Student instructions: Falling
1. Measure and record the mass of each ball.
2. Prepare the sand. Use a ruler or pencil to smooth and level the sand's surface.
3. Use meterstick to determine drop height. Drop each ball from 1 m.
4. Drop ball #1.
5. Determine crater depth. Lay pencil across the crater. Use the ruler to measure the distance from the deepest part of the crater straight up to the bottom of the pencil.
6. Record crater depth in and then repeat the drop two more times.
7. Calculate the average of all three trials and record this number.
8. Beginning at step 2, repeat for second ball.

Teacher preparation and tips: Falling
1. Gather materials.
2. Prepare trays of sand.
• Use moist sand to fill each tray. Sand should be moist enough to stick together and hold its shape—think sand castle.
• Trays should be filled to a depth that is roughly equal the diameter of the balls used.
3. Trays of sand can be reused.

Student instructions: Parachuting
1. Create a parachute by cutting a piece of cloth into squares. Cut three different squares with varying surface areas.
2. Calculate the surface area of each parachute (length × width) and record this number.
3. Assemble parachute: Attach a string to each corner of the parachute, place a golf ball in a baggie, and secure the four strings attached to the parachute and the ball placed in the baggie with a rubber band. Make sure each string's length is the same for each trial.
4. Prepare the sand. Use ruler or pencil to smooth and level the surface.
5. Use meterstick to determine drop height. Drop the ball from 1 m in order to compare the results with data collected from the falling activity.
6. Determine crater depth. Lay a pencil across the crater. Use a ruler to measure the distance from the deepest part of the crater straight up to the bottom of the pencil.
7. Drop the ball/parachute from 3 m.
8. Determine crater depth. Lay pencil across the crater. Use ruler to measure the distance from the deepest part of the crater straight up to the bottom of the pencil.
9. Record crater depth and repeat the drop two more times.
10. Calculate the average crater depth (after all three trials) and record this number.
11. Repeat steps 3–10 for each parachute.

Teacher preparation and tips: Parachuting
1. Gather materials. Pieces of string should be cut to the same length.
2. Prepare the trays of sand.

• Use moist sand to fill each tray. Sand should be moist enough to stick together and hold its shape—think sand castle.
• Trays should be filled to a depth that is roughly equal the diameter of the balls used.

Student instructions: Gliding
1. Each group should make a paper glider of different surface areas (no dart designs).
2. Measure and record the surface area and mass of your glider.
3. Choose one person be the timer and one to be the thrower. The thrower should be the same person each time to control parameters.
4. Throw the glider and calculate the time from release to the time the glider hits the ground. Record the time.
5. Repeat step 4 two more times (three trials for each glider).
6. Calculate and record the average time.
7. Add two layers of newspaper to you glider. Repeat steps 4–6 for four, six, eight, and 10 sheets of newspaper.

Teacher preparation and tips: Gliding
1. Gather materials.
2. Demonstrate how to make a glider, reminding students to make no dart designs.
3. Find a place with low wind interference to conduct this activity.