

## NGSS Correlations

### Drinking Bird DB-100

#### Elementary

##### K-ESS2-1

Students can use the Drinking Bird Demonstration to use and share observations of local weather conditions and describe patterns over time.

##### 3-PS2-2

Students can use the Drinking Bird Demonstration 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 use the Drinking Bird Demonstration to make observations to provide evidence that energy can be transferred from place to place by heat.

##### 4-PS3-4

Students can use the Drinking Bird Demonstration to design, test, and refine a device that converts energy from one form to another.

#### Middle School

##### MS-PS2-2

Students can use the Drinking Bird Demonstration in the plan of an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

##### MS-PS2-4

Students can use the Drinking Bird Demonstration in an investigation to construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

##### MS-PS3-2

Students can use the Drinking Bird Demonstration to develop a model to describe that when the arrangement of objects interacting changes, different amounts of potential energy are stored in the system.

#### High School

##### HS-PS2-4

Students can use the Drinking Bird Demonstration as an introduction to an investigation to use mathematical representations of Newton's Law of Gravitation to predict the gravitational forces between objects.

##### HS-PS3-3

Students can use the Drinking Bird Demonstration to refine a device that works with given constraints to convert one form of energy into another form of energy.

##### HS-PS3-4

Students can use the Drinking Bird Demonstration to conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system.

### **MS-PS3-3**

Students can use the Drinking Bird Demonstration to test what either minimizes or maximizes thermal energy transfer.

### **Suggested Science Idea(s)**

This amazing 50+-year-old science toy can be linked to physical science, earth science, chemistry and more. Effective for students of all ages. It is important before starting any of the investigations; make sure the bird is at equilibrium. A slight adjustment at the fulcrum or metal clip on the neck up or down is all that is needed until Drinking Bird just balances in a vertical position.

### **K-ESS2-1**

The speed of the bird's dipping cycle changes due to the humidity in the air. If the students watch and collect data; overtime in different weather conditions they will see a correlation. Students can use the Drinking Bird Demonstration to use and share observations of local weather conditions and describe patterns over time.

### **3-PS2-2**

Students can use the Drinking Bird Demonstration to make observations and investigate motion. Have the students change the temperature of water and make predictions about the speed of the dipping cycle.

### **4-PS3-2**

### **MS-PS3-3**

### **HS-PS3-3**

### **HS-PS3-4**

Water requires heat to evaporate. In this Drinking Bird Demonstration, water from the wet felt on the outside of the head evaporates, as the vapor in the head cools, the vapor contracts. This causes higher pressure in the lower bulb, allowing liquid to raise up the neck, the center of gravity rises, resulting in the bird to become unstable and tip forward. When the head gets wet, the cycle repeats itself.

### **MS-PS2-4**

### **HS-PS2-4**

Students can use the Drinking Bird Demonstration in an investigation to understand Center of Mass as pressure inside bird changes, so does the fluid moving up the tube.

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