

## Diagnostic test for students

Student Name:

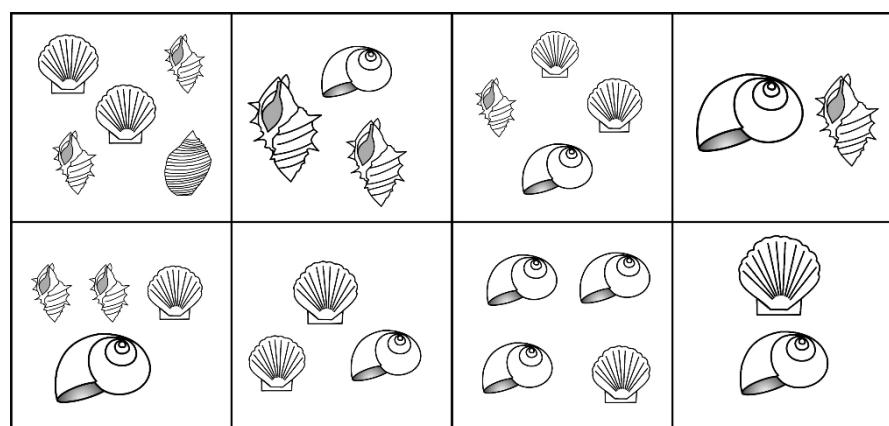
Date:

*This test is designed to help your teachers work out what you really understand about Place Value and where you are stuck. Please have your best guess at what you think the answers are. Try to answer each of the questions. If you really don't know, guess anyway but also draw a question mark on the task.*

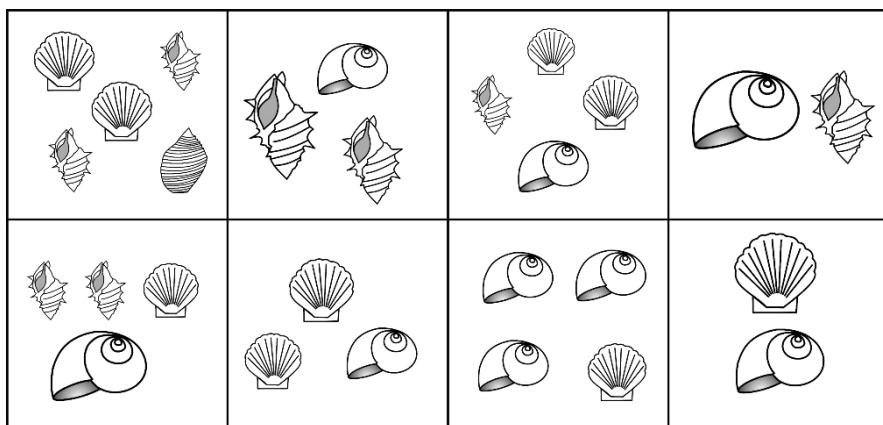
1. Get 8 blocks or counters. Arrange them into a circle. Draw what you have made:

2. Now arrange them differently and draw them again here:

3. Circle all the collections that have 4:



4. Circle all the collections that have 5:



5. Colour some fingers on **both hands** below so that there are **5 fingers coloured altogether**. Don't just colour all the fingers on one hand – make sure you use some from each hand.  
Do it a different way on the second set of hands.



Set 1: colour five fingers here



Set 2: colour five fingers here

6. Jack has 6 shells. You can see some of them in the picture below, but the rest are hidden under the cover. How many are under the cover?

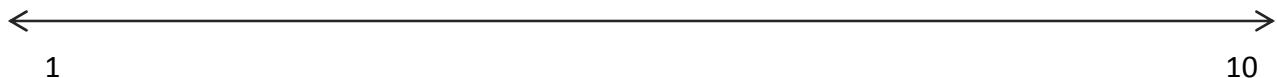


7. Amy wants 12 apples. Here is what she already has. How many more does she need? Draw the missing apples as circles.



8. How would your answer change if she had 4 apples in her bag instead?

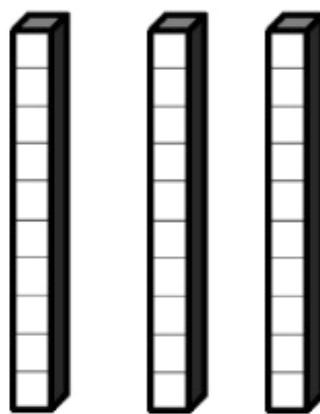
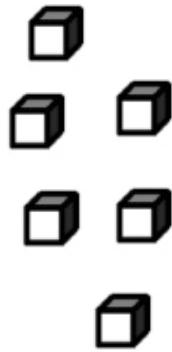
9. Put these numbers in their right spots on the line below: 2, 3, 8



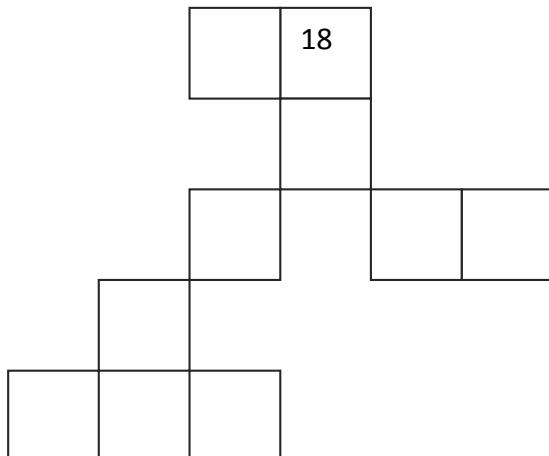
10. How could you make the number 23 using MAB blocks? Draw it here:

11. Which number have I made below using MAB? Circle the correct answer from this list:

1. 63
2. 36
3. Both 63 and 36
4. Neither 63 or 36



12. Some numbers are missing from the hundreds chart below. Fill them in.



**If you are stuck:**  
Ask your teacher for  
the number  
underneath the 18.  
Teacher, give the  
number and circle it.

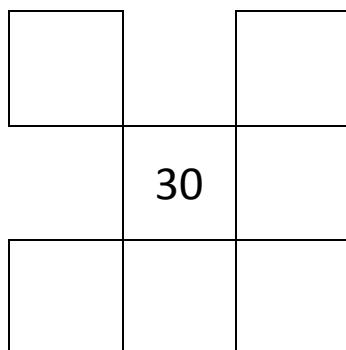
13. Add squares to the hundreds chart above to show where these numbers go: 9, 15, 59

14. How could you make **54** using tens and ones blocks?

Show three different combinations of blocks that would all make 54:

Tens:	Ones:

15. Some numbers are missing from the hundreds chart below. Fill them in. Even though this hundreds chart looks a bit funny because the 30 is in the middle it follows the same pattern as a normal one.



16. Put these numbers onto both of the lines below in their right spots: 10, 20, 50, 70, 90



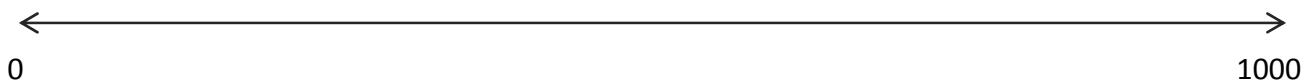
17. What number would I have if I had: *2 tens, 4 hundreds and 5 ones?* Circle the correct answer:

- 245
- 452
- 425
- The numbers above are all the same anyway so it doesn't really matter.

18. What number would I have if I had: *12 tens, 4 hundreds and 15 ones?* Circle the correct answer:

- 12415
- 41215
- 427
- 535
- None of those numbers

19. Put these numbers onto the line below in their right spots: 10, 100



## Diagnostic test: Instructions and Interpretation

This test builds in complexity. Remember to stop at the point where a student begins to get the answers wrong, and start the intervention program from that Lesson. Check the next few questions to make sure that the problem is genuine, but you do not have to complete the whole test once a student consistently gets answers wrong.

- Questions 1-9 refer to stage 1: Numbers to 20
- Questions 10-16 refer to stage 2: Two-digit numbers
- Questions 17-19 refer to stage 3: Three-digit numbers

### What to look for in a student's answers:

#### For questions 1-2:

Watch out for students who:

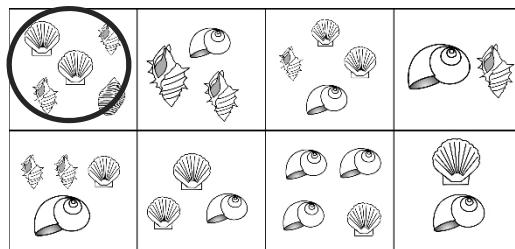
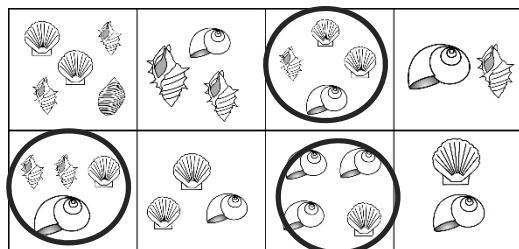
- Don't collect eight blocks or draw eight blocks (even if you think they just weren't listening, record it)
- Draw eight counters in a horizontal line and count only from one end to another (check if they think it won't be eight if you move the blocks – do they need to count them again to be sure?)
- Count their blocks several times to make sure that they really have eight
- Can't draw eight counters in a circle but can draw them in a line

Note: If students struggled with this question but were ok with ones that followed then they may have just not understood the task. Consider carefully whether the advice below is applicable.

If students did not answer these questions correctly and also could not go further in the test then they are absolutely not ready to be introduced to two digit numbers yet, even if they can state the names of numbers and count with one-to-one correspondence. They first need to work on making lots of different numbers to 10, moving the objects around and checking to see if there are still the same amount. They then need to work on Partitioning numbers to 10, then to 20 before any work on Place Value will be successful. See examples in the first two Lessons, but you will need to do much more work until they are confident with these concepts.

Additional support on building understanding of Partitioning is available in the articles section on the Back-to-Front Maths website.

#### For questions 3-4:



If students have missed any of these or circled any others then they do not understand single digit numbers adequately. See the above description for what to do.

#### For questions 5-8

Watch out for students who:

- Colour all of the fingers
- Colour any combination that is not five

Refer to the advice for questions 1-2 as these kids are not ready for two-digit Place Value.

**For question 9:**

Watch out for students who:

- Squash the 2 right next to the 1, then the 3 right next to the 2
- Space the 2, 3 and 8 equidistantly along the line and then try to squeeze the other numbers in
- Have 8 closer to the 1 than the 10
- Do not have the numbers from 1-10 roughly evenly spaced. These do not need to be exact, but should be fairly close, even if the student has made adjustments to their original answer to get it right.

Start at **Lesson 3** for students who were successful for questions 1-8 but got stuck at question 9.

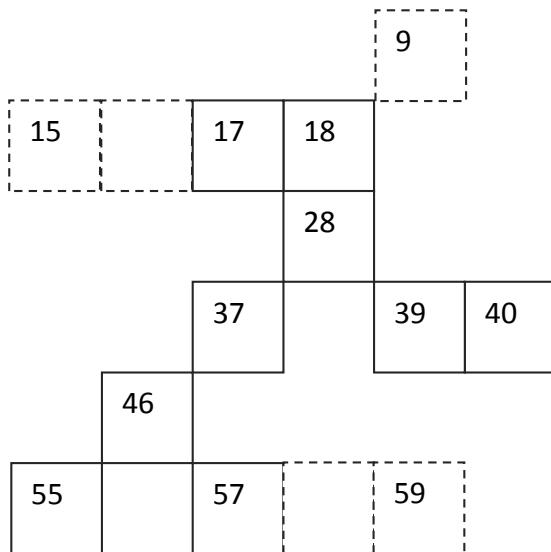
**For questions 10-11:**

Watch out for students who:

- Answered question 10 right, but struggled with question 11
- Answered either question wrong

These questions relate directly to Place Value concepts (1) and (2): Numbers are about the amount rather than where you put the blocks. To help kids who answered wrongly, hold up a *ten* block and ask them how many “little blocks” they think are in it. They may not know for sure that there really are ten. These students may need to count each of the tens blocks to check. Start at **Lesson 4**.

**For question 12 and 13, this is what you should see:**



Watch out for students who:

- Rote count in either 1s or 10s irrespective of the position of the squares
- Get stuck with corner squares and ones that involve going backwards (e.g. the 9, the 15, the 46 and the 55)

For these students, start at **Lesson 4**.

**For question 14:**

Watch out for students who:

- Can only make 54 using 5 tens and 4 ones or 54 ones
- Make amounts that don't add to 54

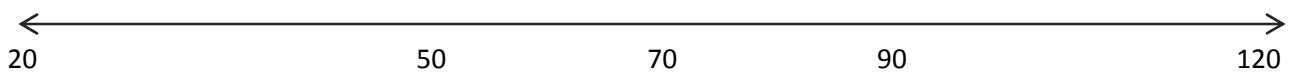
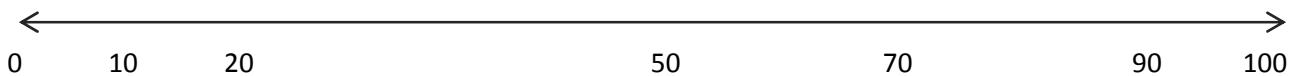
For these students, start at **Lesson 4 or 5**.

**For question 15, this is what you should see:**

19		21
	30	
39		41

For students who struggled with this task, start at **Lesson 7**.

**For question 16, this is what you should see:**



For students who struggled with this task, start at Lesson 7 or 8.

**For question 17, the answer is 425.**

For students who answered this incorrectly, start at **Lesson 11**.

**For question 18 the answer is 535.**

For students who answered this incorrectly, start at **Lesson 13**.

**For question 19, this is what you should see:**



For students who answered incorrectly, start at **Lesson 15**.