

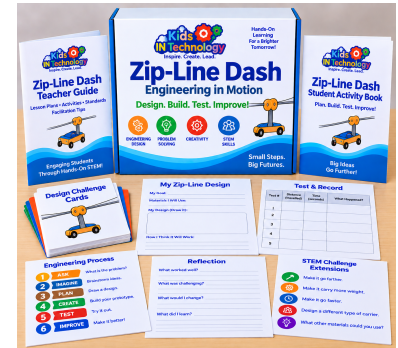


Zip-Line Dash

ENGINEERING IN MOTION

What Students Do

Students design, build, test, and improve a carrier that transports a table-tennis-ball payload down a zip line. They investigate gravity, friction, weight, speed, stability, and engineering tradeoffs while timing repeated trials, recording data, and using evidence to redesign for faster, more reliable performance.


24

STUDENTS

60-90

MINUTES

3-8

GRADES

ACTIVITY

PACK TYPE

KNT Activity Pack Includes

- Teacher Guide and facilitator resources
- Student Activity Book and Engineering Design Planner
- Zip-Line Dash Challenge Cards and Team Role Cards
- Test & Data Recording Sheet, Redesign Reflection, Performance Scorecard, and Exit Ticket
- Printable classroom materials for up to 24 students
- Site supplies common build materials such as line/cord, cups, straws, paper clips, rubber bands, tape, scissors, rulers, timers, and lightweight payloads

Students Learn To

- Follow an engineering design process to solve a defined challenge
- Explain how gravity and friction influence motion on a sloped line
- Measure travel time and compare repeated test results
- Identify variables that affect speed, stability, and payload security
- Use evidence to justify a design change
- Compare multiple solutions and explain engineering tradeoffs

How It Works

- 1 PLAN**
Sketch a carrier and predict how the design will balance speed, stability, and payload security.
- 2 BUILD**
Use common classroom materials to construct a carrier that can travel along the zip line.
- 3 TEST**
Run timed trials, record whether the payload stays secure, and compare performance data.
- 4 REDESIGN**
Change one feature based on evidence, retest, and explain whether the design improved.

Fast Is Not Enough. The Payload Has to Arrive.

A successful carrier must move efficiently while remaining stable and keeping its payload secure. Students learn that engineering requires balancing multiple criteria rather than optimizing only one result.

Designed for flexible afterschool, summer, classroom, and expanded-learning implementation.