

Title: Spacemobiles

Grade Ranges:

 X K-4

 5-8

 9-12

Subject Tag:

Math: Geometry

Synopsis:

As an independent lesson or in conjunction with a unit on space, have students construct a spacemobile, using an assortment of the following objects: cylinders (toilet and paper towel rolls, tin cans), paper cones, boxes in the shape of small rectangular prisms and cubes, styrofoam spheres (or ping pong or golf balls). Students must be familiar with these three-dimensional shapes and terminology such as face, edge and corner. When each student is finished, he or she will explain the creation to the class, using correct names of the objects used, how it was constructed, and what real or imagined function it will perform.

Keywords:

cube, sphere, rectangular prism, cone, cylinder, edge, face, corner, geometry, model, space

Body:

1. Review the definitions and characteristics of the following shapes: cylinder, cone, sphere, rectangular prism, cube. If this is a lesson in conjunction with a unit on space, show pictures of space shuttles, rockets, satellites, and lunar modules and have students recognize the use of these shapes in space vehicles.
2. Tell students they will construct a spacemobile using a selection of the geometric shapes. Have the students share what they already know about other vehicles they have seen. Discuss how the different shapes could be used for different purposes. Students with visual or fine motor skill impairments should work with a partner.
3. Have each student choose at least six objects to work with. Have glue, tape, scissors, yarn, staplers, and paper fasteners available.
4. When students have finished their creations, they should give reports to the class, naming the objects that went into their construction, how they constructed them, and what their purpose or function is.

Related Links:

Exploring Geometric Solids and Their Properties, from the NCTM:

<http://illuminations.nctm.org/imath/3-5/GeometricSolids/>

This site gives students the opportunity to explore the attributes of three-dimensional shapes interactively, and to quiz themselves.

Features:

- ___ Contains special education tips
- ___ Quick Activity (less than 30 minutes; story starter)
- ___ Requires Internet access for students to complete

Objectives:

In completing this lesson, students will apply knowledge of three-dimensional geometric shapes by creating a model of a real or imagined space vehicle.

Standards:

NY: 3.4 Modeling/Multiple Representation: Students use mathematical modeling/multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships.

NYC: M2d. Uses many types of figures (angles, triangles, squares, rectangles, rhombi, parallelograms, quadrilaterals, polygons, prisms, pyramids, cubes, circles, and spheres) and identifies the figures by their properties, e.g., symmetry, number of faces, two- or three-dimensionality, no right angles. **M2f.** Extends and creates geometric patterns using concrete and pictorial models.

CT: 6. Spatial Relationships and Geometry: Students will analyze and use spatial relationships and basic concepts of geometry to construct, draw, describe and compare geometric relationships and patterns to solve problems. **10. Discrete Mathematics:** Students will use the concepts and processes of discrete mathematics to analyze and model a variety of real-world situations that involve recurring relationships, sequences, networks, combinations and permutations.

NJ: 4.3: All students will connect mathematics to other learning by understanding the interrelationships of mathematical ideas and the roles that mathematics and mathematical modeling play in other disciplines and in life. **4.7:** All students will develop spatial sense and an ability to use geometric properties and relationships to solve problems in mathematics and in everyday life.

Prerequisite Skills:

1. Students should be familiar with the names and attributes of cylinders, cones, spheres, rectangular prisms, and cubes.
2. Students should be familiar with the geometrical terms edge, corner, and face.

Time Required:

60 minutes

Technology and Materials Needed:

1. toilet and paper towel rolls, tin cans with tape on any sharp edges, small boxes in the shapes of rectangular prisms and cubes, spheres (styrofoam, golf balls, ping pong balls), paper cones
2. glue, tape, paper fasteners, scissors, yarn

Assessment Criteria:

1. Check students for completion of project.
2. Check students for completeness of oral presentation.

Recommended Lesson Plan Review Date:

NA

Review Comments:

NA