



## San Francisco Opera's Puccini's *MADAMA BUTTERFLY*

### Curriculum Connections

California Content Standards  
Kindergarten through Grade 12

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#### SCIENCE

*The principals of science used in Madama Butterfly.*

##### THE FIVE SENSES:

Sight, sound, touch, taste, and smell.

In the final scene, Butterfly blindfolds Trouble. Try covering your eyes and listening to other students speak or sing. Is the experience different from when you listen, without being able to see?

What are senses involved in experiencing opera?

How do senses develop and decline as you get older?

The loss of what sense would most diminish experience of opera.

##### PARTS OF THE BODY:

Identification of body parts important to performing. Ex. Diaphragm, larynx, throat, mouth, etc.

Identification of body parts associated with hearing music, how ears work.

Identification of body parts associated with viewing opera, how eyes work.

Examine the science of men and women and psychological and physical differences.

##### THE ELEMENTS

Fire, Water, Earth, Metal, Air, Wood.

Find references to the sea in the opera.

Study the four seasons. How would robins nesting in Japan signify the passage of time?

##### PHYSICS

Sound: Voice, Instruments, Acoustics, Amplification, Recording.

Study Japanese musical instruments. What materials are they made of? How do they produce sound differently from Western instruments?

## ACTIVITIES

Research the materials used in a geisha's makeup, historically and now.

Research the relationship between nature and religion in Japan.

List references to nature in *Madama Butterfly*.

Try raising silkworms or caterpillars in your classroom.

Make the kind of paper used in a shoji screen. How do the natural materials become a construction material?

Examine dyes that would have been used in Butterfly's kimono. What is the Japanese dying process?

Examine Japanese lacquer.

Examine the materials used in the making of Japanese swords.