

Create a Creature: Hands-on Genetics

A lesson based on the works of art in

Gene(sis): Contemporary Art Explores Human Genomics

At the Mary and Leigh Block Museum of Art at Northwestern University

September 10 -November 28, 2004

From digitally altered photographs of transgenic beings to abstract gene-mapping paintings, *Gene(sis): Contemporary Art Explores Human Genomics* probes the potential social, emotional, and ethical implications of

one of the most controversial and fascinating subjects of our time -- the deciphering of the human genome. Featuring work by more than 20 renowned and emerging artists, including Christine Borland, Critical Art Ensemble, Dario Robleto, and Chicagoans Eduardo Kac and Iñigo Manglano-Ovalle, *Gene(sis)* explores ways in which our understanding of science, including recent genomic developments, is inextricably bound with our understanding of language and art and multifaceted use of new technologies and science.

The exhibition is organized into four general themes: "sequence" - work that explores the rhetoric and media representations of genomics; "boundary"- artists' investigations of the now permeable boundaries between species; "specimen"- work that engages questions of DNA ownership, personal privacy, and the management of genetic information; and "subject"- artists' re-imaginings of individual subjectivity, family, and human "nature" in the wake of recent genomic developments. Like other arenas of culture, "contemporary art can illuminate many issues of controversy in our culture, the ultimate means of the human genome among them," says *Gene(sis)* curator Robin Held. "*Gene(sis)* interweaves humorous commentary, theatrical installations, documentary images and pseudo (or actual) scientific laboratory situations, elucidating certain technical advances for a lay audience. It exploits the power of contemporary art to provoke, to question, and to articulate new paradigms, providing conditions necessary for a deeper understanding and a fuller discussion of genomic issues." *Gene(sis)* is organized by the Henry Art Gallery in affiliation with the Berkeley Art Museum. A companion website is available online at www.gene-sis.net.

Age Level: Late Elementary/Middle School

Estimated Time: 90 minutes (can occur over several class sessions)

Specific Topic: Animal classification and genetic mutation

Subtopic: Watercolor painting and dough/clay sculpting

Goals of this lesson:

1. To create an imaginary hybrid animal using inspiration from the images in the *Gene(sis)* exhibition and observation from images of real animals.
2. To realize the consequences and effects of genetic mutation by examining how merging of traits effects an animal.
3. To explore, understand, and use different art materials and supplies.

Illinois Learning Standards fulfilled:

Science

State Goal 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

State Goal 12: Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.

Fine Arts

State Goal 25: Know the language of the arts.

State Goal 26: Through creating and performing, understand how works of art are produced.

Key concepts:

- Hybrid
- Mutation
- Offspring
- Dominant
- Recessive
- Watercolor wash

Objectives of this lesson:

1. Students will apply what they have learned through specific works of art in the *Gene(sis)* exhibition to an exploration of animals depicted in artworks and the creation of imaginary creatures that could be offspring of two artworks.
2. Students will identify specific traits in animals.
3. Students will gain knowledge of dominant and recessive traits.
4. Students will learn to use a variety of materials to create different effects texturally and visually.

Suggestions for student assessment:

Evaluate student work using the following criteria. It is advisable to share the criteria with your class before asking students to begin the assignment. Does the student work:

1. Convey an understanding of the dominant and recessive traits?
2. Reflect knowledge of knowing how to use new materials (create watercolor effects, joining techniques in clay)?
3. Convey an understanding of how the new imagined creature will interact in an environment (realize the consequences of the new species)?

Teaching resources necessary to support this lesson: Slides, or large color copies of hybrid animals from *Gene(sis): Contemporary Art Explores Human Genomics* (see examples below) or other depictions of hybrid animals. Slides, or large color copies of art images of different types and species of animals (see examples on Block Museum website), flip chart or white board/markers

Lesson Plan:

- I. Share the *Gene(sis)* artworks with students (examples below or on Block Museum's website). Discuss each asking the following questions. Gauge your questions and discussions to the level/knowledge of the group. Try to generate a discussion about the physical characteristics of the animals, what is real and imaginary and what parental and mediated traits are apparent in the denictions.

Supply List

- ✓ **Heavy weight drawing paper cut into index card sized sheets (4 per student)**
- ✓ **Ebony drawing pencils**
- ✓ **Water color/brushers**
- ✓ **Buckets of water**
- ✓ **White "super dough" – each student needs a piece that is a little larger than a tennis ball**
- ✓ **Journal and Pencil (optional or for later class session)**

For Catherine Chalmers' Transgenic Mice:

- Describe what you see in these photographs. What size are the mice? Texture? Shape? Color?
- How does the way the mice are represented influence what you think about them? Would you hang these up in your house?
- Are these mouse portraits emotional or scientific?
- How are these mice normal or abnormal?

For Daniel Lee's Judgment Series:

- Describe what you see in these images?
- What is the dominant, if any, feature of these hybrids?
- What is their expression?
- How are they human, but not human?

- What is the impact of these figures? Intriguing or disturbing?
- How does the color of the image and the dark setting contribute to the mood of the images?
- These images were created using a computer, does that change your view of them?
- How would they be different if they were created freehand, drawn or painted? Would they have less of an effect?

For Eduardo Kac's Artist with GFP Bunny:

- Describe what you see in these posters.
- This rabbit glows green under a special light of a certain intensity. Why do you think this rabbit glows green? (conduct a discussion about this before revealing the details)
- What are your feelings about the rabbit?
- How is the rabbit different from the mice?
- Is this art, or science? Both? Or neither?

[30 minutes]

Next look at and discuss the art images of different types of real animal species (examples of these on the Block Museum's website)

Categorize each animal according to five physical characteristics. (List on flip chart.)

1. What color is the animal?
2. How many legs does it have?
3. Is the skin smooth or rough?
4. Is the body type curvy or bony?
5. Does it have a tail?

[20 minutes]

- II. Have each student choose two animals from the list on the flipchart. If one animal was the mother and one animal was the father, what characteristics might their offspring have? They will need to decide which traits will be dominant, which will be recessive. Perhaps their animal offspring will mutate somehow.

Using a blank sheet of paper, have each student create three columns and at the top of the first two columns, write the name of each of the parent animals. In the third column, list the name of the offspring/new species. In each column, list the numbers 1 through 6. For the numbers 1 through 5, list the physical characteristics of the parent offspring as on the flipchart. For number six, have the student list another observation he or she has made about the animal. In the third column, have the student list the visible traits of the imaginary offspring of the two parents selected. (or for younger students use attached worksheet for greater ease with the lesson)

[10 minutes]

- III. Next, students should make quick drawings of the offspring they have imagined, following a scientific observation method. On one piece of paper show the animal from the side. On others show it from the front, back, top, etc.

When the sketches are complete, students will add watercolor washes to the drawings. (for younger students, have stencils available) Demo using watercolors to get light and dark washes. For a lighter wash use less paint, more water. For a darker wash add more paint. You can darken a light wash, but you can't lighten a dark wash, so work from light to dark. Watercolor is transparent -- if you overlap colors they will mix, but you cannot totally cover one color with another. Sprinkling salt on the wet paint, allowing it to dry, and brushing the salt off will create a dappled effect and will give the effect of texture.

[20 minutes]

- IV. Have students create a three-dimensional representation of their creatures with Super Dough (or other clay product if Super Dough is unavailable). Demo joining techniques for Super Dough. When using Super Dough, students can add color to wet dough with watercolors. If using another product, painting may have to wait until the clay dries. (This clay air-dries in an hour or so.)

[25 minutes]

- V. (Optional for in the classroom) In journals, have the students write about the characteristics of the mother and father and then describe which traits can be found in the offspring. Finally, have them describe (or draw) the environment in which the animal family may live.

[15 minutes]

(Images used in this lesson come from the *Gene(sis): Contemporary Art Explores Human Genomics* exhibition organized by the Henry Art Gallery. Lessons and color images are available on the museums website at www.blockmuseum.northwestern.edu under the education section.)



Eduardo Kac, *GFP Bunny*, 2000, photographic documentation.
Courtesy of Julia Friedman Gallery.



Daniel Lee, *Juror No. 6 (Leopard Spirit)* from the *Judgment* series, 1994, digital C-print. Courtesy of the artist and OK Harris Works of Art



(**OBESE** Used for diabetes and endocrine-deficiency research.)
\$105 per breeder pair.

Catherine Chambers, *Transgenic Mice: Obese*, digital C-print. Courtesy of the artist and RARE, New York.

**CREATE A CREATURE!
(CIRCLE YOUR CHOICES.)**

HOW MANY LEGS? _____

WHAT KIND OF FEET?

WEBBED

HOOVES

PAWS

CLAWS

FINS

OTHER _____

WHAT KIND OF MOUTH?

SNOUT

BEAK

SHARP TEETH

LIPS

OTHER _____

WHAT KIND OF TAIL?

BUSHY

LONG AND CURVY

OTHER _____

LONG AND WHISPY

WHAT KIND OF EARS?

POINTY

FLOPPY

TINY

LARGE AND ROUND

OTHER _____

BODY SHAPE/TYPE:

DRAW YOUR OWN:

EYES

SKIN OR FUR

ANYTHING ELSE!

WHAT IS THE NAME OF YOUR
CREATURE?
