



Enhancing the social inclusion
of low income single parents

Mathematical competence and basic competence in science and technology

Practical Exercises

Elaborated by Know and Can Association



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KINDLING A BETTER WORLD



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Practical Exercises

Practical exercises should be based on a non-formal learning principle, giving you the freedom to choose time, group selections, etc. Before starting the exercises, we recommend that you get to know with single parents. It might be good to gradually increase the complexity of the tasks and observe the progress for each of single parents. The following exercises are basic, can be complicated or simplified according to the understanding of low skilled/low qualified single parents.

Math Calculations

Materials: Piece of paper, pen, pencil

Tip: Make sure that you follow necessary math rules.

Description:

$$12 - (-3) + 2 = ?$$

$$5 - 3 + 2 + 3 + 2 + 6 = ?$$

$$2.5 \times 2 + 3 - (-1) = ?$$

$$(2 - 3 + 2 + 1) \times 2 = ?$$

$$2 - 3 + 2 + 1 \times 2 = ?$$

You can also use popular tasks with different symbols using collection, subtraction, multiplication and division.

Math Problems

Materials: piece of paper, pen, pencil

Description: It is Black Friday – check if the offer corresponds to reality. The discount percentage is 20%. The old price was 525 – what should be the new one?



Your municipal tax is 388, if you pay until the end of March the whole amount you will get 10% discount – calculate the discount?

Sudoku

Materials: Sudoku game

Description: Sudoku is one of the most popular puzzle games of all time. The goal of Sudoku is to fill a 9×9 grid with numbers so that each row, column and 3×3 section contain all of the digits between 1 and 9. As a logic puzzle, Sudoku is also an excellent brain game. The game improves concentration and focus on problem-solving skills. It can be played online versions (suitable for homework), as well as paper versions are available for several levels. It is recommended for practitioners to explain the rules, and give some examples of how game is played.

Word Problems

Materials: Piece of paper, pen, pencil, internet connection

Description: Read the following word problem. Write and solve the math problem.

Rob, Mike and Jane were picking apples. Rob picked 6 apples, Mike picked 4 apples and Jane picked 2 apples. How many more apples did Rob pick than Jane? How many apples did the children pick all together?

If you have a cake cut to 12 or 16 pieces? What part of the cake will be 2 pieces?

If you have a rolling non-standard die six sides but has the following numbers on its six sides: 1, 1, 3, 3, 5, 5. What is the probability of rolling a 3?

Let's have a two standard dice; six sides with numbers from 1 to 6. What is the probability that the sum of the roll will be greater than 9?

What is the probability of drawing a 10 of clubs randomly from a standard deck of 52 cards?

What is the probability of picking either a red or a black card from a standard deck of 52 cards?

What is the probability of drawing a card from a deck and it being red and a face card (King, Queen and Jack)?



Roulette wheel is one of the most famous symbols of gambling. It includes 37 numbers starting from 0 (green coloured (another story about the green colour) to 36 (half red, half black). A spin starts:

1. What is the probability the ball to fall in odd number?
2. What is the probability the ball to fall in ZERO?
3. What is the probability the ball to fall in a pocket from 0 to 10?

The importance of science in everyday life: through the presentation of an image provided by practitioners, single parents should internalize the importance of science in the development of society. The objective is to identify in life situations the importance and application of science and technology.

Practical exercise in pairs: basic science facts. Practitioners should ask single parents to either analyse or argue about a concept with evidence to back up their view. This method allows them to explain a concept or idea and share thoughts with a partner.

One minute problem is a way of to check if trainees have understanding of a certain lesson. Practitioners should provide statements relevant to the current topic. This technique develops attention and practitioners can evaluate the understanding of certain concepts/theories.

Homogeneity or heterogeneity of chemical mixtures: depending on the components that are mixed, different types of mixes can be obtained. Single parents will learn how to determine the type of mixture, comparison abilities and analytical skills.

How much should you pay per month for electricity consumed by a 100W (incandescent) electric lamp? Assume that the lamp lights an average of 5 hours per day and the cost of electricity is 0,13538 cents per 1 kWh. Note: Keep in mind that the month is 30 days.

Here it is an example of an electricity bill for Bulgaria. In order to be applicable for your country, please adjust it according to specific price costs and any other costs that are applied. Assume that an electricity bill is 71.43 EUR for a house of 80 m² per month during winter season including the following prices:

Daily power consumption - 555 kWh; energy price – 0,13538 cents

Night power consumption – 125 kWh; energy price – 0,05676 cents



Energy transfer – 17.47 EUR (might be not applicable for your country)

If alternative sources of energy are used in order to reduce electricity bills, there are several technologies that can optimize the cost of energy such as listed below. Depending on the area of living (mountain area/seaside) estimate the investment and how it will pay off during one winter season:

Diesel electric generator – which costs 250 EUR; 2kW; 15l. diesel

Solar panel – which costs 2000 EUR; 2kW

Wind generator – 200 EUR; 4kW

Thermal pumps – 500 EUR; 2,6kW

Using the basic concepts of statistics and considering your electricity bills for the past year, calculate the average amount of money that you would pay during one winter season and how much on average do you pay more during winters? This exercise is very helpful for the distribution of single parents' budgets in accordance with specific season.

Math Problems Using Technological Tools

Materials: computers, laptops, smartphones and other devices.

Tips: This practical exercise should be adjusted based on the most used applications in a specific country.

Description: Add your daily schedules on Google calendar;

Prepare a grocery list for a week on your smartphone;

Using navigation apps (e.g Google maps): from your current location (point A) to your job/home address (point B) choose the most efficient way of transportation.

Using an online banking system, try to pay your monthly bills.

Book your medical appointment online.

