YuMi Deadly Maths

Year 1 Teacher Resource:

NA – The teen game

Prepared by the YuMi Deadly Centre
Faculty of Education, QUT

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ACKNOWLEDGEMENT

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Year 1 Number and Algebra

The teen game

Learning goal	Students will use standard place-value partitioning to represent "teen" numbers.
Content description	Number and Algebra – Number and place value • Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line (ACMNA013) • Count collections to 100 by partitioning numbers using place value (ACMNA014)
Big idea	Number – part-part-whole, partitioning
Resources	Rope, Tens/Ones place-value chart, numeral/name cards for 10–19 and also numerals 1–9, big 99 board, bundling sticks, odometer, cubes

Reality

Local knowledge	Discuss the activities teenagers like to do. What would students like to do when they are teenagers?
Prior experience	Focus on: • making connections between number names, numerals and quantities to 20, emphasising how the **language** for teen numbers differs from that for other two-digit numbers. *What part do we say first in teen numbers?* [the ones] *What part do we say first in 20, 30, 40 … 90 numbers?* [the tens] • counting to and from 20 • ordering small collections • answering simple questions: *What number comes after/before 15? What number comes between 11 and 13? What number is one more than/less than 18? If I count to 16, what number comes next?*
Kinaesthetic	Students make teen numbers by taking a big step from the start line, *that's 10*, and a little step, *that's oneteen or 11*; go back to start, take a big step, *10*, and two little steps, *that's twoteen or 12*; repeat for 13–19.

Abstraction

Body	Using a large Tens/Ones place-value chart, count out 19 students to form a group, 19 ones. Count off 10 students and move them over to make one group of ten, place the numeral 1 in the tens' place; count how many ones are remaining and put that numeral (9) in the ones' place. Repeat for all the teen numbers 19–11. Reversal: Show 19 on the place-value chart and ask students the value of the 1. *Does it mean one student? Because it is in the tens column it stands for one group of 10. What does this number show?* [1 ten and 9 ones] *Which numeral is bigger in value, the 1 or the 9?* Repeat for other numbers written on the place-value chart. Big 99 board: Have students walk to a given square, *17*, and the class counts, *one ten and seven ones*. Reverse: Have students stand on the square *13*. *How is 13 made?* Count and move: *one ten and three ones*.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Hand

Bundling sticks (each student has a bag with some made into bundles of 10 and others loose): Students make up a bundle of 10 and place it at the top of their desk. They then proceed to make all the teen numbers 11–19. Check with partner: *I have 11; 11 is one ten and one more*, etc.

Cup odometer for each student and teacher: Students start with both cups showing 0 – 0. They move the inner (ones) cup one place each turn and count from 1 to 9. When they are at count 10, both cups will show zero again. Challenge: *How do we make ten?* [Move the outer cup from 0 up to 1.] Cups now show 10. *What has happened?* [When we get to 10 ones, we have to roll the tens over to make one group of ten in the tens' place.] Count on to 11 and from 11 to 19 saying at each number, e.g. *11 is one ten and one one, we could say oneteen, 12 is one ten and two ones, it could be twoteen*.

Mind

Students visualise teen numbers called by the teacher and give one loud clap for the ten (trusting the ten) and the given number of finger taps on the desk or forearm for the ones. Students take turns to say the number and students give a loud clap for a ten (trusting the ten) and a given number of softer taps for the ones. Reverse: Teacher claps for the ten and taps forearm for the ones. Students call out the number that has been made.

Creativity

Students create a tool that demonstrates different representations of teen numbers partitioned into tens and ones, e.g. a wheel – hub (ten) in the centre and spokes (ones) going to the outer rim; a daisy – centre (ten) and petals (ones); windmill; helicopter.

Forty-seven, 47, is 4 tens and 7 ones. If this language pattern was used for 17, how would we say one ten and seven ones? [onety-seven]

Mathematics

Language/ symbols

teen numbers, tens, ones, represent, model, parts, whole, part-part-whole, partition, split, trusting the ten

Practice

1. Using cubes, model then ask students to repeat:
   - breaking a whole into two parts (10 as a part)
   - identifying the parts
   - combining the parts to make a whole.
2. Students make numbers 10–19 on separate strings for each number using two differently coloured beads, e.g. 10 yellow beads and tie a knot, followed by 1 black bead and tie a knot and cut string close to the knot; another string, ten yellow beads, tie a knot, followed by 2 black beads, tie a knot and cut string close to the knot; repeat to 19. Make a class frieze with all the students' strings of beads.
3. Bundling sticks worksheet: Missing part – picture of bundling sticks, numeral, name.
4. Tens and ones – three different boxes with (a) teen numerals, (b) teen names, and (c) one ten and six ones, etc.; colour to match.

Connections	Stress the relationship and difference of teen numbers to other two-digit numbers, e.g. relate 16 to 26, 36, 46, 56 etc. *Why is 16 different from the other numbers that have tens and ones? How is it different? What else could it be called?* Link to rolling over the groups of ten to make e.g. 28, 29, 30 etc. Then link to rolling a group of ten tens into a hundred, ten hundreds into a thousand.

Reflection

Validation	Students think of items in their world that are made up of teen numbers, e.g. petals on a daisy or gerbera. Link to teenagers as they get one year older. Make birthday cakes with a big "10" candle in the middle, trusting the ten, and smaller ones around the perimeter to represent the ones.
Application/ problems	Provide applications and problems using money. Game: In pairs, throw a die, start at 10 and add on the number thrown. First to 20 wins (Unifix cubes may be used, one colour for the ten and different colours for the ones).
Extension	**Flexibility**. Students find as many ways as possible to represent and partition teen numbers, e.g. bundling sticks, Unifix cubes, counters, drawings, symbols. **Reversing**. Students begin at any of the representations that demonstrate partitioning of teen numbers and identify the others: stories ↔ act out ↔ pictures ↔ language ↔ symbols. Record the representations on a thinkboard. **Generalising**. *When we get a group of ten, we move it over into the tens' place so we have one ten and (perhaps) some ones left over in the ones' place*. **Changing parameters**. *Can you partition numbers greater than 20? What about three-digit numbers?*

Teacher's notes

- Odometer for tens and ones is made of two polystyrene cups (which can later be extended with additional cups to hundreds, thousands, and so on). Mark two cups with ten digits, 0 to 9, separated by lines that are equidistant around the perimeter of the cup. Insert one cup into the other and have the digits corresponding in value. For the exercise, have the students start with the cups showing 0 – 0. The first cup represents ones and the second cup represents tens, 1 – 0.
- Have visual cues, teen numbers with numerals, names and partitioned symbols on steps, ladders etc. around the room.
- Students need to be taught the skill of visualising: closing their eyes and seeing pictures in their minds, making mental images; e.g. show a picture of a kookaburra, students look at it, remove the picture, students then close their eyes and see the picture in their mind; then make a mental picture of a different bird.
- Suggestions in Local Knowledge are only a guide. It is very important that examples in Reality are taken from the local environment that have significance to the local culture and come from the students' experience of their local environment.
- Useful websites for resources: www.rrr.edu.au; https://www.qcaa.qld.edu.au/3035.html
- Explicit teaching that **aligns with students' understanding** is part of every section of the RAMR cycle and has particular emphasis in the Mathematics section. The RAMR cycle is not always linear but may necessitate revisiting the previous stage/s at any given point.
- Reflection on the concept may happen at any stage of the RAMR cycle to reinforce the concept being taught. Validation, Application, and the last two parts of Extension should not be undertaken until students have mastered the mathematical concept as students need the foundation in order to be able to validate, apply, generalise and change parameters.