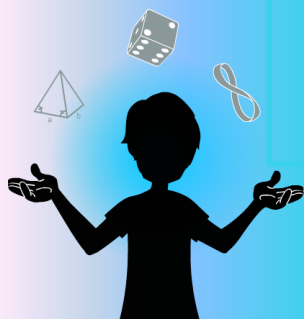


PUZZLING CARTOON

- LUKE'S PIGGYBANKS -



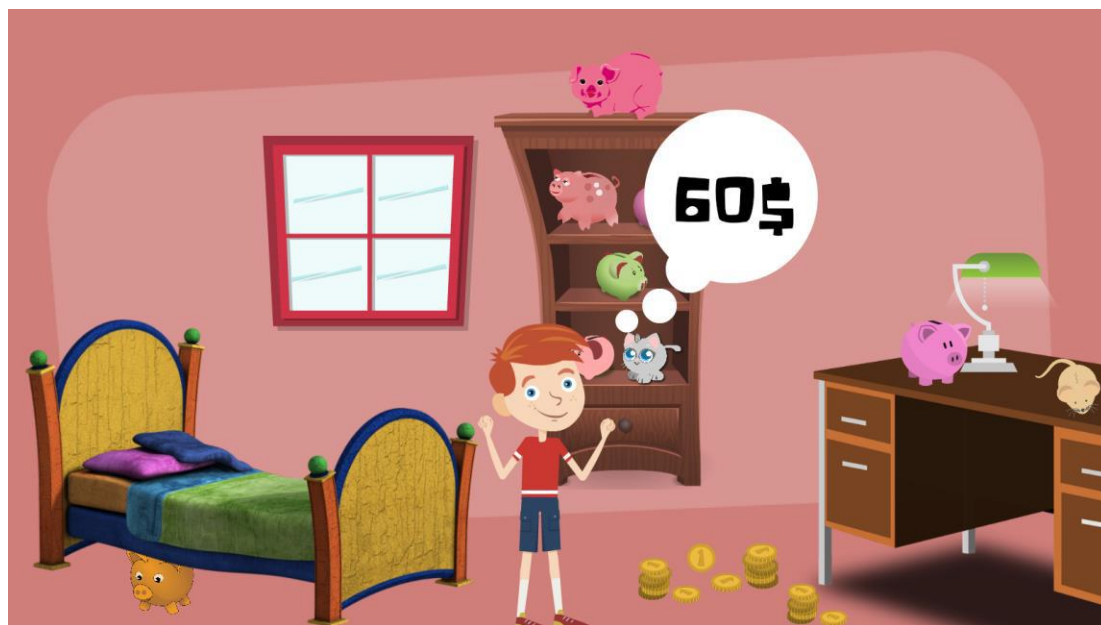
AMAZINGMATHS

Materials:

- Video of the puzzle
- Sheets of paper
- Pencils

The puzzle

Luke, a young boy, has had a passion ever since he was little. He collects piggybanks. He has them everywhere in his room. All of his piggybanks contain one or several \$1 coins. Plus, they all hold a different number of coins inside of them. One morning, Luke counts the total amount that he has accumulated since he started his collection. He realizes he has an amount of \$60.



With this amount of money, what is the maximum of piggybanks that Luke can have in his collection?



PUZZLE SOLUTION



The answer:

Luke has a maximum of 10 piggybanks in his collection.

The solution:

To solve this puzzle, we have to take into account **4 important pieces of information**.

1. In the question, it is asked what the maximum of piggybanks that Luke can have is. The word “**maximum**” tells us that we are looking for the biggest number of piggybanks possible.
2. We know that Luke has a total amount of \$60.
3. We know that each one of Luke’s piggybanks holds coins inside of it, so no piggybank is empty.
4. We know that the piggybanks all hold a different amount.

We are trying to get an amount of \$60 with the biggest number of piggybanks possible. To do that, the piggybanks must hold as less coins as possible. Since the piggybanks cannot be empty, the minimum amount is \$1 for the first piggybank. Since it is impossible to have the same amount twice, the second piggybank will hold \$2. The third amount will be of \$3, and so on, until we obtain \$60.

Here is the addition with ten piggybanks:

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55.$$

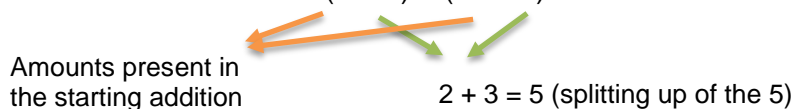
We get an amount of \$55. By adding another piggybank, we exceed the total amount of money. We need to add \$5 to get to the sum of \$60. It is not possible to add a piggybank with an amount smaller than \$11, because the numbers 1 to 10 are already in the addition. So, we need to add the \$5 to an amount that is already in the addition. We can add the \$5 to the \$10, which would make a piggybank of \$15.

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + (10 + 5) = 60$$



We can also split up the \$5 and share it out to the amounts that are already present in the piggybanks.

$$\text{Ex.: } 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + (9 + 2) + (10 + 3) = 60$$



With this solution, Luke would have a maximum of 10 piggybanks.

Another way to proceed is to use the addition that we get by exceeding the total amount of money.

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 = 66$$

We have an extra \$6 dollars in this addition. By eliminating the piggybank that holds the amount of \$6, we get \$60.

$$1 + 2 + 3 + 4 + 5 + \text{X} + 7 + 8 + 9 + 10 + 11 = 60$$

So, Luke owns a maximum of 10 piggybanks.