Year 5 Block D2.c Activities

D2.c.1 Groups of 3 children

As a group, children choose a number range of 100, e.g. 300–400. They take turns to throw the dice three times to create a 3-digit number – they can order the digits as they choose, e.g. if they throw a 6, a 4 and a 1 they can make either 146 or 416 or 461, etc. They then add 99 to that number. They are aiming to achieve an answer within their chosen range. If they succeed, they take a cube. When all children in the group have had a go, they choose another number range of 100 and repeat the activity.
Adult support may be useful in running this activity.

a dice; cubes

Year 5 Block D2.d Activities

D2.d.1 Groups of 3 or 4 children

Each child writes five 1-place decimal numbers between 0 and 1 on their Bingo board. They then take two cards and create a 1-place decimal number, e.g. 3·5. They each work out how much must be added to reach the next whole number, e.g. 0·5. Anyone with that number written on their Bingo board may cross it out. Play continues like this until one child has crossed out all five numbers on their board.
Groups play again starting with a new board each.
Adult support may be useful in running this activity.

Y5 PCM 160a; 0–9 number cards; Bingo boards

D2.d.2 A whole-class investigation with children working individually or in pairs

Children start with 9·9. They then subtract numbers following this process: choose a 1-place decimal number; work out its digital root (the sum of the digits, keeping going till a single-digit number is obtained, e.g. 4·7 → 11 → 2); subtract the number from 9·9; write the answer and work out its digital root; look at the two digital roots together. Children repeat the process with many different starting numbers, always subtracting them from 9·9.
They look at the patterns of the digital roots. Can they generalise – producing a rule that always works?
As an extension, subtract consecutive numbers, looking at the patterns in the answers, and also to try 2-place decimals, e.g. 9·99 – 3·54 (digital root 3).
Adult support is needed to run this activity.

D2.d.3 Groups of 3 or 4 children

Children shuffle the place-value cards and deal them out to create nine decimal numbers. They write them down, and then work out what must be added to each to make the next whole number. They then use a calculator to add together all of the numbers they added on.
Children reshuffle the cards and repeat the activity. *Are the two answers the same? Can you explain this?*

Y5 PCM 160b; place-value cards (U, t, h); calculators

Year 6 Block D2.c Activities

D2.c.1 Pairs of children

Children write all the square numbers up to 20 × 20. They add the digits and keep adding to get the digital root, for example *144: 1 + 4 + 4 = 9*, or *49: 4 + 9 = 13*, *1 + 3 = 4*. They work out the digital roots of all the square numbers up to 400. *Are there any patterns?*

D2.c.2 Groups of 3 children

Children make the first five square numbers using cubes (1, 4, 9, 16, 25). They record these in a list. They write the next seven square numbers up to 12 × 12. They find the differences between each of the square numbers, for example 1 → 4 is 3, 4 → 9 is 5, 9 → 16 is 7, … They discuss any patterns and use this to generate the square numbers up to 25 × 25.

Y6 PCM 150a; cubes

D2.c.3 A group of up to 8 children working in pairs

Children shuffle the number cards and place in a pile face down. Each pair takes two cards and generates a 2-digit number. (They must not make a square.) They then make an estimate of the square root of that number – for example they make 34 and estimate that the square root must be close to 6 because 6 × 6 = 36, so they estimate the square root of 5·8. Then they check by using a calculator to find the exact square root. Children repeat the activity 10 times.

Adult support may be useful in running this activity.

0–9 number cards; calculator

Year 6 Block D2.d Activities

D2.d.1 Pairs of children

Children write Pascal's triangle with the digits (laid out as a triangle):

1

1 2 1

1 3 3 1

1 4 6 4 1 and so on.

Every number in the new line is created by adding the two numbers diagonally above it. What patterns do children find? Can they explain these in words and writing? Ask them to look for the triangular numbers. Can they find these? Adult support may be useful in running this activity.

D2.d.2 Pairs of children

Children generate Fibonacci's sequence. Each pair of numbers is added to generate the next number in the sequence: 1, 1, 2, 3, 5, 8, 13, … They write the first 20 terms. What do they notice about every third number? Every fifth number? What happens if they add the first six numbers and look at the eighth? What happens if they add the first eight numbers and look at the tenth? *Look for triangular numbers in the series – are they there?* … Explore patterns.

Adult support is needed to run this activity.