



Force and Motion – Grades K-2

Nebraska Science Standards

2.2.2 Students will compare relative position and motion of objects

2.2.2.a State location and/or motion relative to another object or its surroundings (in front of, behind, between, over, under, faster, slower, forward, and backward, up and down)

2.2.2.b Describe how objects move in many different directions (straight, zigzag, round and round, back and forth, and fast and slow)

Objective: Students will demonstrate relative position and motion of objects. Students will explore how objects move in different ways and demonstrate gravity and air resistance by making a parachute.

Materials (provided by CSM):

- Slinky
- Plastic or paper cups
- Tissue paper
- String
- Tape (multiple rolls)
- Single hole punch
- Scissors (multiple)
- Pennies

Discussion: (Questions to ask the students)

- What is motion?
 - Motion is just another way of saying movement. Each type of motion is controlled by a different type of force.
 - Ask the students to name some examples of motion or how objects move.
 - Have them demonstrate
 - Straight, zigzag, round and round, back and forth, and fast and slow
- What is gravity?
 - Gravity is the force that attracts a body or object toward the center of the earth, or toward any other physical body having mass.
 - Therefore, objects fall to the ground.
 - Demonstrate gravity by taking an object and releasing it from your hand to see how it falls to the ground.

- If stairs are available, demonstrate gravity with the use of a slinky or set up the slinky to go from your hand to a desktop to a chair. Explain gravity is pulling the slinky down each stair.
 - Can you name some things that defy gravity? In other words, what are some things that don't fall to the ground?
 - Airplanes, birds, hot air balloons
 - Explain each reason why, airplanes and birds have wings that increase their surface area (explain what is surface area). This combined with their speed keeps them up. Hot air balloons stay up since hot air is very active and rises.
- What is air resistance?
 - Air resistance is the force of air pushing against a moving object.

Activity Description: Students will be given the supplies to create a parachute which they will use to visually observe gravity and air resistance.

You will need:

- Plastic or paper cups
- Tissue paper
- String
- Tape
- Single hole punch
- Pennies

Setup:

- Hole punch each cup in four spots.
- Each student should have a cup, string, and tissue paper.
- Students can work in groups to share the tape and scissors.
- Explain to them they can use as much string and tissue paper as they want to design their parachute.

Procedure:

1. Children will work together to use the supplies and will work with the volunteers to engineer a successful parachute.
2. Have each student tie four pieces of string to each of the holes in the cup.



3. The students will then determine the size of their parachute by cutting the tissue paper into a square to their desired size.

4. Have each student tie or tape the loose string to the four corners of their parachute and make sure they are tightly adhered.



5. Test each parachute and work out improvements to make sure it successfully glides down and doesn't just fall to the ground.

6. Now, after releasing their parachute have the students blow on it as it's falling. How does this affect its motion?

7. Give them a penny to put in their cup and then release their parachute again. Ask them what happens and why does this happen?

8. If needed, see if they can improve their design.

- What is happening?
 - The cup glides slowly down because of air resistance (or drag). When air gets under it, the parachute fans out for maximum coverage; this air resistance slows the fall of the object tremendously.