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**IMAX® ORIGINAL FILM**  
**PANDAS**

## **PANDAS AND THE NEXT GENERATION SCIENCE STANDARDS (NGSS)**

Thoughtful viewing of the film, *Pandas*, along with classroom discussion, investigation and reflection by students supports the classroom treatment of the following Life Science and Earth Science Standards for third through eighth grade:

### **GRADE 3-LS4-2**

**Use evidence to construct an explanation for how the variation in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.**

[www.nextgenscience.org/dci-arrangement/3-ls4-biological-evolution-unity-and-diversity](http://www.nextgenscience.org/dci-arrangement/3-ls4-biological-evolution-unity-and-diversity)



A bone in the panda's wrist evolved into a thumb-like structure which makes eating bamboo more efficient.

### **GRADE 3-LS4-3**

**Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.**

[www.nextgenscience.org/dci-arrangement/3-ls4-biological-evolution-unity-and-diversity](http://www.nextgenscience.org/dci-arrangement/3-ls4-biological-evolution-unity-and-diversity)



Pandas cannot survive without bamboo, so they move up and down the mountain to stay close to bamboo that is in season.

### **GRADE 4-LS1-1**

**Construct an argument that plants and animals have internal and external structures that function to support survival, growth, and reproduction.**

[www.nextgenscience.org/dci-arrangement/4-ls1-molecules-organisms-structures-and-processes](http://www.nextgenscience.org/dci-arrangement/4-ls1-molecules-organisms-structures-and-processes)



Develop an explanation for how the panda's wrist bone, which evolved into a thumb-like structure, makes eating bamboo more efficient.

### **GRADE 5-ESS3-1**

**Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.**

[www.nextgenscience.org/dci-arrangement/5-ess3-earth-and-human-activity](http://www.nextgenscience.org/dci-arrangement/5-ess3-earth-and-human-activity)



The Chinese government is using science and technology to protect pandas, and is learning from Dr. Ben Kilham, an American black bear researcher.





### **MIDDLE SCHOOL-LS1-5**

**Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.**

[www.nextgenscience.org/dci-arrangement/ms-ls1-molecules-organisms-structures-and-processes](http://www.nextgenscience.org/dci-arrangement/ms-ls1-molecules-organisms-structures-and-processes)



Panda habitat has plentiful bamboo and few predators.

### **MIDDLE SCHOOL-LS2-2**

**Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.**

[www.nextgenscience.org/dci-arrangement/ms-ls2-ecosystems-interactions-energy-and-dynamics](http://www.nextgenscience.org/dci-arrangement/ms-ls2-ecosystems-interactions-energy-and-dynamics)



The amount of bamboo to keep a panda alive is one factor that limits panda population. Reduced and disconnected habitats make it difficult for the population to thrive.

### **MIDDLE SCHOOL-LS2-4**

**Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.**

[www.nextgenscience.org/dci-arrangement/ms-ls2-ecosystems-interactions-energy-and-dynamics](http://www.nextgenscience.org/dci-arrangement/ms-ls2-ecosystems-interactions-energy-and-dynamics)



Human construction has reduced panda habitat and separates panda groups from each other.

### **MIDDLE SCHOOL-ESS3-3**

**Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.**

[www.nextgenscience.org/dci-arrangement/ms-ess3-earth-and-human-activity](http://www.nextgenscience.org/dci-arrangement/ms-ess3-earth-and-human-activity)



Examine what the Chinese scientists are doing for pandas.

### **MIDDLE SCHOOL-ESS3-4**

**Construct and argument supported by evidence for how increases in human population and per capita consumption of natural resources impact Earth's systems.**

[www.nextgenscience.org/dci-arrangement/ms-ess3-earth-and-human-activity](http://www.nextgenscience.org/dci-arrangement/ms-ess3-earth-and-human-activity)



The effect on pandas has gotten worse over time as the population of China has grown and become more prosperous.

