

Transferring Energy Exploration to Energy Understanding in PLTW Launch

Overview

- Welcome
 - Introduction to the PLTW Launch Instructional Development Team
- Overview of the Energy Exploration Module
 - Why did we develop a new energy module?
 - NGSS Connections
- Explore the Activities, Project, and Problem
 - Hands-on
 - Collaboration
- Q & A



PLTW Launch Instructional Development Team



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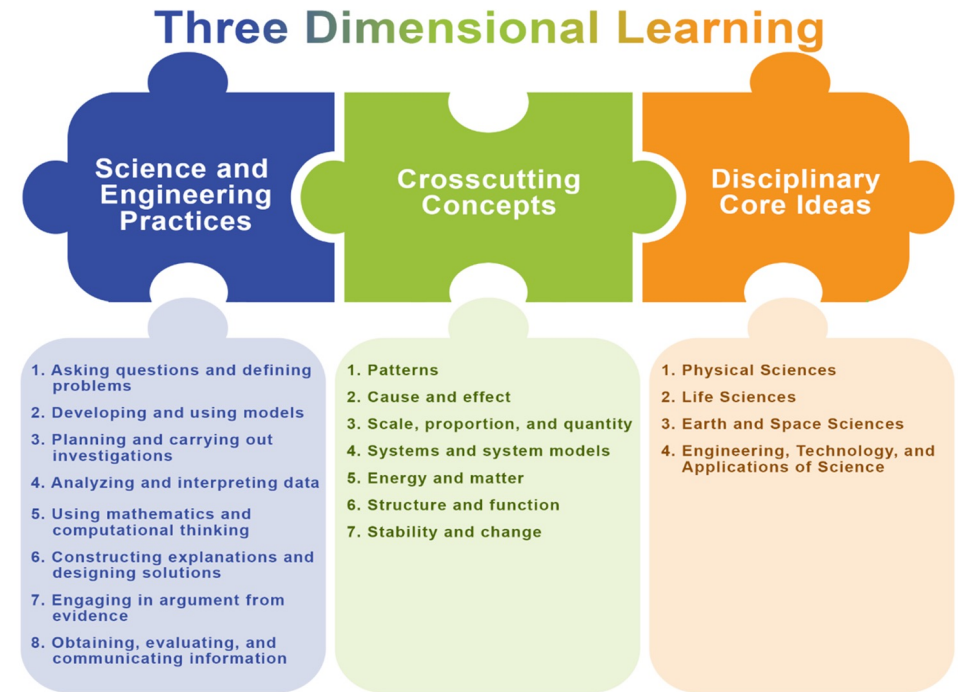


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Why Develop a New Energy Module?

“The **NGSS** emphasize coherence in energy instruction by focusing on a small set of core energy ideas, connecting to science and engineering practices, and emphasizing inquiry tasks that span across disciplines.”

Nordine, 2016, p. 10



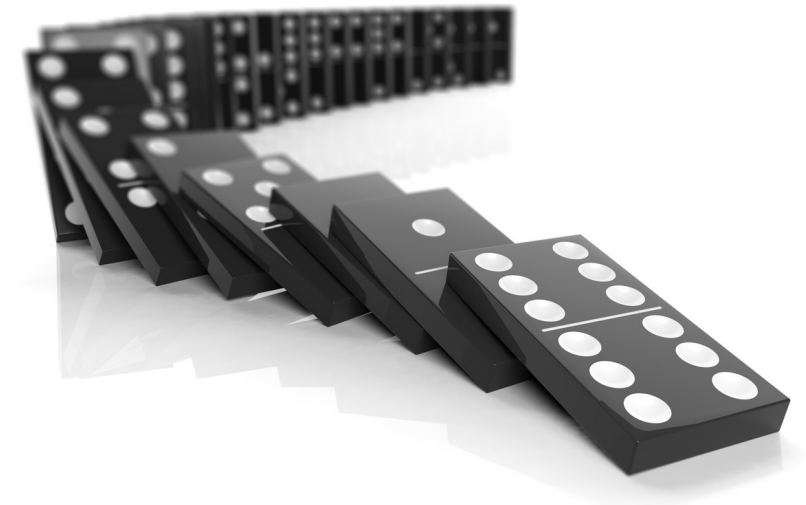
NGSS Connections

Performance Expectation	Standard
4-PS3-1	Use evidence to construct an explanation relating to speed of an object to the energy of that object.
4-PS3-2	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
4-PS3-3	Ask questions and predict outcomes about the changes in energy that occur when objects collide.
4-PS3-4	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Energy Transfer

In Activity 2, students:

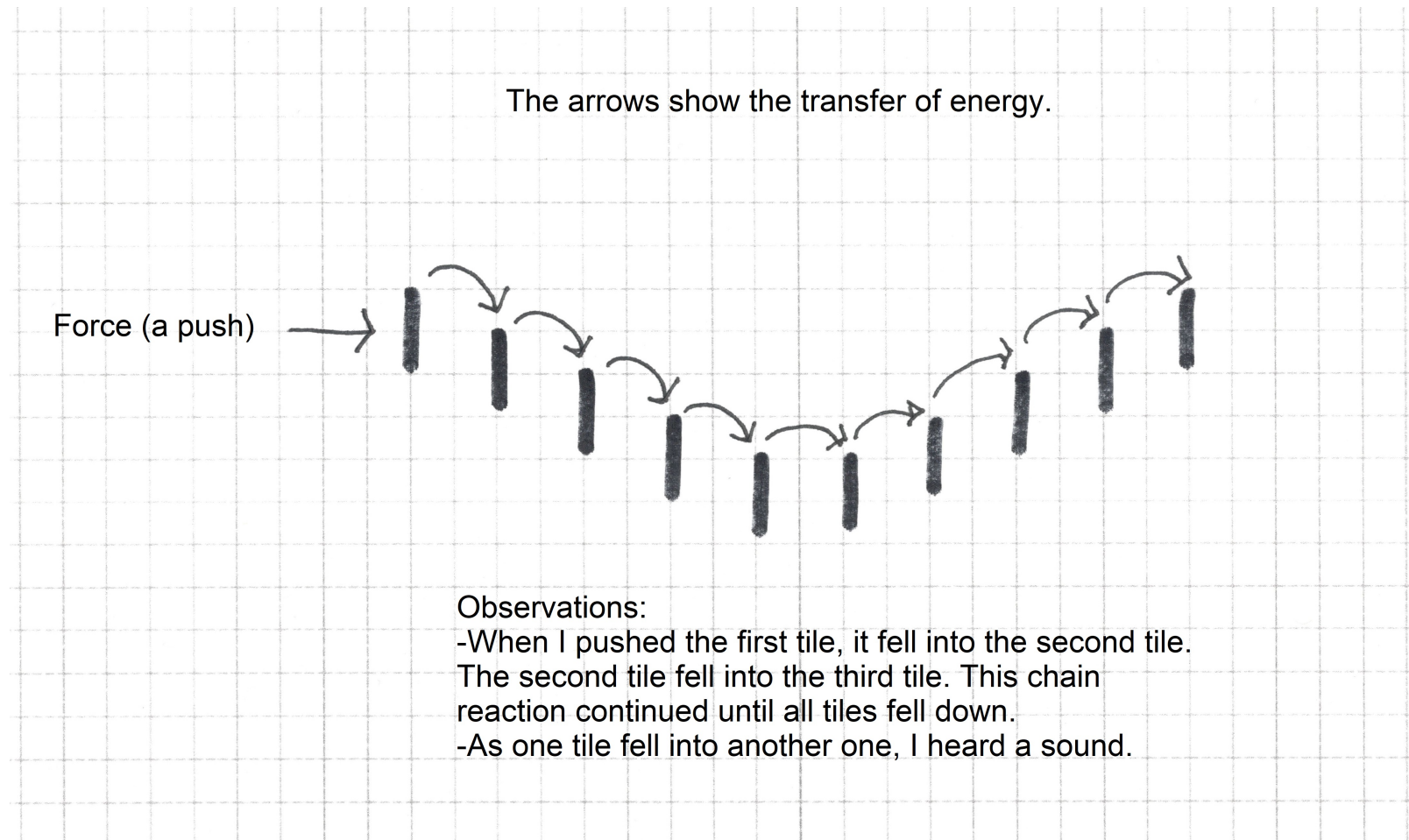
- Explore how energy moves throughout a system.
- Use objects including a solar panel, generator, potato battery, and hand warmers at center activities to explore energy transfer.



Observe-Wonder-Connect

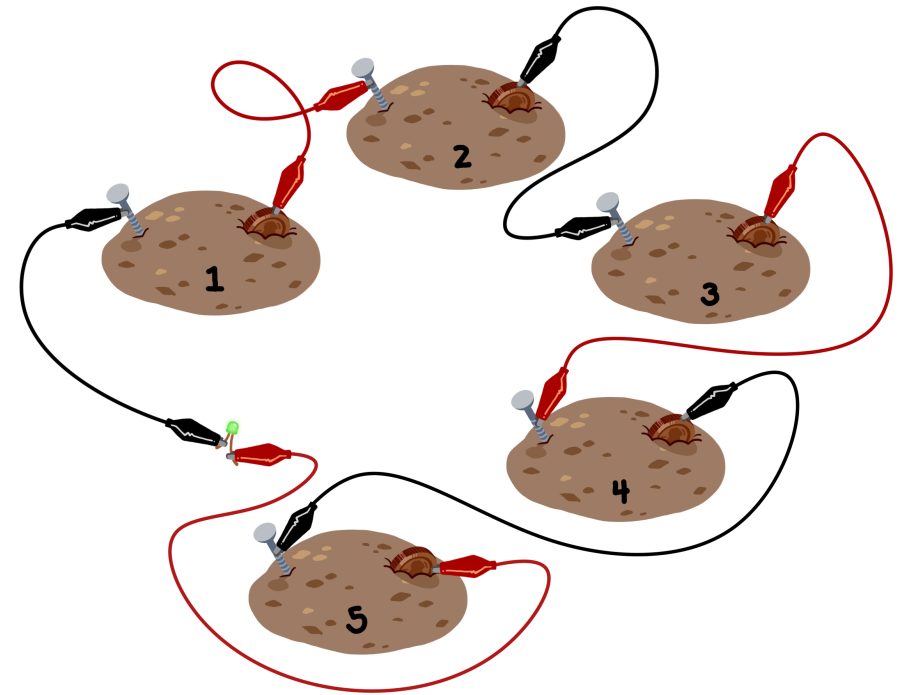
Observe	Wonder	Connect

System Model



Energy Transfer Centers

- Follow the procedure as you complete a center activity.
- Record your observations and wonderings on the Observe-Wonder-Connect table.
- Sketch a system model that includes:
 - The system's objects or components
 - Your observations
 - The energy transfers in the system



An Energy Problem Solver



In Activity 3, students:

- Learn how William Kamkwamba, a real-life problem solver, persevered to bring electricity to his community in Malawi.
- Follow the design process to design a windmill prototype with blades that turn.

Energy Transfer in Collisions



In the project, students:

- Deepen their understanding of energy transfer as they investigate what happens when objects collide.
- Follow the scientific inquiry process as they design an investigation with marbles on a track.
- Design a restraint system to protect a passenger in a car during a collision as part of an optional extension.

Make a Difference on Main Street!

In the problem, students:

- Explore energy from moving water.
- Consider how engineers continue to develop new ways to convert water's energy and improve our world.
- Select a problem to solve, and then follow the design process to design a device prototype that converts energy.



Town Council Meeting

In the optional extension, students:

- Become part of a fictional town that plans to build a new park, to be named Energy Park.
- Apply what they've learned about energy to make real-life decisions.
- Adopt the perspective of a fictional community member as they collaborate and make decisions.
- Engage in cross-curricular learning while building transportable skills such as collaboration, communication, and ethical thinking and mindset.





Q & A