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School Redesign with Environmental Health in Mind

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Introduction

The design of the environments where we live, go to school/work, and spend our recreational time are greatly shaping who we are as individuals and the communities we are a part of. With the average American spending approximately 90 percent of their time indoors ¹, the design our homes, schools, and offices are greatly impacting the health choices we make and the interactive experiences we have. From proximity to healthy foods to eat or the quality of the air that we breathe, our built environment is making many of those choices for us.

Some of us spend our lives in built environments that were designed well before we came to inhabit them and often there is very little we can do to alter them to meet our changing individual and community needs. In Emeryville California, the city where I teach, we are getting a chance to redesign an important part of our built environment; our public K-12 school.

Emeryville is a small 1.2 square mile urban community with a population of approximately 10,000 residents ² nestled in between the cities of Oakland and Berkeley, and at the base of the Bay Bridge across from San Francisco. A flood of state redevelopment funding over the past decade has brought several tech companies, big box stores, a shopping mall, and luxury lofts to replace the abandoned industrial warehouses of Emeryville's past. The new commerce and housing have greatly improved serious economic and safety issues that had plagued Emeryville for decades. However the new development in the city greatly contrasts with the experiences of my students and their families, many of which have lived in Emeryville and neighboring West Oakland for several generations. According to the 2010 US Census, the average household size in Emeryville is 1.68 persons. The shift in new luxury housing geared toward adults without children has forced many of our families to seek housing on the eastern, and older, edge of the city or in neighboring Oakland and Berkeley.

In spite of Emeryville's newer residents tending not to have children, the city's voters have passed a tax measure dedicated to the redevelopment and construction of a new educational and community center called the Emeryville Center for Community Life (ECCL). The ECCL will be built on the site of our current high school and will become the home of a new K-12 school, athletic fields, community health services, senior center, and Emeryville's first public library.

With community forums and design work underway, the opportunity for my students to examine the phases of

the design process and explore what it means to create a facility that promotes healthy living in an urban environment through the lens of the ECCL project will become an authentic design challenge and powerful learning experience.

I believe this unit will challenge my students on several levels by asking them to tap into their prior artistic knowledge and design experiences, while deepening their investigative research skills. Throughout this unit I will ask my students to examine issues of environmental health as they pertain to the design of the ECCL. It will be essential for them to think critically as artists, community members, and seekers of environmental justice as they tackle the realistic challenge of designing a facility that meets the many needs of a large group of diverse users. My hope is that this integration will not only deepen my students' artistic critical thinking and problem solving skills, but will also help develop the 21st Century Skills³ around communication, creativity, information, media, and technology that they will need in their years beyond high school.

Scope and Sequence of this Unit

This unit will span four months in the second semester of the school year; during this time there are several scheduled interruptions in the calendar for school breaks and state testing. Students work in groups for much of this unit while simultaneously working on individual shorter projects. Our schedule will most likely focus work on this project 2-4 days a week with set days for research, discussion, and studio work time.

Three phases will guide students' learning throughout the four-month exploration; understanding the environmental health issues facing urban environments, investigating the environmental health issues facing our community in Emeryville and design of the ECCL, and applying new knowledge around environmental health issues to redesign a space within the ECCL. The first phase, lasting about two weeks will introduce students to the environmental issues facing urban environments and ask students to identify and analyze these risks. The second phase of this unit will run approximately four weeks and require students to investigate an urban environmental health issue within the design of the ECCL with a partner. The third and final phase of the unit students will apply all that they have learned about urban environmental health issues to a design challenge working within small groups.

Throughout each phase of this unit, students will engage in small group and whole class discussions using Project Zero Thinking Routines to focus on deepening understanding and exchanging ideas around the issues of environmental health and the ECCL project. Students will use graphic organizers (visual representations of knowledge, concepts, and ideas) to organize their data. They will analyze and communicate their findings with others through the use of a learning wall (visual representation of collective class learning that displays information progressively). A class set of iPads and a SMART Board will aid in research, planning, mapping activities, presentations, and documentation.

Every community faces a series of questions it must consider when entering a redesign process. Given Emeryville's urban environment, it is important that my students explore, research, and understand the environmental health issues that are unique to urban environments and make meaningful connections to their own neighborhood. There are numerous concerns facing urban environments that my students could explore, however I have identified four that I feel will engage and be relevant to my students and their experiences. These include: Obesity and Absence of Physical Activity, Safety and Personal Security, Air pollution and

Respiratory Health, and Absence of Green/Recreational Space. I am anticipating that some issues such as safety and personal security will be easy for my students to identify at first, however I want them to look beyond what they know and explore why each problem exists within the context of our community. In order to guide students it will necessary to understand each environmental health topic, identifying Guiding Questions, instructional strategies, and ongoing assessment methods. To help students develop consistent research strategies, each of the four urban environmental health topics will be introduced through a series of similar learning activities.

Understanding the Environmental Health Issues Facing Urban Environments

Obesity and Absence of Physical Activity

Weight is something my students tease each other about on a regular basis, whether they are overweight or underweight, they find endless entertainment in cracking a joke about someone's weight. While on the surface there is a great deal of laughter about the subject, deep down many of my overweight students are very unhappy about their weight. They know that they struggle climbing stairs and find themselves lagging behind in gym class. I see some students feeling left out during school spirit days, when the class T-shirt that fits their friends doesn't fit them. Over the last thirty years, the prevalence of childhood obesity, in terms of body mass index (BMI), has tripled. Of American children ages six to eleven, approximately 30 percent are overweight and 15 percent are obese.

African American children, which make up a majority of my student population, have even higher rates: among African American girls ages six to eleven, approximately 38 percent are overweight and 22 percent are obese. ⁴

Many of my students carry around the burden of obesity and don't understand what is causing it. There could be numerous factors causing obesity: inactivity, stress, genetics, chemical and hormonal imbalances, and prescription medications could all be contributors. I would like my students understand that there are many factors that cause obesity, and hone their investigation to look at environmental and behavioral habits that the ECCL could play a role in influencing.

Guiding Questions: Obesity and Absence of Physical Activity

What health risks are associated with obesity and absence of physical activity?

Is obesity and absence of physical activity an issue in our community?

How can we address obesity and absence of physical activity in an open, sensitive, and constructive manner?

Learning Activities: Obesity and Absence of Physical Activity

To introduce the issue of obesity and absence of physical activity, students will engage in a meaning making activity (students exchange personal knowledge and experience with the perspectives of others to construct common definitions and knowledge) with the Guiding Questions that have been put forth to the class and are posted in large format in the classroom. Writing on post-it notes, students will generate possible initial

thoughts and answers to the Guiding Questions posed to them and put those post-its on and around each of the Guiding Questions. Then students will participate in a gallery walk where they will read each other's responses. Following, we will gather around the Guiding Questions and post-it note responses to discuss current understating and further questions around this issue.

To develop a deeper understanding of the issue of obesity and absence of physical activity, students will read individually and in small groups during one to two class periods from the book *Making healthy places designing and building for health, well-being, and sustainability* with a focus on chapter two: "Community Design for Physical Activity" and chapter three: "Food Environments". Chapters from this book will be available to students to view in PDF format on a class set of iPads. Students will read and annotate comments, connections, and questions using the app iAnnotate, then send their annotations to me via the app Dropbox. For the next class period students' annotations from readings will be printed in large font and hung around the art studio. This class period will begin with a reminder of the Guiding Questions that focus on obesity and absence of physical activity, then students will participate in a gallery walk where they will have a short amount of time to walk around the room and read each others' annotations. Then students will break into eight groups with their iPads and annotations to discuss the readings further. Students will use the Project Zero thinking routine: *I used to think...But now I think...* as a framework for this discussion. Following the small group discussions, students will summarize and share out from their group conversation using the Project Zero thinking routine: *Headlines*. The headlines that students produce will be added our learning wall.

Safety & Personal Security

"They shot up Raven's 5 block yesterday" one student said. "I heard the police found eighty-one shells in the street" added another somberly. "Yeah, but they didn't get anyone" said a third student as if everything was fine because no one was actually hit by a bullet. Their classmate, Raven was home sick with the flu the day before when gunfire erupted on her street. When she had not returned to school the next day or responded to her friends' text messages they were concerned. When she finally did return to class, she assured us that it was "No big deal. When they started shooting and I just hid under the bed. It wasn't as bad as the week before when I was at my auntie's house and they started shooting."

At first I was struck by Raven's lack of concern for her personal safety. She seemed more concerned about convincing everyone else that it was really not "that bad". I quickly realized that to protect herself, she had detached emotionally from what had just happened. Raven had become very good at detaching herself from the violence around her since she had been wounded in the arm by gunfire while attending a Halloween party last fall. Months of painful surgeries and physical therapy had given her back some mobility and left her elbow covered with scars. It wasn't until that afternoon that I recognized Raven's other, more hidden scars.

Raven's story is not unique to the students at my school. About two thirds of my students know one or more people who have died from gun violence and nearly all of them know someone who had been wounded. Instead of doodling the names of classmates they have crushes on or favorite bands, my students write the names those they've lost over and over on their notebooks. They write poetry and draw in their sketchbooks about hearing gunshots at night when they try to sleep. My students are painfully aware each day that their neighborhood is not safe.

Creating safe and secure spaces is something my students desperately need in their lives and the design of the ECCL could be a step toward bringing a sense of safety and security to our community. It will be important for students to look at the multiple uses of the ECCL facilities to understand how use by a range of people over

different parts of the day is possible. The more diverse in terms of age, race, and income the users of the ECCL are over a longer period of the day will likely provide additional security. Community spaces that are accessed in the evenings and on weekends in addition to weekday use avoid large spans of time when they are inactive and susceptible to inappropriate use. Students will also examine how to design lighting, landscaping, around buildings could lend an air of openness and visibility to the center. Creating a space that encourages use by more residents is also likely to instill a greater sense of ownership and investment in maintaining the ECCL. Students will examine the factors that create a facility that encourages diverse use.

Guiding Questions: Safety and Personal Security

What are health issues associated with safety and personal security?

Is safety and personal security an issue in our community?

How can we address safety and personal security in an open, sensitive, and constructive manner?

Learning Activities: Safety and Personal Security

To introduce the issue of safety and personal security, students will engage in a meaning making activity with the Guiding Questions that have been put forth to the class and are posted in large format in the classroom. Writing on post-it notes, students will generate possible initial thoughts and answers to the Guiding Questions and put those post-its on and around each of the Guiding Questions. Then students will participate in a gallery walk where they will read each other's responses. Following, we will gather around the Guiding Questions and post-it note responses to discuss understating and further questions around this issue.

To develop a deeper understanding of the issue of safety and personal security, students will read individually and in small groups during one period from the book *Making healthy places designing and building for health, well-being, and sustainability* with a focus on chapter five: "Injuries and the Built Environment". Students will read and annotate comments, connections, and questions using the app iAnnotate, then send their annotations to me via the app Dropbox. For the next class period students' annotations from readings will be printed in large font and hung around the art studio. This class period will begin with a reminder of the Guiding Questions that focus on safety and personal security, then students will participate in a gallery walk where they will have a short amount of time to walk around the room and read each others' annotations. Then students will break into eight groups with their iPads and annotations to discuss the readings. Students will use the Project Zero thinking routine: *I used to think...But now I think...* as a framework for this discussion. Following the small group discussions, students come back to whole class discussion. With teacher guidance, students will generate a list of new terms and words that might be helpful to add to our learning wall. A couple of students will chart as student suggest and define these terms/words and lists will be added to the learning wall.

Air pollution and Respiratory Health

My colleagues and I encourage our students to get outside, to be active, and exercise often because we know it is good for their physical health, however there are increased risks to their respiratory health when they inhale polluted air while physically exerting themselves. Groups of boys frequently come to class covered in sweat and struggling to catch their breath because they were outside during lunch playing soccer or basketball. Some of them know that their respiratory distress occurs because of a background of asthma that has been triggered by their increased physical activity on a hot day. What they might not recognize is that

prior ozone exposure while playing outside may have contributed to them developing asthma in the first place. ⁶

When thinking about air pollution, it is easy to only consider the quality of outdoor air. When we see clouds of smoke or haze, we know that the air is not safe to breathe, but what about the air pollution that we cannot see? Knowing how to recognize air contaminants that are not visible will be critical for my students to understand as they begin their design work on the ECCL. For example they will have to consider the impact of outdoor contaminants that are able to enter the indoor environment through ventilation systems and open windows. Students may initially think of open windows near heavily auto trafficked streets, however there may also be materials located on our campus that off gas and directly contribute to air pollution. The design team of the ECCL have discussed replacing our current grass athletic field with one made of recycled synthetic materials. The synthetic material has been presented as better choice because it is perceived require lower maintenance and therefore a lower cost option. However air tests on synthetic fields show the presence of chemical carcinogens, neurotoxins, respiratory toxins and skin and eye irritants. The concentrations vary among fields and among samples by factors of two to ten times. A study released by Environmental and Human Health, INC. found that increasing the period of air sampling from two hours to six hours raised the number of different chemicals identified on the fields. Synthetic fields also retain heat at greater rates than grass fields, during testing summer temperatures consistently reached 90 degrees with fields frequently exceeding temperatures over 135 degrees. Higher temperatures would increase the off gassing of chemicals and cause greater health risks. ⁷ Students will investigate how different building materials as well as how building structures and landscaping can contribute to air filtering and better respiratory health.

Guiding Questions: Air Pollution and Respiratory Health

What health issues are associated with air pollution and respiratory health?

Is air pollution and respiratory health an issue in our community?

How can we address air pollution and respiratory health in an open, sensitive, and constructive manner?

Learning Activities: Air Pollution and Respiratory Health

To introduce the issue of air pollution and respiratory health, students will engage in a meaning making activity with the Guiding Questions that have been put forth to the class and are posted in large format in the classroom. Writing on post-it notes, students will generate possible initial thoughts and answers to the Guiding Questions and put those post-its on and around each of the Guiding Questions. Then students will participate in a gallery walk where they will read each other's responses. Following, we will gather around the Guiding Questions and post-it note responses to discuss understating and further questions around this issue.

To develop a deeper understanding of the issue of air pollution and respiratory health, students will read individually and in small groups during one to two class periods from the book *Making healthy places designing and building for health, well-being, and sustainability* with a focus on chapter four: "Community Design and Air Quality" and chapter fourteen: "Healthy Schools". Students will read and annotate comments, connections, and questions using the app iAnnotate, then send their annotations to me via the app Dropbox. For the next class period students' annotations from readings will be printed in large font and hung around the art studio. This class period will begin with a reminder of the Guiding Questions that focus on air pollution and respiratory health, then students will participate in a gallery walk where they will have a short amount of time to walk around the room and read each others' annotations. Then students will break into eight groups with

their iPads and annotations to discuss the readings. Students will use the Project Zero thinking routine: *I used to think...But now I think...* as a framework for this discussion. Following the small group discussions, students come back to whole class discussion. With teacher guidance, students will generate a list of reoccurring themes or similarities between the urban environmental health issues they are learning about to add to our learning wall. A couple of students will chart responses and lists will be added to the learning wall.

Absence of Green/Recreational Space

Emeryville's children, many of which live in multi-unit buildings without balconies, or grassy lawns, spend a great deal of time inside. There are six parks in our city, and they are built mostly from man-made materials such as concrete and steel. Many of our parks are far from my students' homes in the older residential area of Emeryville. Marina Park, the largest in Emeryville is covered in grass and surrounded by large trees. The park has seven and a half acres filled with picnic tables, BBQ grills, trails, and a beach/shoreline not to mention the stunning views of Sausalito, Alcatraz Island, the Golden Gate Bridge, and the San Francisco skyline. However to take advantage of these landmark views you need to travel to the westernmost edge of the city, crossing under the I80 freeway. This remote area is best accessed by car. Two free bus routes provided by the Emeryville business community service this area, one is an express bus that travels to the light rail train Bay Area Rapid Transit (BART) station in Oakland and the other travels along the commercial shopping district, neither have stops or intersecting routes that are near the older residential areas of Emeryville. Marina Park could be an ideal location for families to gather on weekends and for schools to have events, however its inaccessibility by public transportation limits those who can take advantage of its resources.

Some of our smaller parks have planter boxes and small areas with grass or shrubs. Three of our parks have basketball courts these parks also have picnic tables and playgrounds, but only one has a bathroom and no park has a space for a soccer game which is a favorite sport among many of my students. These three parks are small and the largest is only an acre and three quarters. Though there is a lot for the small footprint, these parks do not include much space for overlapping activities to take place, which can isolate individuals rather than connect community members. Creating green/recreational spaces that adapt to multiple activities at a time through out the day is a design challenge that my students will investigate, because the ECCL is poised to become an additional recreational space in Emeryville. The issues students identified around creating safe and secure spaces will most likely surface as they explore creating green/recreational spaces that adapt to a variety of activities their challenge will be to find parallel solutions to these design challenges.

Guiding Questions: Absence of Green/Recreational Space

What health issues are associated with an absence of green/recreational space?

Is access to green/recreational space an issue in our community?

How can we address an absence of green/recreational space in an open, sensitive, and constructive manner?

Learning Activities: Absence of Green/Recreational Space

To introduce the issue of absence of green/recreational space, students will engage in a meaning making activity with the Guiding Questions that have been put forth to the class and are posted in large format in the classroom. Writing on post-it notes, students will generate possible initial thoughts and answers to the Guiding Questions and put those post-its on and around each of the Guiding Questions. Then students will participate in a gallery walk where they will read each other's responses. Later, we will gather around the Guiding

Questions and post-it note responses to discuss understating and further questions around this issue.

To develop a deeper understanding of the issue of absence of green/recreational space, students will read individually and in small groups during one period from the book *Making healthy places designing and building for health, well-being, and sustainability* with a focus on chapter fifteen: "Contact with Nature". Students will read and annotate comments, connections, and questions using the app iAnnotate, then send their annotations to me via the app Dropbox. For the next class period students' annotations from readings will be printed in large font and hung around the art studio. This class period will begin with a reminder of the Guiding Questions that focus on absence of green/recreational space, then students will participate in a gallery walk where they will have a short amount of time to walk around the room and read each others' annotations. Then students will break into eight groups with their iPads and annotations to discuss the readings. Students will use the Project Zero thinking routine: *I used to think...But now I think...* as a framework for this discussion. Following the small group discussions, students come back to whole class discussion. With teacher guidance, students will generate a list of reoccurring themes or similarities between the urban environmental health issues they are learning about to add to our learning wall. A couple of students will chart responses and lists will be added to the learning wall.

Learning Activities: Connecting Four Urban Environmental Health Issues

To help students solidify their understanding of the four urban environmental health issues that we are exploring, students will brainstorm questions that they still have about urban environmental health in small groups and write each question on a post-it note. Then with guidance, students will put their post it notes on one of four different posters. Each poster will have the name of one of the four urban environmental health issues that students have been learning about. Students will have to choose which issue best fits their question, which may prove to be a challenge and help students see that the issues we are exploring are interconnected. Then students will participate in a gallery walk where they will have a short amount of time to walk around the room and read the questions that have been raised. Posters will be moved to a central meeting point and the class will gather around to discuss observations, connections, and possible next steps toward inquiry.

Investigating the Urban Environmental Health Issues Facing Our Community and Design of the ECCL

Connecting Four Urban Environmental Health Issues To Emeryville and ECCL

The next series of lessons will begin with the environmental health issues facing urban environments posters with student questions on post-it notes hanging in the center of the room. Beneath each poster will be two additional Guiding Questions for each issue. Students will learn that these additional questions are my challenge for them to solve with creative solutions. These learning experiences will help students recognize that each of the urban environmental health issues that they studied overlap when they begin to look at them in the context of their city. Students will also begin to identify the needs of Emeryville residents.

Obesity and Absence of Physical Activity: Where is the problem of obesity coming from in our community? What are some possible solutions to the obesity problem in our community?

Safety and Personal Security: Are there elements of the current physical design of our community that allow/encourage unsafe areas? What are some possible changes to our community's physical design that could promote safer public spaces?

Air Pollution and Respiratory Health: Where is air pollution coming from in our community? What are some possible strategies to reduce air pollution in our community?

Absence of Green/Recreational Space: How are the green/recreational spaces utilized in our community? What are some ways the green/recreational spaces in our community could be improved?

Mapping Activities: Connecting Four Urban Environmental Health Issues To Emeryville and ECCL

To begin making connections to our own city, students will use the apps Map Pad and Google Earth to highlight and color code resources and services with Emeryville, including: commerce, housing, food options, civic services, educational, and recreational spaces individually on iPads. Through this activity students will identify where resources are and develop a deeper sense of the scale of those resources within their own city. As a class we will gather to compare our findings, projecting iPads with the SMART Board. A few students will chart on large paper as students share out observations, charted responses become additions to the learning wall.

In the following class period, students will focus on mapping streets and bike paths. They will map their routes to school and where they go after school. For weekend homework, students will map their travel paths over one Saturday and Sunday. These two mapping exercises will ask students to differentiate by color walking, biking, skating, bus, train, and car travel. With their iPads to reference the different travel paths, students will gather in eight groups to share out using the Project Zero thinking routine: *I used to think...But now I think...* to help articulate observations and connections about their travel around Emeryville. Each group will bring their findings to the learning wall for a whole class discussion that will help students identify travel patterns within members of the class.

Site Visit Activities: Connecting Four Urban Environmental Health Issues To Emeryville and ECCL

During two class periods my students will visit two different city parks in Emeryville. The parks will be selected based upon their input. While at the parks, students will take photos, create sketches, and collect information using graphic organizers about current resources, measurements, and observations of use by residents. For weekend homework, students will visit a third park of their choosing in Emeryville to collect the same data. During the following classes students will compile the information they collected and look for trends in small groups. Each small group will share out to the whole class as they add their information to the learning wall with an emphasis on Guiding Questions related to Emeryville and the ECCL.

Following visits to parks, student learning will focus on looking at travel at our temporary school site and the district's elementary school to collect information about travel to, from, and around each site. At our current school site and the elementary school students will use graphic organizers and take photos to collect information about how students arrive and depart from school. Through the lens each urban environmental health issue, students will make observations about modes of transportation, volume of people, and accessibility to the school buildings during these peek times. Students will gather in small groups to compile information and share out to the whole class as they add their information to the learning wall.

Context Activities: Connecting Four Urban Environmental Health Issues To Emeryville and ECCL

Through out the conversations following both the mapping activities and site visits, students will be reminded of the four urban health issues facing Emeryville by revisiting the Guiding Questions related to Emeryville and the ECCL. Referencing these questions as a focus for our class discussions will help students recognize the needs of residents and identify the interconnectedness not only of the issues but also the possibility of creating integrated solutions through design.

Next, using the architects' schematic drawings of the ECCL project as a launching point, students will apply what they have learned about the needs of Emeryville residents and consider how the ECCL design could meet those needs while combating the four urban environmental health issues they have studied. The Project Zero thinking routine: *See, Think, Wonder* will allow students to do this through a focused conversation as a large group. This thinking routine will encourage students to deepen their understanding of what the architects' drawings are depicting, articulate their thoughts and opinions about the drawings, and then identify questions or curiosities about the drawings. Student opinions and questions will launch the next, inquiry phase of the unit.

Inquiry Based Learning

When my students can steer their own learning they become empowered to learn more and the feeling in my classroom can become electric. This is why I have chosen an inquiry-based approach to deepen student understanding around the four selected environmental health issues facing urban environments. Following their initial learning about these issues I am going to survey students to see which issues really "grab" them, and use the student responses to group students by interest in the environmental health issues facing urban environments. Once grouped, students will begin the inquiry process with a guiding question designed to help them focus their thinking about these issues within the scope of our community and the design of the ECCL. Together with other team members they will develop an inquiry question that they want to research. Students will then research articles and gather data related to their question. A class collection of resources related to the environmental health issues facing urban environments will help support this. Students will also need to conduct a small field study or interview a primary source such as community members who will use the ECCL or the architects that are working on the ECCL to help gather more information about their topic as it relates to our community and design of the ECCL. At this point in the unit, students have experienced and utilized several strategies to collect information and visualize it for themselves and their classmates to understand. They will need to look back at the methods they used to decide how they proceed in collecting information related to their inquiry question. Following the collection of information, students will synthesize and present their findings in small groups.

How Can the ECCL Promote Healthy Eating and Encourage Physical Activity?

Possible Student Inquiry Questions: Can a living roof with a vegetable/fruit garden be built within the ECCL? How can play spaces be designed to accommodate many children moving around safely at the same time? What would facilities need to have to host a farmers market?

How Can the ECCL Promote Safety and Personal Security

Possible Student Inquiry Questions: Can a seating and social gathering space be combined with a grassy space large enough to play soccer on in the commons area? How can the ECCL open spaces reconfigure for evening and weekend use? How can bike and skateboards be safely secured when not in use while encouraging their use for transportation?

How Can the ECCL Reduce Air Pollution and Promote Healthy Respiratory Health?

Possible Student Inquiry Questions: How should a structure that has a roof gathering area be vented? Is artificial or a grass athletic field safer to use and maintain? Are there native plants that could help filter air?

How Can the ECCL Develop and Maintain Green/Recreational Space?

Possible Student Inquiry Questions: Is it possible to re-establish the Temescal Creek within the ECCL? Could there be areas in addition to the commons area open for public recreation? How can the athletic field encourage other activities in addition to organized athletics?

Learning Activities: Group Inquiry

This phase of student learning will largely be structured based upon student directed investigations. Activities that will support their individual inquiry will include studying our current temporary school site (Santa Fe), the district's elementary school (Anna Yates), and the ECCL project site to document the site and surrounding area through sketches, photos, video, and space measurements. Students will return to the art studio to categorize and discuss their findings. Students will be encouraged to use the classroom library and internet resources as well as reaching out to the design team working on the ECCL to investigate their question further.

Midway through this phase of research, students will share the progress of their investigations with the class using the Pecha Kucha format. This quick "snapshot" of where each group is in their investigation will be followed up with feedback and questions from the class. From this point, groups will be able to sharpen their focus and identify additional avenues of research.

Applying New Knowledge Around Environmental Health Issues to Redesign the Commons Space of the ECCL

Individual and group research will have laid a strong foundation for students to begin the design phase of this unit. Working within their inquiry groups students will now take on the challenge of redesigning an outdoor space within the ECCL. Each group will need to decide early on if they will be creating a small model of how they are designing their space or will they construct large-scale pieces to fit within their space (such as furniture, shade structures, bicycle/skateboard storage, etc.). Students will use pencil and paper as well as the app Google Sketch Up to begin to begin their initial design work, then they will select from materials that they have worked with previously to construct their projects. Materials available to work with include: cardboard, wood, wire, paper, clay, reeds, string, plastic bottles, aluminum cans, glass jars, fabric, cork, Tyvek, and PVC piping.

If students chose to create a small model of their redesigned space possible projects could include a focus on: common gathering spaces, outdoor learning environments, recreational spaces, walking and bike paths, landscaping, or how spaces can convert from school use to after school use. Life size pieces could include building furniture that would fit within a certain space or portable structures to serve multiple purposes.

During this phase of the project each group will work independently with a weekly check-in meeting with me, and one day of scheduled peer feed back using a Project Zero thinking routine chosen by the group receiving

feedback. During group check-in meetings, conversations will focus on schedule and process, materials, challenges, and identifying next steps.

Culminating Learning Activity

Projects will commence near the end of our spring term and coincide with our spring showcase of learning, where student work will be on display and community members are encouraged to discuss projects with students. As an extension of this event, I am anticipating that my students will be able to present their work through this unit to the school board, city council, and ECCL design team.

Learning Strategies

Gallery Walk

Students post work on tables or walls then walk around the room observing each other's work. Students will later use those observations to discuss the work in a small group or as a whole class.

Graphic Organizers

Visual representations of knowledge, concepts, and ideas to help students organize their information.

Headlines

This routine helps students capture the core or heart of the matter being studied or discussed. It also can involve them in summing things up and coming to some tentative conclusions.

This routine draws on the idea of newspaper-type headlines as a vehicle for summing up and capturing the essence of an event, idea, concept, topic, etc. The routine asks one core question: *1. If you were to write a headline for this topic or issue right now that captured the most important aspect that should be remembered, what would that headline be?* A second question involves probing how students' ideas of what is most important and central to the topic being explored have changed over time: *2. How has your headline changed based on today's discussion? How does it differ from what you would have said yesterday?* ⁸

I Used to Think... But Now I Think...

This routine helps students to reflect on their thinking about a topic or issue and explore how and why that thinking has changed. It can be useful in consolidating new learning as students identify their new understandings, opinions, and beliefs. By examining and explaining how and why their thinking has changed, students are developing their reasoning abilities and recognizing cause and effect relationships.

Remind students of the topic you want them to consider. It could be the ideal itself—fairness, truth, understanding, or creativity—or it could be the unit you are studying. Have students write a response using each of the sentence stems: I used to think...But now, I think... ⁹

Learning Wall

Wall space within the classroom to post student observations, questions, notes, photos, sketches, and newly discovered information about a learning topic that is ongoing. This visual representation of student learning expands as student knowledge grows.

Pecha Kucha

Pecha Kucha is a slide presentation format where the presenter shares 20 slides that are timed to advance after 20 seconds. The presenter shares their work and ideas within this time frame followed by an opportunity for questions and group discussion. This format encourages both presenters to be concise when sharing their ideas and an audience to think about the whole presentation before giving input.

See Think Wonder

This routine encourages students to make careful observations and thoughtful interpretations. It helps stimulate curiosity and sets the stage for inquiry.

The routine works best when a student responds by using the three stems together at the same time, i.e., "I see..., I think..., I wonder...." However, you may find that students begin by using one stem at a time, and that you need to scaffold each response with a follow up question for the next stem. ¹⁰

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