Home Learning TV – Senior Maths – Thursday 28 May

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| **Segment lesson planning details** |  | |
| Title for segment: | Percentages Part 2 | |
| Year levels *(e.g. Yrs1 – 3)*: | Years 7-10 | |
| NZC learning areas: | Maths and Stats | |
| Purpose of lesson:  (What learners will learn) | **Number strategies and knowledge**  * Find fractions, decimals, and **percentages** of amounts expressed as whole numbers, simple fractions, and decimals. (Level 4) * Know the equivalent decimal and **percentage** forms for everyday fractions. (Level 4) | |
| Success Criteria – students will be able to:  (how they will know when they have learnt it) | Know commonly used fraction to percentage conversions, i.e. one half, one and three quarters, one and two thirds, multiples of one tenth.  Use iteration (repeated copying), and equipartitioning, to find common fractions and percentages of a download bar. | |
| **Segment production details** | | |
| Equipment requirements: | Strips of coloured paper made from A4 cut long-ways, marker pen (e.g. Sharpie) | |
| Copyright requirements:  Please be specific: Source(*Seven Sizzling Sausages* by Sam Smith –url link to the source), intended use (to demonstrate alliteration), and length (timings for video clips) | Access to <https://www.stats.govt.nz/infographics/new-zealand-as-a-village-of-100-people-2018-census-data> specifically the poster <https://www.stats.govt.nz/assets/Uploads/Infographics/New-Zealand-as-a-village-of-100-people-2018-Census/new-zealand-village-of-100-people-2018-census.pdf> | |
| **Segment links and attachments *(list all links to recordings or attachments, the source and confirm that copyright permissions are granted)*** | | |
| Links to recordings /resources | * Teacher led e-ako : Getting partial to percentages: Level 4 * Go to <https://e-ako-student.nzmaths.co.nz/> and log in using hltv2 / hltv2 * Choose the HLTV pathway * Choose “Getting partial to percentages: Level 4” | |
| Attachments | PercentagesPart2.pptx | |
| **Segment plan content** | | |
|  | Teaching and learning activities linked to purpose | High level script (key points/questions) |
| **Activate**: Activating prior learning, knowledge of contexts and relationships | Orientate students to the use of percentages in statistics.  Motivate them to engage with the results of the 2018 census through use of immigrant, and ethnic, composition of Aotearoa.  Connect fractions with fractions. | Kia ora, Talofa, Namaste, Welcome (Suitable greeting that presenter is comfortable with)  In our last lesson we heard how statistics from our 2018 census were presented as percentages.  We saw a poster that represented all of Aotearoa like a village of 100 people. The idea comes from this wonderful book by David J Smith. [Show Slide 1 of Percentages Part 2 PowerPoint]  If New Zealand is a village of 100 people, it looks like this: [Show Slide 2. Allow some looking time]. 27% of kiwis are not born in Aotearoa. That’s very similar to Australia but not high compared to some countries like the Arab Emirates or Singapore. [Show Slide 3. Allow looking time] New kiwis come from South Africa, The United Kingdom, China, India, Australia and many, many other nations.  But how many kiwis are immigrants? Let’s use our bar model again.  [Work through Slide 4 commenting and questioning as you go. Pace the steps slowly]  100% of 4.7 million is 4 700 000 people. 27% is about 25% which is one quarter.  50% of 4 700 000 equals 2 350 000 by halving.  25% of 4 700 000 equals 1 175 000 by halving 50%.  To find exactly 27% I need 1%.  If 100% equals 4 700 000, if I divide by 100, I get 1%, that’s 47 000 people.  27% equals 1% multiplied by 27.  [Go to calculator and presenter. Enter and say each step deliberately]  4 700 000 ÷ 100 x 27 = 1 269 000 kiwis weren’t born in New Zealand.  That’s interesting.  [Show slide 5. Allow looking time]  If Aotearoa is a village then 17 of the 100 people identify as being Māori. That is not quite one fifth, 20%. It is closer to one sixth.  Remember that some of Māori also identify as belonging to other ethnicities.  How many people in Aotearoa identify as being Māori?  Can you use a bar model and a calculator to work it out?  Model working out the problem without your working being visible. Allow 30-45 seconds.  [Slide 6 shows a solution. Talk it through slowly]  Remember. Find 1% by dividing 100% by 100.  Multiply 1% by 17, you get 17%, that’s 799 000 people.  Which ethnic groups do you identify with?  You might like to investigate how many people are in the other ethnic groups after this lesson. |
| **Learn**: Introducing learning  Reinforce routines, provide multiple exposure to concepts, and strategies. Scaffolding learning | Use the download bar as a powerful length-based model for locating percentage benchmarks.  Find the location of fractions by equi-partitioning and iterating with a strip model.  Relate fractions and percentages. | Another place you find percentages is the download bar on your computer.  When you download a big file, you will see something like this:  [Show Page 10 of teacher-led e-ako: Percentages Level 4. Play the video and complete the question about 100%]  Some files, like complete movies, contain a lot of data. They take a few minutes, even hours, to download.  [Show page 11 of e-ako. Allow viewing time]  Look at these files.  What percentage of the whole file has been downloaded in each case?  You can’t be exact. Try for a reasonable answer. Record your answers.  [Allow time (45-60 seconds) as you model iteration and equi-partitioning yourself (see below) without being too leading]  [Strips of coloured paper made from A4 cut long-ways]  Did you write down your answers?  Before we check your answers let’s think about some strategies you might use. I’ve got some strips of paper to be my download bars.  I want you to think about benchmark percentages. Benchmarks are percentages that are used a lot.  100% is the whole bar.  I am folding the bar in half. It’s impossible on a computer screen but you can visualise dividing a length in half.  [Fold strip in half then open]  What percentage does this crease represent? That’s right, 50%.  [Write 50% on the crease]  I am folding one half in half. [Fold both lower and upper halves in half and open up. Make these folds very obvious and deliberate]  What do these creases represent? 25% and 75% [write percentages on strip]  25%, 50% and 75% are excellent benchmarks.  Look carefully. One quarter equals 25%, two quarters equal, 50%, that’s one half. Three quarters equal 75%. [Point to each crease]  [Take another strip and fold in thirds by overlapping slowly and deliberately]  Let’s try thirds.  What percentages match one third and two thirds?  30% is too low because 30 multiplied by three equals only 90% not 100%.  33% is close for one third since 33 multiplied by three equals 99% [write 33% of strip]  Subtract 33% off 100% and you get…[pause] 67% for two thirds. That’s close enough. [Write 67% on the strip]  Let’s check those percentages on a calculator.  [Show 1 ÷ 3 % = and 2 ÷ 3 % = ]  Notice that one third equals 33.3 recurring percent.  Two thirds equal 66.6 recurring percent.  33% and 67% are very close to one third and two thirds.  [Align the quarter and third strips in shot]  A close up of a piece of paper  Description automatically generated  Another excellent benchmark is 10%, one tenth of 100%.  Can you visualise how long 10% is?  It’s very hard to fold a strip into tenths. I’ll need to use a different method.  First, I fold the strip in half and mark 50%.  Second, I estimate where 10% and ‘step it out’ five times to see if it is about right.  A close up of a piece of paper  Description automatically generated  Now I can mark 10%, 20%, 30%, until I reach 100%. [You might fold the strip over and use the marks to measure 60%, 70% etc. Be deliberate about creating the 10% bar as you go.  Align the quarter, third, and tenth strips.]  Which is more, one half or five tenths? Look carefully.  They are equivalent, 50%.  Which is more, one third or three tenths? Look carefully. [Point to both fractions as percentages]. One third is a bit more than 3% greater.  In fact it is 3.3 recurring percent more.  Let’s go back to your answers to the download bars and see if the paper folding has been useful. Check your answers as I work through them.  [Go back to Page 11, discuss each bar and type in an answer]  File A. It could be three quarters, 75%, but it’s slightly more than that. 80% might work. That’s two tenths away from 100%  File B. That looks like one tenth, 10%.  File C. That looks like one third, 33%.  File D. This is more than one half, 50%. It’s about 10% more, let’s try 60%.  [Check the answers, and look for ticks]  Did you get them about right? Nice job. Ka Pai. |
| **Respond**: Providing opportunities to use and practice | Modelling of percentage bar as a representation of percentage location.  Use of commonly known fraction to percentage conversions. | Let’s work on some examples of using the download bar.  [Pages 12-13 of e-ako. Work through the examples]  50%. What fraction is that? [Click on menu and choose one half. You may need to read the fractions as they will appear small on screen. Allow students to think. Which answer do you think is right?  Etc. For other examples.  [Note the fifths examples]  That looks like two tenths. What is equivalent to two tenths? One fifth.  That looks like four tenths. What is equivalent to four tenths? Two fifths.  Now it’s your turn. Draw four bars that are the same length.  [Model drawing the bars allowing students at home time to do likewise]  I’ll give you a percentage and you shade that much of a download bar.  Are you ready?  Shade 60% of the first bar.  Shade 28% of the second bar.  Shade 93% of the third bar.  Shade 37.5% of the fourth bar.  Do your answers look like this?  [Slide 7 of Percentages Part 2 PowerPoint]  Excellent mahi.  [Optional: If time permits work though pages 14-20 of the e-ako. Students put their hands up when they think the given fraction has downloaded. Fill in the answers as you go. Deliberately work through examples of finding a percentage of an amount] |
| **Share**: Learner and parent reflection on learning and engagement and what they can do next | Reflection on the learning intention/s  Invitation to practise using the download bar model. | That’s all we have time for.  Reflect on what you learned today.  You can place percentage benchmarks on a download bar by knowing the fraction for each percentage.  Practise drawing download bars and marking percentage benchmarks in the correct place.  I hope you have enjoyed this lesson on using percentages in everyday life.  I’ve enjoyed your company.  Haere ra, Tofa, Farewell until next time. |