

## Both statements are true

**Magnification** refers to a radiographic image that appears larger than the actual size of the object it represents. The image magnification on a dental x-ray is **influenced** by the:

- **Target-film distance** (also called *source-to-film distance*) is the distance between the source of x-rays (**focal spot on the tungsten target**) and the film. It is determined by the length of the position-indicating device (also called **PID**). When a **longer PID** is used, more parallel rays from the middle of the x-ray beam strike the object rather than the diverging x-rays from the periphery of the beam. As a result, a **longer PID** and target-film distance result in **less image** magnification, and a **shorter PID** and target-film distance result in **more image** magnification.
- **Object-film distance:** is the distance between the object being radiographed (*the tooth*) and the x-ray film. The **closer** the proximity of the tooth to the film, the **less image** enlargement there will be on the film. A **decrease** in object-film distance results in a **decrease** in magnification, and an **increase** in object-film distance results in an **increase** in image magnification.

A **distorted image** does not have the same size and shape as the object being radiographed. A **dimensional distortion** of a radiographic image is **influenced** by:

- **Object-film alignment:** to minimize dimensional distortion the **film** and should be **parallel to the long axis** of the tooth. **Foreshortening** results from **excessive vertical angulation** when the x-ray beam is perpendicular to the film **but not** the tooth. **Elongation** results when the x-ray beam is oriented at **right angles** to the tooth **but not** to the film.
- **X-ray beam:** to minimize dimensional distortion, the x-ray beam must be **directed perpendicular** to the tooth and the film.

**Scales of contrast:** is the range of useful densities seen on a dental radiograph. Two terms are used to describe the appearance of an x-ray:

- **Short-scale contrast:** is an x-ray that shows only **two densities**, areas of black and white. Short-scale contrast results from the use of a **lower kilovoltage** range.
- **Long-scale contrast:** is an x-ray that shows **many densities**, or many shades of gray. Long-scale contrast results from the use of a **higher kilovoltage** range.

**Contrast** is the difference in degrees of blackness between adjacent areas on an x-ray. **Low contrast** describes an x-ray with many shades of gray and few areas of black and white. **High contrast** describes an x-ray with many black and white areas and few shades of gray.