

TEACHING GUIDE

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The Most Up Open Ended Maths Manipulative



Ideas for using the resources in line with the National Curriculum

produced by Freemantle Community Academy

with special thanks to Dr Angela Webb



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AGES 3-4

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AGES 3-4 TEACHING GUIDE AUTUMN TERM

Pegs to Count Up can be used in Nursery or F1 to: Explore counting and counting with one to one correspondence – counting with pegs and matching these to rods to support the understanding of the cardinal principle.

Children should start by counting objects that are identical before moving on to objects with slight differences. The pegs can be used here, initially all in the same colour and then varying colour. The pegs can be placed on the board in a line to help children understand there is a clear start and end point.

To subitise up to three pegs without counting and show that the total remains the same regardless of how they are represented.

Subitising needs to be embedded through early experiences of number. The three rods can be used to subitise and compare numbers within three using the pegs, however the pegs themselves can be used to create regular and irregular representations of number both horizontally and vertically.

To support number fascination, having a concrete understanding of numbers 1 -5 and show interest in larger numbers.

Numerals can be introduced through number cards or using the blackboard squares, although children are not expected to write them. Greater emphasis is placed on the exploration of number through the manipulation of the concrete objects.







AGES 3-4 TEACHING GUIDE SPRING TERM

To continue to support number fascination, having a concrete understanding of numbers 1 -5 and show interest in larger numbers.

Children need to learn the one to one principle; learning that they need to assign one number name to each peg being counted. Children need to learn the stable order principle; that when counting the numbers need to be said in a certain order.



To develop an understanding of comparison – recognising when they have the same amounts of pegs, exploring numbers up to 5.

Use the pegs to create regular and irregular representations of number both horizontally and vertically. Use the pegs combined with the rods to make comparisons using highly visual and tactile resources.

To explore and add to simple linear patterns and identify what comes next.

The pegs can be joined to illustrate the unit of repeat when discussing the make up of a pattern. Again, the opportunity to create patterns across the board, around the board, or upwards from the board supports mastery-based thinking in supporting children to approach challenges/problems in different ways.





AGES 3-4 TEACHING GUIDE SUMMER TERM

To learn that numbers are made up of (composed) of smaller numbers. To separate a group of three or four objects in different ways and recognise that the total is still the same. To explore number bonds to 5.

Use the rods and pegs to show part whole models of numbers – Pegs to Count up enables these representations to be stacked vertically or to show the range of ways this could be achieved whilst visually demonstrating the total is still the same.

To solve practical problems in play and meaningful activities.

Pegs to Count up is highly visual, tactile, motivating and exciting – its versatility lends itself to children exploring their own fascinations based on their developing number sense which is being developed through Continuous Provision and adult led tasks.

To recognise that each counting number is one more than the one before.

Pegs to Count up can be used to explore step counting and the one rod can be used to show the differential.







Pegsto Pegsto RANGE The Most Open Ended Maths Manipulative with special thanks to Dr Angela Webb

AGES 4-5

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AGES 4-5 TEACHING GUIDE AUTUMN TERM

Pegs to Count Up can be used in Reception or F2 to support maths across F2 and is an excellent resource to complement the NCETM and White Rose EYFS planning. Themes to explore across autumn term could include: To explore sorting – explore sorting pegs by colour into the coloured peg pots or other trays. Find and match rods which are the same – this could include hiding rods within the indoor or outdoor environments, or drawing around the rods and asking children to find the rod that matches the outlines.

To compare amounts – *Exploring number of pegs in zippy bags, then taking out to explore, compare, match etc. Grab a handful of counters and encourage a friend to do the same – how many do you have? Match onto number rod. Who has more? Place rods in feely bag and ask children to find one that is more than 1, 2 etc.*



To explore patterning – as with nursery or F1 – model unit of repeat, then use pegs and board to explore AB, ABB, ABC patterns both in horizontal and vertical format.

To explore number – *Explore counting, subitising, matching, comparison of number using the pegs and rods. Place pegs on a rod and talk about how many pegs they have and how many spaces are left (link to subitising e.g. can they see how many more they need to make 10 without having to count). Explore which smaller numbers make up a bigger number – vertical stacking of rods and pegs will support with understanding that the total remains the same.*







To count up from 1 to 10 – Explore step counting using the pegs, rods and count up board. Use the one rod to physically show how each number is increasing by one as you count up.



AGES 4-5 TEACHING GUIDE SPRING TERM

Pegs to Count Up can be used in Reception or F2 to support maths across F2 and is an excellent resource to complement the NCETM and White Rose EYFS planning. Themes to explore across spring term could include: To compare numbers to 5 then 10 – Again further strengthening understanding of number e.g. could use rods and pegs on board when singing number songs to visually show the total decreasing or increasing depending on the song. Or children select number cards and find the corresponding rod to match to the card. Check amounts by counting pegs.

To explore the composition of numbers 1 - 5, then 1 - 10.

- as before but giving the children opportunities to explore this through Continuous Provision to demonstrate understanding and thinking. Which numbers have the most combinations of numbers? Compare this by looking at the vertical stacks representing the different ways of making 5. Encourage children to use different colours of pegs on the rods to show how numbers are made up of smaller numbers.

To compare and match numbers. To explore more and less. - Make towers of pegs and count. Extend to use 2 different colours of pegs to match a given tower – what combination of number have you used to make a tower that matches. Develop use of language of more and less in context though guided play and interaction.

To combine two groups of numbers. To compare length and height – use pegs to make towers. Which is the shortest, tallest, longest, smallest etc. How many pegs have you used. Draw comparisons.

To count back from 10 to 0 - *Explore step counting using the pegs, rods and count up board. Use the one rod to physically show how each number is decreasing by one as you count down.*











To explore different ways of making 10 – number bonds to 10 - Use the rods and pegs to show part whole models of numbers – Count up enables these representations to be stacked vertically or to show the range of ways this could be achieved whilst visually demonstrating the total is still the same.

To further explore pattern – as before but asking children to create own patterns and show unit of repeat. Extend complexity of pattern depending on need.





To learn order irrelevance principle – total the same no matter where the counting starts.

Optional: To compare capacity – pegs can be used to fill the pots or other containers to show how many pegs are needed to fill the containers and make comparisons.



AGES 4-5 TEACHING GUIDE SUMMER TERM

Pegs to Count Up can be used in Reception or F2 to support maths across F2 and is an excellent resource to complement the NCETM and White Rose EYFS planning. Themes to explore across summer term could include: To estimate and compare amounts and match to numbers – Explore possibilities through using the count up resources to support concrete understanding e.g. count 5 pegs into a pot, take an amount out and hide in hand – how many could be left in the pot? Explore the range of possibilities and represent these using rods and pegs to support understanding.

To explore the composition of numbers beyond 10 – Use the 10 rod and other rods to show how numbers 11-19 are made up of one ten paired with a smaller number. Or, roll dice and count out that many pegs to add to the rods. How many more are needed to reach the total?

To explore adding more and taking away – *Initially model through step counting, then random numbers.*

To deepen understanding of patterns and relationships – use pictorial representations of rods or actual rods to match to number cards. Discuss make up of numbers and noticeable patterns seen.

To explore sharing and grouping – how can I share this group of pegs between 2 people, 2 people etc. How can I share these pegs equally onto 2 ten rods etc.

ELG's for end of Reception or F2:

ELG: Number

Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including











4

ELG: Numerical Patterns

Verbally count beyond 20, recognising the pattern of the counting system.

Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

With the EYFS reforms, EYFS maths now places a greater focus on developing reasoning through playful first-hand experiences using concrete resources. There is greater emphasis on the need for automatic recall of number bonds and facts rather than a focus on strategies for addition and subtraction. There is a greater focus on comparison and patterning to support settings in promoting and developing the foundations for a mastery approach to mathematics and support children in developing depth of understanding. As demonstrated, Pegs to Count up can be used effectively to secure a good level of development in maths and secure foundations on which National Curriculum maths expectations can be built on.



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AGES 5-6

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AGES 5-6 TEACHING GUIDE AUTUMN TERM

Pegs to Count Up is an excellent resource to complement the NCETM and White Rose planning and can be used in the Year 1 maths curriculum in the Autumn Term to: Count, read and write numbers to 100 in numerals - *As in FS children can count pegs using a single colour at first, placing them on the board to reinforce start and end point. They can*

use the blank tiles to write on the number they have counted. Using the rods to support counting.

Identify one more and one less - The children can use pegs of different colours to show one more and one less after a number. The blank tiles can be used to introduce the symbols for addition and subtraction. Building the pegs up in a tower will give children the concrete and visual view when comparing towers with one more or one less.

Use the language of: equal to, more than, less than (fewer), most, least - *Children can explore problems using this language with the pegs, rods and boards. They can create their own problems for their learning partners – e.g. I have a tower of 6 red pegs and 7 blue pegs – which tower has the most?*

Identify and represent numbers using objects and pictorial representations including the number line - The pegs, rods and board can be used to assess children's understanding of number – asking them to show amounts in different formats – 'show me 10 in as many different ways as you can'.

Read and write numbers from 1 to 20 in numerals and words - Daily sessions using pegs and rods with the blank tiles to illustrate their understanding of numerals and words. As in FS use pegs and rods to show part-whole models.

Represent and use number bonds and related subtraction facts within 20 - Using the board children can create pictorial representations of number bonds to 20. Use of different colour pegs to show the number pairs e.g. 1 blue peg and 19 green pegs. Children can then use these representations to support their use of language around subtraction.













Add and subtract one-digit and two-digit numbers to 20, including zero - Pegs of different colours used horizontally or vertically can provide concrete and pictorial representations of one and two-digit numbers to 20. Exploring a range of ways to represent, children can photograph outcomes to journal their understanding.



Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs *The blank tiles can be used to represent the +, - and = signs as part of a problem.*

Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems - Using the pegs and rods as manipulatives to provide concrete and pictorial representations, children can explore problems and record outcomes with photographs to support emergent maths journaling.

Vertical and horizontal representations with pegs will embed concrete understanding.



AGES 5-6 TEACHING GUIDE SPRING TERM

Pegs to Count Up is an excellent resource to complement the NCETM and White Rose planning and can be used in the Year 1 maths curriculum in the Spring Term to: Count in multiples of twos, fives and tens – Using pegs of different colours children explore patterns made with two, five and ten pegs. Using the board children can create multiples and visually recognise links – subitising groups of two, five and ten.

Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher – As with addition and subtraction problems Count Up materials can be used in a range of ways to support children as concrete representations. Pegs can be used to represent arrays both vertically and horizontally.

Recognise, find and name a half as one of two equal parts of an object, shape or quantity – *children can be supported to create shapes using the pegs to copy photographs of previously constructed shapes – using different colour pegs to illustrate half of a shape allowing them to quantify e.g. a rectangle is made up of 4 blue and 4 red pegs – 4/8 pegs are blue and 4/8 pegs are red (half)*

Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity – *As above – children can explore shapes made out of the pegs using four colours to identify four equal parts.*









AGES 5-6 TEACHING GUIDE SUMMER TERM

Compare, describe and solve practical problems for: lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] – Using the pegs in a vertical way children can be encouraged to explore, compare and descried heights of the peg constructions using the correct mathematical vocabulary. The visual representation will support accurate identification of long/short, longer/shorter, taller/shorter, double/half. Using the rods children can also describe different lengths and heights. Problems can be posed by teachers for instance – how many pegs will I need to remove to make the green tower shorter than the yellow tower? How can I make my blue tower longer than the red tower?.



Describe position, direction and movement, including half, quarter and three-quarter turns – Count Up pegs and boards can be used to develop and assess positional language in a variety of ways. Using the blank rods to create a number axis children can be given a peg with a starting point and then instructions (using positional language) from a partner or teacher to move to a new point on the board. This fits with the computing curriculum and is the start of coding. The board can be used as a treasure map and the children have to move the pegs (representing pirates) to find the treasure using specific criteria e.g. you can only move your peg one space at a time and only horizontally or vertically.



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AGES 6-7 TEACHING GUIDE

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AGES 6-7 TEACHING GUIDE AUTUMN TERM

Pegs to Count Up is an excellent resource to complement the NCETM and White Rose planning and can be used in the Year 2 maths curriculum in the Autumn Term to: Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward – Building on FS and Year 1 learning and strengthening their number sense children can use the pegs to create patterns of 2,3, 5 and 10 on the Count Up board. The whole board can be used as a 100 square and pegs colours can indicate steps of 2, 3 and 10 from any position within 100. The tactile interaction along with the visual use of colour will support children to count forward and backwards with confidence.

Using the ten rods – explore counting in 10's up to 100. This could be done with 2 rods, 5 rods etc. To support children in visualising how the number increases as they add more rods.

Compare and order numbers from 0 up to 100; use <, > and = signs – Developing skills of comparison through play – as in FS can continue – with the greater than, less than and equal to signs written on blank tiles children can grab two handfuls of pegs, make estimates initially and then count up placing the correct sign between the two piles. This can also be played in pairs. Using the pots children can be given different amounts of pegs which they can order through estimation initially and then count up in towers.

To explore patterning – as with nursery or F1 – model unit of repeat, then use pegs and board to explore AB, ABB, ABC







patterns both in horizontal and vertical format.

To explore number – *Explore counting, subitising, matching, comparison of number using the pegs and rods. Place pegs on a rod and talk about how many pegs they have and how many spaces are left (link to subitising e.g. can they see how many more they need to make 10 without having to count). Explore which smaller numbers make up a bigger number – vertical stacking of rods and pegs will support with understanding that the total remains the same.*



Identify, represent and estimate numbers using different representations, including the number line – Give children a number – can they create that number with rods and pegs in different ways/combinations? Revisit suggested activities for Year 1 to consolidate prior learning.

Read and write numbers to at least 100 in numerals and in words – Using the 100 square printed children can cover numbers with blank tiles and challenge partner to identify missing numbers. Role the 10 sided die and then create the number in pegs and identify it on the 100 square.

Recognise the place value of each digit in a two-digit number (tens, ones) – Identify H, T, O by labelling blank tiles and placing pegs below each column to represent the digits chosen.

Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 - Putting given amounts of pegs on to the board with addition or subtraction symbol written on blank tiles – children can remove or add to the pegs according to the calculation required. Using different colours of pegs to identify the related facts to 20. As per work card 24 explore making number bonds to 20 on the Pegs to Count Up frame. Children can record their number sentences to represent the number bonds they have created and challenge a friend to do the same.

Add and subtract numbers using concrete objects with pictorial representations

Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot - Challenge children to make addition and subtraction stories using the rods and pegs.

Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems - Challenge children to make addition and subtraction stories using the rods and pegs. Showing the same stories with inverse relationship.















solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods - Provide opportunities for the children to explore the Pegs to Count Up equipment and follow their own lines of enquiry.

The above relates to and works with the mastery approach to maths where children could be encouraged to create their own number problems for their friends to explore. Children could use computing to photograph and document their work as part of their journaling in relation to using the appropriate numbers and symbols.

