



2016 JAMES D. MACCONNELL AWARD SUBMISSION



## EXECUTIVE SUMMARY

Odyssey Elementary is an educationally innovative school built around the theme, Bodies in Motion: The Animal Kingdom. The school champions the importance of healthy, active lifestyles and helps students understand their place in nature. **It is a net-zero facility** that has successfully become the greenest, most energy-efficient public school in the state of Utah. Odyssey is on-track to earn **a LEED Gold Certification**. Utterly unique in its design, it accommodates any learning modality the teachers wish to implement.

There are four learning wings at Odyssey – groups of classrooms called “habitats” – red, orange, blue and green. Each habitat corresponds to one of the thematic motions of the school (fly, run, swim, and jump), and includes 8 classrooms, a central collaboration area, teacher prep and storage areas, and toilet room facilities. The organization of students into habitats reduces anonymity and encourages collaboration. Classrooms are designed with a 16-foot-wide roll-up glass door, allowing them to combine with the collaboration space or other classrooms. Every classroom door light bears the image of an animal that performs the motion of the house (a kangaroo rat, a shark, etc.). Critical to the success of the project is the totally unique furnishing package of mobile chairs, tables, stools, ottomans and modular soft seating that students move at a moment’s notice to accommodate different learning scenarios.

The landscaping also represents the ways creatures move with plant materials and sculptural concrete. On the north side, footfall patterns show up in concrete textures and benches. In the courtyard, the idea of flight or swimming and the swirling vortices created by beating wings or fins are represented with benches and planter forms. On the south side, jumping is represented using benches indicating a springing motion. The building is carefully oriented to best take advantage of daylighting.

## “BODIES IN MOTION: THE ANIMAL KINGDOM”



Building spaces are multi-use for efficiency. The dining area is integrated into the circulation. Large glass doors between the dining area and the multipurpose room lift for use as an auditorium. There are no computer labs because technology is integrated into all learning spaces.

The walls and hallways of the building are peppered with inspirational quotes, encouraging students and patrons alike to do their best and make a difference in the world. Portals that open into the habitats include intriguing signage regarding the animals that run, jump, swim and fly. Images of athletic activities serve to further inspire students.



# OVERALL GOALS & OUTCOMES

The overall goals of Odyssey Elementary were developed over a period of 24 months, utilizing a series of meetings and involving a wide variety of stakeholders interested in exploring ideas for a completely new kind of elementary school. The results of numerous surveys were also important in the goal development. The facility program describes a building framework that will encourage the design of a building that will enhance learning of the digital natives of the 21st century.

## 1. Community Engagement

The building engages the community, accommodates after school events, and serves as a hub for the neighborhood

## 2. Project-Based Learning

Project-based learning is accommodated through the use of large, flexible, daylit classroom spaces with adjoining large central collaboration spaces.

## 3. Relevant Technology

The facility was designed to allow for easy and readily accessible technology – all occupants utilize personal computing devices.

## 4. Theming and Branding

The school was designed as a “destination”. Theming and branding to attract young people, create interest, and generate curiosity in our students is a central design goal, integral to the architecture. Signage presents ‘fun facts’ about animals on one side of the entry portals while video monitors on the opposite side play live “zoo cams” or any other digital feed.

## 5. Adaptable Furniture

Furniture selection was a vital part of the building design. Furnishings must be comfortable, inviting, easily movable and reconfigurable, and should encourage learning.

## 6. Outdoor Learning

Outdoor learning is accommodated through the outdoor courtyard(s), that have been designed to facilitate learning activities.

## 7. Sustainability

The school must be beautiful, durable, and energy efficient. Net Zero energy usage and LEED Gold certification are desirable.



# PROJECT SCOPE & BUDGET

Odyssey is a new school accommodating 900 students, grades Kindergarten through 6, on a 12 acre site. The school is designed to be utilized as a year round facility if the need arises. Part of the project scope was LEED Certification and Net-zero energy use, (the project is on track for LEED Gold). Also included in the scope was project branding to engage the students, and furniture design that would enhance project based learning.

Site acres:	12
Area:	84,760 sf
Student capacity:	900
Grades served:	Kindergarten – 6
Date occupied:	August 2014
Total Project Budget:	\$18,000,000
Construction Cost:	\$15,709,080



## COMMUNITY ENGAGEMENT



People flock to the open house at Odyssey Elementary, slated to be the greenest school in the state, Thursday, Aug. 21, 2014, in Woods Cross. The school will open its doors to students Monday, Aug. 25, using less energy than any other school in the state and costing less to operate than any other school in the Davis School District.

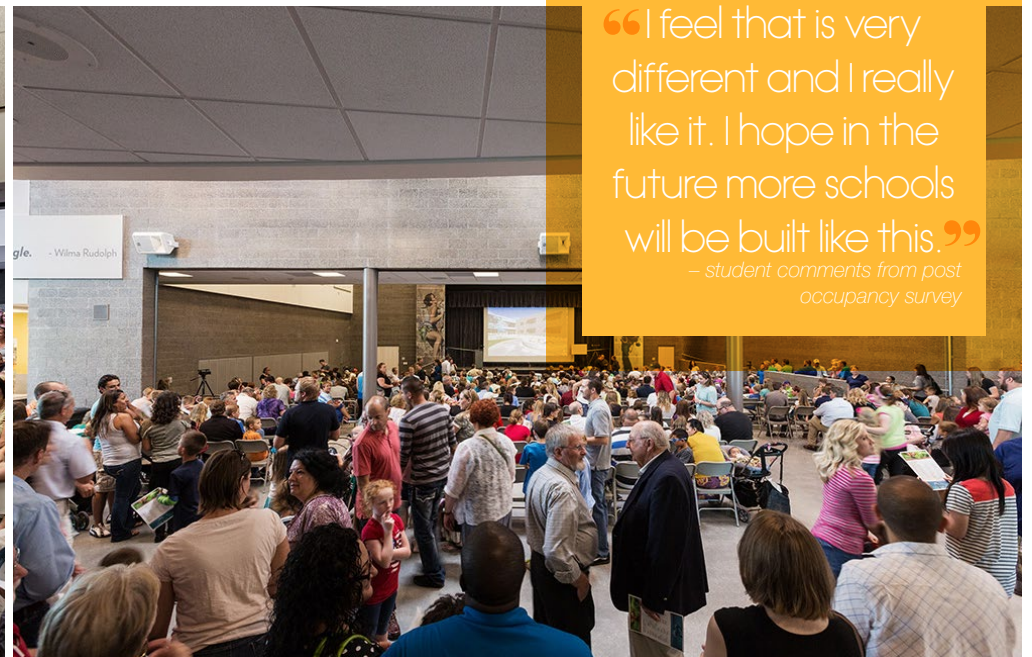
### BUILDING DESIGN

During the Blue-Sky meetings, community members were added to the stakeholders list and engaged in the conversations that developed the program and conceptual design. Issues regarding a 2 story vs 1 story school, school safety, transportation (student drop off), parking, playground supervision, etc. were discussed. Various designs were presented, vetted and developed further. Interior theming was an important part of the school environment. The community members had input on the final graphic images representing "bodies in motion".

### SCHOOL NAMING

Davis School District always engages the community in naming their schools.

A public meeting was held where the architect presented the theme of the new elementary school. The attendees suggested 22 names for the new school, which were narrowed down to 3 choices. These 3 were sent out to the entire community which then voted. Odyssey Elementary was selected as the name of the school, a reference to a "journey" —to a new way to teach and learn, a path to sustainability and the future, and the growth of the individual students as they grow.



“I feel that is very different and I really like it. I hope in the future more schools will be built like this.”

— student comments from post occupancy survey



## OPEN HOUSE

Two days before school began an open house was held. Over 900 people showed up. Vicki Corwin, the principal of the school gave a presentation showing off her wonderful school. Hughes Construction, the general contractor brought animals to represent the 4 "habitats".



The "Run Habitat" had a pony,



the "Fly Habitat" was represented by a Macaw,



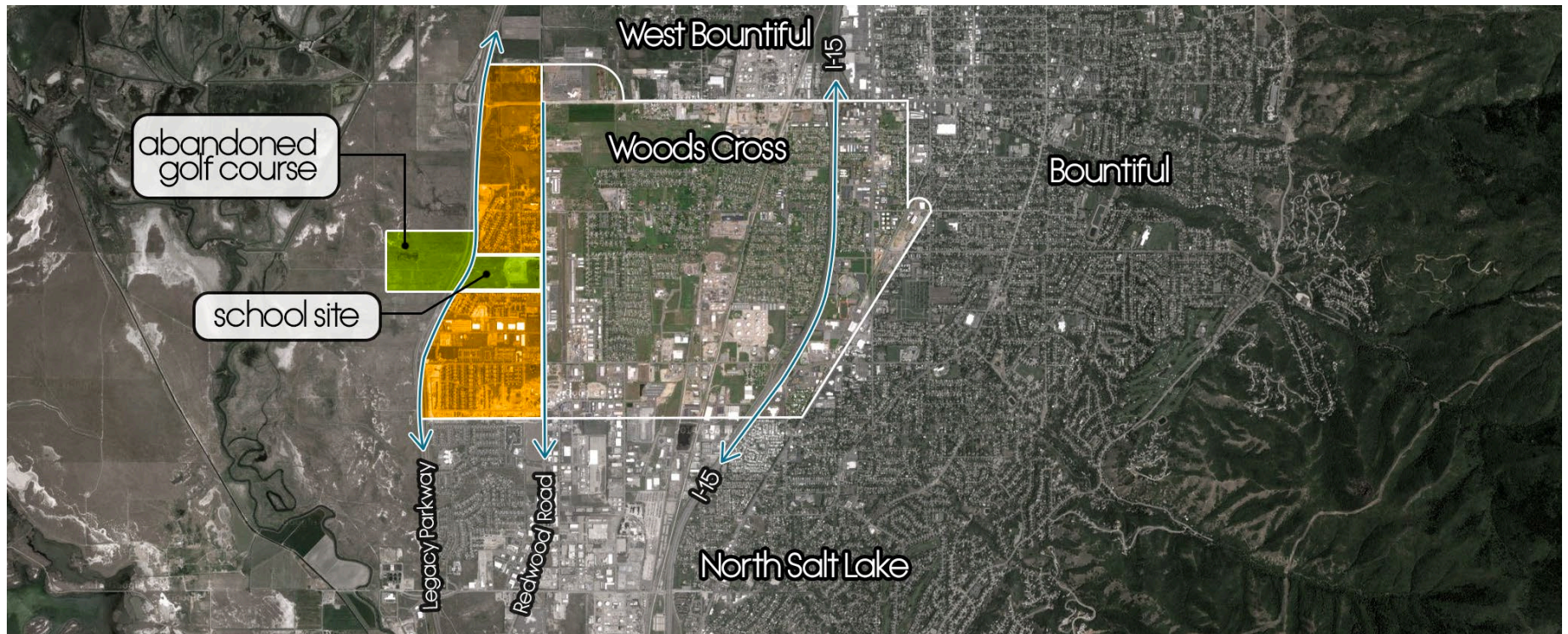
the "Jump Habitat" presented poison dart frogs (under glass of course),



and the "Swim Habitat" held an alligator!







## SITE PLANNING

Woods Cross is 1 of 15 cities in Davis County, Utah. Davis School District serves the entire county. For years the city had a stable population, 6,000 to date, but it is growing now. The reason is that raw land is becoming scarce in Davis County. Most residential development was to the east along the I-15 corridor. Industrial/warehousing development was to the west along Redwood Road, a major north-south artery. Six years ago, the Legacy Parkway, another freeway, was completed along the west edge of Woods Cross City. The land between Redwood Road and Legacy Parkway filled up rapidly with single family starter homes

and apartment buildings. Davis School District needed to meet the growth with new schools.

The school district approached the city to help find the correct site. This collaboration led to an abandoned golf course that had been purchased by Utah Department of Transportation for the Legacy Parkway right-of-way. The remaining acreage was much too large for just the school site, so the school district master planned the land with the city to allow the acreage around the school to be developed into additional housing. Working with the city, Davis School District pioneered

the development of streets and utilities to access the preferred school parcel from Redwood Road.

Local residents living north and south of the abandoned golf course were invited to city meetings to discuss connecting new streets to their existing neighborhoods.

The school site is adjacent to a wild-life preserve, so special care was taken to ensure that area was left undisturbed. The goal is that the school, with its leadership in sustainability and energy conservation, will serve as a catalyst to an alternative form of development.



## EDUCATIONAL ENVIRONMENT

Odyssey was designed to bolster the educational pedagogy of the District through small learning communities focusing on a project-based curriculum. Each “habitat” includes 8 learning spaces and a central collaboration space. That goal translated into large collaboration spaces that are fully accessible to the learning spaces using 16-foot wide glass roll-up doors. These doors provide the instructor flexibility in instruction. They can expand their classroom into the collaboration space by opening the door, keep the door closed and still supervise a small group working in the collaboration space, and collaborate with multiple teachers across the collaboration space by opening multiple doors. The floor plan also provides the administration the flexibility to reconfigure grade levels into mini-academies, allowing for far easier cross-grade collaboration than in previously built schools.

Inside the learning spaces, full height cabinets are whiteboard surfaced, serving as impromptu sketching and writing surfaces for students as they work together. Teachers on the planning committee agreed that the sinks normally found in the classroom could be relocated to the collaboration space, allowing the functional size of the classroom to expand. Similarly, all millwork is a more easily utilized 18” depth, returning useable square footage to the learning spaces.

Furniture selected directly fosters a project based curriculum. It is all durable, yet light and on casters, so is easily reconfigurable to accommodate a variety of teaching methods. Students change seating types during the day, choosing between chairs, stools that encourage wiggling, soft ottomans and reconfigurable couches, standing at tables with an easy height adjustment, or of course the carpeted floor. Many of the tables incorporate a white board top that students utilize during their work, table tops which can be flipped up and stacked out of the way during activities that need more open space.

LEARNING SPACES THAT SUPPORT CURRICULUM



COLLABORATION SPACES THAT SUPPORT A VARIETY OF TEACHING STYLES



COMMON SPACES THAT INSPIRE AND MOTIVATE







#### main level

- 1 administration
- 2 multi-purpose
- 3 kitchen
- 4 dining
- 5 mechanical
- 6 teacher prep
- 7 classroom
- 8 collaboration area
- 9 work room
- 10 media center



#### upper level

- 5 mechanical
- 6 teacher prep
- 7 classroom
- 8 collaboration area
- 9 work room
- 10 media center





## LEARNING SPACES THAT SUPPORT CURRICULUM

The “Classroom” space was programmed to be a flexible learning environment. The size was increased from the district standard 900 SF to 1000 SF. Sinks were relocated to the collaboration spaces and teachers desks were put on wheels to allow for reconfiguration of the room.

Millwork was designed to accommodate spaces for individual students to have their own storage space. Doors over tall storage units were covered with white board surfaces.

Furniture selection was a significant part of the design. Furnishings needed to be comfortable, inviting, and easily movable and reconfigurable. It was selected to encourage learning and allow for multiple varied activities.

1. No attached desk and chair units.
2. All table and chairs are on casters.
3. Some tables are adjustable from sitting to standing height.
4. Most surfaces are white boards.

“The classroom window is always open and always gives us natural light, and our pull up door is open almost all of the time.”

— student comments from post occupancy survey





## COLLABORATION SPACES THAT SUPPORT A VARIETY OF TEACHING STYLES

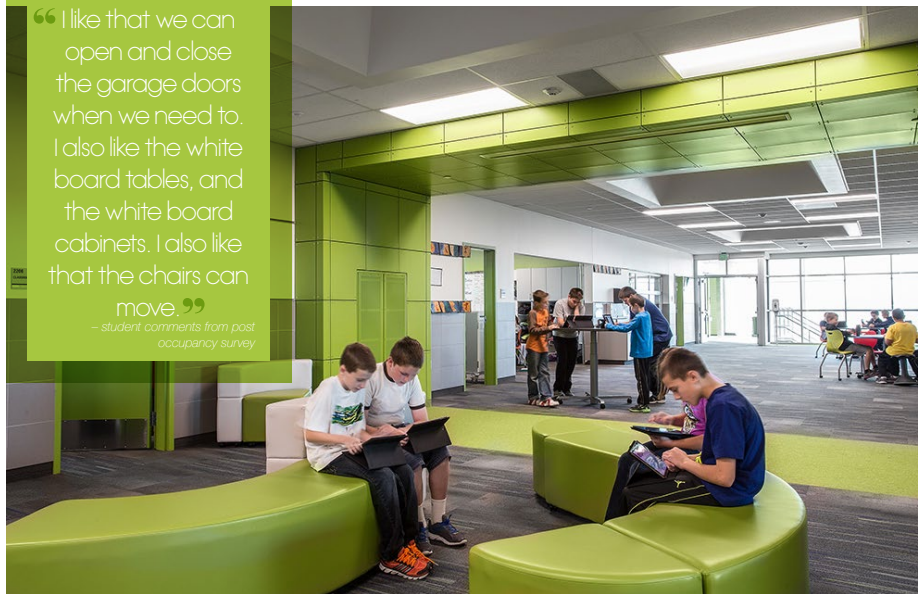
In addition to being the most energy efficient and greenest school in state, Odyssey is also one of the most technologically advanced as well. During the planning process, the need for a full integration of technology was highlighted as a need by the panel of teachers and administrators. Each learning space, in addition to the collaborative and public spaces, features an interactive short throw projector for the teachers and students to use. Ample charging areas were required

in the learning spaces because each one has its own mobile bank of iPads. The design of the millwork in the learning spaces provided connections for small portable projects or interactive monitors to facility student-to-student collaboration and interaction.

The school wanted the flexibility to consider all areas of their building as learning spaces, and as such, interactive projection, power and wireless connections

are accessible from every area of the school, providing teachers total flexibility. The sustainable features are displayed in the student Commons though an interactive kiosk, for students to monitor their usage against the generation of the PV array on the roof, but that information is also provided wirelessly throughout the school so teachers can integrate that information into their curriculum.

“I like that we can open and close the garage doors when we need to. I also like the white board tables, and the white board cabinets. I also like that the chairs can move.”  
— student comments from post occupancy survey



“The building is part of the learning environment in a way I’ve never seen. It’s designed for collaboration and exploration. I want to be 10 years old again just so I can go to school at odyssey.”  
— Lily Eskelsen, President of the National Education Association, after visiting odyssey and seeing how the teachers and students are interacting



## COMMON SPACES THAT INSPIRE AND MOTIVATE

The dining “room” was designed as an open commons for the students, to provide a space that can be used for more than just dining. The multipurpose room features large glass overhead doors that allow expansion into the commons for a performance. This design allows both spaces to be more visible and available throughout the day and after for collaboration and community activities. The platform at the multipurpose room can be closed off using a folding sound partition, and features a large window to create a pleasant learning space for the students' music program.



“I’m always so excited to come to school and see all of the nice places that the school has.”

— comment from post occupancy survey

Students were sent on a digital scavenger hunt to watch videos about the different features of the school.

welcome to odyssey



<http://youtu.be/2E3YkuCiykA>

construction recycling



<http://youtu.be/0mDZkiDAFF8>

energy



<http://youtu.be/iRE1Ul--faY>

planning



<http://youtu.be/D0GucQrkVUo>

NOTE: Please do not watch these videos to the conclusion, as they show the name of our firm.



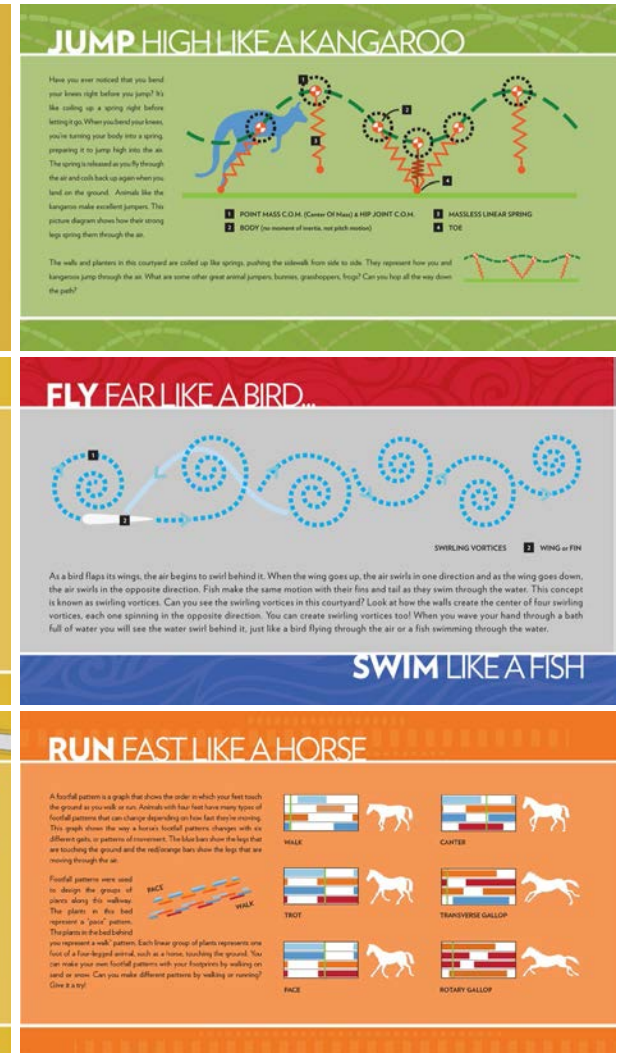




## Branding

The fully integrated branding of Odyssey Elementary School is very unique. Early in the planning process, the District along with the design team decided that "Bodies in Motion; the Animal Kingdom" would be the theme of the school and would be used to inform the overall design, the aesthetics, the wayfinding, and the educational signage in the building. The classrooms are organized into "habitats" named for four different types of movement animals use; run, jump, swim, and fly. Portals that open into the habitats include intriguing, educational signage highlighting some animals that use the type of movement specific to the habitat. Those animals are then used to identify the individual classrooms, fostering a sense of identity and belonging among the students.

The branding was used to inform the exterior design of the school as well. The idea of movement was expressed through use of an undulating color pattern in the metal tiles which were selected to bring to mind fish scales. The masonry pattern was also designed to evoke a feeling movement. Each courtyard and exterior teaching space references one of the habitats, with swirling benches for Swim and Fly, linear plantings for Run and spring-like benches for Jump.



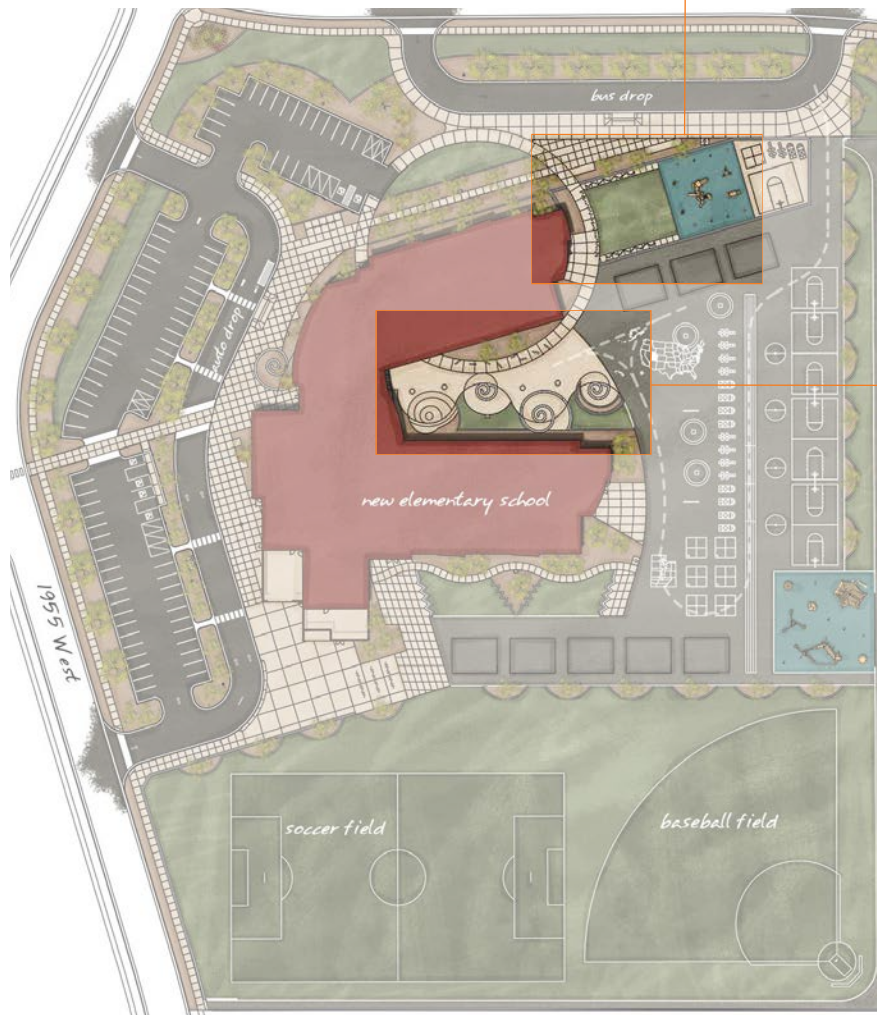


## Outdoor Learning

Outdoor learning plays an integral part in the design of the school. Teachers can utilize outdoor courtyard(s) to do learning activities.

Students learn about photo-voltaic energy generation from the PV cells on the window shading devices.

Little students have their own play area with exciting playtoys and safe softfall tiles, located adjacent to their habitat.





## SUSTAINABLE DESIGN

### NET ZERO

Odyssey Elementary School is the first Net Zero school and the most efficient and sustainable school in the state of Utah.

Odyssey Elementary School is designed to provide healthy environments for students and teachers. Ample daylight, healthy materials and effective ventilation all contribute toward the ongoing health and wellbeing of the occupants. The building lighting and mechanical systems also have enhanced controls to allow each learning space to be adjusted to meet the unique class needs. Each classroom also has an operable window to allow direct access to fresh air when the weather is nice.



“ I think it’s cool that  
Odyssey is the greenest  
school in Utah, and  
possibly the country or  
planet! ”

— comments from post occupancy review

### Energy Efficiency

Davis School District is the state-wide leader in energy efficient facilities for K-12 schools. The District’s ongoing efforts have resulted in an overall energy consumption that has remained constant over the last 13 years, while adding 840,000 square feet of new building area within the district. This effort to improve efficiency and reduce resource consumption while improving the learning environment led to the design and construction of Odyssey.

In late 2009, we were selected to design a new series of prototype elementary schools for Davis School District. Based on the previous efficiency efforts as well as decades of building system improvements, the project team was able to set an energy consumption goal of 18 kBtu per square foot per year. This energy consumption level is below the typical target of 25 kBtu per square foot per year of most zero energy buildings. With a constant desire to improve the building performance, the team set their sights on designing and constructing a net zero school.

### Getting to Net Zero

In addition to the incredible learning spaces, the new prototype incorporates a variety of high performing systems, all working in tandem to reduce the upfront construction costs as well as the ongoing operational costs of the building. The building envelope has three inches of continuous insulation as well as a continuous air and moisture barrier to ensure reduced air infiltration and thermal gains and losses through the exterior walls. This reduces the required size of the mechanical and ventilation systems while improving the comfort of the students and teachers. Strategically placed windows also allow ample daylight to enter the learning and working environments. Balancing the daylight with glare reduction as well as thermal heat gain reduction was a priority, leading to the integration of solar photo-voltaics used as sun shades on the south faces of the building.



The lighting is all LED with a sophisticated control system that allows for integrated daylight sensors, vacancy sensors and multiple lighting levels in all spaces, and the district maintains strict lighting schedules and timers to reduce energy consumption. The teachers now have a variety of lighting level options and the District has the ability to track energy utilization used by the lighting system.



The mechanical systems consists of layers of efficiency strategies to achieve optimal performance. The ventilation air is delivered using thermal displacement ventilation, which supplies lower velocity, more temperate air near the floor, reducing energy used to power fans as well as energy to heat and cool the ventilation air. The delivery of air near the floor also improves student and teacher health and comfort. A ground-source geothermal system is then used to heat the building. This heat-exchange system uses electricity to extract heat from the earth and transfer it to the ventilation air in the school. When ground temperatures are low enough, the geothermal loop is piped directly to the fan units to achieve “free cooling” early in the season. Coupled with a two-stage evaporative cooling system that uses water to cool the ventilation air, Odyssey has some of the most resource efficient systems available.

Based on the strategies noted above, the design predicted electricity consumption of the building was modeled at 17 kBtu per square foot per year, below

the targeted 18 at the beginning of the design process. **After a year of operation, the actual measured electrical usage of the building was just over 16 kBtu per square foot per year, exceeding both the usage goal and the energy model.** The renewable energy system selected for the school is a roof-based ballasted solar photo-voltaic system. **The scale of the roof and effort to reduce roof-mounted equipment allowed for the installation of a 320,100 kW solar array, which is designed to exceed the demand of the building and is currently exceeding the production design by 13%.**

Demand charge cost reduction is another key consideration for Davis School District, as their electricity rate is based on the peak demand for the building. A key concern with a ground-source heat pump system is the amount of electricity needed to bring the building to temperature in the winter. To counter-act this increased cost that occurs in the winter, an efficient gas boiler was

added to the project to cap the demand charge at a pre-determined level. This boiler, although adding to the resource utilization and upfront cost of the project, will reduce operational costs over the life of the building. This boiler, in addition to the reduced mechanical demand, contributes to a building that will cost half as much to run on an annual basis, compared to a typical school of a comparable size.

### A Milestone

This project is a tremendous milestone for Davis School District and for Utah. It demonstrates that an institutional scale building can achieve on-site net zero electricity consumption within a set and standard budget. Odyssey Elementary School is the first in a series of prototype schools that will work toward net zero energy use, demonstrating that the triple bottom line of environmental consciousness, economic responsibility and social equity are not only feasible, but inherently beneficial.





# LEED GOLD CERTIFICATION

## Sustainable Sites

! prerequisite

✓ credit

### ! SS 1: Construction Activity Pollution Prevention

To reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

### ! SS 2: Environmental Site Assessment

To ensure that the site is assessed for environmental contamination and if contaminated, that the environmental contamination has been remediated to protect children's health.

### ✓ SS 1: Site Selection

To avoid the development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

### ✓ SS 4.2: Alternative Transportation - Bicycle Storage and Changing Rooms

To reduce pollution and land development impacts from automobile use.

### ✓ SS 4.3: Alternative Transportation - Low-Emitting and Fuel-Efficient Vehicles

To reduce pollution and land development impacts from automobile use.

### ✓ SS 4.4: Alternative Transportation - Parking Capacity

To reduce pollution and land development impacts from automobile use.

### ✓ SS 5.2: Site Development - Maximize Open Space

To promote biodiversity by providing a high ratio of open space to development footprint.



### ✓ SS 6.1: Stormwater Design - Quantity Control

To limit disruption of natural hydrology by reducing impervious cover, increasing on site infiltration, reducing or eliminating pollution from stormwater runoff and eliminating contaminants.

### ✓ SS 6.2: Stormwater Design - Quality Control

To limit disruption and pollution of natural water flows by managing stormwater runoff.

### ✓ SS 7.2: Heat Island Effect - Roof

To reduce heat islands to minimize impacts on microclimates and human and wildlife habitats.

### ✓ SS 8: Light Pollution Reduction

To minimize light trespass from the building and site, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction and reduce development impact from lighting on nocturnal environments.

### ✓ SS 9: Site Master Plan

To ensure that the environment site issues included in the initial development of the site and project are continued throughout the future development caused by changes in programs or demography.

## Water Efficiency

### ! WE 1: Water Use Reduction

To increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

### ✓ WE 3: Water Use Reduction

To further increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.



## Energy and Atmosphere

### ! EA 1: Fundamental Commissioning of Building Energy Systems

To verify that the project's energy related systems are installed, calibrated and perform according to the owner's project requirements, basis of design and construction documents.

Benefits of commissioning include reduced water use, lower operating costs, reduced contractor callbacks, better building documentation, improved occupant productivity and verification that the systems perform in accordance with the owner's project requirements.



## ⚠ EA 2: Minimum Energy Performance

To establish the minimum level of energy efficiency for the proposed building and systems to reduce environmental and economic impacts associated with excessive energy use.

## ⚠ EA 3: Fundamental Refrigerant Management

To reduce stratospheric ozone depletion.

## ✓ EA 1: Optimize Energy Performance

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

## ✓ EA 2: Onsite Renewable Energy

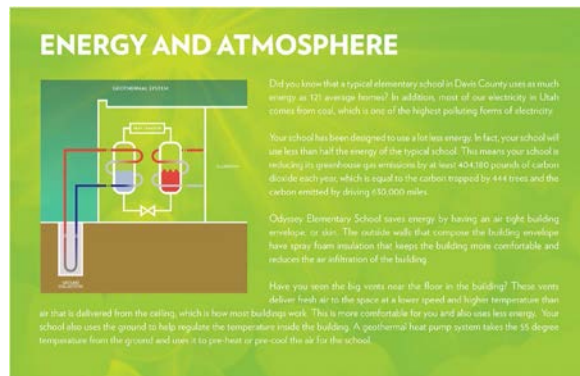
To encourage and recognize increasing levels of onsite renewable energy self supply to reduce environmental and economic impacts associated with fossil fuel energy use.

## ✓ EA 3: Enhanced Commissioning

To begin the commissioning process early in the design process and execute additional activities after systems performance verification is completed.

## ✓ EA 4: Enhanced Refrigerant Management

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.



## ✓ EA 5: Measurement and Verification

To provide for the ongoing accountability of building energy consumption over time.

## Materials and Resources

## ⚠ MR 1: Storage and Collection of Recyclables

To facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

## ✓ MR 2: Construction Waste Management

To divert construction and demolition debris from disposal in landfills and incineration facilities. Redirect recyclable recovered resources back to the manufacturing process and reusable materials to appropriate sites.

## ✓ MR 4: Recycled Content

To increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

## ✓ MR 5: Regional Materials

To increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.



## Regional Priority

## ✓ RP 1.1: Regional Priority

To provide an incentive for the achievement of credits that address geographically specific environmental priorities.

## ✓ RP 1.2: Regional Priority

To provide an incentive for the achievement of credits that address geographically specific environmental priorities.



## Indoor Environmental Quality

## ⚠ IEQ 1: Minimum Indoor Air Quality Performance

To establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in buildings, thus contributing to the comfort and wellbeing of the occupants.

## ⚠ IEQ 2: Environmental Tobacco Smoke (ETS) Control

To prevent or minimize exposure of building occupants, indoor surfaces and ventilation air distribution systems to environmental tobacco smoke (ETS).

## ⚠ IEQ 3: Minimum Acoustical Performance

To provide classrooms that are quiet so that teachers can speak to the class without straining their voices and students can effectively communicate with each other and the teacher.



✓ IEQ 1: Outdoor Air Delivery Monitoring  
To provide capacity for ventilation system monitoring to help promote occupant comfort and wellbeing.

✓ IEQ 3.1: Construction Indoor Air Quality Management Plan - During Construction  
To reduce indoor air quality (IAQ) problems resulting from construction or renovation and promote the comfort and wellbeing of construction workers and building occupants

✓ IEQ 3.2: Construction Indoor Air Quality Management Plan - Before Occupancy  
To reduce indoor air quality (IAQ) problems resulting from construction or renovation to promote the comfort and wellbeing of construction workers and building occupants.

✓ IEQ 4.1: Low-Emitting Materials - Adhesives and Sealants  
To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and wellbeing of installers and occupants.

✓ IEQ 4.2: Low-Emitting Materials - Paints and Coatings  
To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and wellbeing of installers and occupants.

✓ IEQ 4.3: Low-Emitting Materials - Flooring Systems  
To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and wellbeing of installers and occupants.

✓ IEQ 4.4: Low-Emitting Materials - Composite Wood and Agrifiber Products  
To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and wellbeing of installers and occupants.



✓ IEQ 5: Indoor Chemical and Pollutant Source Control  
To minimize building occupant exposure to potentially hazardous particulates and chemical pollutants.

✓ IEQ 6.1: Controllability of Systems - Lighting  
To provide a high level of lighting system control by individual occupants or groups in multi-occupant spaces (e.g., classrooms and conference areas) and promote their productivity, comfort and wellbeing.

✓ IEQ 6.2: Controllability of Systems - Thermal Comfort  
To provide a high level of thermal comfort system control by individual occupants or groups in multi-occupant spaces (e.g., classrooms or conference areas) and promote their productivity, comfort and wellbeing.

✓ IEQ 7.1: Thermal Comfort - Design  
To provide a comfortable thermal environment that promotes occupant productivity and wellbeing.

✓ IEQ 7.2: Thermal Comfort - Verification  
To provide for the assessment of building occupant thermal comfort over time.

✓ IEQ 8.2: Daylight and Views - Views  
To provide building occupants a connection to the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

## Innovation in Design

✓ ID 1.1: Innovation in Design - Education Program  
To inform students, staff and visitors of the sustainable design and construction efforts to create a healthier, more efficient school.

✓ ID 1.2: Innovation in Design - Green Cleaning Program

✓ ID 1.3: Innovation in Design - Exemplary Energy Performance

✓ ID 1.4: Innovation in Design - No Mercury Lighting  
To reduce the hazardous materials in the building by using all LED lighting systems, and not bringing mercury into the building.

✓ ID 2: LEED Accredited Professional  
To support and encourage the design integration required by LEED to streamline the application and certification process.

✓ ID 3: The School as a Teaching Tool  
To integrate the sustainable features of a school facility with the school's educational mission.



## PLANNING PROCESS



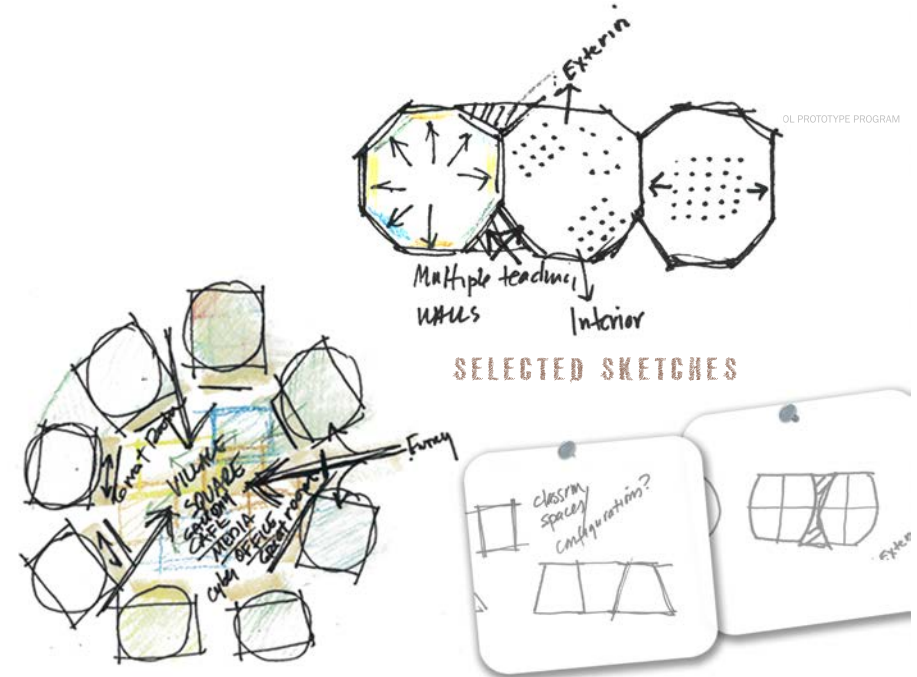
Community groups present their ideas and wishes to school administrators and architects.



The community is divided into small groups to discuss ideas and sketch solutions.



A fifth and sixth grade student panel gave input and fielded questions - a very informative group!





# SYNOPSIS

3

blue sky workshop 3.1

ELEMENTARY SCHOOL PROTOTYPE PROGRAM

## PROCESS

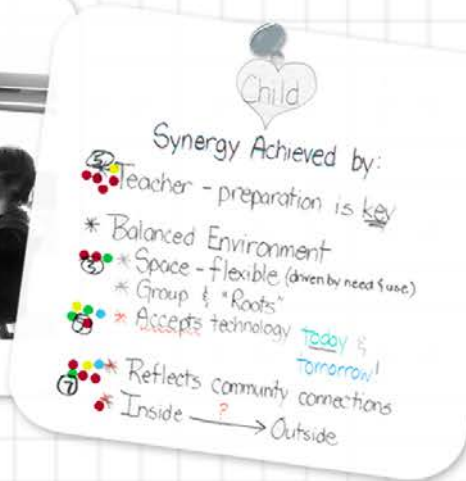
The Blue Sky Workshop began the process of programming the new prototype. Simply described, key stakeholders were gathered together for a two day planning retreat, the object of which was to engage in free discussion regarding the opportunities and challenges of the future Davis School District elementary school facility. Day 1 began with four 6 minute and 40 second presentations, called pecha kuchas, based on four topics - Pedagogy, Tools, Community, and Environment. These presentations, each comprising 20 slides shown for 20 seconds apiece, were created by our firm to stimulate thoughts and discussion in the four topic areas. Following each pecha kecha, workshop participants, who were seated at round tables of 5-6 people, brainstormed with their table mates to create lists of their reactions and ideas on each topic.

These ideas were distilled into a single pecha kecha from each group, presented at the start of the second day of the workshop by representatives from the six groups. Included in the appendix is a jump drive with the video presentation of all six pecha kuchas. The main ideas generated were posted on the wall, and workshop participants were given a fixed number of adhesive dots to place by the ideas about which they felt most strongly.

The final activity of the day was a panel discussion from five elementary school students, who shared the things they liked and disliked about the schools they were currently attending. This included a Q&A period in which the students answered questions from the group.



progressive change!  
it's time for  
**change**  
my friends.



DAVIS SCHOOL DISTRICT



# PROCESS

3

ation workshop 3.3

DAVIS SCHOOL DISTRICT ELEMENTARY SCHOOL PROTOTYPE PROGRAM

## CONCEPTUALIZE

The conceptualization meeting continued the process of programming the new prototype. At this half day meeting, key stakeholders again gathered together. The meeting began with a number of presentations, including a video recap of the pecha kuchas created by each group in the Blue Sky Meeting. Participants were also shown a power point including a summary of the issues they had identified as most important for the next generation of Davis School District Elementaries, (refer to the Blue Sky Synopsis for this list), and an overview of the design of the last of the Creekside/Lakeside school model, Endeavour Elementary.

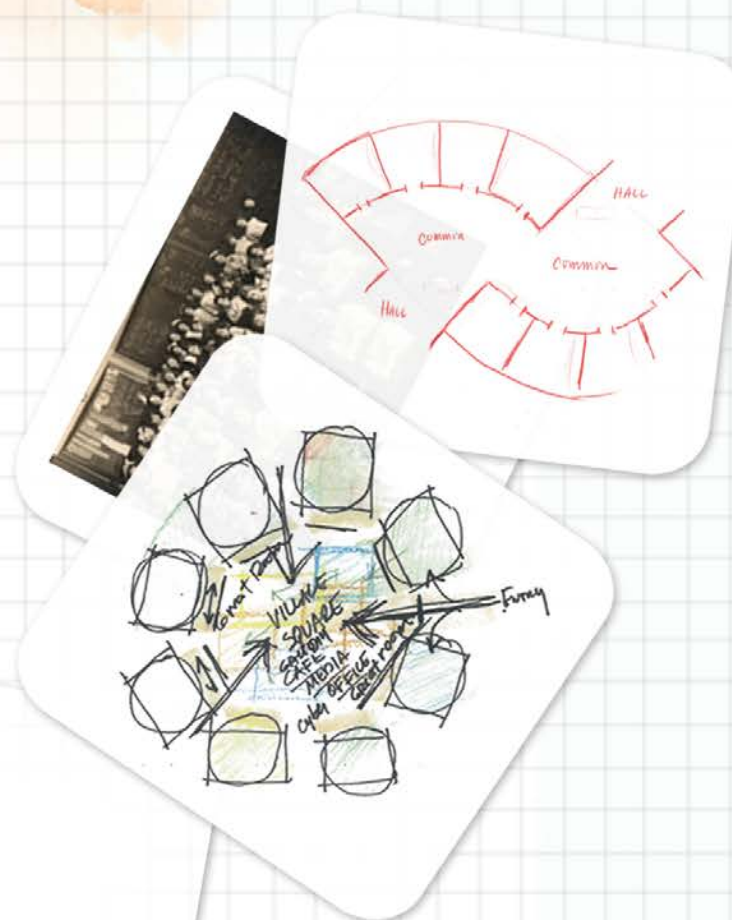
The presentations generated a lively discussion amongst the attendees regarding the issues. Refer to the Appendix for notes on the interchange of ideas.

Following the group discussion, participants again broke into small groups for a more detailed discussion and sketching exercise. Each group was given the assignment to create visual images that would express the ideas generated from the morning presentations. The meeting concluded with a “report out” from each group explaining their group’s thoughts and showing their drawings.

[pe-cha kuh-cha]

1. japanese for “chit chat”
2. a simple idea- 20 images x 20 seconds

pecha-kucha.org



DAVIS SCHOOL DISTRICT



# PROCESS

3

instructor questionnaire 3.4

ELEMENTARY SCHOOL PROTOTYPE PROGRAM

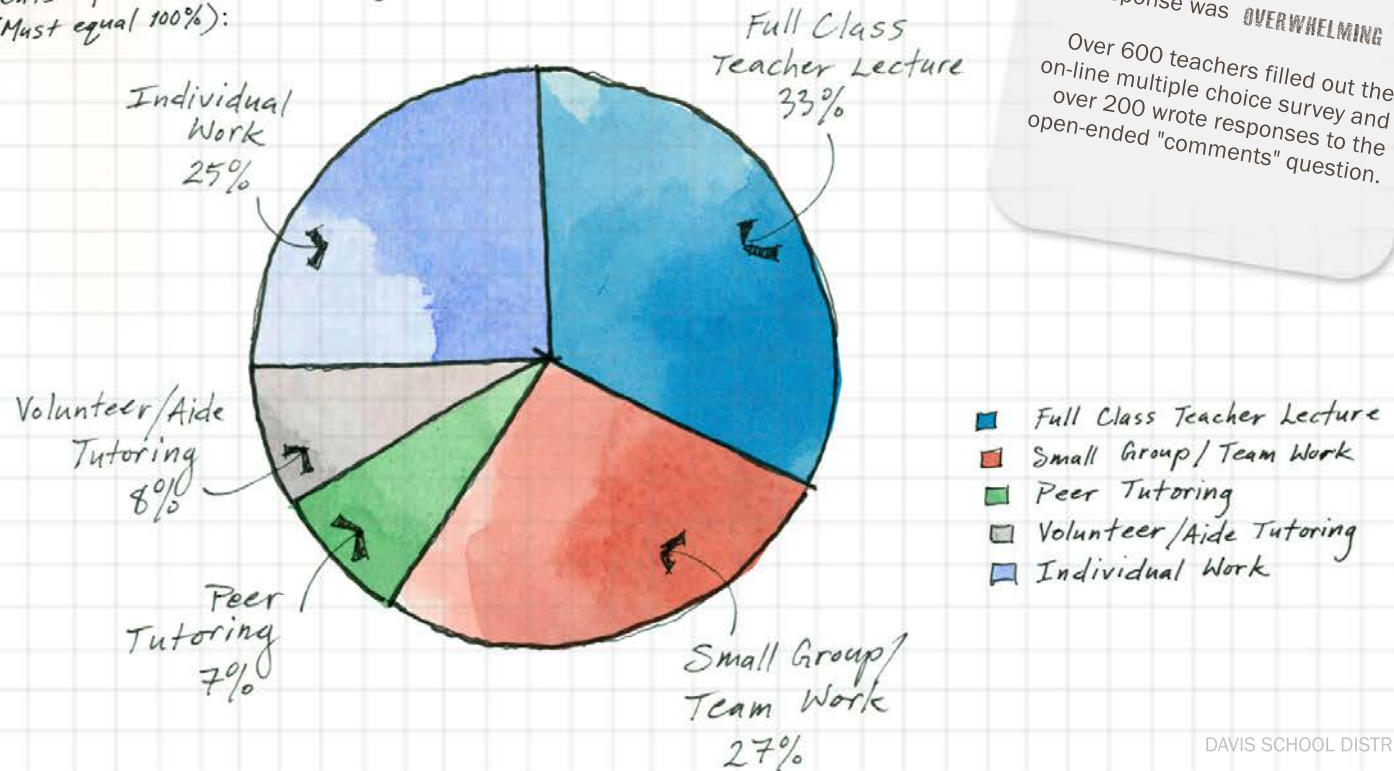
## QUESTIONNAIRE- METHOD & RESPONSE

Discussions during the Conceptualization Meeting made it clear that it would be critical to include a broader cross section of teachers and staff than could be accommodated in the formal programming meetings. In order to accomplish this, a questionnaire was developed, utilizing "Survey Monkey", an on-line survey program.

The Davis School District e-mailed a request and a link to the survey to all 59 elementary schools in the District asking for their teachers' participation.

The following are samples, (please refer to the Appendix for the full text/charts from the survey):

**Q** Please estimate the percentage of time each week that the students spend in the following activities (Must equal 100%):



DAVIS SCHOOL DISTRICT



# PROCESS

3

Instructor questionnaire 3.5

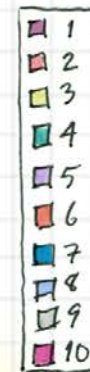
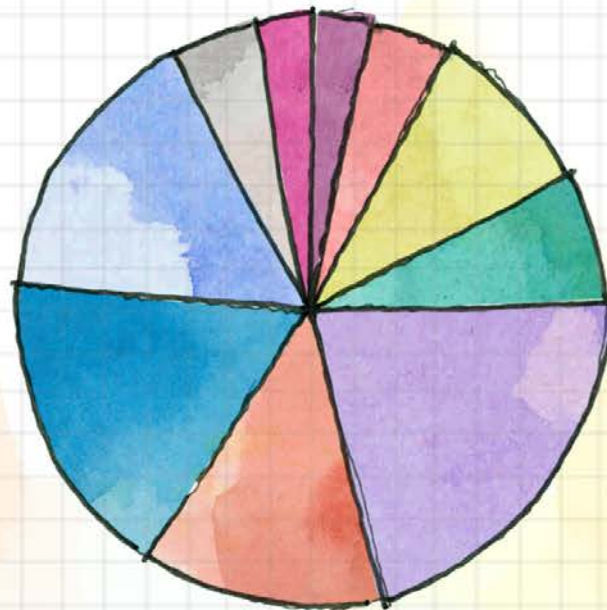
ELEMENTARY SCHOOL PROTOTYPE PROGRAM

## QUESTIONNAIRE- METHOD & RESPONSE

On a scale of 1 to 10, 1 being least comfortable and 10 being most comfortable, how would you rate the comfort of the student furniture?

ANSWER:

Most teachers think student furniture is pretty uncomfortable!



DAVIS SCHOOL DISTRICT



# PROCESS

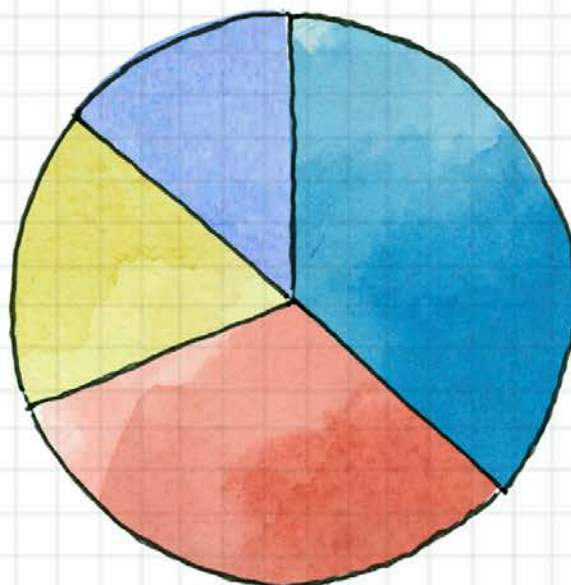
3

instructor questionnaire 3.6

ELEMENTARY SCHOOL PROTOTYPE PROGRAM

## QUESTIONNAIRE- METHOD & RESPONSE

Please estimate how often your students interact with DIFFERENT grade students in the school:



Seems like **COLLABORATION** on a multi-grade level is happening more often than not...



can you believe this?! ever since they mixed us all together, i've been playing kickball with the 4th graders!



DAVIS SCHOOL DISTRICT



# Davis Elementary Prototype Program Summary, Jan. 2011

## Programmed Spaces (Square Feet New Prototype 2010)

5

areas summary 5.6

ELEMENTARY SCHOOL PROTOTYPE PROGRAM

Administration  
Secretary/Reception 600  
Principal's Office 200  
Assistant Principal's Office 120  
Counseling Offices 240  
Faculty Lounge 600  
Conference Room 225  
Work Room 200  
Adult Toilets 140 (2@70)  
Health Suite - Cot Room 175  
Health Suite - Lavatory 50  
Subtotal 2550

Multi Purpose  
Student Dining 2700  
Stage 1000  
Table Storage 360  
Chair Storage 200 (20'x10')  
P.E. Equip. Storage 350  
Gymnasium 3600  
Subtotal 8210

### Media Center

Main Reading Room 2500  
(Circulation, Reference,  
Lounge Reading, Small and  
Large Group Instruction)  
Conference Room 150  
Office 130  
Work Room/Media Production 450  
Subtotal 2420

### Instructional

Classrooms:  
5th/6th 7600 (8@950)  
3rd/4th 7600 (8@950)  
1st/2nd 7600 (8@950)  
Kindergarten/Preschool 3800 (4@950)  
Collaboration Space 2400 (2@1200)  
Teacher Preparation Rooms 800 (2@400)  
Storage Room 600 (3@200)  
Subtotal 30,400

### Special Education

Resource Room 750  
Self-Contained Room 865  
Lavatory 85  
Specialist Offices 520 (4@130)  
Subtotal 2420

### Faculty Areas

Lounge 600  
Lavatories 200 (4@50)  
Teacher Preparation Rooms 800 (2@400)  
Subtotal 1600

### Custodial Services/Building Support

Storage Rooms 180  
Custodial Office 90  
Receiving/Can Wash 400  
Exterior Storage Room 200  
Mechanical/Electrical/Comm 3000  
Subtotal 3870

### Health Suite

Cot Room 175  
Lavatory 50  
Subtotal 225

### Kitchen

Reheat Kitchen/Serving 750  
Dry Stor./Cooler/Freezer 450  
Locker/Laundry/Mop Sink 160  
Office 80  
Subtotal 1440

### Computer Related Instruction Lab 0 (Utilize C.D.W.'s and Lab)

### Restrooms

Boys 700 (2@350)  
Girls 700 (2@350)  
Little Boys 240 (1@240)  
Little Girls 240 (1@240)  
Teacher Lavatories 200 (4@50)  
Men 280 (1@280)  
Women 280 (1@280)  
Subtotal 2640

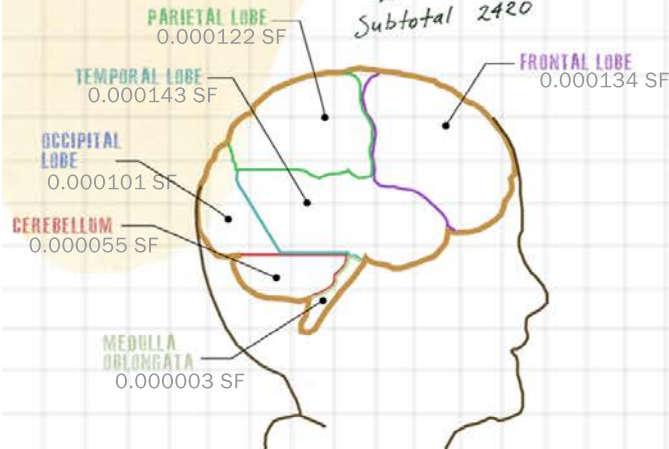
Subtotal 54,760  
35% Factor for Walls,  
Circulation, etc.

Grand Total 73,926

THE RAW DATA

DAVIS SCHOOL DISTRICT

AN AREA SUMMARY  
OF JOEY'S BRAIN!





## PROGRAM SPACE

SF

## classrooms:

5th/6th	(8@950) 7,600
3rd/4th	(8@950) 7,600
1st/2nd	(8@950) 7,600
kinder./preschool	(4@950) 3,800

collaboration space	(2@1,200) 2,400
teacher prep. room	(2@400) 800
storage room	(3@200) 600

subtotal 30,400

INSTRUCTIONAL



PROGRAM SPACE  
resource room  
self contained room  
lavatory  
specialist offices

SF  
950  
865  
85  
(4@130) 520

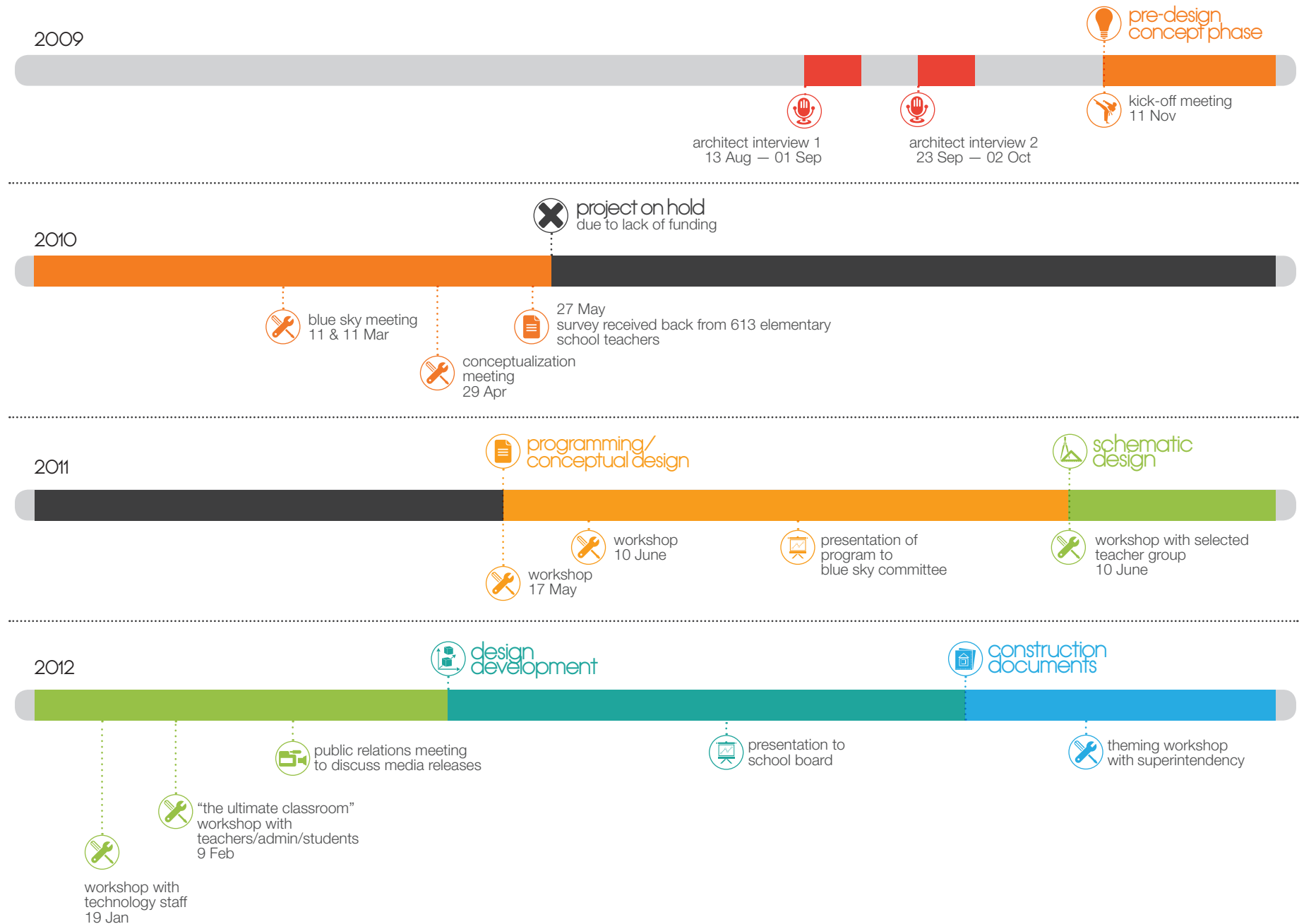
subtotal

2,420

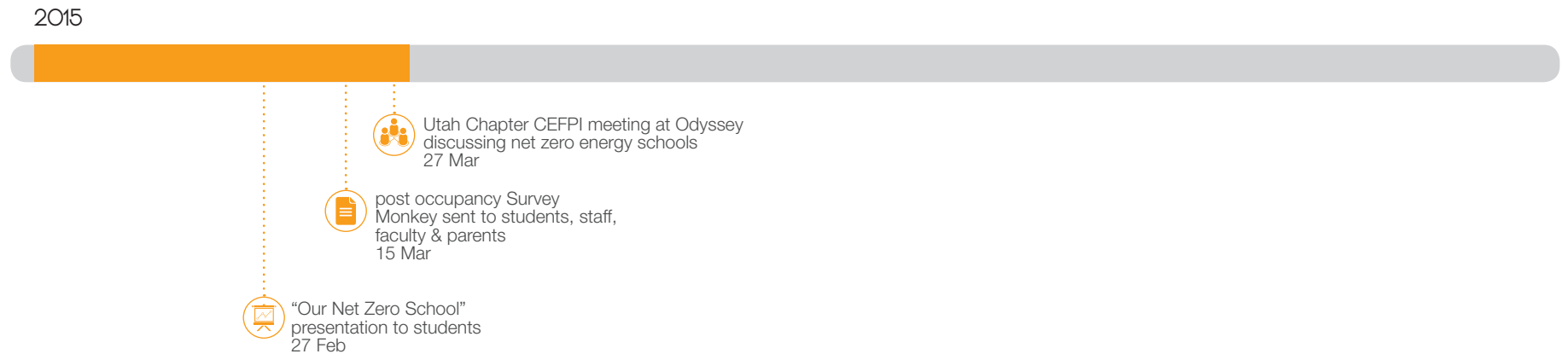
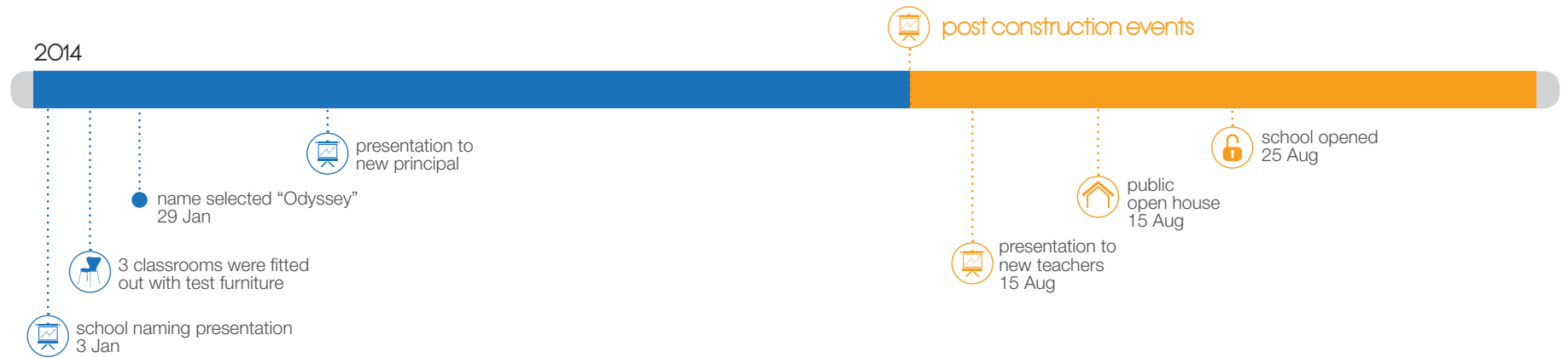
SPECIAL EDUCATION



## PROJECT TIMELINE









## SUMMARY OF STATE'S GUIDELINES

### Utah State Office of Education per Student Suggested Space Criteria

For purposes of this table, Gross Square Feet Area is defined as the sum of the area on each floor 1 foot from the exterior walls. It includes all rooms, corridors and storage areas, etc.

Level	Square Feet Per Student	Number of Students	Total Gross Square Feet Area
Elementary	72	600 or more	43,200+
	73	550	40,150
	74	500	37,000
	75	450	33,750
	76	400 or less	30,400-
Middle/ Intermediate/ Jr. High	115	1,500 or more	172,500+
	116	1,410	163,560
	117	1,320	154,440
	118	1,230	145,140
	119	1,140	135,660
	120	1,050	126,000
	121	960	116,160
	122	870	106,400
	123	780	95,940
	124	690	85,560
	125	600 or less	75,000-

Level	Square Feet Per Student	Number of Students	Total Gross Square Feet Area
Senior High	145	1,500 or more	217,500+
	146	1,452	211,992
	147	1,405	206,535
	148	1,358	200,984
	149	1,311	195,339
	150	1,263	189,450
	151	1,216	183,616
	152	1,168	177,536
	153	1,121	171,513
	154	1,074	165,396
	155	1,026	159,030
	156	979	152,724
	157	932	146,324
	158	884	139,672
	159	837	133,083
	160	789	126,240
	161	742	119,462
	162	695	112,590
	163	647	105,461
	164	600 or less	98,400-



## RESULTS OF THE PROCESS & PROJECT

Throughout the process of this project, the design team has utilized a series of surveys to gather input.

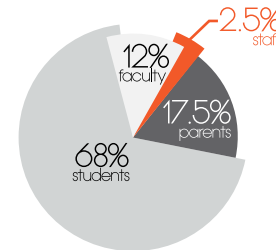
Discussions during the Conceptualization Meeting made it clear that it would be critical to include a broader cross section of teachers and staff than could be accommodated in the formal programming meetings. In order to accomplish this, a questionnaire was developed, utilizing "Survey Monkey", an on-line survey program.

The Davis School District e-mailed a request and a link to the survey to all 59 elementary schools in the District asking for their teachers' participation. Over 600 teachers filled out the on-line multiple choice survey, and over 200 wrote responses to the "open-ended comments" question, giving the design team extremely valuable input.

For the furniture selection phase of the project, the design team developed an on-line survey for teachers and students to provide input prior to using the new furniture for 5 weeks and then after the 5 weeks had elapsed. Three existing schools in the District were provided with a classroom of the test furniture, which was utilized by two sets of teachers within each building. The team analyzed the results of the surveys, and adjusted the types and quantities of the furniture to be ordered for Odyssey.

Finally, in mid March 2015, a Post Occupancy survey was launched on Survey Monkey. The survey tailors questions to students 3rd grade and above, staff, faculty and parents. As of this submittal, 271 people have filled out the online survey:

survey respondents:



Selected data is bulleted below:

In response to the question "In your opinion, what factors are primarily responsible for the success of your child's academic performance and learning?"



46% of parents responded that the classroom and building design played a role



Over 83% of responding faculty and students agreed that the layout of the school and classrooms makes it easy to work in groups, while over 86% felt that the layout of the school and classroom makes learning more fun.



More than 82% of respondents were satisfied with the outdoor play area and the courtyard.



82% of responding faculty agreed that the layout of the school and classroom encourages student-teacher interaction.



Over 78% of teachers who responded were satisfied or very satisfied with the design of the building in helping them to provide quality learning experiences for their students.



Almost 88% of responding students and faculty agree that the classroom furniture is easy to move, and over 56% change the classroom layout and furniture locations weekly or oftener.



61% of all classrooms open the large roll-up door weekly or oftener.



85% of respondents are satisfied with the amount of natural daylight in their classroom.



65% of the responders felt that the "habitats" help students feel part of the school community.



86% of respondents found the "habitat" displays well designed, organized, and interesting (i.e., quotes, facts, animals, actions, colors, etc.).



Over 82% of those responding agreed that it is easy to find your way around school (i.e., such as finding a room you have never been to before).



84% felt safe while inside the school and on school grounds.



Over 87% of all those responding to the survey were satisfied with the building overall.



**Q67 Based on your impressions of the school, how would you describe the overall appearance and visual quality of the building? (Please select all that apply)**

Answered: 230 Skipped: 41

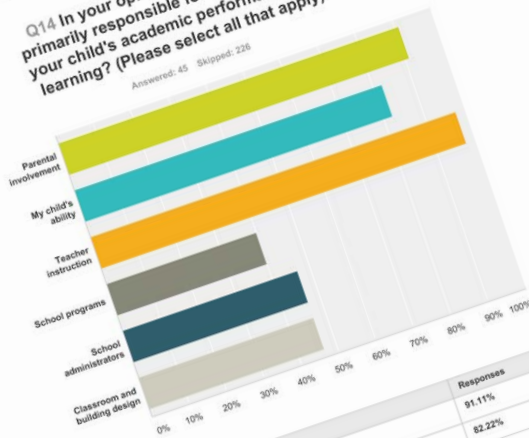


SurveyMonkey

Odyssey Elementary School - Building Survey

**Q14 In your opinion, what factors are primarily responsible for the success of your child's academic performance and learning? (Please select all that apply)**

Answered: 45 Skipped: 226



Total

#

1

2

Answer Choices

Parental involvement

My child's ability

Teacher instruction

School programs

School administrators

Classroom and building design

Total Respondents: 45

Other (please specify)

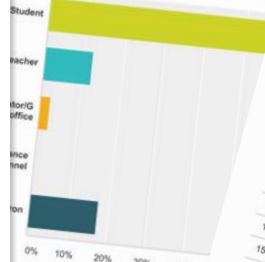
There are no responses.

15 / 88

School - Building Survey

**Q1 What is your role at the s**

Answered: 271 Skipped: 8



0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

0% 10% 20% 30% 40%

84 / 88

Odyssey Elementary School - Building Survey

**Q2 What school did your child attend last year?**

Answered: 43 Skipped: 226

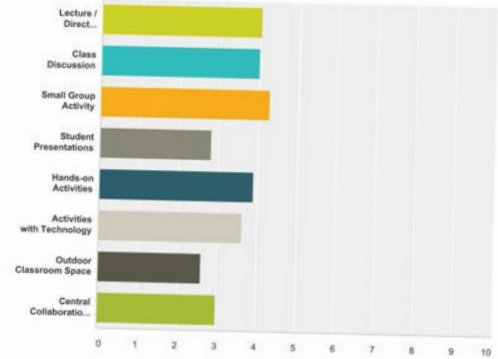
#	Responses	Date
1	preschool	4/2/2015 12:58 PM
2	Foxboro	4/2/2015 11:25 AM
3	Foxboro	3/30/2015 3:34 PM
4	Foxboro	
5	Foxboro	
6	Washington Elementary (Preschool)	
7	Foxboro	
8	Foxboro	
9	Park Lane Elem	
10		
11		
12	Fo	
13	Fox	
14	foxb	
15	foxbor	
16	Foxboro	
17	none	
18	n/a	
19	Foxboro	
20	Foxboro Elem	
21	Morgan Elem	
22	Woods Cross El	
23	Preschool program	
24	Foxboro	
25	Foxboro	
26	Woods Cross Elem	
27	Foxborow	
28	Foxboro Elementary	
29	Woods Cross Elementary	
30	Woods Cross	
31	Woods Cross Elementary	
32	Foxboro	
33	Woods Cross Elementary	

Odyssey Elementary School - Building Survey

SurveyMonkey

**Q33 How often do you use each of the following instructional techniques?**

Answered: 23 Skipped: 248



	Almost never	Once in a while	Sometimes	Frequently	Almost all the time	N/A	Total	Weighted Average
Lecture / Direct Instruction	0.00%	4.55%	13.64%	50.00%	27.27%	4.55%	22	4.05
Class Discussion	0.00%	4.35%	8.70%	65.22%	17.39%	4.35%	23	4.00
Small Group Activity	0.00%	0.00%	8.70%	52.17%	34.78%	4.35%	23	4.27
Student Presentations	17.39%	8.70%	43.48%	17.39%	4.35%	8.70%	23	2.81
Hands-on Activities	0.00%	4.35%	26.09%	39.13%	26.09%	4.35%	23	3.91
Activities with Technology	9.52%	0.00%	28.57%	28.57%	23.81%	9.52%	21	3.63
Outdoor Classroom Space	21.74%	13.04%	34.78%	21.74%	0.00%	8.70%	23	2.62
Central Collaboration Space	17.39%	13.04%	26.09%	21.74%	13.04%	8.70%	23	3.00
Other (please specify)								

39 / 88





Children play on the new playground at Odyssey Elementary, slated to be the greenest school in the state, Thursday, Aug. 21, 2014, in Woods Cross. The school will open its doors to students Monday, Aug. 25, using less energy than any other school in the state and costing less to operate than any other school in the Davis School District.

Tom Smart, Deseret News

## Summary

Awed parents and excited children flooded the new Odyssey Elementary School on Thursday, taking in the building's colorful, open-concept elementary at back-to-school night.

## Odyssey Elementary opens doors for open-concept learning and innovative play

by McKenzie Romero, Deseret News

**WOODS CROSS** — In planning the new Odyssey Elementary School, school district officials looked to nature.

Awed parents and excited children flooded the colorful, open-concept elementary for a back-to-school night, taking in the building's unique layout. Classrooms are distributed between four wings, called "habitats," that branch off the building's central area and are named to inspire students to swim, run, jump and fly.

Full of natural light thanks to banks of big windows, Odyssey will be powered by the sun thanks to more than 1,200 solar panels and will use less energy than any other school in Utah, making it the "greenest" school in the state, according to the Davis School District.

"I like the doors," said 8-year-old Kera Keeler, investigating a large, roll-up door that connects her new classroom in the "fly" habitat to a communal center.

Bryan and Eva Keeler, Kera's parents, said they believe the new school will jumpstart the year for Kera and her 7-year-old sister, Leslie.

"I think it's a school for the times. It's something that wouldn't have existed back when I was a kid," Bryan Keeler said. "I think for kids these days, it's probably just the ticket. It's technologically advanced and just kind of cool."

Tucker Farris, who starts fourth grade in the "swim" habitat Monday, is especially excited about the open and active feel of his new school.

"It's different than other schools," Tucker said. "I like unusual things."

Tucker's mom, April Farris, said she likes the new technology available at the school and the way her son's classroom (complete with rolling desks and chairs, fun shaped stools and countless customizable white board surfaces) fits with his active personality.

"Kids like to move and so, in some ways, I think it could help them focus if they have some leeway," Farris said. "He'll either thrive or get distracted."

Farris has two older children now in junior high. In the nine years her family has lived in Woods Cross, her kids have attended three elementary schools.

"We're the neighborhood that always gets moved," she said. "We're hoping we're good for a while."

Farris said the school's open design and large windows on the classrooms could be a security concern. District officials assured that entrances to each of the four habitats can be locked down in an instant from the main office, and all outer doors will remain locked throughout the day, opening only with secure faculty and staff key cards.

The walls in an open cafeteria and auditorium area are decorated with large, colorful photos of hikers, rock climbers, hang gliders and surfers, while inspirational quotes ranging from Lao-Tzu to J.K. Rowling to Thomas Jefferson line the balconies and doorways.

continued...



Rachel Wright and Didier Chanel were anxious to show off their classrooms in the “fly” habitat as they welcomed their class of second-graders and their parents Thursday. Both first-year teachers, Wright and Chanel will tag-team the group of French-immersion students.

Wright, who worked for the Discovery Gateway museum before making the switch to teaching, told students and parents that Odyssey feels like a perfect fit for her education philosophy.

“It’s a taste of the energy that’s going to come during the year,” said Wright as she watched the group file out. “I think it’s this awesome trifecta of being a first-year teacher and having students be new to the school in a brand new school. It’s just a perfect combination of exciting opportunities.”

There are still a few missing pieces, however. Classrooms still need desks (the table tops have arrived but not the legs, a district official said) and teachers are waiting on computers and printers.

Wright told parents those things will be delivered as school gets underway Monday.

Odyssey’s unique floor plan and philosophy incorporates the needs of parents, students and teachers, Wright said.

“They thought of everything when they made this school,” she said.



## Odyssey Elementary Becomes the Greenest School in Utah

09/25/2014



Odyssey Elementary, slated to become the greenest school in the state, opened its doors to students August 25 in Woods Cross, Utah. The building can function as a net-zero facility, generating all its own electricity, and is on track to achieve LEED-Gold certification.

The owner, Davis School District, is pushing the envelope for 21st century schools. In traditional schools, teachers are often limited in their pedagogical approaches by the classroom and the building in which they teach.

Not so at Odyssey. The school has flexible spaces that can be easily moved or adjusted to meet student and teacher needs. It was designed around the theme “Bodies in Motion: The Animal Kingdom,” and highlights animals (including humans) as they run, jump, swim and fly.

Odyssey Elementary makes use of highly efficient building systems that are responsive to each another. More than 1,200 solar panels on the building convert the sun’s energy into direct-current electricity for the building’s use. This includes a photovoltaic array on the roof as well as solar panels that double as sunshades over the windows on the south side of the building.

The building has an interactive-energy dashboard where children can learn about their school’s energy use. They will be able to see the exchange of heat between the earth and the building and what areas in the building are using energy and how much. QR codes around the building feature videos explaining how the energy-saving features work.

Odyssey Elementary stands as proof that a net-zero school need not cost any more than a traditional school. The children who are educated at Odyssey will study and witness first hand how energy works, how it is used and how it can be harnessed most effectively.

An interactive open house was held for students, parents and other interested parties before the start of the 2014 school year.