Objective

By the end of this lesson, the student will understand the basic principles of physics as they relate to motocross and be able to apply them to real-life scenarios.

Materials and Prep

- A computer or tablet with internet access
- Pen and paper
- Access to a safe outdoor area or a large open space indoors

Prior knowledge of basic math operations and an interest in motocross.

Activities

- 1. Research and discuss the physics concepts involved in motocross, such as:
 - Newton's laws of motion
 - Friction and traction
 - Momentum and inertia
 - Gravity and balance
- 2. Apply the physics concepts to real-life scenarios:
 - Calculate the speed of a motocross rider using distance and time measurements
 - Investigate how different tire treads affect traction on different surfaces
 - Explore the relationship between mass, velocity, and momentum
 - Experiment with balancing techniques to understand how it affects stability on a motocross bike
- 3. Create a mini motocross track using household objects and test the physics principles learned:
 - Design jumps and ramps to explore the concept of projectile motion
 - $\circ\,$ Observe how changing the angle of a ramp affects the distance a bike can jump
 - $\circ\,$ Experiment with different inclines to understand the impact of gravity on speed

Sixth Grade Talking Points

- "Motocross is an exciting sport that combines skill, speed, and physics."
- "Newton's laws of motion help us understand how objects move and interact with each other."
- "Friction and traction are important factors in motocross. They determine how well the tires grip the ground."
- "Momentum is the product of an object's mass and velocity. It affects how difficult it is to stop or change the direction of an object."
- "Gravity is a force that pulls objects towards the center of the Earth. It affects how high a motocross rider can jump and how fast they can go downhill."
- "Balance is crucial in motocross. It helps riders stay upright and maintain control of their bikes."