

CATAPULT ENGINEERING CHALLENGE

COURSE GUIDE

Grade Band	3-6
Duration	90 minutes / 1 session
STEM Focus	Engineering • Physics • Force & Motion • Data
AI Literacy Focus	Recommendation • Prediction • Evidence • Verification
Framework	KNT I.D.E.A.S.™ Framework



KNT Catapult Kit
Hands-on components shown from the current lesson package.

Driving Question

Can we use engineering, data, and AI predictions to design a catapult that performs better?

Student Challenge

Students build a working craft-stick catapult, establish a baseline through repeated testing, compare their engineering ideas with an AI-generated recommendation and prediction, change one variable, retest, and use evidence to decide whether the redesign improved performance.

KNT EVIDENCE RULE: AI CAN PREDICT. ENGINEERS TEST. EVIDENCE DECIDES.

Program Design Note: AI supports the investigation; the physical engineering build remains the center of the learning experience.

Learning Objectives

- Build and safely operate a simple lever-based catapult.
- Explain the difference between potential energy and kinetic energy.
- Conduct repeated tests and record performance data.
- Identify one variable that could change catapult performance.
- Use evidence from testing to improve an engineering design.
- Compare an AI recommendation/prediction with real-world results.
- Explain why engineers verify predictions through testing.

Standards Alignment

NGSS 3-PS2-1: Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

NGSS 3-PS2-2: Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

Engineering Practice: Students define a performance goal, test a design, compare evidence, change one variable, and improve the design through iteration.

At-a-Glance Learning Sequence

1. BUILD	Construct the craft-stick catapult and establish safe launch procedures.
2. TEST	Complete repeated baseline launches and record performance.
3. COMPARE	Review an AI recommendation/prediction alongside the team's own engineering idea.
4. REDESIGN	Change one approved variable and complete additional launches.
5. VERIFY	Use real-world evidence to decide whether performance improved and whether the AI recommendation was supported.