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Working with Bar and Pie Charts in Primary School Classes

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Abstract: This article discusses methods of working with bar and pie charts in primary school classes, focusing on developing students' logical thinking, comparison, and analytical skills. It presents practical exercises aimed at helping students understand information visually and interpret it using various types of diagrams.

Keywords: Chart, bar chart, pie chart, primary education, textbook problems.

Introduction: In today's rapidly globalizing and technologically advancing world, the demands placed on the modern education system are steadily increasing. The primary education stage plays a crucial role in shaping children's intellectual potential and personal development. For this reason, President Shavkat Mirziyoyev has repeatedly emphasized the need for fundamental reforms in the education sector. The following statement highlights the importance of this direction:

"In order for every child to grow up as an educated, thoughtful, and modern-minded individual who meets the requirements of the times, we must pay the utmost attention to primary education."

As the President stressed, every child should be raised as an independent thinker, able to make proper use of information, and possess critical and creative thinking skills. Achieving this goal requires the early development of students' analytical thinking abilities, teaching them to analyze real-life situations, and guiding them to read, interpret, and express information using graphical tools. Diagrams – graphical representations in the form of bar and pie charts – are among the most effective tools for developing mathematical thinking in primary school students through visual learning. With the help of diagrams, students gradually develop skills such as receiving information, sorting it, grouping, analyzing, and drawing conclusions. In particular, working with diagrams plays a special role in developing information literacy, which is one of the core competencies of the 21st century.

By teaching students to work with bar and pie charts, they not only learn how to read quantitative data, but also acquire the ability to independently represent, analyze, and interpret that data, draw statistical conclusions, and express these conclusions both orally and in writing. This forms a solid foundation for successful learning in the later stages of education – at secondary and higher education levels – as well as for conducting scientific research and working with digital technologies.

The word diagram (from the Greek diagramma – drawing, picture, shape) refers to one of the methods of representing relationships between quantities in graphical form. For example, in statistics, diagrams are collections of drawings that display data using geometric shapes (areas, lines, circles, etc.). The unit of measurement used in a diagram (percent, kg, g, etc.) depends on the type of quantity being represented. For instance, weight (mass) is measured in tons, kilograms, or grams, while temperature is expressed in degrees.

Graphical diagrams provide a visual representation of numerical data, helping the human brain to better understand the relationships between different types of data and their categories. A diagram is a method of

visually illustrating data that is otherwise presented in table form, making the information not only easier to understand but also faster to process. Diagrams play an especially important role when illustrating large amounts of numbers and the relationships between them. They help identify the structure of a process and any changes within it.

In primary school education, working with bar and pie charts is not only an integral part of mathematics instruction but also serves as an effective method for fostering students' analytical thinking, visual perception, and functional literacy. Presenting information through diagrams helps students develop skills in perceiving, analyzing, comparing, and drawing conclusions from statistical data. Especially when diagrams are explained in connection with children's everyday lives, topics become more relevant and are reinforced through real-life experiences.

Bar charts help students understand quantitative relationships, conduct basic statistical analysis, and grasp cause-and-effect relationships. Pie charts, on the other hand, prepare students to understand proportions, percentages, and the relationships between groups. The knowledge acquired through working with these diagrams serves as a solid foundation for learning graphical analysis and studying economic and social statistics in higher grades.

A diagram, as a tool for presenting data graphically, plays an important role in developing imagination, thinking, and memory in children. For primary school students, this may be a new concept, so it is recommended to begin working with diagrams using simple examples related to everyday life.

Diagrams perform the following functions:

a) Present information in a visual form;

b) Enable comparison;

c) Encourage analytical thinking;

d) Promote an active learning process.

The most commonly used types of diagrams in primary grades are:

1. Bar chart (Column chart)

2. Pie chart

A bar chart is a graphical representation that displays different categories of data using bars (vertical or horizontal). Each bar represents the value of a specific category or group, and its height (or length) is proportional to the value. One axis shows the categories, while the other shows the values. The bars are compared to each other to determine which is greater or smaller. The use of colors or labels helps facilitate understanding.

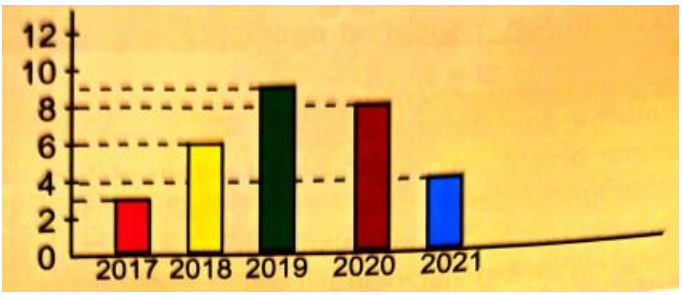
Working with bar charts helps students develop skills in comparing numerical data and representing it graphically. Since the data in the problem is presented in an organized manner, it will be easier for students to understand. We can see this in the examples taken from textbooks below.

Problem: The diagram shows how many new buildings were constructed in the district over five years. Answer the following questions:

1. In which year were the most buildings constructed?

2. How many buildings were constructed in 2018?

3. How many buildings were constructed in total over the five years?

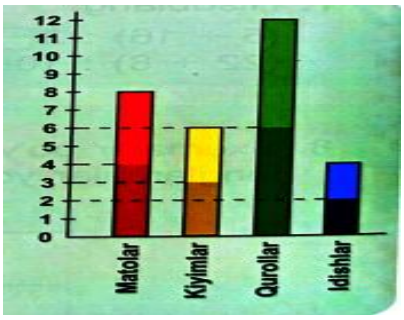


Students will not face difficulties answering these questions because all the information is clearly presented in the bar chart. By carefully examining and comparing the data, students can find the correct answers.

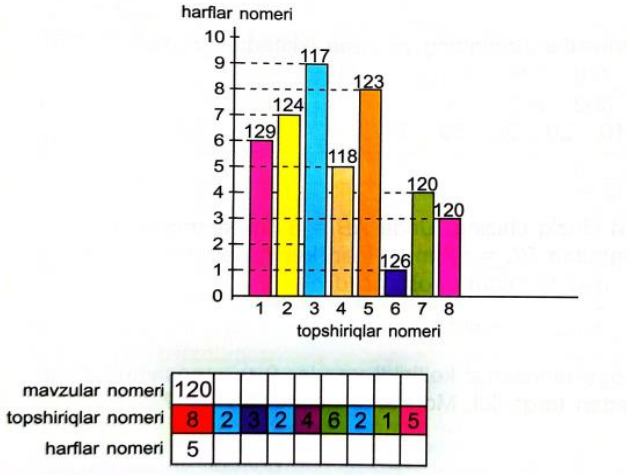
Problem: Museum exhibits are evenly distributed between two floors.

How can we find out how many exhibits are on each floor?

And how can we determine the total number of exhibits in the entire museum?

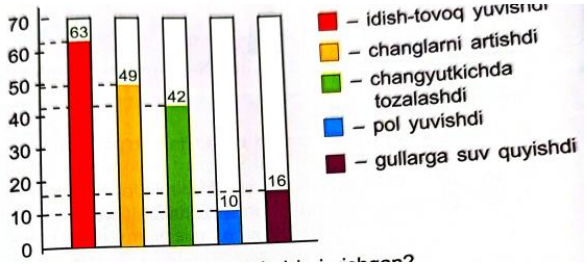


Problem: Study the chart. It contains hidden letters: in the horizontal direction, you will find the task number, and in the vertical direction, the letter's position in that task. The topic number in which you should search for the letter is shown inside the chart.



What can you say about these words? How are they related to our country?

Problem: Two classes of students created a list of good deeds they performed throughout the week. According to the list, the students washed the dishes 63 times in total



Which task did the students perform the most?

Which one did they perform the least?

Pie Chart – A pie chart is a diagram in the shape of a circle that represents parts of a whole (100%) by their proportions. Each sector (slice) represents its share in the overall value. The total of the circle equals 100%. Each slice (sector) shows the percentage share of a specific category in the whole. It is very convenient for visual comparison of percentages.

Working with pie charts helps students

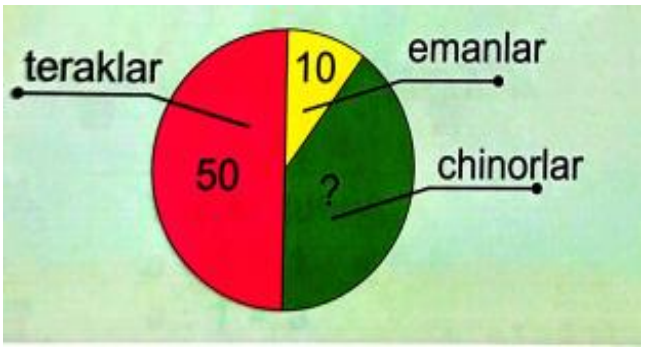
understand the ratio between the whole and its parts, familiarize themselves with percentages, and develop skills in representing proportions graphically. The concept of a pie chart can be explained by comparing it to a pie or cake ("How many people ate the pie?"). First, numerical data is defined: how many options there are,

and how many students chose each option. The whole is considered as 100%, and each part is expressed as a percentage (or simply show how many out of 10 students chose each option). Dividing the chart can be done through basic drawing techniques.

Problem: If there are 100 trees in a garden, create a problem related to the trees in the garden.

What do these expressions mean?

50 : 10 100 – 50 – 10 100 : 50 50 + 10



The meaning of the given expressions can be determined based on the diagram provided. According to the diagram, there are 50 poplars, 10 oaks, and a total of 100 trees. From this, we can deduce that the number of plane trees is 40.

The given expressions represent the following:

50 : 10 = 5 — This indicates that there are 5 times more poplars than oaks.

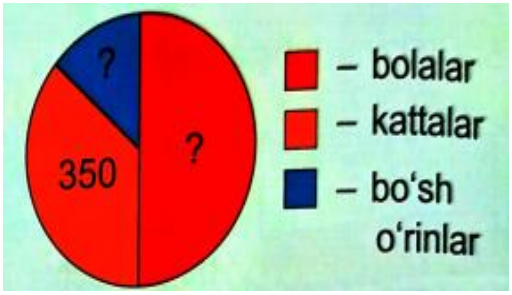
100 - 50 - 10 = 40 — This represents the number of plane trees.

100 : 50 = 2 — This means that the poplars make up half of the total number of trees.

50 + 10 = 60 — This expression shows the total number of poplars and oaks.

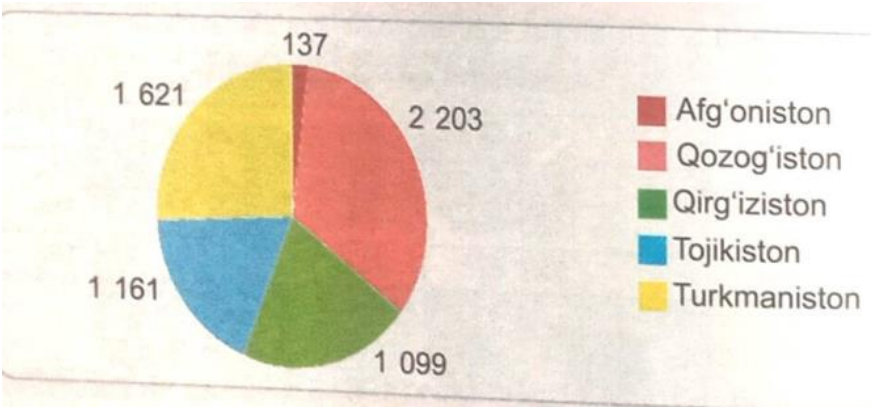
Problem: The circus has 1,000 seats. Half of them are occupied by children, and 350 seats are taken by adults. How many seats are left vacant?

What is the form of the diagram representing this problem?



In the problem, the diagram is represented in a pie chart form. From the information that there are 1,000 seats and half of them are occupied by children, we can conclude that there are 500 seats taken by children. 350 seats are occupied by adults. Therefore, 1000 - 500 - 350 = 150 seats are left vacant.

Problem: Based on the diagram, determine which country Uzbekistan shares the longest and the shortest border with. Find the total length of Uzbekistan's borders with other countries.



In the modern educational model, effective use of various information sources, visual analysis, and processing skills are recognized as key competencies. From this perspective, it is essential for primary school teachers to plan the process of working with diagrams carefully and incorporate modern technologies into the classroom. This, in turn, increases students' interest in the learning process and helps to develop them as independent thinkers, active learners, and individuals with innovative thinking.

CONCLUSION

In conclusion, teaching column and pie charts in primary education is a unique educational tool through which not only mathematical knowledge but also life skills, information processing abilities, and social-

emotional intelligence are developed. By approaching this topic methodologically and promoting interdisciplinary integration, a foundation is created for the comprehensive development of primary school students. Working with column and pie charts in primary education plays an important role in developing students' thinking processes. Through these activities, they not only learn to work with graphical representations but also develop the skills of independent thinking and making correct decisions in problematic situations. Organizing lessons on working with diagrams based on interactive methods increases students' interest.

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