Meet an Engineer:
Arthur Scott

Development and Evolution Chief Engineer

ULA®
United Launch Alliance

As a boy, Arthur Scott sketched and dreamt about race cars, jets, and rockets. He spent countless hours working at his father's auto repair business. "I love to tinker, take things apart, see how they work, and repair or improve them. That's still true." He leads the technical portion of the RL10C program, converting excess Delta IV engine inventory into usable engines on the Atlas V rocket for ULA.

Arthur earned Bachelors and Masters Degrees in Mechanical Engineering and an MBA. His career began at NASA's Kennedy Space Center. "That was a fantastic experience; I had tremendous responsibility right out of college. One of my first assignments lead a team through the test and checkout of the Space Shuttle's major pieces of launch critical ground support hardware."

Arthur has worked on teams to design, develop and launch critically important systems that our country's war-fighters and decision-makers used to protect our way of life. This unique opportunity allowed Arthur to see the truly incredible capability this country developed.

One of the most important skills Arthur mastered was to respect others regardless of their background, and listen carefully to truly hear what they say. "I was required to work with teams of Japanese engineers, travelling throughout Japan. Working through cultural differences to ensure a common understanding whether verbally, visually, or analytically, is the key to effective teamwork and successful outcomes no matter what one's cultural origin may be."

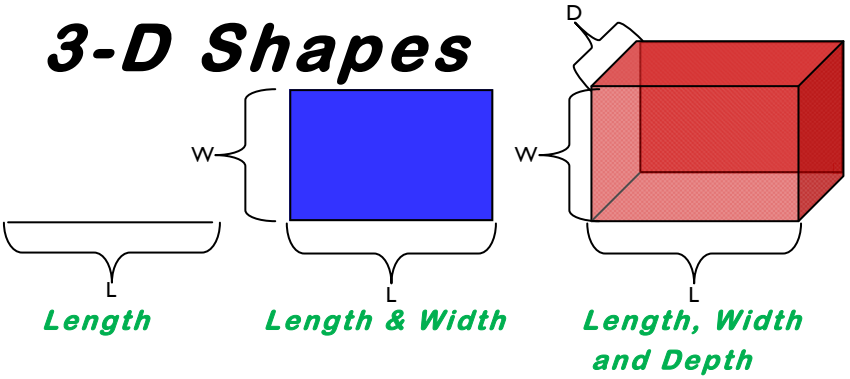
STEM Connections

Colorado State University Extension

Dr. Barbara J. Shaw

Connecting Science, Technology, Engineering, and Math concepts to our everyday lives.

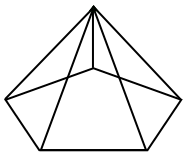
3-D Shapes



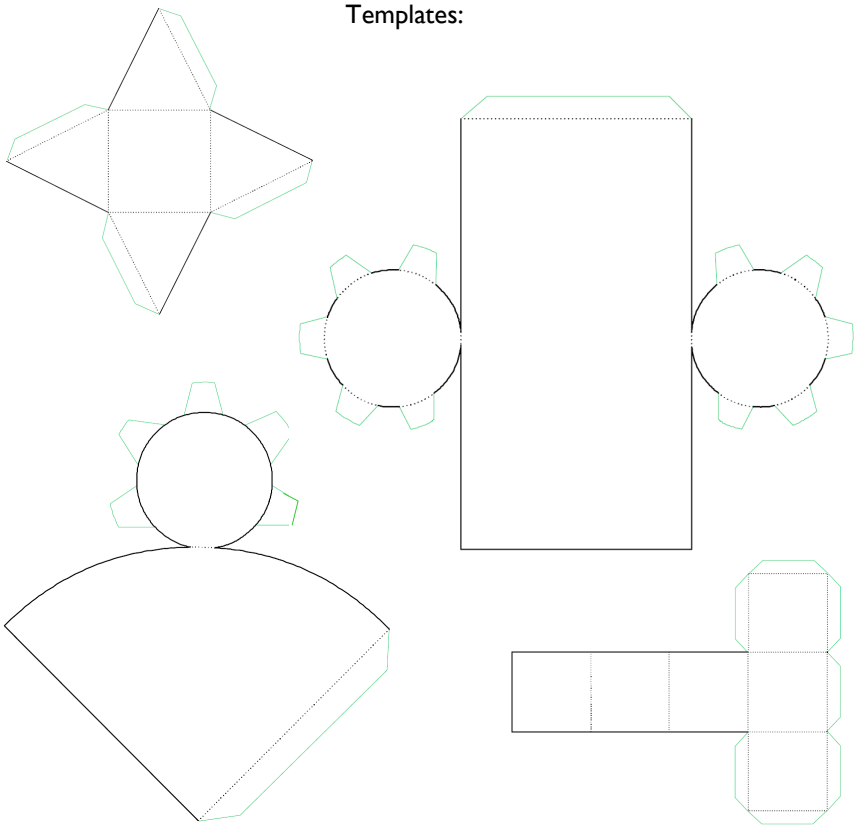
Length *Length & Width* *Length, Width and Depth*

EXPLORE IT - DESIGN IT - DO IT

Each geometric shape is described by three terms: face is the planer surface defined by the straight lines in a closed path, like the blue rectangle pictured above; edge is the line segment that encloses the face, and together, they make a polygon; and the vertex (plural vertices) is the point of angle where the edges meet. In a polygon (2D shape) a vertex is the point where two edges meet. In a polyhedron, the general term for a geometric solid in 3D with flat faces and straight, closed edges, vertex is the point where three or more edges meet. The shapes pictured above are a line (one dimension of length), a rectangle (two dimensions of length and width), and a polyhedron (three dimensions of length, width, and depth). The red shape above right is called a hexahedron (hex means 6), or a rectangular cuboid. A hexahedron is a 3D shape with 6 faces, and the most familiar have 12 edges, and 8 vertices, like a cube. There are other, bizarre hexahedrons with different number of edges and vertices like the pentagonal pyramid pictured on the right with 6 faces, 10 edges, and 6 vertices.



Templates:



Materials:

- Scissors
- Templates (below)
- Scotch tape
- Piece of scratch paper
- Pencil or pen

Directions:

- If this newsletter comes electronically, or you have access to a copier with a zoom feature, enlarge the templates below and to the left. It will be easier to work with the polyhedrons, but it is not necessary.
- Cut out the four shapes along the outer edges. Be sure to keep the tabs (if this is in color, they are the green lines, if in B&W, lighter shade of gray).
- Examine each shape carefully, and on the scratch paper, sketch your prediction of the polygon's shape after construction.
- Construct your 4 shapes by folding along the dotted lines and taping.
  - Suggestion: trying to press the tape against paper is difficult. If you slide a butter knife under the paper by the edge, you can use the blade as a firm surface to gain a better seal with the scotch tape.
- Compare your prediction sketches to the final polygons. How close were you to the correct shape? Correct any sketch and compare to the original template.
- Can you name each to these polygons? The answers are located in this newsletter.
- **Challenge**: Using scratch paper and scissors, can you design a sphere (ball shape)? (VERY difficult! Peel an orange for ideas.

http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/3d/index.htm

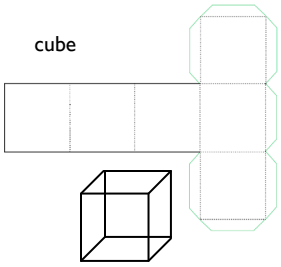
4-H Projects: spatial design

Cake Decorating	Quilting
Ceramics	Robotics
Leathercraft	Scrapbooking
Model Rocketry	Sewing
	Wood Work

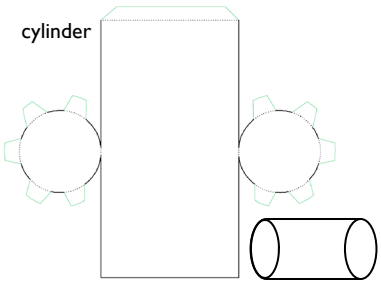
Agents and 4-H Assistants:

Please insert the answers (each of the individual graphic below) by copying and pasting each of the polygons throughout your newsletter, and not all bunched together in one spot. Thanks.

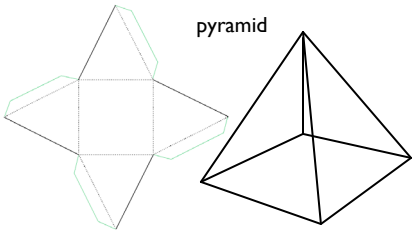
cube



cylinder



pyramid



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