

Counting in Powers of Ten Challenge Cards **Answers**

1. Counting in 10s

Lily counts forwards and backwards in 10s from 63.

She says, "As I count forwards and backwards from 63, all of the numbers I say will end in 3."

Jiang says that she is incorrect. Why did he say this?

Jiang said that she is incorrect because all of the positive numbers will end in a 3, but the negative numbers will end in a 7.

Write a number that you can count from in tens, forwards and backwards, that will always have the same digit in the ones place. **Accept any number ending in 0 or 5.**

2. Counting in 100s

Adam writes some numbers. From each number, count forwards and backwards in hundreds. Write down the 3rd and 7th number that you arrive at each way.

7 th backward	3 rd backward		3 rd forward	7 th forward
-381	19	319	619	1019
317	717	1017	1317	1717
45 127	45 527	45 827	46 127	46 527
381 234	381 634	381 934	382 234	382 634

Can you see any relationships between the numbers in each row? Explain what the relationship is.

The 7th number forward is 1000 more than the 3rd number backward ($19 + 1000 = 1019$). Also, the 3rd number forward is 1000 more than the 7th number backward ($317 + 1000 = 1317$). This is because the difference is ten counts of one hundred, which is one thousand.

3. Counting in 1000s

Adam and Jiang work together to count in thousands.

First, Adam chooses the number 5926. Each of them will take it in turns to count forwards in thousands.

Work with a partner and try this activity.

How far can you and your partner get in one minute?

Children's answers will vary depending on their start number.

4. Counting in 10 000s

Jiang says: "When you count in ten thousands, the last four digits of a number stay the same."

Explain when Jiang would be correct, and when he would be incorrect. **Jiang is correct when the numbers are all positive or all negative, but when the sequence crosses zero, the last 4 digits will usually change.**

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5. Counting in 100 000s

Lily writes down some numbers. How many times will she count in 100 000s from each number to exceed 1 000 000?

92 472	10	592 310	5
267 109	8	311 003	7
810 672	2	991 726	1

Can you identify a pattern between the starting number and the number of 100 000s needed?

Accept any answer that acknowledges that the digit in the hundred thousand column and the number of hundred thousands needed are number bonds to 10. For example, 267 109 + 800 000.

6. Counting in 1 000 000s

Adam counts backwards in millions from 4 572 921. What is the first negative number he will come to? **-427 079**

Explain how you could calculate this for any number.

Accept any suitable explanation and method.

Explain your method to a partner. Did they use the same method as you?

7. Combined counting

Jiang writes the number 2 937 840.

He counted backwards in different powers of 10 to get to 0. How could he have counted?

Count backwards 2 times in 1 000 000s to 937 840

Count backwards 9 times in 100 000s to 37 840

Count backwards 3 times in 10 000s to 7840

Count backwards 7 times in 1000s to 840

Count backwards 8 times in 100s to 40

Count backwards 4 times in 10s to 0

Jiang writes the number 8 584 152. Why will he be unable to count in powers of 10 back to 0?

Accept any answer that explains that 8 584 152 is not a multiple of 10.