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# FORMATION OF CONCEPTS ABOUT PLANE FIGURES IN BEGINNER CLASSES

**Andijon State Pedagogical Institute**
**Mathematics and its teaching methodology**
**Abdullayev Iqbol Abduvokhidovich**

**Annotation:** This article deals with important information about formation of concepts about plane figures in beginner classes. Moreover, ways of teaching plane figures in beginner classes were discussed.

**Key words:** *plane figure, two-dimensional shapes, stationary garden, quadrilateral, many-sided polygons, rectangular prisms, traffic cones, cylinder.*

For children in kindergarten and up, geometry and spatial relationships are a part of their daily lives. Understanding an object's position in space and learning the vocabulary to describe a position and give directions are important. Terms like above, below, left, right, or between enable children to orient themselves with their surroundings and describe the world around them. They can apply these same terms when describing plane and solid shapes in the classroom. A plane figure is a geometric shape. A plane figure is known as a 2-dimensional shape because it has only length and breadth. The thickness of the plane figure is zero. Any shape that is drawn on paper is known as a plane figure. In the real world, there is no object that represents a plane figure. Plane shapes are two-dimensional shapes. They have a breadth and a width but do not have a thickness. Plane shapes are closed and are formed by joining curved or straight lines together. Some common examples of plane shapes include squares, rectangles, circles, triangles and ovals[1]. These are also commonly known as Plane Geometric Figures or Flat Shapes. The straight or curved lines that make up the shape are called its sides. The point where two sides meet is called its vertex. The part of geometry which studies two-dimensional figures drawn on a flat surface is known as plane geometry. This knowledge is very important because many problems people attempt to solve in everyday life are either two-dimensional by nature, or they can be simplified into two dimensions. Many problems might appear to be three-dimensional at first glance, but they are actually two-dimensional. One such example is a stream of water coming out of a stationary garden hose or a fire hose. This is because the water is always on a plane - a vertical plane. The elimination of the third dimension makes it much easier to study the projectile motion.

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Although many problems are truly three-dimensional, we may simplify them into two-dimensional problems to make a solution easier, if we can do that with reasonable accuracy. For example, plane surveys always treat any small segment of land as a horizontal plane. When observing nature closely, we find that the seemingly unusual and complicated shapes are merely extensions of a few simple basic figures. In plane geometry, these simple basic shapes include point, line, triangle, quadrilateral, many-sided polygons, and circle. Each has a distinct character of its own. When combined to form a unique object, new properties and useful applications are formed. Plane figures include squares, rectangles, triangles, circles, pentagons, octogen, hexagons, ovals etc. A grouping of shapes is called polygons, like squares and rectangles, but circles and ovals are not polygons.

In contrast to solid shapes, a closed two-dimensional or flat surface figure is known as a plane shape. Instead of edges and faces, they possess several light lines that make a corner or a vertex where the two straight lines meet. Some basic plane shapes are triangles, squares, rectangles, circles and ovals. If we closely observe a sheet of paper, our observation would be on its length and width but no depth, so they are closed shapes as they are made by joining either two straight lines or curved lines. They are also known as plane geometric figures or polygons. There are many types of plane figures[2]. Although children are familiar with the most common shapes, before kindergarten, they may not have been able to verbalize what distinguishes a square from a rectangle or a circle from a triangle. They will learn to describe shapes in terms of their sides and corners.

- Triangles- A triangle is a closed plane geometric figure formed by connecting the endpoints of three line segments endpoint to endpoint.
- Quadrilaterals- A quadrilateral is a four-sided closed plane figure.
- Parallelograms- A parallelogram is a quadrilateral with both pairs of opposite sides parallel.
- Rectangles- A rectangle is a quadrilateral that has four right angles.
- Rhombi- When a quadrilateral has four congruent sides, it is called a rhombus. A rhombus is actually an equilateral parallelogram.
- Squares- A square is a quadrilateral with four congruent sides and four right angles.
- Trapezoids- If a quadrilateral has only one pair of opposite sides that are parallel, then the quadrilateral is a trapezoid. The parallel sides are called bases. The non-parallel sides are called legs.

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- Polygons- Since poly means many and gon means angles, polygon means many angles. In geometry, a polygon is a closed plane figure formed by three or more line segments called sides. Each side intersects exactly two other sides, one at each endpoint. No two sides with a common endpoint are collinear.
- Circles- A circle is the set of points on a plane that are equidistant from a fixed point known as the center. A circle is named by its center[3].

For students who are ready, you may want to show how the sides must be straight and the corners must be right angles for the shape to truly be a rectangle. For students who are ready, you may want to show how all the points of a circle must be the same distance from a center point for the shape to truly be a circle. Flags around the world present colorful ways to showcase all sorts of shapes and designs. What countries interest your students? Showcase their flags and have students identify the flat plane shapes they see. Many of the everyday objects that children are familiar with are solid shapes. For example, blocks are often cubes or rectangular prisms. They have six faces, or flat surfaces. Other familiar solid shapes are spheres, which children might recognize as being shaped like balls. One shape children might not immediately recognize is a pyramid, which has one rectangular face and four triangular faces. They will likely, however, recognize cylinders, which are shaped like cans, and cones, like ice cream cones or traffic cones. As with plane shapes, children will learn to describe solid shapes in terms of their attributes. For example:

- Roundness or flatness
- Ability to roll or slide
- Number of sides or corners

They will also come to see how the plane shapes comprise the faces of solid shapes. This is an important idea, as the real world around us is three dimensions and made of solid shapes! The place where people see flat plane shapes is generally on the faces of 3-D objects. Because of this, it is common to teach solid shapes first before moving on to plane shapes, which we practice in HMH Into Math. Tracing around the face of solids will help a child understand a cube differs from a rectangular prism because all six of its faces are squares[4]. This will enrich the ways in which they can describe and compare solids. For example, a child might see that although both a cylinder and a sphere can roll, a sphere has no faces and cannot slide. A cylinder, on the other hand, has two circular faces, so it can both roll and slide.

To sum up all given facts above it should be noted that geometry and its elements are everywhere in real life. The real-life applications of geometry are vast and knowing the

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properties of shapes and patterns will definitely help find solutions to some problems. Once children can recognize and describe the attributes that distinguish plane and solid shapes, such as those that make a triangle different from a square or a cylinder different from a cone, they can begin to create and continue patterns. When children create or find patterns, they are using the attributes of not just one but of a series of shapes to determine the order or pattern.

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