

Ordering Numbers - Teaching Notes

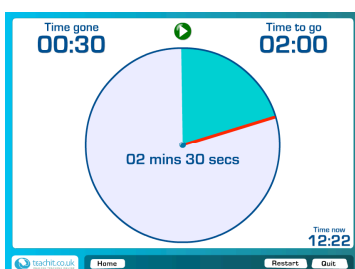
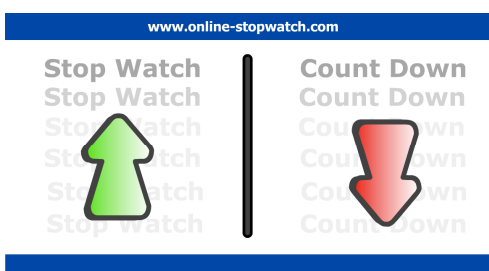
Challenging students to find all the ways of arranging 4 digits (or 3 digits as an introductory task) provides an excellent opportunity to integrate the development of number sense and place value with combination theory. Many adults would find this a challenging task, and yet it is accessible to young students with appropriate scaffolding.

Students respond well to the physical aspect of holding a large digit on a laminated card, with instructions coming from the audience (the rest of the class). Having the students repeat the task back at their desk with a smaller format helps to reinforce the mathematical concepts embedded in the task.

This task offers a good window for a teacher to observe students' strategies in '*working as a mathematician*' and how they record and publish their data.

There are several formats and ways these resources might be used:

- Students out the front of the class holding cards, responding to questions posed by the teacher or the class. Eg. Can you make the biggest number? Smallest number? An odd number? And another? And another? A number between 2000 and 3000? And another? And another?
- Large format cards (18 in all, showing all arrangements of 4 numbers, with a zero) can be used for students standing out the front, arranging them in ascending or descending order. The ledge on a whiteboard might be useful for this. If you have carpet on your walls, 1-2 velcro tabs on the back of each card would work well.
- Small format cards (same as above) can be used as a table-top version for students, once they are familiar with the structure of the task. The task can be further extended by using a count-down timer or stopwatch (eg. <http://www.online-stopwatch.com/full-screen-stopwatch> or http://www.teachit.co.uk/custom_content/timer/TeachitTimer.zip). If students collect their data, a good opportunity for graphing arises. Using the Teachit Timer, students can nominate their own time, and try to beat it.



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2045	2045	2045
2054	2054	2054
2405	2405	2405
2450	2450	2450
2504	2504	2504
2540	2540	2540
4025	4025	4025
4052	4052	4052
4205	4205	4205
4250	4250	4250

4502	4502	4502
4520	4520	4520
5024	5024	5024
5042	5042	5042
5204	5204	5204
5240	5240	5240
5402	5402	5402
5420	5420	5420

Want to change the numbers used?

Use **Find & Replace** in your word processor to change the digits.

Large format cards are for four individual students to stand out the front.

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O

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Large format cards for ordering out the front of the class. The cards can be ordered on a whiteboard ledge. If carpet is on the walls, then velcro tabs on the back would work well.

2045

2054

2405

2450

2504

2540

4025

4052

4205

4250

4502

4520

5024

5042

5204

5240

5402

5420

Cut these out (one set per column) and store in ziplock bags. Students can work in pairs to order the numbers in ascending or descending order. They can time themselves to see if they can improve. Graph their results over time.

2045	2045	2045
2054	2054	2054
2405	2405	2405
2450	2450	2450
2504	2504	2504
2540	2540	2540
4025	4025	4025
4052	4052	4052
4205	4205	4205
4250	4250	4250

4502	4502	4502
4520	4520	4520
5024	5024	5024
5042	5042	5042
5204	5204	5204
5240	5240	5240
5402	5402	5402
5420	5420	5420