



## San Francisco Opera's Mozart's *DON GIOVANNI*

### Curriculum Connections California Content Standards Kindergarten through Grade 12

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## MATHEMATICS

### ATTRIBUTES

*Comparisons in The Marriage of Figaro*

Sorting and Classifying: What characters belong together, which don't, and why? Ex: Dr. Bartolo and Marcellina are older, Cherubino and Barbarina are younger. The Count and Countess are nobility, Susanna and Figaro are members of the servant class.

### MEASUREMENT

*Use of Standard Units of Measurement in Story & Set Design.*

2D & 3D Dimensions: Area, Perimeter, Volume, Scale, Proportion, Ratio.

- Create a set for *Don Giovanni* to scale.
- Design a menu with recipes (with measurements) for the wedding celebration.

Weight: Physical, Metaphorical, Balance.

Time: Passage of time (real & theatrical time), times of day (morning, afternoon and night; yesterday, today, tomorrow; time of everyday events such as dinner & bed time), estimation, reading time, age of characters.

What units of measure were used during the time of the opera?

Measure distances between places mentioned in the opera. Use map scales to convert inches to miles.

Research the architecture of Spanish palaces during the time of Don Giovanni.

What currency was used during Mozart's day? How much was it worth compared to today's money? How much would Leporello have made as Don Giovanni's servant?

If you were Don Giovanni, how much would it have cost to run your household? Create a budget for his household, taking into account all expenses.

Research Mozart's and da Ponte's salaries for *The Marriage of Figaro*. What is the proportion of one to another?

Estimate how many people are in large ensemble scenes. Taking into account all the people on stage, how much would such a scene cost, in Mozart's time and now?

Count the number of people who need to be paid when putting on an opera; use cast and company listings in the program to calculate.

Create a budget for a production of the opera. Students are responsible for accomplishing production and staying within budget.

## GEOMETRY

*As found Don Giovanni's character, costume & set design.*

Identification of Shapes, Repetition & Pattern, Rhythm & Symmetry.

Planes (Square, Rectangle, Triangle, Circle) & 3D (Cube, Pyramid, Sphere).

Positive & Negative Space, Interior & Exterior Space.

Calculate area of opera stages today vs. opera stages during Mozart's time.

Calculate area of Don Giovanni's palace.

Create analogies between polygons and different ensembles in the opera (i.e. a trio is a triangle, a quintet is a pentagon).

Draw polygons that show the relationships between characters in relative terms (i.e.: Would Leporello, Don Giovanni and Donna Anna be represented by an equilateral, isosceles or a scalene triangle?)

## NUMBER SENSE

Formulas & calculations: Addition, subtraction, multiplication, division.

More, less, or same as.

Concept of zero (absences, disappearances. Ex. rests/silence in music.

Ordering & sequencing.

Recognizing and creating numerical patterns. Ex. beats, ABA pattern in music.

Survey taking: tallying and graphing.

Predictions.

Create a list like Leporello reads in his Catalog aria.

Write down the numbers Leporello lists in his Catalog aria; read them out loud.

## STATISTICS

Create a graph based on Leporello's list of how many women Don Giovanni has wooed in how many different countries. Experiment with different kinds of charts or use computer programs to explore different styles of data visualization.

## ACTIVITIES

Calculate how many conflict permutations there are between two characters or between three characters. Ex. Don Giovanni vs. Donna Elvira; Don Giovanni vs. Leporello; Leporello vs. Donna Elvira, etc.

Design and play a board game based on the opera.

Build a scale model of Don Giovanni's palazzo. Take proportions into account.

Build a scale model of a set for *Don Giovanni*. Specify your materials and estimate the quantities and costs of the materials that you will use to build your model.

Create costume patterns for *Don Giovanni*. Use yourself as a size model and design the patterns to fit you.

\*Examples: Applying the Math Standards to Mozart's *DON GIOVANNI*

**GRADE 3**

**Measurement and Geometry**

- 2.1- 2.2 Describes and classifies plane and solid geometric figures

Lesson: Watch the scenes from Don Giovanni with ensembles. Introduce the vocabulary and meaning of the words: duet, trio, quartet, quintet, sextet, septet, and octet. Compare and match them to the geometric plane figures with the corresponding number of sides. For example:

A trio is to music as a triangle is to polygons

Quartet: rectangle or square

Quintet: pentagon

Sextet: hexagon

Septet: heptagon

Octet: octagon

Question: Ask the student why there is no correlate to a duet?

**GRADE 4**

**Number Sense**

- 1.1 Reads and writes whole numbers through the millions

Watch the DVD of *Don Giovanni*, focusing on Leporello's Catalog Aria.

Lessons: Ask students to write in both regular and expanded notation the number of women that Don Giovanni has "wooded".  $640 = 600 + 40$  or  $231 = 200 + 30 + 1$

Discuss the use of "Leporello's list". Ask why does he keep it? What do we use lists for in our lives? What are the reasons and ways in which we keep track of large groups of numbers.

- 1.2 – 1.4 Compares, orders and rounds whole number to the millions...

Lesson: Ask students to number the countries in order of highest number of women to lowest or vice versa.

**Number Sense – Computation**

- 3.1 Adds and subtracts multi-digit numbers

Lesson: Put the different number of women Don Giovanni has "wooded" up on the board. "640 in Italy, 231 in Germany, 100 in France, 91 in Turkey, but in Spain, 1,003" Ask students to subtract the number in Germany from the number in Italy, etc. Ask students to add the number of women in France to the number in Spain.

- 3.2 - 3.5 Multiplies multi-digit number by two digit numbers

- 3.4 Divides multi-digit number by a one digit divisor

Lessons: Ask students to multiply the number of women from the various countries by 2, 3, 4, etc.

Ask students to divide the number of women from the various countries by 2, 3, 4, etc.

- 3.1 – 3.8 Understands and shows relationships between plane and solid geometric attributes

Lesson: Watch the DVD of Don Giovanni and using graph paper begin to draw, as close as possible to relative scale, the stage's dimensions. Now taking more graph paper begin to draw and cut out structures on the stage to scale. Tape the 3-D structures to the diagram of the stage. Discuss how these drawings/objects show the relationships between plane and solid geometric attributes.

**Statistics, Data Analysis, and Probability**

- 1.1 – 1.3 Organizes, displays, and interprets data on graphs, tables, and charts

Lesson: Make a graph that illustrates the number of women in the various countries that Don Giovanni "wooded"

