Upon Reflection:
Upside Down in a Spoon

Purpose
To examine the type of image seen in a concave mirror.

Materials
Large metal serving spoon
Ruler
Pencil

Procedure
1. In one hand, hold the spoon vertically with the inside of the spoon’s bowl about 1 foot (30 cm) from your face.
2. With your other hand, hold the pencil upright in front of, but not touching, your face. Then slowly move the pencil toward the spoon until it touches the spoon’s bowl. As the spoon is being moved, observe the pencil’s image in the spoon’s bowl.

Results
When the pencil is held at a distance from the spoon, its image is smaller than the pencil’s actual size and inverted. When the pencil is close to the spoon, its image is upright and larger than the pencil’s actual size.

Why?
Surfaces that curve inward, such as the inside of the spoon’s bowl, are said to be concave. Concave mirrors cause the light hitting them to bend so that you see a small, upside-down image of an object that is distant from the mirror. This image is a real image, which means it could be projected onto a screen. If the object is close to the mirror, you see an enlarged upright virtual image. Concave mirrors are used for shaving or applying makeup.
Upon Reflection:
Downside Up in a Spoon

**Purpose**
To examine the type of image seen in a convex mirror.

**Materials**
Large metal serving spoon
Ruler
Pencil

**Procedure**
1. In one hand, hold the spoon vertically with the back side of the spoon’s bowl about 1 foot (30 cm) from your face.
2. With your other hand, hold the pencil upright in front of, but not touching, your face. Then slowly move the pencil toward the spoon until it touches the spoon’s bowl. As the spoon is being moved, observe the pencil’s image in the spoon’s bowl.

**Results**
The image of the pencil is upright and smaller than the pencil regardless of its distance from the spoon. But the image is larger when the pencil is held closer to the spoon than when held at a distance.

**Why?** Surfaces that curve outward, such as the backside of the spoon, are said to be convex. Convex mirrors cause the light hitting them to bend so that the image is virtual, upright, and smaller than the object. Because convex mirrors cause a large area to appear small, they are sometimes used in stores to allow clerks to watch large areas.