

## Plusville Hiding Places

Alena Vávrová, ZŠ Karla Čapka, Praha 10 – Vršovice

**Topic:** Open a safe by finding all equations hidden in the code.

**Aim (expected outcome):** By searching for hidden equations we exercise all types of mathematical operations.

**Typical age group:** 10 years.

**Instructions:** Prepare twelve packets with small items that you can give to the children (like candies). In Bank of Plusville there are 12 safes that no one uses anymore and anyone can open them and take what's inside if they can do it. The Bank knows each safe's code but safes can only be opened by those who can find all equations hidden in the codes. We are in Plusville after all.

- Project the safe room (Worksheet PL7) on the board and let children decode them. Then check the code and give out – or not – the contents.
- Or you can print the Worksheet PL7 and hand it out to children working as individuals or in groups. Of course it is possible to give them only one safe at the beginning of the lesson.

This activity is based on the assumption that children have experiences with finding hidden equations. If you have already introduced powers and roots you have to discuss with the children their use in this activity. Codes are composed so that all numbers from a code constitute an equation. Other equations, of course, consist of less numbers. Children may have troubles finding the “big” equations at the beginning.

You can project the big picture of a safe (PR10) on the board for motivation or explanation.

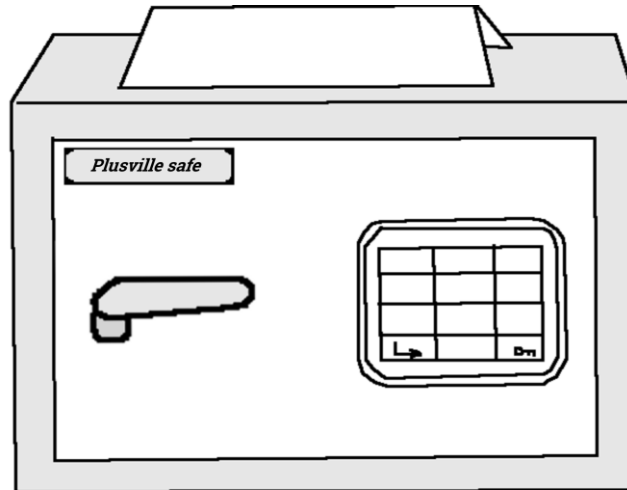


Fig. PR10

For check-up:

72981:  $72 + 9 = 81, 7 + 2 = 9, 72 : 9 = 8, 9 - 8 = 1$

651550:  $65 - 15 = 50, 6 - 5 = 1, 5 \times 1 = 5, 1 \times 5 = 5$

186482:  $18 + 64 = 82, 8^2 = 64, 8 \times 6 = 48, 86 - 4 = 82, \sqrt{64} = 8$  (cube root of 8 = 2)

123446:  $12 + 34 = 46, 12 : 3 = 4, 1 + 2 = 3$

55496:  $55 - 49 = 6, 54 : 9 = 6, 5 + 4 = 9$

729981:  $729 : 9 = 81, 7 + 2 = 9, 9 \times 9 = 81, 9 - 8 = 1$  (cube root of 729 = 9)

246488:  $24 + 64 = 88, 24 : 6 = 4, 2 + 46 = 48, 2 + 4 = 6, 2^2 = 4, \sqrt{64} = 8, 64 : 8 = 8$  ( $4^3 = 64$ )

38240:  $38 + 2 = 40, 3 \times 8 = 24, 8 : 2 = 4, 2^2 = 4$  (cube root of 8 = 2)

27936:  $27 + 9 = 36, 27 : 9 = 3, 2 + 7 = 9, \sqrt{9} = 3, 9 - 3 = 6$

213758:  $21 + 37 = 58, 21 : 3 = 7, 2 + 1 = 3$

81990:  $81 + 9 = 90, 81 : 9 = 9, 8 + 1 = 9, 1 \times 9 = 9$