

# The Bicycle Man

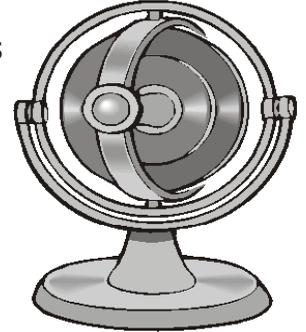
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**Program Description:** LeVar explores the world of wheels—from bicycles and skateboards to scooters, rollerblades, and human-powered vehicles. He talks to a free style bike specialist who demonstrates some stunts, and learns about skateboard features from a pro.



## Top Speed

**Key Words:** wheels, gravity

**Concept:** A spinning wheel must be turning quickly to stay upright.

The speed of a spinning wheel is important when trying to hold an object upright. Some of the aerodynamic bikes seen on the show needed a “push start” to help the riders keep the bikes upright until they gained enough speed to stay up on their own. A rapidly spinning wheel can help keep an aerodynamic bike upright, but if the speed of the wheel is not great enough the bike becomes harder to balance and the force of gravity will pull it down.

**Materials:** Plastic lids (from margarine tubs, whipped topping, or other similar containers), pencils, a smooth surface, newspapers (optional).

1. Stand a plastic lid up on edge with your finger on the top. Then push the lid so that it rolls across the floor. What happens when it slows down? (It falls over.)
2. Next find the center of the lid. Plastic lids usually have a small raised point at the center. If there isn't one, then use a ruler to measure halfway across the lid at its widest point.
3. To make a simple top, push the end of a pair of scissors through the center of the lid. Then push a sharpened pencil through the hole in the lid until the lid is about 1" above the pencil point. Adjust the pencil so that it is perpendicular to the surface of the lid.
4. Place the top on a smooth surface that won't be harmed by some pencil marks (e.g. a table top covered with newspapers). Without spinning the top, try to balance it on the pencil point so that the top stays upright even when you move your hand away. It is virtually impossible!
5. Now try spinning the top on the pencil point as fast as you can. What happens when it slows down? (It falls down.) When does the top stay standing up and when does it fall down? (The top stays up when it is spinning rapidly. It falls down when it begins to slow down.)

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# (Gyro) Scoping Out The Situation

**Key Words:** gyroscopic motion, wheels, gravity

**Concept:** The axis of a spinning wheel tends to stay in the same general position.

A bicycle is easier to balance when its wheels are on the move. This is because the axis of a rapidly spinning wheel tends to resist tipping from side to side. Small forces such as little pushes, bumps or the pull of gravity will not affect it much. This helps riders, and even trick riders like Woody Ibsen, keep their bicycles balanced. A spinning wheel also helps keep ships at sea and space crafts on a steady course. Many ships have a device called a gyroscope which contains a rapidly spinning wheel. Make a gyroscope and see how it works.

**Materials:** Lightweight cardboard from cereal boxes or other similar cardboard containers, long round pencils, paper, scissors, a 9" or 10" circular plate.

1. In this activity you need to find the center of a cardboard circle. This is easiest to do by first making a paper circle pattern. Draw a circle on a sheet of paper by tracing around a small plate, then cut out the drawn circle. Fold the paper circle in half, and then in half again to make a shape similar to a piece of pie. Cut off the very tip of this pie shape. When you unfold the shape, there will be a small hole in the center of the circle.
2. Using the paper circle pattern, draw a circle on cardboard and mark its center. Cut out the cardboard circle and push the point of the scissors through the center of the cardboard to create a hole.
3. Push a pencil through the center hole. Move the pencil in a circular motion to widen the hole (about 1/2" in diameter) so that the cardboard circle slips very easily around the pencil.
4. Holding the pencil horizontally with one hand, position the cardboard circle in the middle of the pencil and spin the circle as fast as you can with the other hand. Try tilting the ends of the pencil up and down several degrees. The circle will stay at whatever angle it was at when you started it spinning.