

Dominoes Challenge



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STEM-CTE HUB



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Dominoes Challenge

The Dominoes Challenge Kit allows students to create intricate chain reactions using various components like dominoes, stairs, turn styles, and more. With assorted dominoes, stair pieces, turn styles, fencing, and obstacles, students can engineer complex sequences full of twists, turns, and motion. Ideal for hands-on exploration of physics, spatial reasoning, and teamwork.



Grade Level

K - 12

Group Size

Small groups or whole class

Time Duration

30 - 90 minutes

Content of Kits

Components

- Assorted dominoes
- 6x Stairs
- 3x Line up tools
- 24x Fencing pieces
- 4x Plastic turn styles
- 2x Wooden turn styles
- 4x wooden rectangles
- 2x Arch ways
- 2x Obstacles



Usage

Getting Started

1. **Start with Simple Runs** – Have students begin by building basic domino lines before incorporating stairs, turns, or obstacles. This helps them build foundational spacing and alignment skills.
2. **Explore Each Component** – Allow time for students to test how different elements like turn styles, stairs, and fencing affect motion and timing.
3. **Use Line-Up Tools for Accuracy** – Introduce the line-up tools early to help students practice even spacing and reduce setup frustration.
4. **Sketch Your Plan Before You Build** – Encourage students to draw their domino course plans first to organize their ideas and sequence the flow of the chain reaction.

Storage

- Please return all kit components to the provided storage bin when the kit is not in use.

Troubleshooting

- **Dominoes Not Falling Smoothly** – Check for uneven surfaces, inconsistent spacing, or misaligned dominoes—use line-up tools to reset.
- **Turn Styles Not Rotating Properly** – Ensure they are placed on flat surfaces and are triggered with enough momentum to complete the turn.
- **Chain Reaction Stops on Stairs** – Adjust domino spacing on each stair step and test starting heights for reliable falls.
- **Obstacles Too Challenging** – Encourage students to test obstacle placements separately and adjust their designs for better flow or stability.



Activity Guide

Beginner

Domino Basics & Line Control

Students will use the line-up tools to build a straight line of dominoes, then experiment with spacing to see how it affects the success of the chain reaction. They'll use fencing pieces to create a designated build area and practice placing dominoes with consistency and control. This introduces precision, cause-and-effect, and basic sequencing.

Intermediate

Turning Points

Students will design a domino layout that includes at least one plastic or wooden turn style. They'll test how much momentum is needed to activate the turn and adjust their design for reliable motion. This encourages understanding of energy transfer, angles, and how to troubleshoot chain reactions involving moving parts.

Advanced

Obstacle Course Engineering

Students will create a complex domino course that includes stairs, an archway, at least one obstacle, and a minimum of two turn styles. They'll plan the course on paper, assign team roles, and refine their setup through multiple test runs. This challenges students to integrate problem-solving, engineering design, and creative thinking.

Extension Activities:

Domino Design Challenge

Students will receive a design prompt, such as 'build the tallest successful stair sequence' or 'trigger a turn style using only 20 dominoes.' They'll work in teams to brainstorm, prototype, and present their final design."They'll work in teams to brainstorm, prototype, and present their final design with a brief explanation of what they changed to make it work. This activity builds innovation, reflection, and presentation skills.



Learning Extensions

STEAM Connections: Engineering - Math - Art

Learning Objectives:

- Develop spatial reasoning and sequencing skills through the construction of chain reactions.
- Apply principles of physics, including force, momentum, and energy transfer.
- Strengthen planning and design thinking by creating and refining multi-step domino courses.
- Collaborate in small groups to build, test, and improve engineered structures with purposeful movement.

Career Connections:

- **Mechanical Engineer** – Designs and tests moving systems that rely on precise timing and force distribution.
- **Architect** – Uses spatial planning and design principles to create structurally sound and visually effective layouts.
- **Industrial Designer** – Develops product interactions and systems with a focus on user experience and functionality.
- **Film & Special Effects Technician** – Applies knowledge of sequencing and physical triggers in visual storytelling and practical effects.

Essential Employability Skills:

- Problem-Solving
- Critical Thinking
- Teamwork
- Communication
- Attention to Detail
- Resilience
- Adaptability





Resources and Accessibility

Safety Guidelines

- **Set Up in Clear, Flat Areas** – Ensure builds take place on smooth, open surfaces free from clutter or foot traffic to avoid accidents.
- **No Running Near Builds** – Maintain a calm environment to prevent unintentional triggering or injuries around intricate setups.

Accessibility

- **Adjust Building Surfaces** – Use tables or raised platforms so students who use wheelchairs or have mobility challenges can access builds easily.
- **Offer Alternative Roles** – Allow students to take on supportive roles like timing, observation, sketching plans, or documenting results if a physical building is challenging.
- **Break Builds into Steps** – Break Builds into Manageable Steps – Use visual schedules, build guides, or sequence cards to scaffold planning and setup for students who benefit from extra structure.

Encourage Peer Collaboration – Pair students with diverse abilities so everyone can contribute to the design, setup, and testing process.

Library Catalog



Library Resources



Feedback

QR to feedback survey

