**Planning Overview**
**Year 3 Place Value**

Count from 0 in multiples of 50 and 100; find 10 or 100 more or less than a given number.
Recognise the place value of each digit in a three-digit number (hundreds, tens, ones).
Compare and order numbers up to 1000.
Identify, represent and estimate numbers using different representations.
Read and write numbers up to 1000 in numerals and in words.
Solve number problems and practical problems involving these ideas.

3NPV–2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.
3NPV–3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.
3NPV–4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.
3NPV–1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.

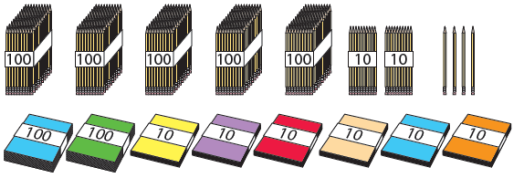
| | **Teaching and Learning** |
|---|---|
| **Introduction** | Have a range of resources on the table with 1, 2 and 3 digit numbers written on cards. Chose a number and make it in a range of ways. What is the value of each digit? How many 100s, 10s, 1s? Record one number in their books using pictorial representations e.g. Part – Whole model, PV Chart, drawings of dienes, PV Counters etc. |
| **Counting in 100s** | Count in 10s – what is the pattern? Model counting in 100s – can the children explain the pattern? What's the same, what's different about the 10s and 100s count? Why are there 2 zeros?<br><br>Complete number sequences involving 100s. Forwards and backwards, with different starting points and back to 0.<br><br>Word problems e.g. you need 800 marbles. They come in packs of 100, how many packs do you need?<br><br>Spot the mistake with 100s numbers represented in different ways.<br><br>True or False – when I count in 100s the 100 column is the only column that changes? Do the children spot that once we get to 900 the thousand column will also change? |
| **Value of the digits – partitioning** | Make the number 425. What does this look like using a range of different representations? Why might it be difficult to show what 408 or 480 look like using resources? What would we need to be careful about when making these numbers? |

Fluency based questions making numbers using equipment and pictorial representations and identifying numbers from an image.

**Mastery**

Find the number of pencils.

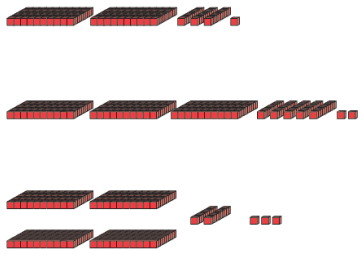
Find the number of exercise books.




*Guide pupils to use practical equipment to deepen their understanding of place value and apply their knowledge of place value in mental and written calculation.*

**Mastery**

What number is represented in each set?



Mastery Assessment

- 8 hundreds, 3 tens and 6 ones together make ☐.
- 457 is made of ☐ hundreds, ☐ tens and ☐ ones.
- 250 is made of ☐ hundreds and ☐ tens.

Spot the mistake about how numbers have been formed or read using common misconceptions e.g. 203 represented with 2 hundreds and 3 tens or more than 9 counters in a place value column.

**Mastery with Greater Depth**

Captain Conjecture says 'The number in the place value grid is the largest 3-digit number you can make using all 10 counters'.

| 100s | 10s | 1s |
|---|---|---|
| ● ● ● ● ● ● | ● | ● |

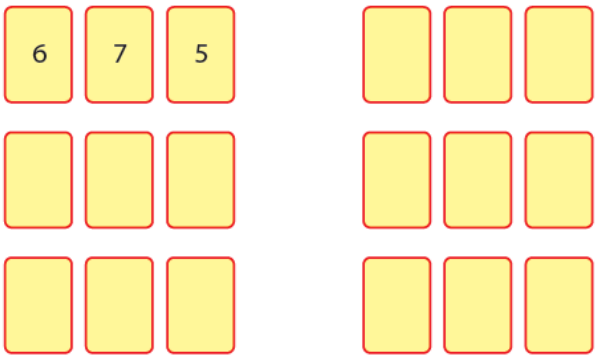
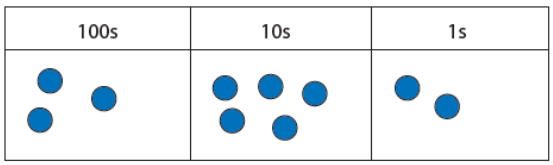
Do you agree?

Explain your reasoning.

Bring all children together to look at problem solving.

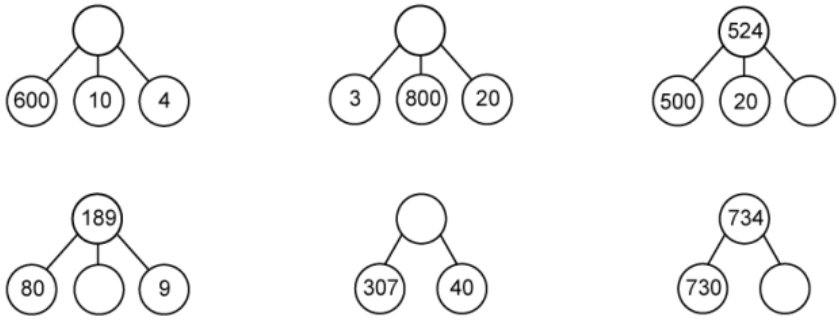
Focus on the skills of working systematically. How do we work in a system e.g. if there were 3 colours for a football kit or 3 ice cream flavours how many different combinations could we make? Blue/Red/White tops and shorts. What different combinations of kit could you wear? BB, BR, BW, RR, RW, RB, WW, WB, WR

<table>
<tr>
<td></td>
<td>
What if we were working with numbers? What would we keep the same and what would we change in order to work systematically?<br><br>
Mastery<br>
Megan has made a 3-digit number with these cards.<br>

<br>
What other 3-digit numbers can she make with these cards?<br>

<br>
What is the largest number she can make?<br><br>
Consider whether or not children are working systematically.<br><br>
Mastery with Greater Depth<br>
What is the value of the number represented by the counters in the place value grid?<br>

<br>
Using all of the counters, how many different numbers can you make?<br>
Have you made all the possible numbers?<br><br>
Explain how you know.<br><br>
What range of 3-digit numbers can you make with a digit sum of 9?</td>
</tr>
<tr>
<td>Partitioning in different ways</td>
<td>Build the number 654. Talk to the children about how we can partition this in a number of different ways. If we use a part whole model we can partition this out into 6 hundreds, 5 tens and 4 ones but we can also partition this into 500, 150 and 4. Put the equipment back together again and show children that we still have 654.<br><br>
As children in their places to partition 654 in a different way. Can we all find a different way to do it?</td>
</tr>
</table>

Children practice practical non-standard partitioning until they are confident with this

3. Fill in the missing numbers to complete these partitioning diagrams.

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Apply this to calculation and balanced and imbalanced statements

4. Fill in the missing numbers.

$600 + 70 + 1 = \square$ $3 + 500 + 40 = \square$

$461 = \square + 60 + 1$ $20 + \square + 3 = 823$

$953 - 50 - 3 = \square$ $846 - \square - 40 = 800$

$\square = 203 + 90$ $\square = 290 + 3$

$628 = 20 + \square$ $628 = 8 + \square$

5. Fill in the missing symbols (<, > or =).

$100 + 60 + 5 \square\ 105 + 60$

$300 + 40 + 2 \square\ 300 + 24$

$783 - 80 \square\ 783 - 3$

$839 - 9 - 30 \square\ 839 - 39$

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**Greater Depth**

Look at the number 237 – can you make this using dienes? Reinforce that 1 hundred is also 10 tens and 100 ones. Reinforce that 1 ten is also 10 ones

237 could be
200 and 30 and 7
2 hundreds and 3 tens and 7 ones
23 tens and 7 ones
237 ones

What else could it be?
e.g.
1 hundreds and 13 tens and 7 ones
22 tens and 17 ones

<table>
<tr><td></td><td>Greater Depth Assessment<br>674 is made of 6 hundreds, 7 tens and 4 ones.<br>674 is also made of 67 tens and 4 ones.<br>674 is also made of 6 hundreds and 74 ones.<br><br>Find different ways of expressing:<br>■ 630<br>■ 704<br>■ 867</td></tr>
<tr><td>1, 10, 100 more or less</td><td>Make a number using resources. What is 1/10/100 more/less? Which column changes? Support children less confident with crossing the 100s barrier when counting in 10s with a 200 grid.<br><br>Two-hundred grid:<br><table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr><tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr><tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr><tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr><tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr><tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr><tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr><tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr><tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr><tr><td>101</td><td>102</td><td>103</td><td>104</td><td>105</td><td>106</td><td>107</td><td>108</td><td>109</td><td>110</td></tr><tr><td>111</td><td>112</td><td>113</td><td>114</td><td>115</td><td>116</td><td>117</td><td>118</td><td>119</td><td>120</td></tr><tr><td>121</td><td>122</td><td>123</td><td>124</td><td>125</td><td>126</td><td>127</td><td>128</td><td>129</td><td>130</td></tr><tr><td>131</td><td>132</td><td>133</td><td>134</td><td>135</td><td>136</td><td>137</td><td>138</td><td>139</td><td>140</td></tr><tr><td>141</td><td>142</td><td>143</td><td>144</td><td>145</td><td>146</td><td>147</td><td>148</td><td>149</td><td>150</td></tr><tr><td>151</td><td>152</td><td>153</td><td>154</td><td>155</td><td>156</td><td>157</td><td>158</td><td>159</td><td>160</td></tr><tr><td>161</td><td>162</td><td>163</td><td>164</td><td>165</td><td>166</td><td>167</td><td>168</td><td>169</td><td>170</td></tr><tr><td>171</td><td>172</td><td>173</td><td>174</td><td>175</td><td>176</td><td>177</td><td>178</td><td>179</td><td>180</td></tr><tr><td>181</td><td>182</td><td>183</td><td>184</td><td>185</td><td>186</td><td>187</td><td>188</td><td>189</td><td>190</td></tr><tr><td>191</td><td>192</td><td>193</td><td>194</td><td>195</td><td>196</td><td>197</td><td>198</td><td>199</td><td>200</td></tr></table><br>1. Fill in the missing numbers.<br><table><tr><td>900</td><td></td><td>700</td><td>600</td><td></td><td>400</td><td></td><td>200</td></tr><tr><td>370</td><td></td><td>390</td><td></td><td></td><td>420</td><td></td><td>440</td></tr></table><br>Mathematics guidance: key stages 1 and 2 Non-statutory guidance for the national curriculum in England.</td></tr>
</table>

**Fluency without exchange**

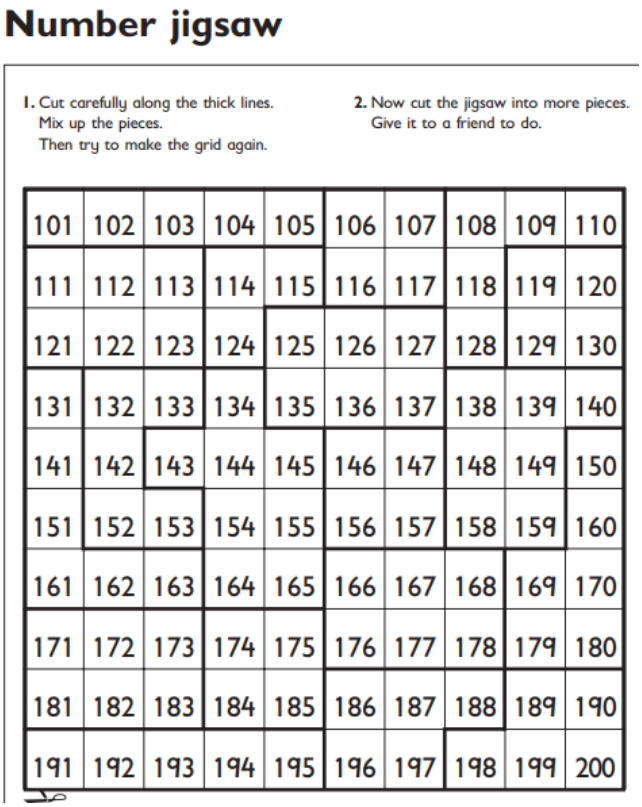
| | +1 | +10 | +100 |
|---|---|---|---|
| 123 | | | |
| 356 | | | |

| | -1 | -10 | -100 |
|---|---|---|---|
| 376 | | | |
| 563 | | | |

| | +1 | +10 | +100 |
|---|---|---|---|
| | | 456 | |
| | | | 263 |

**Fluency with exchange –** Complete charts as above where exchange is needed. Can children explain how they know there is going to be an exchange?

BEAM number jigsaw.



**Number jigsaw**

1. Cut carefully along the thick lines. Mix up the pieces. Then try to make the grid again.

2. Now cut the jigsaw into more pieces. Give it to a friend to do.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 |
| 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 |
| 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 |
| 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 |
| 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 |
| 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 |
| 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 |
| 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 |
| 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 |
| 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 |

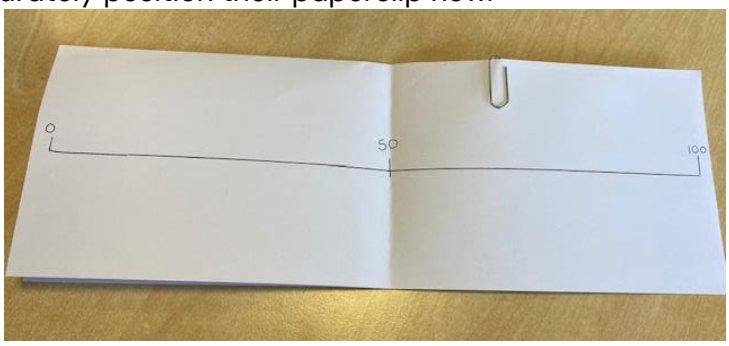
I think of a number +100 and -10 I end up with 345 what number was I thinking of?

Is it quicker to count up to 30 in ones or count up to 300 in tens? Why?

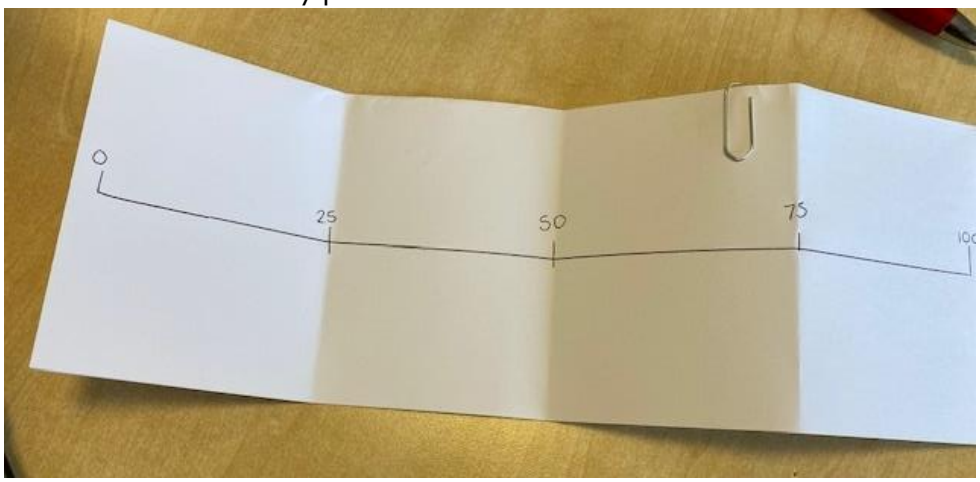
Sometimes/always/never When I add or take away from a column that is the only digit that changes.

| | |
|---|---|
| **Counting in 50s** | Recap counting in 10s on a number line. Along the same number line children to recap counting in 5s. What do they notice about the 2 sequences?<br><br>Recap counting in 100s on a number line, then mark each half way point. Can the children work out any of these points?<br><br>Relate counting in 10s and 5s to counting in 100s and 50s.<br><br>Complete number sequences involving 50s. Forwards and backwards, with different starting points and back to 0.<br><br>Word problems e.g. you need 300 marbles. They come in packs of 50, how many packs do you need?<br><br>Spot the mistake with 50s numbers represented in different ways.<br><br>Fizz Buzz with multiples of 50 and 100.<br><br>True or False - All multiples of 100 are multiples of 50 therefore all multiples of 50 are multiples of 100?<br><br>If my sequence starts at 450 and increases by 50 each time then I will say 945. Is this true or false? |
| **Comparing objects and numbers** | Show 2 numbers and ask the children to explain how they knew which was bigger.<br>5 and 999<br>23 and 426<br>146 and 239<br>152 and 196<br>165 and 167<br><br>Develop an explanation about what thought processes you go through when deciding which is the larger number. Use pictorial and concrete equipment as appropriate to support understanding.<br><br>Complete fluency questions comparing numbers. |
| **Number lines** | Give the children a strip of paper. Ask them to draw a blank number line of their strip. Label one end of the number line as 0 and the other end as 100. With a paper clip as them to identify where they think 70 would go on this number line.<br><br>  |

Ask the children to fold their number line in half and mark on the midpoint. They now have 3 known pieces of information on their number line. They also have 2 small number lines now. One 0-50 and one 50-100. Which small number line would 70 go on? Ask children if they can more accurately position their paperclip now.




Ask the children to now fold the number line in half and in half again to be able to mark on the quarter and three quarter points. We now have 5 pieces of known information and 4 small number lines. Children can now much more accurately position 70.




Children to repeat this skill with a variety of number lines with different start and end points e.g.
0-1000
100-200
0-400

3. Estimate and mark the position of these numbers on the number line.

600 200 480 840 762 195

0 1000

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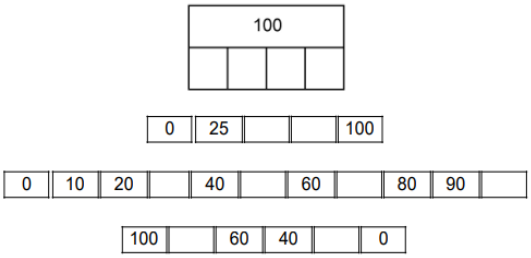
Teach children about intervals. Once you think you know a number, continue the count to make sure the next numbered interval is correct.

Position numbers on a number line split into intervals of 1, 10 or 100.

Position numbers on a number line split into intervals of 2, 5, 20, 25 or 50.

1. Fill in the missing numbers.

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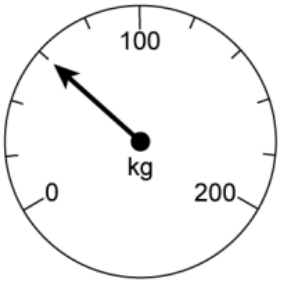
3. Miss Scot weighs herself. How much does she weigh, in kilograms?




4. How many centimetres long is the ribbon?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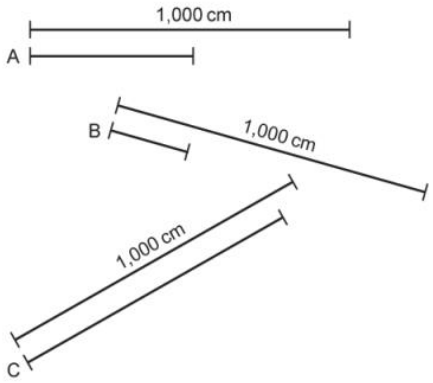
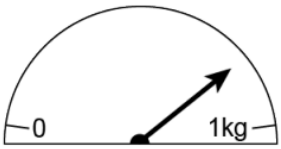
Estimate values on blank number lines.

5. Look at lines A, B and C. Can you estimate how long they are by comparing them to the 1,000cm lines?



6. Estimate the mass, in grams, shown on this weighing scale.

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Estimate a range of start and end points on a number line based on one given number i.e. if this arrow is pointing a ¼ of the way up this number line and the number showing is 70, what could the start and end points be? Is there more than one possibility?

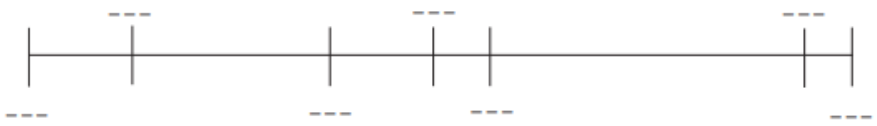
First4Maths Digging Deeper Problem

**SETTING THE SCENE**

A mischievous pumpkin (or character linked to your topic/current book) has come along and destroyed my number line. I had put these 3 digit numbers on there for you to look at and now they are on the floor. Can you work out where each of the three digit numbers would go on this blank number line? Give children a selection of 3 digit numbers to order.

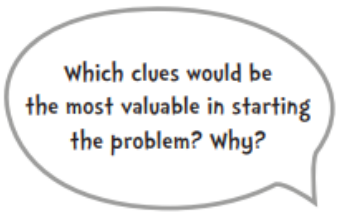
**EXPLORE**

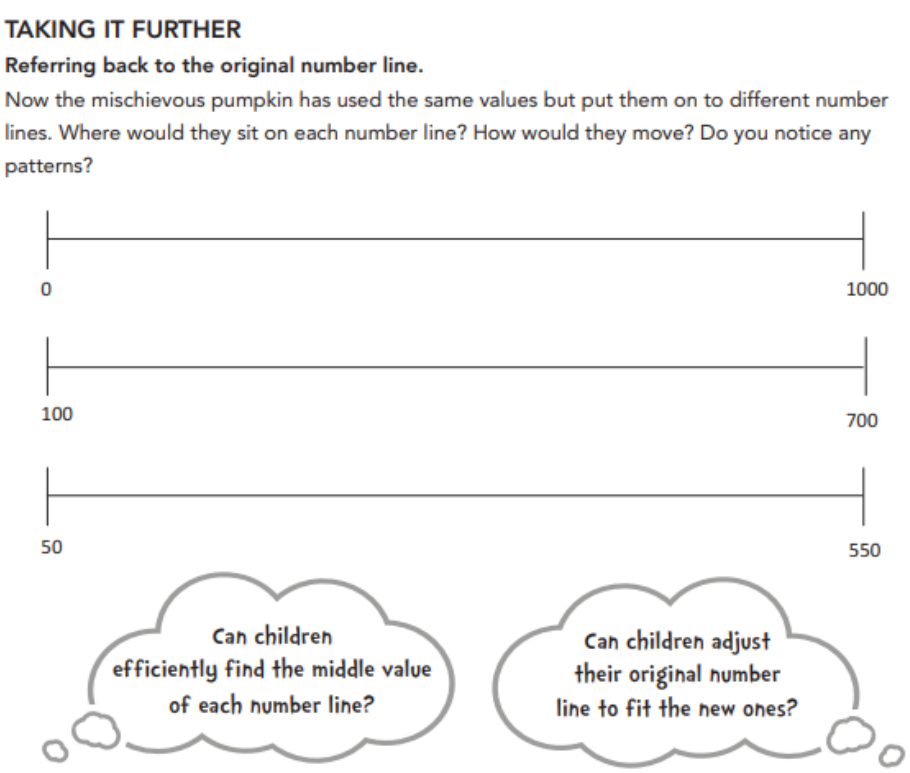
Now the pumpkin has hidden all the cards as well but he has left you some clues to put the number line back together. Can you solve this number line nightmare?



Clues:

- The highest value has 5 hundreds, 0 tens and 0 ones
- One has 32 tens and _ ones
- One is 100 more than the 2nd smallest value
- One is 2 tens less than 500
- The three digits in one number total 6
- One value has 25 tens and 2 ones
- 300 is the middle value






**Ordering numbers**

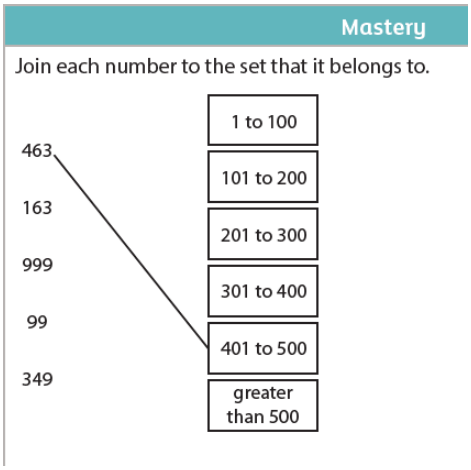
Follow on from the work on comparing two numbers and positioning numbers on a number line, give children a set of 5 numbers and ask them to order them and position them on a number line. What size of number line do you need?

**Do, then explain**

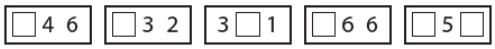
835 535 538 388 508

If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers.

Using the digits 3, 4 and 5 what range of 3-digit numbers can you make? Order them on a number line.




What is the same and different about these 3 digit numbers 434, 443, 334, 343? Can you order them?

| | |
|---|---|
| | **Mastery with Greater Depth**<br>Insert a digit into each box so that the numbers are in order from smallest to largest.<br>  <br>Which digits can you place in the boxes to create the largest interval between any two consecutive numbers?<br><br>Consider the outcome of this question. Children should spot that the biggest difference between the first, second and third numbers will be less than 300 so they will have to consider the difference between the 3rd, 4th and 5th numbers. Can they explore this? |