SCIENCE NORTH SCIENCE NORD



ZIP TO THE FINISH

ELEMENTARY SCHOOL PROGRAM
Grades 4 to 6 | 50 minutes
Structures and Mechanisms | Forces | Motion | Engineering Design

Students become zipline engineers as they build, test, and improve a K'NEX carriage on ziplines. Teams investigate how gravity, friction, angle, and balance affect motion as they test their creations. Each test gives students evidence to improve their design and create a safer, smoother ride.

KEY LEARNING OBJECTIVES

- Identify how gravity pulls the carriage down the zipline and causes motion at different angles.
- Measure and record zipline angles using a protractor at the pivot point on the post.
- Test a design, observe what happens, record the result, and use evidence to decide what to change.
- Use science and technology vocabulary such as force, gravity, friction, motion, controlled movement, test, redesign, balance, stability, centre of mass, weight distribution, angle, slope, and counterbalance.

STEM TOOLS

K'NEX pieces, Pulleys, Protractors

CURRICULUM EXPECTATIONS

GRADE 4 — STRUCTURES AND MECHANISMS

- A1.3 use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems
- D2.2 identify the parts of various mechanisms and describe the purpose of each part
- D2.3 describe how different mechanisms transmit various types of motion, including rotary motion, from one system to another

GRADE 5 — STRUCTURES AND MECHANISMS

- A1.3 use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems
- D2.1 identify internal forces acting on a structure, and describe their effects on the structure
- D2.2 identify external forces acting on a structure, and describe their effects on the structure

GRADE 6 — STRUCTURES AND MECHANISMS

- A1.3 use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems
- E2.3 describe the relationship between the force of gravity and the weight of a body