Circle Attribute Schema

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Whenever a student is daunted by a problem involving a cone, cylinder, semicircle, hemisphere, etc., he or she should be instructed to complete these “circle blanks" and then re-read the problem.

AREA	RADIUS	DIAMETER	PERIMETER = CIRCUMFERENCE
A	R	D	P = C
πr^2	r	2r	πD

The terms are arranged in the indicated order because

- area relates most directly to radius
- radius relates directly to both area and diameter
- diameter relates directly to both radius and perimeter
- perimeter relates most directly to diameter

The above perceptual/relational schema applies principles of cognitive psychology demonstrated by Bower with earth science terms. Perceptual and/or relational schemas such as the above should be reviewed and applied briefly each day until students have mastery.

In the USA, the circle does not include the interior; the circle is only the points around the rim. In Europe, and in primary grades in the USA, the circle includes the interior. In the USA beyond primary grades, the term *disk* is used for the circle + interior.

Origin of π

For any size circle, $\pi = \frac{C}{D}$

This is demonstrated with round lids of varied color and size, and masking tape, with students working in pairs per teacher leading, drawing conclusions as pairs and then as a class. This discovery must be reinforced daily with review discussion, applications, and solving the tennis-ball problem.