Camera Basics

Exposure:

When making a photograph it is important that the scene is exposed accurately. In short, if your exposure is incorrect you will lose quality in your final image.

If you do not let enough light into the camera (you under-expose) your photograph will appear dark and you will lose details in the shadow areas. Conversely, if you let in too much light (you over-expose) the photograph will appear very light and you will lose details in the brightest areas of the image (called the highlights). In either case you cannot bring back detail that is not there to start with.

There are basically three elements that control the amount of light that enters the camera: shutter speed, aperture, and sensor/film sensitivity (known as the ISO).

Shutter Speed:

This is the amount of time that the camera sensor or film is exposed to light. Camera shutter speeds can range from 1/8,000th of a second (or shorter) to 30 seconds or longer. Generally the more sophisticated the camera the greater the range of shutter speeds that are available.

Fast shutter speeds will freeze any motion in the scene, while slow shutter speeds will give the impression of movement to your photograph. Therefore if you are photographing a waterfall and use a fast shutter speed (say 1,000th of a second or shorter) you will freeze the movement of the water and capture individual drops suspended in the air. A slow shutter speed (1/15th of a second or longer) will allow the water to flow during the exposure and produce a soft fluid effect. Very long exposures (a second or more) will make the water appear almost mist-like.

Aperture:

This controls the volume of light entering the camera through a diaphragm in the lens. A series of aperture settings are called f/numbers, and typically run: f/2; 2.8; 4; 5.6; 8; 11; 16; etc. As you can see, the larger the f/number the smaller the size of the aperture.

The primary effect that aperture has on your image (besides regulating the volume of light entering the camera) is to regulate how much of your photograph is in focus. This is called 'depth of field' (or DOF).

Depth of Field (DOF):

Definition: The area in front of and behind a focused subject in which the photographed image appears *sharp*.

The zone of sharpness or DOF extends from 1/3rd in front of the point focused on, to 2/3rds behind it. In other words, you have twice as much DOF behind your point of focus than in front of it.

There are three main elements that will affect Depth of Field in a picture:

1. the lens opening (f/number): the smaller the f/number the shallower the zone of sharpness (DOF), and vice versa

2. the focal length of the lens: wide angle lenses appear to have a greater zone of sharpness than telephoto lenses, and vice versa

3. the distance from the lens to the subject: the nearer the subject is, the shallower the zone of sharpness and vice versa.

DOF can be used creatively in your photography. If you are taking a landscape you may want everything from the foreground to the distant horizon to be sharp. To achieve this you will need to use a small aperture (e.g. large f/number: f/11 or higher) and a wide angle lens. If, on the other hand, you are taking a 'head and shoulders' portrait and would like to throw the background out of focus (to place emphasis on your model) you would need to use a wide aperture (e.g. small f/number: f/2.8 or so) with perhaps a telephoto lens.

ISO:

The higher the ISO number the more sensitive the camera is to light. If you are photographing in good light (e.g. on a sunny or bright day) you should aim to use an ISO setting of around 100 or 200. Indoors or during dull weather you may want to use ISO400 or higher. The disadvantage of using higher ISO settings is that the image becomes progressively more 'noisy', or takes on a grainy appearance. However all is not lost as there are several excellent programs that can reduce the effects of noise in a photograph. Take a look at Noise Ninja and Neat Image. Both of these programs can be used either as a 'stand-alone' or as a plug-in for Adobe Photoshop and Elements.