

Sample Lesson Plan using TechChains.org

Potential NGSS Standards: 3-PS2-1, 3-PS2-2, 3-5-ETS1-2, MS-ETS1-2, MS-ETS1-4, MS-PS2-2

<u>Question / Activity</u>	<u>Objectives / Next Steps</u>
Why do things fall? Whole Class: Hold an object aloft and ask students what will happen when you let it go. Why do we know for certain what will happen?	<ul style="list-style-type: none">• Gravitational pull between two objects (usually one object and the Earth) always exists. <p><i>How do you keep objects in place?</i></p>
How do you keep objects in place? Whole Class: Have students hold a small object above shoulder level. Ask them what they must do to hold the object steady. What happens when they increase the force they are using?	<ul style="list-style-type: none">• An equal and opposite force to gravity is required to keep an object in place. <p><i>How do elevators work?</i></p>
How do elevators work? Whole Class: Use TechChains.org to work backwards or forwards through the technology chain “motor,” “pulley,” “counterweight,” and “elevator.” Discuss how each technology contributes to control of the elevator car’s location.	<ul style="list-style-type: none">• An elevator functions using a motor, pulley, and counterweight. As the motor turns, a cable on the motor’s shaft raises/lowers the elevator car while having an opposite effect on the counterweight. <p><i>How do you move an elevator?</i></p>
How do you move an elevator? Small Groups: Have students build a model elevator using supplies like a motor, string, and a nut/bolt with washers. The students’ goal is to move the elevator from one floor to another.	<ul style="list-style-type: none">• For the elevator to move, the counterweight must be changed or a force must be applied by the motor. <p><i>How do you control an elevator’s motion?</i></p>
How do you control an elevator’s motion? Small Groups: Challenge students to refine the control of their elevator so it can lift even heavy loads predictably.	<ul style="list-style-type: none">• Finer control requires careful force applied to the motor. What matters is not the amount of power applied (eg. 2 seconds of power), but how many times the motor’s shaft rotates.