

LAUNCH FAMILY ENTERTAINMENT

STEM

EDUCATIONAL CHALLENGE

Physics + Fun + Flight

**A HANDS-ON LEARNING EXPERIENCE
AT THE TRAMPOLINE PARK**



WHAT STUDENTS WILL EXPLORE

Introduce your group to the basic laws of physics through hands-on trampoline activities. Students explore Newton's Laws of Motion, energy transfer, reaction time, jump height, balance, stability and leverage—all while having fun.

FUN FACTS



1936:

George Nissen, an American gymnast, built the first trampoline.



68%:

Jumping on a trampoline is 68% more effective than jogging.



14.2 G:

Each move by a trampolinist can create 14.2 G-force.



SKILLS:

Trampolining enhances coordination, strength, flexibility, timing and balance.



HOW IT WORKS:

The elasticity of a jumping mat is caused by the springs that attach the fabric to the trampoline frame.

**LEARN.
BUILD.
PLAY.
EXPLORE.**



KEY PHYSICS VOCABULARY

FORCE	An interaction that changes an object's motion.
MOTION	An act or process of changing place.
ACCELERATION	The act or process of moving faster.
VELOCITY	The quickness of motion or rapidity of movement.
GRAVITY	The force that causes things to fall toward Earth.
INERTIA	A state of rest or uniform unless changed by an external force.
ENERGY	The ability to do work.
POTENTIAL ENERGY	Energy an object has because of its position.
KINETIC ENERGY	Energy an object has because it is in motion.



THINK.



TEST.



DISCOVER.



LAUNCH!

DAY OF EVENT

4 HANDS-ON CHALLENGES »»»

01



ENERGY TRANSFER

THE CONCEPT:

Can energy move from one object to another?

ACTIVITY:

Have a participant hold a lightweight foam ball at chest level. Ask them to jump up and down a few times. On the final bounce, right as they land, have them drop the ball onto the mat directly next to their feet.

STEM QUESTIONS:

- What happened to the ball?
- Why do you think Launch prohibits two individuals in the same trampoline square at the same time?



02



REACTION TIME

THE CONCEPT:

How does distance affect reaction time?

ACTIVITY:

Have Participant A stand 4 ft away from Participant B and hold their right hand extended away from their body. Participant B counts to 3, then releases the ball at a moderate speed toward Participant A's right hand. Repeat at 8 ft and 16 ft.

STEM QUESTIONS:

- What happened to Participant A's reaction time at the various distances?
- How would this challenge relate to a driver in moving traffic on a highway, with brake lights ahead?



03



JUMP HEIGHT

THE CONCEPT:

How do trampolines impact jump height?

ACTIVITY:

Have each participant jump from the ground/platform area and, with their extended hand, mark the highest point they can touch on a tall pole. Record the height. Then move to the trampolines, repeat the challenge and record the new height.

STEM QUESTIONS:

- What happened to participants' reach point on the platform vs. the trampoline?
- What component of the trampoline is assisting you in jumping higher?
- What do you think would happen to your jump height if we decreased the number of springs by 50%?



04



BATTLE BEAM STABILITY

THE CONCEPT:

How does repositioning your body help increase or decrease stability?

ACTIVITY:

Pair up on the beam and perform controlled trials, testing balance without aggressively trying to injure each other. Record observations about what makes a human "beam" structurally sound.

STEM QUESTIONS:

- What science-related concepts can you attribute to these challenges? (Hint: Isaac)



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BATTLE BEAM

3-PHASE OBSERVATION GUIDE



01



STANCE & CENTER OF MASS

ACTION:

Trial A: Stand with feet tight together, heel-to-toe along the beam. Give a light nudge.

Trial B: Widen your stance along the length of the beam and slightly bend your knees. Nudge with the same force.



STEM LESSON: Observe how lowering the center of mass and widening foot placement changes structural stability against external forces.

02



LEVERAGE & PIVOT POINT

ACTION:

Trial A: Stand perfectly upright. Deliver a light push to the shoulder area.

Trial B: Stand upright and deliver the same light push directly to the hip/hip-center.



STEM LESSON:

Calculate or map how hitting an object farther from its pivot point (the feet on the beam) multiplies tipping force via leverage.

03



COUNTER-BALANCING

ACTION:

Stand on one foot on the beam and swing a heavy pugil stick forcefully in front of you without hitting anything.



STEM LESSON:

Notice how your body automatically counterbalances or shifts backward to oppose the momentum of the heavy stick.

FOLLOW-UP

TAKE THE LEARNING BACK TO THE CLASSROOM



DISCUSS

In-class discussion about gravitational forces and energy transfer.



REFLECT

- Shared reading of student reflections.



PRESENT

- Class presentation of other everyday objects that apply to basic physics.