**Prime numbers: Activity sheet**

This activity will help you to investigate prime numbers. Definition: A prime number has exactly two factors. Firstly, consider the factors of all the numbers from 1 to 20. Continue the table.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Factors** | **Number of factors** | **Prime?** |
| Factors of 1 | 1 | 1 | No |
| Factors of 2 | 1, 2 | 2 | Yes |
| Factors of 3 | 1, 3 | 2 | Yes |
| Factors of 4 | 1, 2, 4 | 3 | No |
| Factors of 5 |  |  |  |
| Factors of 6 |  |  |  |
| Factors of 7 |  |  |  |
| Factors of 8 |  |  |  |
| Factors of 9 |  |  |  |
| Factors of 10 |  |  |  |
| Factors of 11 |  |  |  |
| Factors of 12 |  |  |  |
| Factors of 13 |  |  |  |
| Factors of 14 |  |  |  |
| Factors of 15 |  |  |  |
| Factors of 16 |  |  |  |
| Factors of 17 |  |  |  |
| Factors of 18 |  |  |  |
| Factors of 19 |  |  |  |
| Factors of 20 |  |  |  |

Note: A number with an odd number of factors is called a square number.

**Numbers 1-100**

As part of this investigation into prime numbers, you will need a grid of the numbers 1 to 100.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Cross out multiples of 2, 3, 5 and 7. **Do not shade in 2, 3, 5 or 7 though!**

You should reveal all prime numbers less than 100.

**Questions**

1 Why is 1 not a prime number?

2 Why is there no need to cross out all the multiples of 4?

3 Why is there no need to cross out all the multiples of 6?

4 Why is there no need to cross out all the multiples of 8?

5 Why is there no need to cross out all the multiples of 9?

6 If the grid were to be expanded, what would be the next number that would be   
needed on the list to cross out?

7 Why is there no need to cross out all the multiples of this number (your answer   
to question 6) on the grid covering numbers up to 100?

8 Why, for all numbers up to 100, is it only necessary to cross out the multiples of   
2, 3, 5 and 7 in order to leave only the prime numbers?