

Connecting With Your Child

Exploring Gravity

Here are several activities for exploring the effects of gravity with your child.

Activity 1: In the Balance

You can learn about how gravity affects an object by attempting to balance the object on the edge of a surface. For example, try balancing a meter stick on the arm of a chair or a spoon on the edge of a bowl. Keep inching the object farther over the edge until it no longer balances. The point at which the object balances perfectly is the object's center of gravity.

Here are some questions to discuss with your child:

- How is Earth's gravitational pull affecting each end of this object when it is not balanced correctly?
- How is Earth's gravitational pull affecting each end of this object when it is balanced correctly?
- When the object is placed off-center, is Earth's gravity pulling evenly on both sides? How about when it is placed on its center of gravity?

Activity 2: Gravity versus Momentum

Follow this procedure to study the balance between Earth's gravitational pull and an object's forward momentum.

1. Cut a piece of twine or string to about two to three feet long.
2. Tie one end of the string around a small object, such as a ball or a keychain.
3. Go outside or to an area with plenty of open space. Make sure you are far away from any breakable objects!
4. Hold onto the other end of the string, letting the object dangle toward the ground.
5. Begin to spin around very slowly.
6. Now spin faster and faster until the string becomes horizontal and the object moves parallel to the ground. Make sure to slow down before you get dizzy!

Ask your child to explain the object's movement in terms of gravity and forward momentum. (When you are standing still, the object has no forward momentum. The object hangs down on the string because Earth's gravity is always pulling the object toward the ground.

When you spin very slowly, the object still hangs down. The momentum you give it by spinning is not enough to overcome Earth's gravitational pull. As you spin faster, the object's momentum increases until the object rises into the air. When you stop spinning, the object loses momentum and it is pulled back down toward the Earth.)

Here are some questions to discuss with your child:

- How is the object's motion similar to a planet's orbital path?
- How is the object's motion different from a planet's orbital path?
- What do you think would happen if you continued to spin faster and faster?



When you ride a swing, your momentum speeds you up away from Earth. Earth's gravity slows you down as you rise and then pulls you back toward the ground.