A **dilation** is a transformation that produces an image that is the **same shape** as the original, but is a **different size**.

A dilation used to create an image **larger** than the original is called an **enlargement**. A dilation used to create an image **smaller** than the original is called a **reduction**.

You are probably familiar with the word "**dilate**" as it relates to the eye. "**The pupils of the eye were dilated.**"

As light hits the eye, the pupil enlarges or contracts depending upon the amount of light. This concept of enlarging and contracting is "dilating".

The washers shown in this photo illustrate the concept of dilation.

The washers are the same shape, but they are different in size.
The description of a dilation includes the **scale factor** and the **center of the dilation**.

**NOTE:** the scale factor is sometimes referred to as the scalar factor.

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**In mathematics**, the dilation of an object is called its **image**. If the original object was labeled with letters, such as polygon $ABCD$, the image may be labeled with the same letters followed by a **prime** symbol, $A'B'C'D'$.
If the scale factor is greater than 1, the image is an enlargement.
If the scale factor is between 0 and 1, the image is a reduction.

A figure and its dilation are similar figures.

The length of each side of the image is equal to the length of the corresponding side of the original figure multiplied by the scale factor. The distance from the center of the dilation to each point of the image is equal to the distance from the center of the dilation to each corresponding point of the original figure times the scale factor.

Remember:

**Dilations are enlargements (or reductions)**