

NGSS Correlations

Bimetallic Jumping Disc HEA-450

Elementary

K-PS2-1

Students can use the Bimetallic Jumping Disc to plan and conduct an investigation to compare the effects of pushes and pulls on the motion of an object.

2-PS1-4

Students can use the Bimetallic Jumping Disc in an investigation to construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

3-PS2-2

Students can use the Bimetallic Jumping Disc to make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

4-PS3-2

Students can make observations of the Bimetallic Jumping Disc to provide evidence that energy can be transferred from place to place by heat.

4-PS3-4

Students can use the Bimetallic Jumping Disc in an investigation to apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Middle School

MS-PS1-4

Students can use the Bimetallic Jumping Disc in an investigation to develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS3-2

Students can use the Bimetallic Jumping Disc in an investigation to develop a model to describe that when the arrangement of objects interacting, different amounts of potential energy are stored in the system.

MS-PS3-4

Students can use the Bimetallic Jumping Disc in an investigation to determine the relationships among the energy transferred the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.

DCI-MS/PS3A: Definitions of Energy.

A system of objects may also contain stored (potential) energy, depending on their relative positions.

High School

HS-PS2-6

Students can use the Bimetallic Jumping Disc in an investigation to observe and communicate scientific information about why the molecular-level structure is important in the functioning of a material.

HS-PS2-6

Students can use the Bimetallic Jumping Disc in the design of a device that works with given constraints to convert one form of energy into another form of energy.

5-PS1-3

Students can use the Bimetallic Jumping Disk to make observations and measurements to identify materials based on their properties.

Suggested Science Idea(s)

K-PS2-1

2-PS1-4

3-PS2-2

4-PS3-2

4-PS3-4

5-PS1-3

MS-PS1-4

MS-PS3-2

MS-PS3-4

DCI-MS/PS3A

HS-PS2-6

HS-PS2-6

Simple enough for elementary students; challenging enough for AP physics classes! Students can investigate both the structure of the disk and potential energy it possesses. These disks, which have two layers of bonded metals with different thermal expansion properties, will release the potential energy to kinetic energy when a change in temperature occurs. It causes these disks to jump approximately 12 inches or higher into the air!

The bi-metal stays in one position when at room temperature, and in another position when at approximately 98 degrees F. For a simple investigation, warm the Bimetallic Jumping Disk to about 98 degrees in your warm hand, and then snap or click the disk between your fingers. Place it on a table or flat surface. When the metal is warmed enough, the disk will remain in the 'inverted' position (potential energy) until it cools down. When the disk cools, it will jump up and be restored to the original position.

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