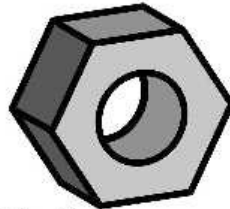


Christy Rupp
Swimming in the Gene Pool
Teacher Curriculum Guide



Kidspace
at MASS MoCA

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Discover-A-Bug

Grades K-5

What?

Students will learn about the basic parts of insect anatomy and, working in art-making teams, explore concepts of scale and proportion to construct a large paper-relief insect.

Why?

This lesson is designed to introduce students to ideas related to Christy Rupp's genetically engineered insect sculptures. Students will also practice communication skills, cooperation, and creativity.

Materials

diagrams or pictures that detail insect anatomy, including head, thorax, legs, eyes, wings, antennae, and abdomen
books about insects from the school library
large paper & a combination of different types of papers, e.g.: butcher paper, roll craft paper, newsprint, newspaper, poster board, tissue papers, recycled copy paper
tape, staplers, glue sticks
markers, paint or crayons

Time Needed

15-30 minutes for Part 1
60-90 minutes for Part 2 (could be spread over several days)
10-15 minutes for Part 2

PART 1—Gathering/Research

1. Bring in pictures and books about insects that you have collected, and explain to your class that they will work together to learn more about an insect through research and a group art project. Students might also do preliminary research on their own, and/or may want to bring in an insect collection of their own for the class to examine.
2. Show your students diagrams of insect anatomies that you find in books or on the internet. To help your students become familiar with the vocabulary of insect anatomy, lead a discussion that includes the following:
 - What anatomical parts do bugs and humans have in common? (head, abdomen, legs, eyes)
 - What parts do bugs have that we don't have? (thorax, wings, antennae)

- Help your students to research how the anatomy of the bug helps it to survive in its habitat. What is their habitat like?
- What types of food does it eat and what parts of the insect's body helps it to search for food?
- How does it procreate and take care of its young? Does it have special skills for this particular task?
- How does it defend itself against its enemies? Who are its enemies? Has it developed special anatomical characteristics, such as camouflage, to protect itself?
- Is your bug considered a pest by some farmers? If so, what is done to control its population? Has it adapted to these controls over time?
- Using the diagram of your bug, discuss scale, proportion, and symmetry with your students. Can your students determine if this image of the bug is larger-than-life size or the same size as a real insect? What about in terms of proportion? If you draw a grid over the diagrams, how big is the head relative to the thorax relative to the abdomen? Ask your students if the bug they chose is symmetrical.

PART 2—Create Your Bug

1. Imagine that the bug you create will be 4 (or 6 or 8!) feet long. Divide the class into five bug part factories, each assigned to make one part of the bug (wings, antennae, head, thorax, and abdomen). Explain that just as car parts are all made in different places and then brought together to be assembled, your bug parts are going to be made by different teams and then brought together to be assembled. Pretend that a big spider ate your instructions. Some things are bound to “go wrong” with your bug assembly (as they may have in Christy Rupp’s insect sculptures), but that’s okay.
2. Based on your discussion of scale, proportion and symmetry, help each group determine how their “part” of the bug should look, and how big it should be (relative to the other parts) if the entire bug is 4 (or 6 or 8!) feet long. This is just an estimate—it doesn’t have to fit perfectly. (For example, the head might be one foot long; the thorax might be 1 ½ feet, etc.)
3. Now, using the large paper as a base (cut to the estimated dimensions for each group), the five “factories” can begin decorating their “part.” Using markers, crayons, and all of their colored papers, each group can create its

part. Encourage your students to use the paper three-dimensionally, building it up to create a paper-relief sculpture.

4. When all of the groups are finished, assemble your bug parts on a big wall using tacks and tape to put the creature together as best you can.
5. Look at your bug as a class. How does it compare to a real bug?
6. If you and your class want to continue, decide what alterations you think the bug needs. What could be added? What would further emphasize the qualities you think it possesses? Remove it from the wall and continue making these alterations till you think the sculpture embodies these qualities.

PART 3—Reflection

Lead a class discussion about the *Discover-A-Bug* activity. Ask students what they learned. Did they like working together on a project like this? What were some of the challenges in working with a group?

Noise Poems: Bugs, Bugs Everywhere!

Grades K-5

What?

The insect sculptures by Christy Rupp all have “personalities.” Your students can have fun creating personalities for their own insect sculptures that they made as a class.

Materials

pencil and paper
tape recorder (optional)
digital or video camera (optional)

Time Needed

10-20 minutes for Part 1
10-25 minutes for Part 2

Why?

To continue the creative process and have some fun.

Part 1 – Gathering/Research

1. Have your students (individually or as a class) make a list of all the noises that their insect might make. Ask them if the different parts of the bug make different sounds. For example, do wings sound different from antennae? How does their bug sound different from a real bug?
2. Where is their bug from? Boston? Chicago? Los Angeles? Peru? France? Korea? Haiti? What language does it speak? Is it musical? Does it sing or whistle?
3. Now have each student pick one bug noise from the list and have them practice making this sound keeping in mind the bug’s language and personality. You may want to have them sound out and try to write their sound on a piece of paper. Review the noises with the students, making sure everyone has an appropriate sound creation.

Part 2 – Compose Your Noise Poem

1. It's now time to create your noise poem by combining all of the individual noises. Get ready—the teacher will be the first conductor of this original piece!
2. “First time around”: go around the classroom and have everyone make his/her noise once. Remind students that they must stick to the sound they have chosen, and not to change it. You may also want to ask them to describe *what* the sound is that they're making and *why* they have chosen to make this sound. (You could even have the other students guess the answer to the first question.)
3. “Second time around”: start building the sound poem. Explain to the class how you will “conduct”: when you point to them, they are to make their noise, and they should continue it until you point to them again. Or, you can point and hold up fingers to indicate how many times they should make their noise. Go around the room, adding students in one by one, or two by two... have some overlap, some go solo...you decide. Some students may go fast, some may go slow, but student should repeat his or her noise exactly as you indicate. Add and subtract from the poem, experimenting with the quality of sound. Ask the students what they think of the poem. How does it sound? What changes would they like? Try and try again!
4. If you have access to a tape recorder or video camera, be sure to record they poem as your bug poets are enacting it.
5. Switch the roles around so those students are able to “play” different parts of the poem. You may want to let students try conducting!

Part 3 – Reflection

Lead a class discussion as a way to reflect on the process of creating and developing a poem with sound.

For Fun:

1. Have each student write a noise poem. Ask them to incorporate their own, and perhaps a few of their classmate's noises, into the poem. To help them do this, first do one as a class. Write one of the noises on the board. Show them many ways it might be written, i.e.: adding extra vowels, stretching letters, making a picture from the letters. Then, add another sound, and experiment again. What more do they think the poem needs? It can have other words (not necessarily sounds), or not. It can rhyme, or not. It can make sense, or just sound great!
2. As a class, write a noise poem that incorporates all of the poems composed by the students. Then, you may want to Xerox a copy of it for each student and have each of them illustrate it in their own way.
3. Talk with your music teacher about turning your class's poem into a full-fledged song, using musical instruments and/or piped-in music.
4. Collaborate with other classes to create a symphony of noise poems.
5. Make up a story about a "day in the life" of your bug. What would your bug encounter, what conversations with other animals might it have? Try to write your story as a script, and then have the class read/perform the script incorporating their sounds.

Water Works

Grades K-5

What?

Students will experiment with various water “pollutants” and create collages representing what they discover.

Why?

This lesson will help your students begin thinking about Rupp’s water-related artwork. By adding unnatural water changes, your students will also begin thinking

Materials

white paper or sketch paper
colored pencils, crayons or markers
plastic or any clear containers/canisters
water

any or all of the following “pollutants”:
laundry/dish detergent,
vinegar, molasses, wood chips,
Jell-o, baking soda, newspaper,
colored paper, potting soil, dry
grass, sand, olive oil

clear or colored cellophane

glue sticks

construction paper

scissors

string (optional)

Time Needed

15-30 minutes for Part 1

PART 1—Gathering/Research

1. Ask students to make a sketch of what they think clean water looks like. When they have finished this picture, ask them to make another sketch of what they think water might look like after any of the substances they are planning to use in their experiments have been added to the water.
2. If you would like, these preliminary hypotheses can be organized as a prediction chart so that the students can address the following questions: What do we know? What do we think might happen? What do we want to know?
3. Set up a row of clear containers filled about half way with water on a table at the front of your classroom. Then, one at a time, ask students to add one of the suggested substances to each container of water. Make sure everyone is watching. Do this until all containers hold water and a “pollutant.”
4. Talk with your students about what happened to the water in these experiments. Does the water still look clean after the substances have been added? Did their predictions, or what they predicted the water would look like in their drawings, come true?

PART 2—Picturing Water

1. Now tell the students that they will each be making a picture of one of the water experiments they just observed. They will be attempting to represent a particular polluted water world as they observed it, and how they imagine it, **if it were to be magnified.**
2. Give each student two sheets of cellophane, approximately the size of one piece of construction paper. Both pieces of cellophane should be the same color.
3. Give each student two sheets of construction paper and ask them to cut one big circle out of each one. They should cut the two pages at once, so that the circles are identical. Then, they can put the circles aside, and keep the identical frames. For younger students you might do this cutting ahead of time.
4. Next, tell students to glue one sheet of the cellophane to each one of the frames.
5. Have your students imagine what magnified pollutants look like. What colors might they be? What shapes? Have the students then cut construction paper shapes of all colors and sizes to match the image they had thought about.
6. When the students have finished cutting up their shapes they can arrange them on one piece of cellophane. Are their shapes swimming, floating, sinking, and swirling? Are they making patterns or rows? Are they moving in a certain direction?
7. When they have finished arranging their underwater scene, help them gently place the other frame and cellophane over their picture, making sure the cellophane and frames line up exactly. (You may also choose to have them use a glue stick to adhere the shapes to the cellophane.) Their shapes should be between the two pieces of cellophane. Glue the two frames together, and trim the cellophane if necessary, so it does not stick out from the edges of the frame.
8. Punch holes through the top of the construction paper. Weave a string through their work and hang the underwater masterpieces in your windows; the pictures can also be taped directly to the window.

Part 3 – Reflection

When students have completed this project, lead a class discussion about their ideas and discoveries. You may want to follow up by having students research the topic of water pollution.

For Fun:

1. As part of Part 1—Gathering/ Research—have your students make additional sketches of what the water looks like after the pollutants have been added. This could help them in deciding what shapes they want to include in their pictures.
2. Have your students write a story about a creature that might live in the water and that might be adversely affected by pollutants such as newspaper, bleach, and oil.

Creative Containers: Tell Us What We Are Eating!

Grades K-5

What?

Students will research supermarket packaging and create labels of their own. In doing so, they will learn about and use the practices of advertising and persuasion by communicating their messages about their products to their classmates

Why?

This lesson will prompt your students to pay close attention to what packaging and labeling on containers really tell us about the products inside.

Materials

research questionnaire (provided by Kidspace)
recycled food containers (for suggestions, see Part 1, 2.). Students should bring these from home, but you may want to bring some in as well.
miscellaneous materials such as: Styrofoam peanuts, toothpicks, leaves, scraps of fabric, plastic food, old socks, bubble gum wrappers, yarn or string, small plastic toys
construction paper or white paper
markers or crayons
scissors
tape
Create-A-Product worksheet (provided by Kidspace)

Time Needed

For Part 1: This can be either a take-home project or a classroom exercise and should not take more than 30-45 min. for the research section and 20-25 min. for the class presentation/discussion section.
For Part 2: 45-60 minutes

Part 1—Gathering/Research

1. Read over the Research Questionnaire with your students. Explain to them that this is a project that they will need to complete in the next week's time and that they should bring in the completed worksheet and (clean, empty) food container of their choice to class by an assigned date. (You may also choose to have your students fill out the questionnaire at school if this is easier.)
2. Students should bring in a clean, empty container or you can bring them in for them. Some suggestions include a cereal box, or cookie box, large yogurt

containers, fruit/vegetable soup cans, and any metal or plastic container with tight-fitting lid.

3. Ask your students to display their containers in the front of the room and describe what was originally inside. Ask them to read the labels out loud. How much of what they just read can they really understand? Does the label on the outside of the container use language that is understandable to the average person to *tell us* information about the product inside? Do we learn a lot or only a little? Do we really know what we are eating when we eat this product?

Part 2—Create a New Product

1. Now, ask your students to choose a material from the array of unexpected materials (toothpicks, yarn, etc.) that you have brought in. They can fill their own containers with these materials. Next, they can cover their containers with plain construction paper or white paper, using tape or glue sticks.
2. Now, it's time for a swap. Each student should pass his or her newly filled and *label-free* container to another student who will then play the role of an advertising agent and make up a new label for this weird product, using the Create-A-Product worksheet as a guide .
3. Once the “advertisers” have completed this worksheet, they can begin to decorate their “packaging.” They should create new labels on paper and then carefully cut them out and glue them to the containers, or they can color new labels directly on the paper that covers the containers.
4. “Advertisers” can now present their newly created containers of “food” to the class and try to persuade their classmates to purchase their products.

For Fun

1. Students might research which containers are recyclable, and which companies work to promote this in their labeling.
2. Students might make a graph of the kinds of packaging materials and number of times in a week their family uses these materials in the home. Are the materials that were used most often biodegradable? Are they recyclable?

3. You might display some of the students' creative containers somewhere in the school, or even somewhere in the community—maybe at your local grocery store!
4. Create a more elaborate advertisement for your container and its creative product. Use posterboard and props or costumes to play the part of an advertiser and “sell” your product. Ask your students to comment on how to be persuasive and how to employ advertising techniques such as bandwagons, slogans, emotional words, and repetition.

Bugs In Our Bodies: Imaging the Environment Inside

Date _____ Teacher _____

Name _____

1. What color do you think the flu might be? What shape?

2. What part of our bodies do you think it is in when we have it?

3. What color do you think a sore throat is? What shape?

4. Do you think it is in other places besides our throats?

5. What color do you think rabies is? What shape?

6. What part of our bodies (or animals' bodies) do you think it is in when we (they) have it?

Curling the Invisible

Paper Curl Viruses and Bacteria

Grades K-5

What?

Students will create larger than life size viruses and bacteria using construction paper curls.

Why?

Using what they have learned about viruses and bacteria, and scale and proportion, students will create virus and bacteria sculptures.

Materials

introductory books on germs, viruses and bacteria
colored construction paper
scissors
pencils
white glue
lid from a margarine tub or other medium-sized plastic container
1", 2", 3" wide (and as many different lengths as you want) construction paper strips

Time Needed

30-40 minutes for Part 1
40-60 minutes for Part 2
15-25 minutes for Part 3

Part 1—Gathering/Research

Show your students the images of viruses & bacteria that you have found in books. Talk about shapes and scale. Set up some relative statements.

For example, a bacterium is to a _____ as a tree is to the _____, and so on.

(For example, thousands of bacteria could live just on the head of a pin!)

1. Briefly discuss with your students the basic parts of a bacterium and a virus. Students can then choose a virus or bacterium that is most interesting to them and sketch it. They should attempt to identify as many parts in their sketch of their virus or bacterium as possible. This might include a cell wall, plasma

membrane, and different proteins. This sketch will be the model for their paper curl sculpture.

Part 2—Making Sculptures

1. On colored paper, have your students draw the basic outline of a virus or bacterium that they have sketched.
2. Pour a small amount of glue into the plastic lid. Dip one long edge of one long paper strip into the glue and place down around the outline of the drawn shape. (This will be standing off the surface of the colored paper.)
3. Now, have your students start making paper curls by winding strips of construction paper around pencils. They can do as many as they want in different sizes and colors. Have them play around with the placement of the curls within the outline on the construction paper page before gluing them down. These paper curls will represent the different parts of a bacterium or virus.
4. When they're ready to glue in the various parts of their sculpture, have them dip one long edge of the curl into the glue lid, as they did before. They should glue the sides of the curls to each other as they place them inside their virus or bacterium.
5. Encourage students to use their imaginations in making their sculptures.
6. Allow the paper to lie flat while the glue dries.
7. With cut construction paper, students may also want to glue on other features and details left flat, not curled.
8. Hang your sculptures in a "colony" around the room or somewhere prominent in the school.

For Fun:

Your class could do some additional research on viruses and bacteria. Some questions to guide their research might be: What effects do viruses and bacteria have on animals? What are the three basic shapes of bacteria? How are viruses and bacteria different from each other?