Home Learning TV – Lesson Plan – 30 September 

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| **Segment lesson planning details** |  |
| Title for segment: | Solving word problems - part 1 |
| Year levels *(e.g. Yrs1 – 3)*: | 1-3 |
| NZC learning areas:  | Maths and Statistics |
| Purpose of lesson:(What learners will learn) | * use materials, drawings and numbers to work out a problem
* show different ways of solving a problem
* think about how they solve a problem and why they did it that way
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| Success Criteria – students will be able to:(how they will know when they have learnt it) | * Interpret word problems
* Solve problems in multiple ways
* Understand that some problems have multiple answers.
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| **Segment content/context details *(as appropriate)*** |
| Māori specific content i.e. the learning draws on Mātauranga Māori: |  | Pacific specific content i.e. the learning is focused on Pacific knowledge: |  |
| **Segment production details** |
| Equipment requirements: | 20 sticks (popsicle sticks, toothpicks, matchsticks), pens and paper, Pictures of courier vans and bikes |
| 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) |  |
| **Segment links and attachments *(list all links to recordings or attachments, the source and confirm that copyright permissions are granted)*** |
| Links to recordings /resources |  |
| Attachments  | JuniorMaths11-1.png, JuniorMaths11-2.png, JuniorMaths11-3.png, JuniorMaths11-images.pdf |
| **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 | Connection to prior theme and to the careers theme – couriersCurrent experiences - increase in deliveries.Connection to  | Welcome in multiple languages.Remember our last theme was about Matariki well our new learning is going to be around the theme of careers. Today we will be talking about couriers and the role they have played recently.Start with a bit of a talk about couriers* We haven’t been going to the shops as much as usual
* But I have had some things delivered to me after ordering them online
* Have you had packages delivered?
* Did you see the person arrive?
* What kind of vehicle did they have? I had a package delivered by a woman in a van yesterday. But last week a man delivered my package on a motorbike.
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| **Learn**: Introducing learningReinforce routines, provide multiple exposure to concepts, and strategies. Scaffolding learning  | Introducing word problem - understanding what is being asked in the problem.Show problem copymaster JuniorMaths11-1.png**Show on screen**Introducing materials as a tool to support solving the problem.Show the full sheet on screen JuniorMaths11-images.pdfShow three vans4+4+4 = 12Move bikes one at a time as you count on in 2s 14, 16, 18, 20.Record on paper:3 vans and 4 bikes = 20 wheels altogether12 + 8 = 20Acknowledging that some problems have multiple solutions.Move **one** van away and put **two** bikes beside itCount and record on the same piece of paper as the previous answer2 vans and 6 bikes = 20 wheels altogether8+ 12 = 20 Presenter completes table as she talks and moves the vehicles. Continue until you have recorded all answers down to 0 bikes and 5 vans

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| Bikes | Vans | Total wheels |
| 10 | 0 | 20 |
| 8 | 1 | 20 |
| 6 | 2 | 20 |
| 4 | 3 | 20 |
| 2 | 4 | 20 |
| 0 | 5 | 20 |

Using a table to be systematic in finding all solutions to the problem. | Remember in our last lessons we have been solving multiplication and division problems by making groups.We are going to learn how to solve problems in different ways.I’ve got a problem about couriers that I’d like us to solve together. **The courier company has both bikes and vans. There are 20 wheels altogether on the vehicles in their car park. What might be parked there?** Ok - so what do we know about this problem? * There are **20 wheels**
* Some of them might be on **bikes** – they have **2** wheels each
* Some of them might be on **vans** – they have **4** wheels each

What could we use to help us solve the problem?...I’ve got an idea - I’ve got some pictures of vans and bikes. Why don’t you have a look and see what you can work out while I cut mine out (or get my cut out ones?) Ok - I’m ready with mine. Did you have any ideas? How many vans do you think there are? Let’s just guess - maybe 3?So here are three vans - how many wheels is that? [show three vans]Four and four makes eight wheels, and four more makes 12, so that would be **12** wheels on the vans - we’ll need some more wheels. Let’s skip count on from 12 with the bikes. Remember that we’ll need to count in 2s.14, 16, 18, 20.So, I had **three** vans, and I’ve added 1, 2, 3, 4 bikes, and now we have 20 wheels! I’ll write that down here - write down “3 vans and 4 bikes = 20 wheels altogether”.Hooray - so that must be the answer - right?I hear someone saying that they had a different answer - how can that be?Wait a minute - each of these vans has four wheels. What if one van left? How many bikes would we need to add to the carpark to still have 20 wheels? I’m going to move **one** van away, that’s 4 wheels gone and I’m going to replace it with **two** bikes. That’s still 4 wheels, so there are still 20 wheels. If they go into the carpark instead of the van, then the number of wheels will be the same.So how many of each do we have now? Wait a minute - if there are two answers, maybe there are more!How can we make sure we find all the answers?Shall we make a table? Maybe you can make one yourself if you have a pen and paper at home.Draw a table like this:If we want to make sure we find every answer we need to be organised.What is the most bikes that could be in the carpark?Let’s skip count to see. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 [move bike pictures across as you count.] So if we had 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 bikes, that would be all the wheels - and there would be no vans at all. I’ll write that down like this. [write 10 in the bike’s column and 0 in the van’s column].Now what if there weren’t 10 bikes - what if there were only 9 bikes? How many vans would we need? skip count 2,4,6,8,10,12, 14,16,18 and work out that you’ve got 18 wheels. Oh, dear vans need 4 wheels. That’s right – I’ll have to swap two bikes for a van. So if there were 8 bikes, how many vans? Just one. [record in the table]And if we take out another two bikes and put in a van that would be 6 bikes and two vans [record in table] **[Continue until you have recorded all answers down to 0 bikes and 5 vans].**That’s interesting. What do you notice?Wow - now we have not only answered the problem - we have found six different answers - ka pai!So, we can use models to help us work out problems and we need to remember to use our skip counting (4’s for vans, 2’s for bikes). We can make a table to find all the possible answers |
| **Respond**: Providing opportunities to use and practice  | Introducing a related word problem - understanding what is being asked in the problem.Connection to the careers theme - farming.**Show on screen** JuniorMaths11-2.pngUsing equipment to solve the problem (20 sticks/toothpicks)Make one pig, then a total of 4 pigsPresenter counts the 4 pigs and 2 chickensRe read the questionPresenter GUESSESCheck again and confirm that the numbers are correct this timeUsing a diagram to solve the problem.**The farmer looks out into his field and sees 7 animals. Some of them are chickens and some of them are pigs. He counts all of their legs and there are 20 altogether. How many pigs and how many chickens does he see?**Presenter draws 7 circles to represent bodies2, 4, 6, 8, 10, 12, 14Write “3 pigs and 4 chickens” underneath | Here’s a similar problem. This time it’s on a farm.**The farmer looks out into his field and sees 7 animals. Some of them are chickens and some of them are pigs. He counts all of their legs and there are 20 altogether. How many pigs and how many chickens does he see?**Ok - so what do we know about the problem this time? * There are 7 animals
* There are 20 legs
* Some of them are chickens - how many legs do chickens have? 2
* Some of them are pigs - how many legs do pigs have? 4

Now that reminds me of our vans and bikes. I’m going to have to think of counting in 2’s and 4’s again.I’ve got some sticks that I’m going to use to model the problem to help me. I’ve got 20 of them to be the legs for my animals.So, what should I do with them? I know I’ve got the right amount of legs, but I don’t know what animals they go on.Maybe I’ll make these four into a pig - I’ll just put them over here. [Make a total of 4 pigs]Oh dear, I’ve only got four legs left - I’d better make those into chickens otherwise I won’t have any.So now let’s check what I’ve got.I’ve got tahi, rua, toru, whā pigs - that’s 4 pigs and tahi, rua, that’s two chickens. Have I solved the problem?Let’s go back and check the question. **The farmer looks out into his field and sees 7 animals. Some of them are chickens and some of them are pigs. He counts all their legs and there are 20 altogether. How many pigs and how many chickens does he see?** Oh dear, I’ve only got **6** animals and I need **7**. What have I done wrong?Can you see how I could change my animals so that I have one more, without using any more legs?Oh - good idea - one of my pigs could be changed into two chickens!So, **3** pigs (that’s 12 legs) and **4** chickens (that’s 8 legs) So I’ve got 7 animals!So, do we need to look for more answers like we did for the wheels problem? We don’t this time, because if we change any more pigs into chickens we’ll have too many animals, so this time there’s only one answer.I know another way to solve the problem - I’ll do it on paper this time. You watch.First I’ll draw the 7 bodies. I don’t know whether they are pigs or chickens so I’ll just draw circles for now. Then I’ll give them each 2 legs because I know each one needs at least 2 legs.I can skip count to check how many legs I have used up – 2, 4, 6, 8, 10, 12, 14. That means I have 6 more legs that I need to add to my animals. I’ll put them on in twos. So now I have three animals with 4 legs - those are pigs, and 4 with 2 legs, those are chickens![write “3 pigs and 4 chickens” underneath].So, when we have problems like these we need to Remember To:* guess and check
* draw pictures or make a model
* use skip counting
* re-guess and check
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| **Share**: Learner and parent reflection on learning and engagement and what they can do next | Reflecting on learning and challenge for at home.**Show on screen** JuniorMaths11-3.png | What have we learned today? We’ve discovered that:* some problems have more than one answer, and some don’t
* there are lots of different ways to solve problems
* we can use equipment or pictures, make a table, or we can draw a diagram

We can use those ideas to solve other problems at school or at home.That’s just about all the time we have to work on together, but I’ll give you another problem you can work on yourself if you like.The second -hand store has bikes and skateboards for sale. There is a total of **6 ride ons**, and they have a total of **16 wheels**. How many bikes and how many skateboards?Sign off in multiple languages. |