunities to develop, share and debate their own hypotheses about how names have changed over time.

Acknowledgements

The data for popular baby names in 1957 comes from the NSW Registry of Births Deaths & Marriages, the South Australian Government Data Directory, and the Registry of Births, Deaths and Marriages Victoria.

LESSON 1

reSolve MATHS BY INQUIRY What's in a Name?

How Popular Are We?

Y7

About this lesson

Students review the 100 most popular boys' and girls' baby names for 2017, use spreadsheets to analyse these names, and compare their findings to the names of students in the class or school. There is a focus on finding meaningful ways to evaluate the datasets, as students use modal values to develop new representative 'composite' names.

Australian Curriculum: Mathematics (Year 7)

ACMSP171: Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data.

ACMSP172: Describe and interpret data displays using median, mean and range.

Mathematical purpose

- To explore data that is meaningful to students and use measures of central tendency appropriately.

Learning intention

- To find out what was the 'average' baby name in 2017.

Time

Two lessons of approximately 1 hour each.

Vocabulary

- composite
- median
- modal
- mode

Resources

- reSolve PDF *1a McCrindle Report Top 100*
- reSolve PDF *1b Baby Names Australia 2018*
- reSolve Excel Spreadsheet *1c Names*

reSolve: Mathematics by Inquiry is funded by the Australian Government and is managed by the Australian Academy of Science.

Is your name popular?

Resources: Provide students with reSolve PDF *1a McCrindle Report Top 100*, which lists the 100 most popular boys' and girls' names for 2017.

Discuss:

- *Is your name on the list?*
- *Are there any names of people in the class whose names are not on the list? Why do you think this might be?*

Resources: Ask students to skim read reSolve PDF *1b Baby Names Australia 2018*.

Students skim read reSolve PDF *1b Baby Names Australia 2018* and write down two observations that they find interesting/surprising and why. Students share their observations with a partner and together they choose two observations that they think are the most interesting or surprising. They record these two observations and will return to them in Lesson 2: How Popular Are They?

Exploration

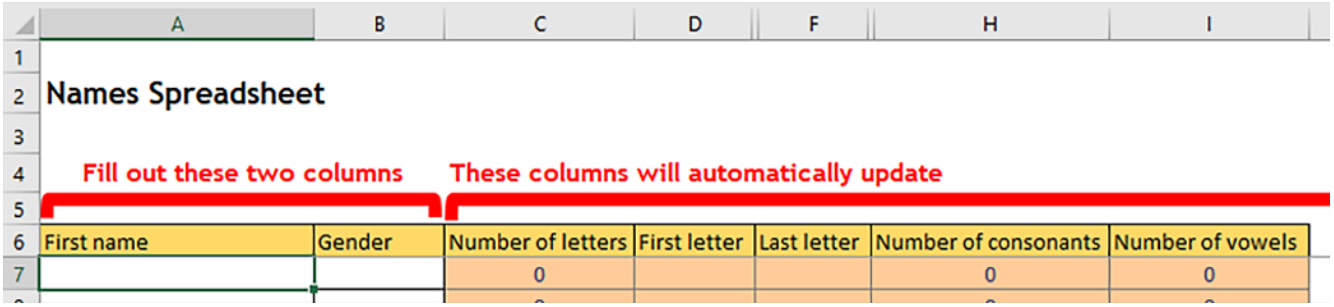
Have students record:

- their name
- the length of their name
- the first and final letters of their name
- the number of vowels and consonants in their name.

Ask students to make some predictions about the class data; for example: what is the most common first letter? What is the most common length of name?

Resources: Students open reSolve Excel Spreadsheet *1c Names* and fill in cells A7 and B7 about themselves.

Columns C to AI will fill in automatically. Does anyone notice anything strange? Observe that columns H and I classify the letter y as a vowel and discuss why this might be.



	A	B	C	D	F	H	I
1							
2	Names Spreadsheet						
3							
4	Fill out these two columns		These columns will automatically update				
5							
6	First name	Gender	Number of letters	First letter	Last letter	Number of consonants	Number of vowels
7			0			0	0

Teacher notes:

- In most first names the letter y is used as a vowel sound; that is, as a long or short *i* sound as in *my* or *hymn*. The main exception to this is when it is used in a *-ya* sound such as in the name *Aaliyah*.
- For these reasons, the spreadsheet is set to recognise the letter y as a vowel. You may choose to discuss this as a class and instead decide to classify the letter y on a case-by-case basis. To remove this rule in the spreadsheet, delete 'Y' from the formula in cell H7.

Have students complete columns A and B of the spreadsheet for the entire class (or, optionally, for the entire year group) and fill down columns C to AI. Students can answer the following questions:

- *What is the longest name in the class? What is the shortest? What is the median length? What is the modal length?*
- *What is the most common first letter? Is this different for boys and girls?*

Discuss findings with the class.

Composite class names

Pose the problem: *Can you use the modal data in row 44 of our spreadsheet to create a new girl's name and a new boy's name? We will call them 'composite' names because they summarise all of the most common features in our class's names.*

The complexity of this task can vary amongst students.

- Students could create new names using the modal first and last letters.
- Students could use the modal number of consonants and vowels to make up a name.
- Students could also take into consideration which letters are most frequently used.

Students present their composite names to the class and explain how they were created; for example:

- *I noticed that most of the boys' names were four letters long, started with the letter A and ended with the letter M. So I think the name 'Adam' is a good composite boy's name for our class.*
- *I noticed most of the girls' names in our class were six letters long. E was the most common first letter and A was the most common last letter. The other most common letters in girls' names were I, L, N and R. I think the name 'Erlina' could be a composite girls' name for our class.*

Discuss strategies that students used and any trends in the names that they created. Are any of them real names or do they sound like they could be real names? Do these names look like they are representative of the class's names?

Composite top names

reSolve Excel Spreadsheet *1c Names* also contains the same table filled out with the Top 100 Boys' and Top 100 Girls' Names of 2017. Students can create composite names from each Top 100 list. Compare these composite names to those of the class's composite names. What do students notice?

Reflection

Discuss: *What are some differences between the names that were popular in 2017 and the names of students in our class? What naming trends have changed across the years?*

The composite names created in this task used modal data, so you could also call them *modal names*. Discuss whether you could create *median names* or *mean names*. Which data could be used for this? How might you go about creating such names?

LESSON 2

reSolve MATHS BY INQUIRY What's in a Name?

How Popular Were They?

Y7

About this lesson

Students compare datasets of popular names in 2017 and 1957 to see how the popularity of names has changed over time. They hypothesise about the reasons for these changes.

Australian Curriculum: Mathematics (Year 7)

ACMSP172: Describe and interpret data displays using median, mean and range.

Mathematical purpose

- To explore meaningful data presented graphically and in text form.

Learning intention

- What names were popular 60 years ago? How do the top 100 names in 1957 compare with those in 2017?

Time

A lesson of approximately 1 hour.

Resources

- reSolve Excel Spreadsheet *2a 1957 Top 100 Names*

Vocabulary

- modal
- mode

reSolve: Mathematics by Inquiry is funded by the Australian Government and is managed by the Australian Academy of Science.

Introduction

Introduce students to http://names.darkgreener.com/ and http://www.babynamewizard.com/voyager. The first website tracks the popularity of baby names in England and Wales from 1996 to 2018. Any name given to three or more babies in a year is ranked by popularity and listed with the number of babies given that name. The second site shows the top 1000 baby names in the USA in every decade from the 1880s to 2018 (this site shows only the **rank** of the name, not how many babies were given that name).

Students can look up their own name. Is it included? If so, when was it most and least popular? Can students suggest *why* it has changed in popularity? If their name is not included, why might that be?

Exploration

Ask students to use http://www.babynamewizard.com/voyager to find:

- a name that is uncommon now that was once very common (prompt: grandparents' names)
- a name that is common now that was once very uncommon (prompts: celebrity names, fictional characters)
- a name that has stayed at about the same popularity for an extended amount of time.

For each name, students should suggest a reason *why* the name may have or may not have changed in popularity.

Ask students to compare the names of students in their class to each popularity graph. Do the names in your class align more closely to the England and Wales data or to the US data? Generally, were the common classroom names popular in the year students were born?

Resources: The reSolve Excel Spreadsheet *2a 1957 Top 100 Names* contains lists of the top 100 names for 1957 in New South Wales, South Australia and Victoria.

Ask students to review the data and discuss anything interesting they notice; for example:

- the comparative popularity of 'Deborah' and 'Debra'
- similarities in the top 10 boys' names in each state
- the appearance of 'Unnamed' in the South Australian lists.

Students choose a single state and use the data to create a composite girl's name and a composite boy's name, as in Lesson 1.

- Students could create new names using the modal first and last letters.
- Students could use the modal number of consonants and vowels to make up a name.
- Students could also take into consideration which letters are most frequently used.

Ask students: *How do your findings compare with the composite names you found for the class?*

How do your findings compare with the composite names you found for 2017?

Reflection

Remind students of the *interesting observations* they recorded at the start of Lesson 1. Can they use their research from the past two lessons, as well as the two websites, to find out more about their observations? Have students explain how their data relate to their interesting observation.