ON THE EDGE

how sustainable and community centered design creates place

BRAYARCHITECTS

introductions

We are so excited to be here at LearningSCAPES in San Antonio!

Maria Welch, AIA NCARB
Architect, Design Specialist + Associate
Bray Architects

Chris Eger, AIA
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Kate Egan, AIA ALEP LEED AP BD+C
Architect, Design Specialist
Bray Architects

Kerri Modjeski
Forest Edge Elementary Principal
Oregon School District

Andy Weiland
OSD Business Manager
Oregon School District

It takes a village!

BRAYARCHITECTS

MSA

FREDERICKSEN Engineering

Actively Building Competency, Character, Culture & Community

OREGON SCHOOL DISTRICT

AMBROSE ENGINEERING

HGA

Boelter

Findorff

Learning objectives

OBJECTIVE 1: Learn how designers analyze a school's environmental context and district's goals to conceptualize a new building.

OBJECTIVE 2: Recognize the many benefits of a net zero energy school for its students, district, community from the example of Forest Edge Elementary School.

OBJECTIVE 3: Understand the potential of environmental branding and accessible digital technology to connect students to their physical and natural environment.

OBJECTIVE 4: Experience a net zero school from a student's perspective by participating in a brief lesson that Forest Edge teachers give to their students.

What gives a learning environment a sense of identity and community?


context


education


CAN THERMAL ENERGY DO?
goals

context

Where is the district/school located?

What kind of community does the district/school serve?

education

What is the school district's mission and vision?

What does the school's curriculum delivery look like?

Who learns here? Who teaches here?

goals

What additional aspirations or unique goals does the district have?

How does that affect the design strategy?

location

surroundings

community

curriculum

district vision

students + staff

additional aspirations

unique goals

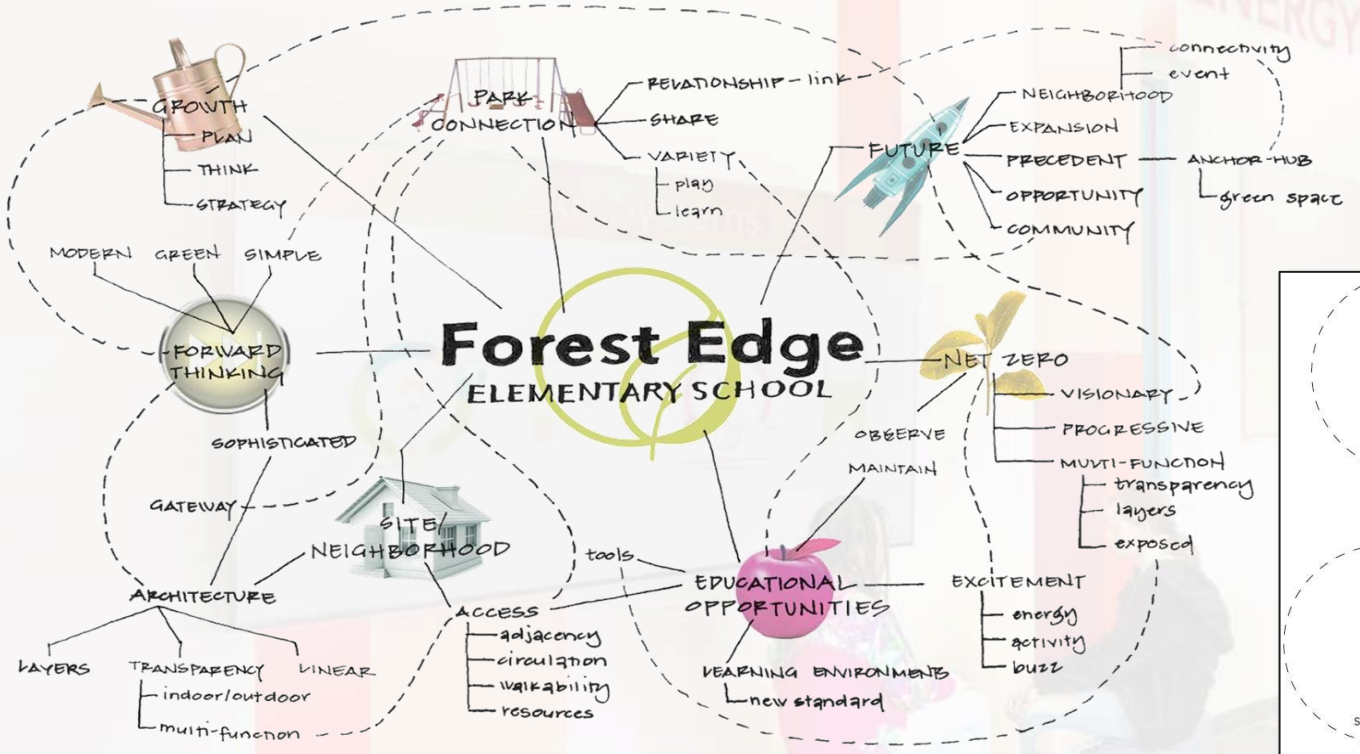
collaborative process

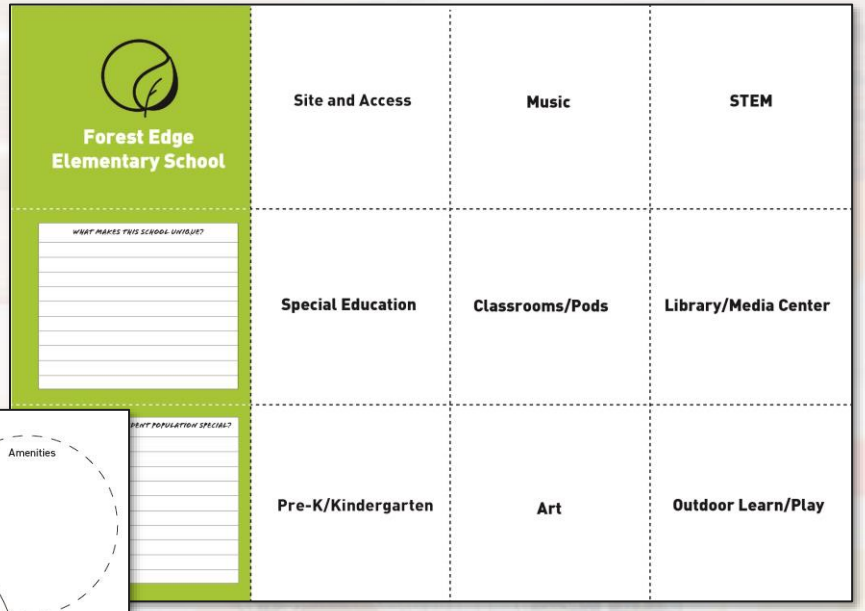
unique learning community

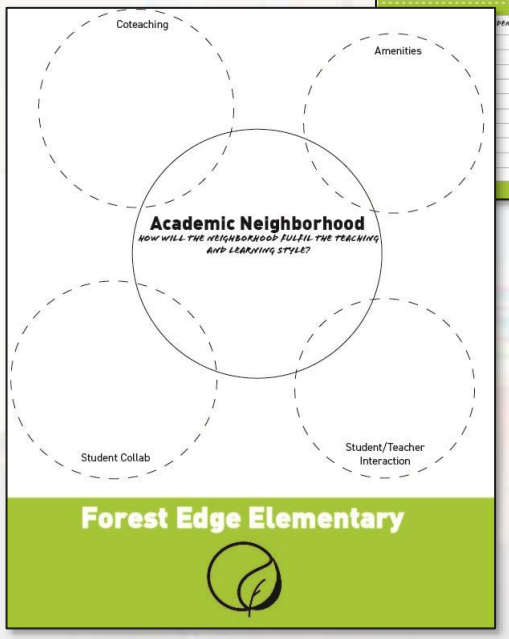
Forest Edge Elementary School

- Location: 4848 Brassica Road
  Fitchburg, WI 53711
- Grade Configuration: K – 6th Grade
  [future transition to K – 5th Grade]
- Construction Cost: $35,015,000
- Construction Start: April 2019
- Construction Complete: August 2020
- Building Size: 126,850 square feet

throw it all **out there**







natural landscape

emerging progressive neighborhood

family + community partnerships

emphasize empowerment, innovation, and instill lifelong learning

Prioritize sustainability (net zero achievement)

foster community relationships

Forest Edge Elementary School

_context

context map

context map

agrarian vernacular

agricultural region

growing community | Terravessa neighborhood

Andy Weiland,
OSD Business Manager.

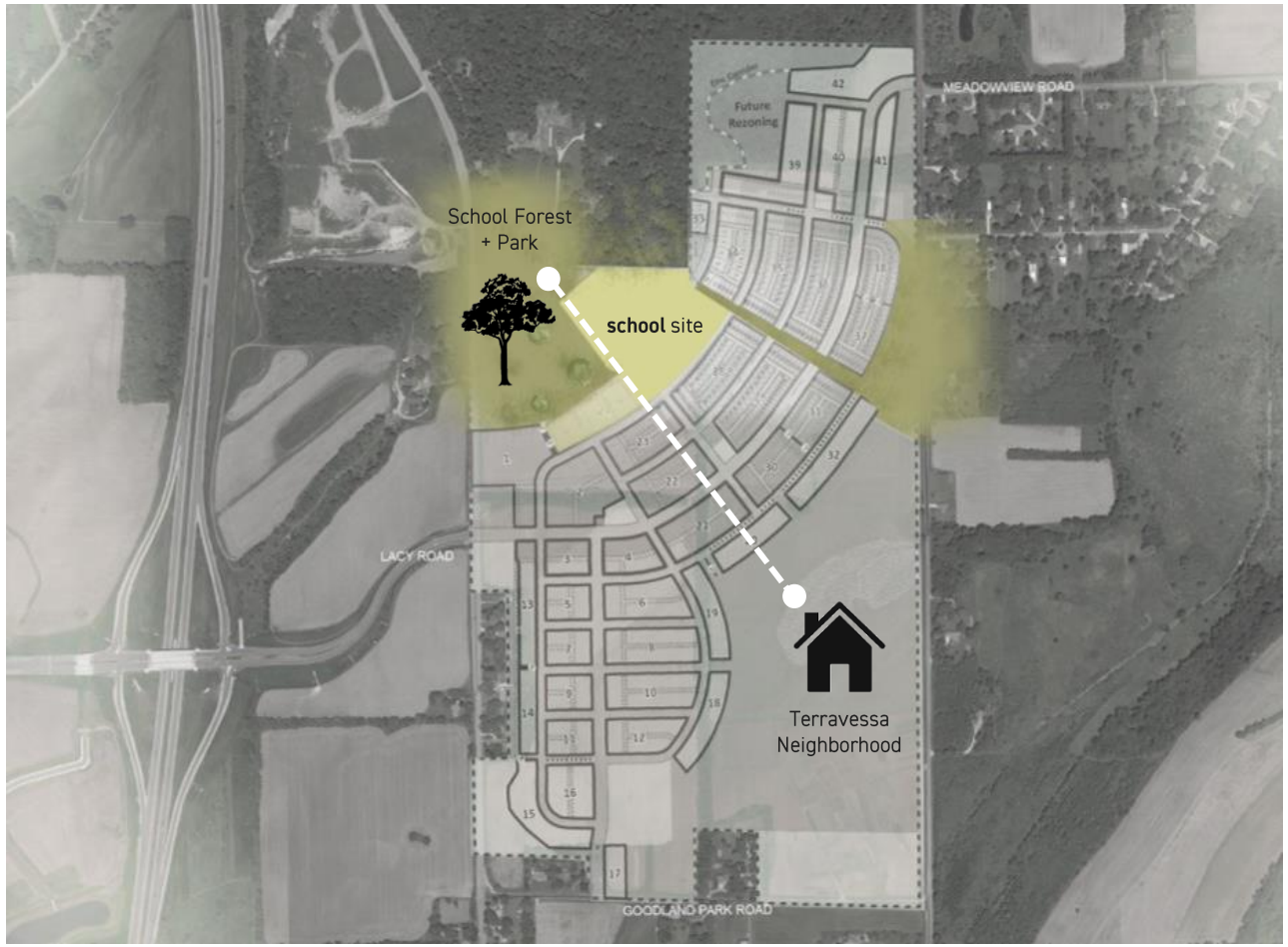
"Fitchburg is known as a progressive and environmentally-conscious community — where residents care about sustainability, accessibility, and open spaces. That's why we're excited to bring you amenity-rich Terravessa — a 21st Century neighborhood that embraces all of these attributes and much more."

natural beauty | school forest

"I think it is pretty cool, a lot of our science lessons are based out there. Its really nice to have that instead of taking a bus or a mile walk or something. You get to just go outside."

Karola, FES 6th grader

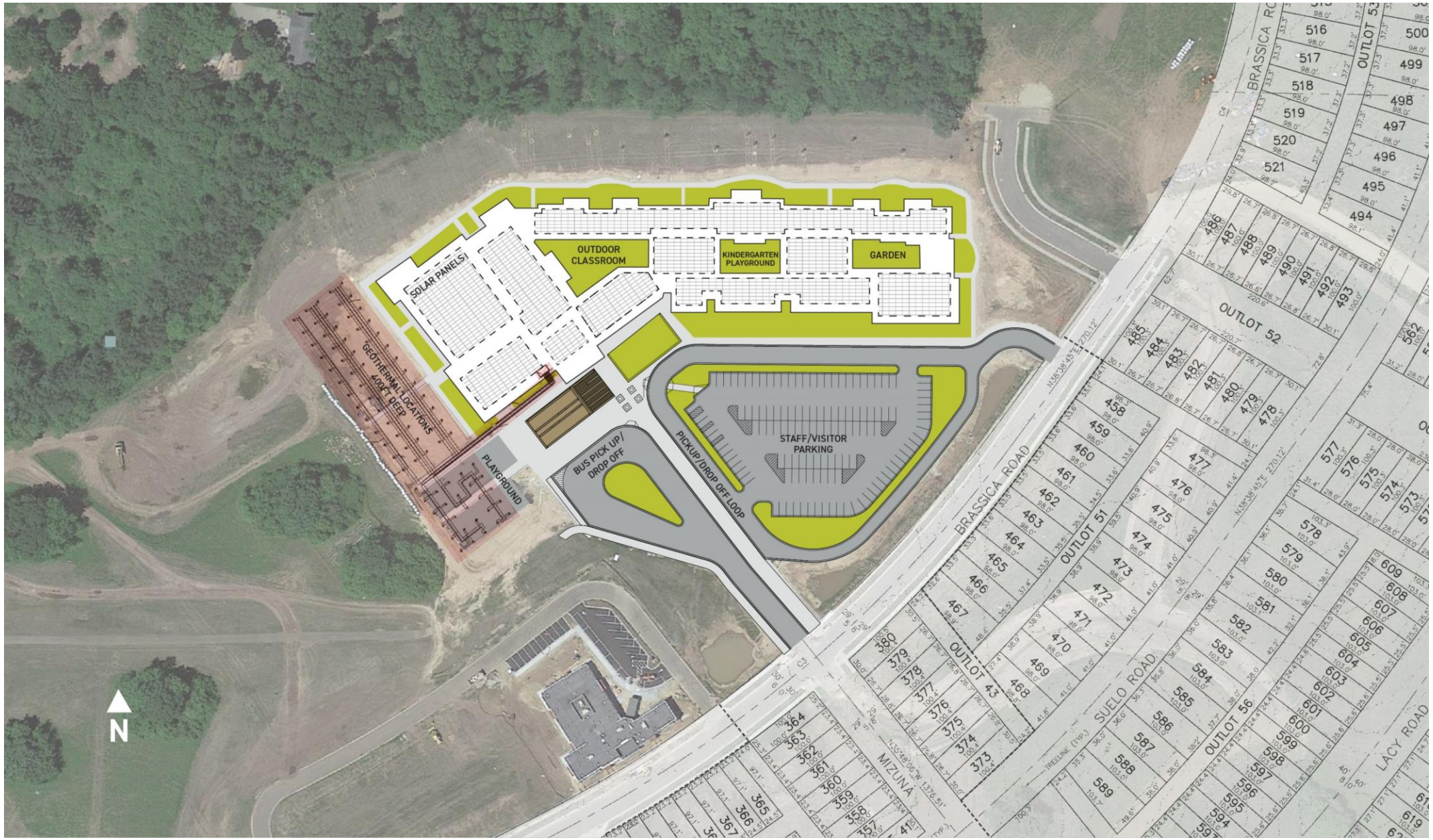
site connection



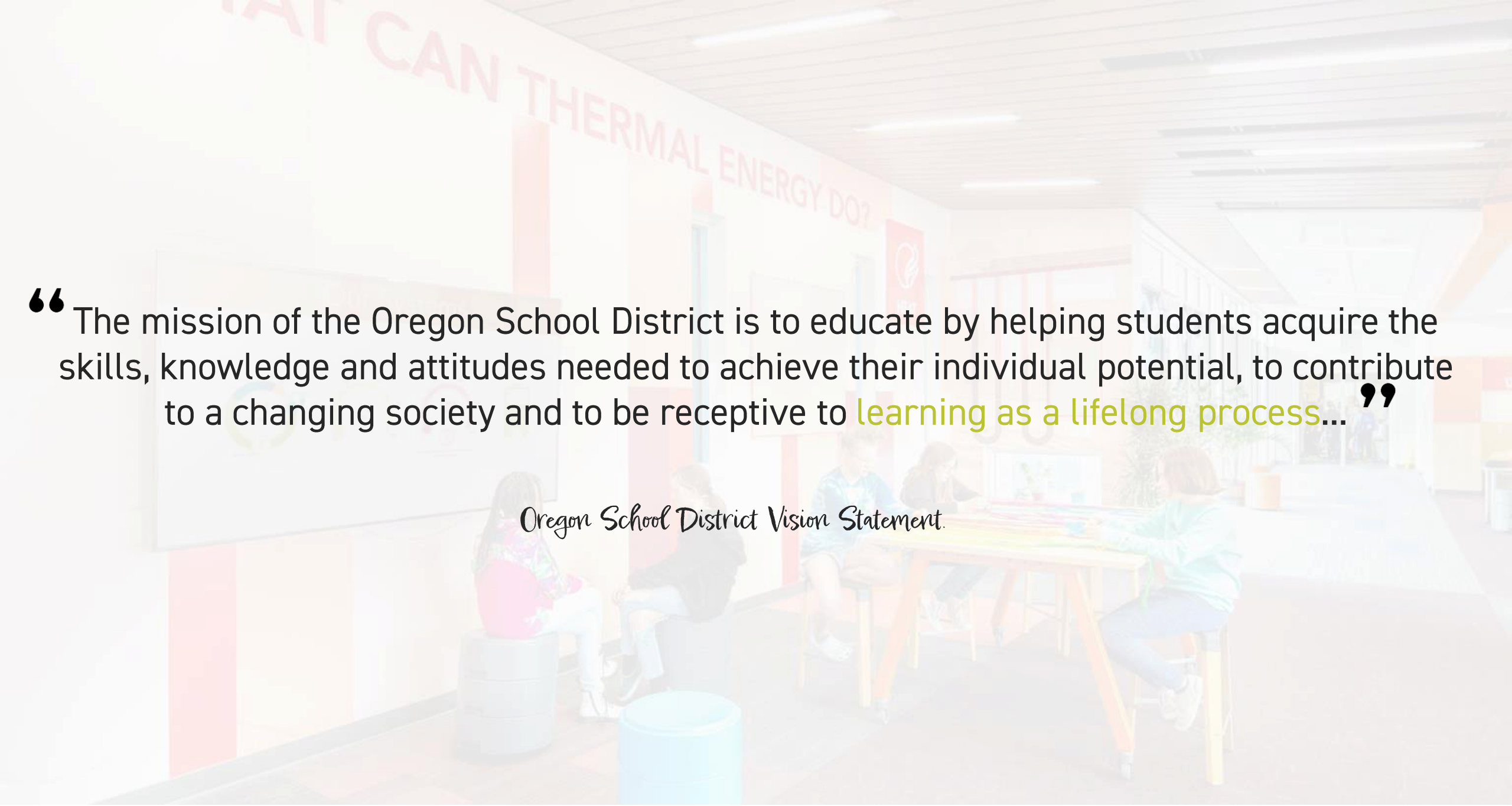
school forest

emerging community

site plan


SOLAR PANELS!
OUTDOOR CLASSROOM
KINDERGARTEN PLAYGROUND
GARDEN
GEOTHERMAL LOCATIONS 400 FT DEEP
PLAYGROUND
BUS PICK UP/ DROP OFF
PICKUP/DROP OFF LOOP
STAFF/VISITOR PARKING
N
BRASSICA ROAD
SUELO ROAD
MIZUNA
LACY ROAD
OUTLOT 52
OUTLOT 51
OUTLOT 43
OUTLOT 56

education



“The mission of the Oregon School District is to educate by helping students acquire the skills, knowledge and attitudes needed to achieve their individual potential, to contribute to a changing society and to be receptive to learning as a lifelong process...”

Oregon School District Vision Statement.

District + FES background

https://youtu.be/PQMZlzjd4Cg

Kerri Modjeski, FES principal

floor plan

SEE TAB 1

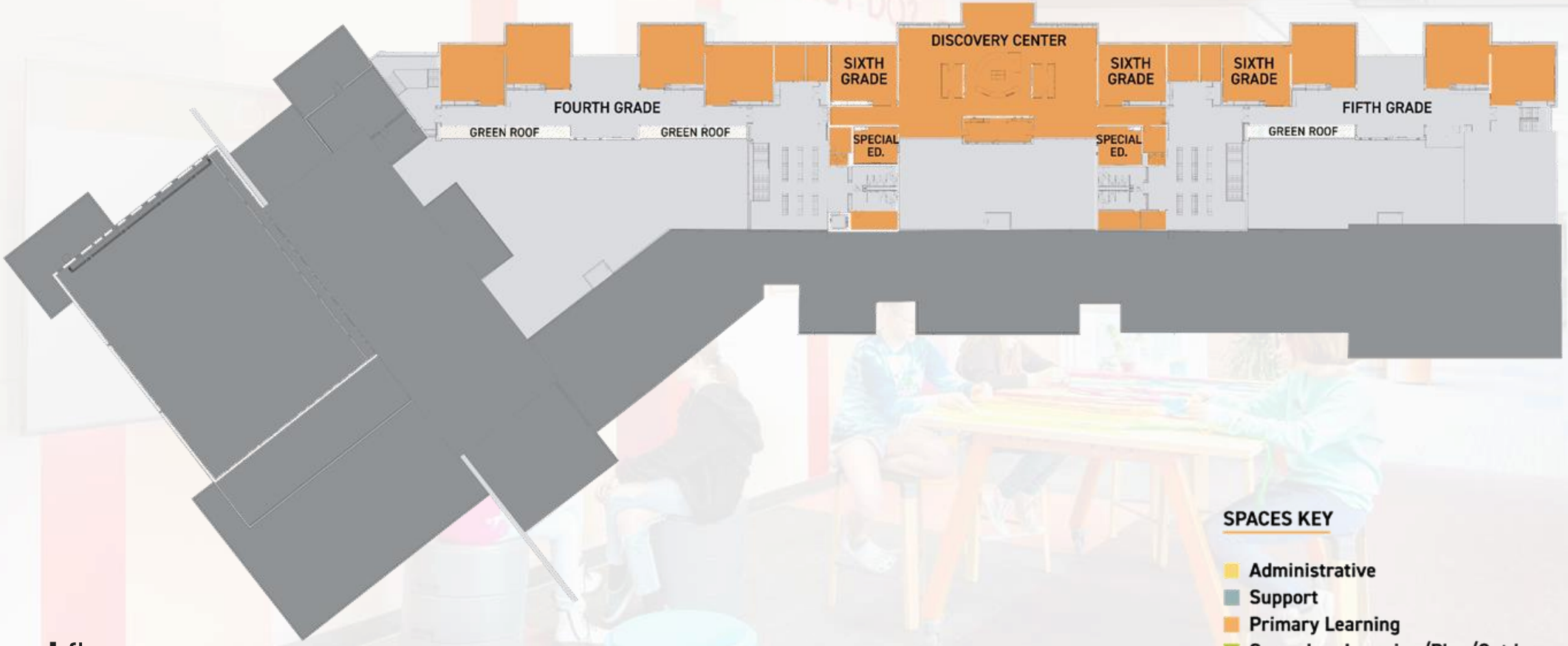
N

first floor

SPACES KEY

- Administrative
- Support
- Primary Learning
- Secondary Learning/Play/Outdoor

floor plan



N

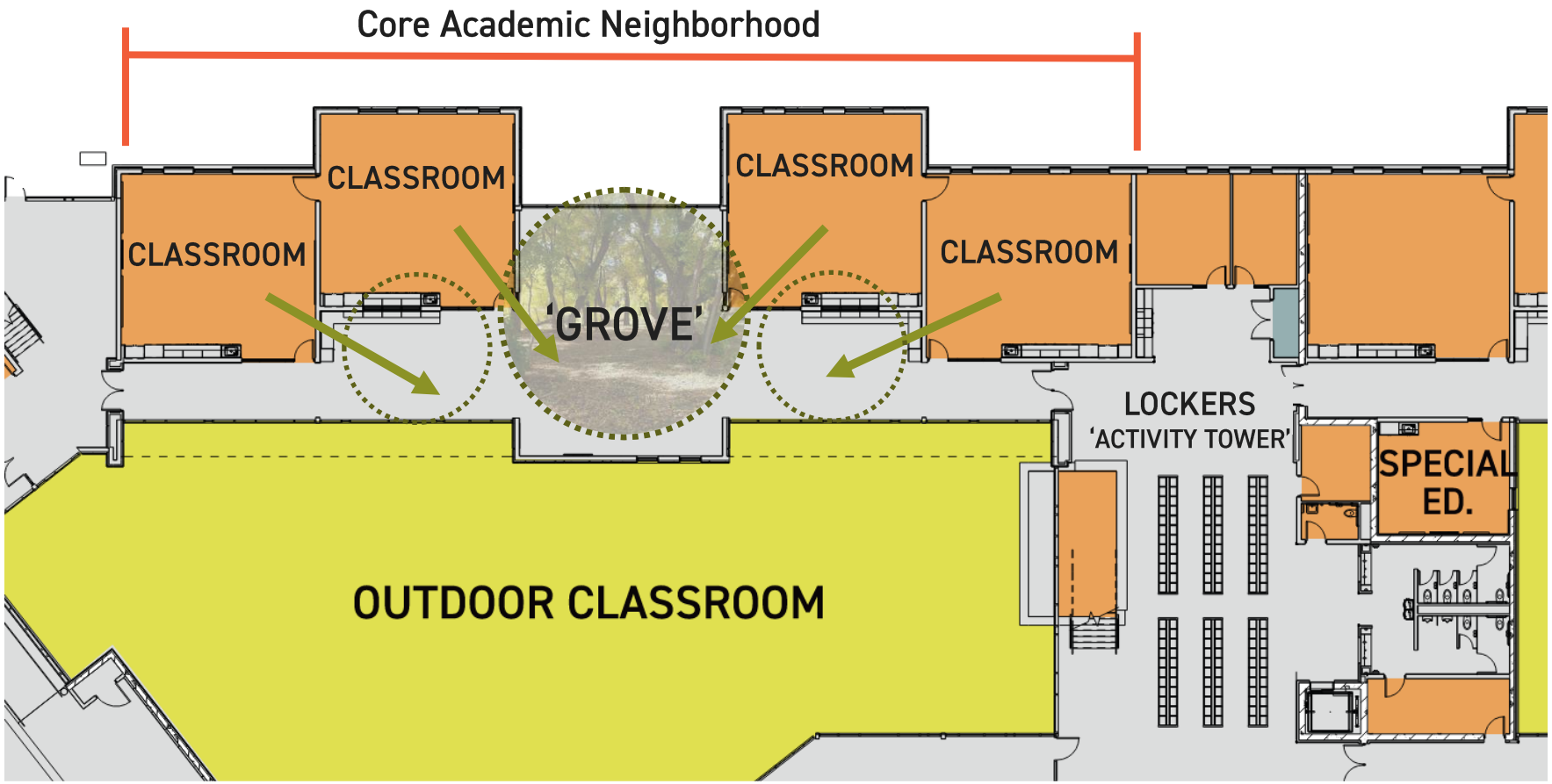
second floor

SPACES KEY

- Administrative
- Support
- Primary Learning
- Secondary Learning/Play/Outdoor


Student Collaboration
167
STEAM


The Nest
NEW
NONFICTION
Nonfiction
Reebok



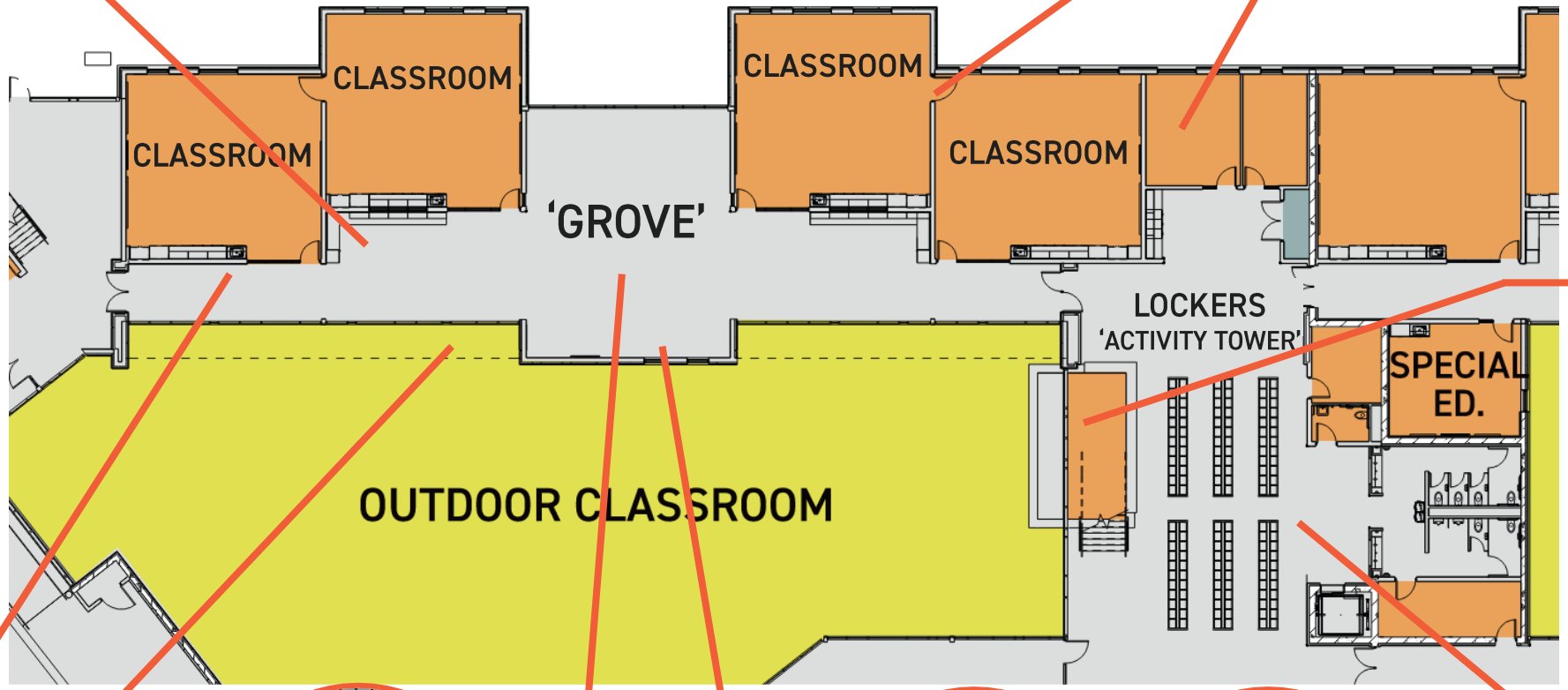
grove
/grōv/
noun
1.a small wood, orchard, or group of trees.

grove design

shared storage +
built in seating area

coteaching door

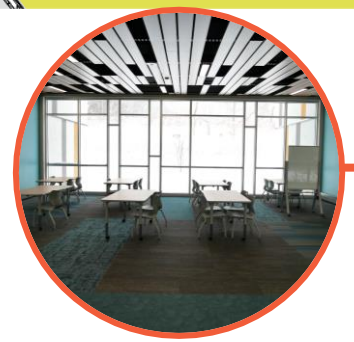
teacher support rooms



under stair
seating area

transparency
to collab

views to outdoors



open collaboration

teaching wall

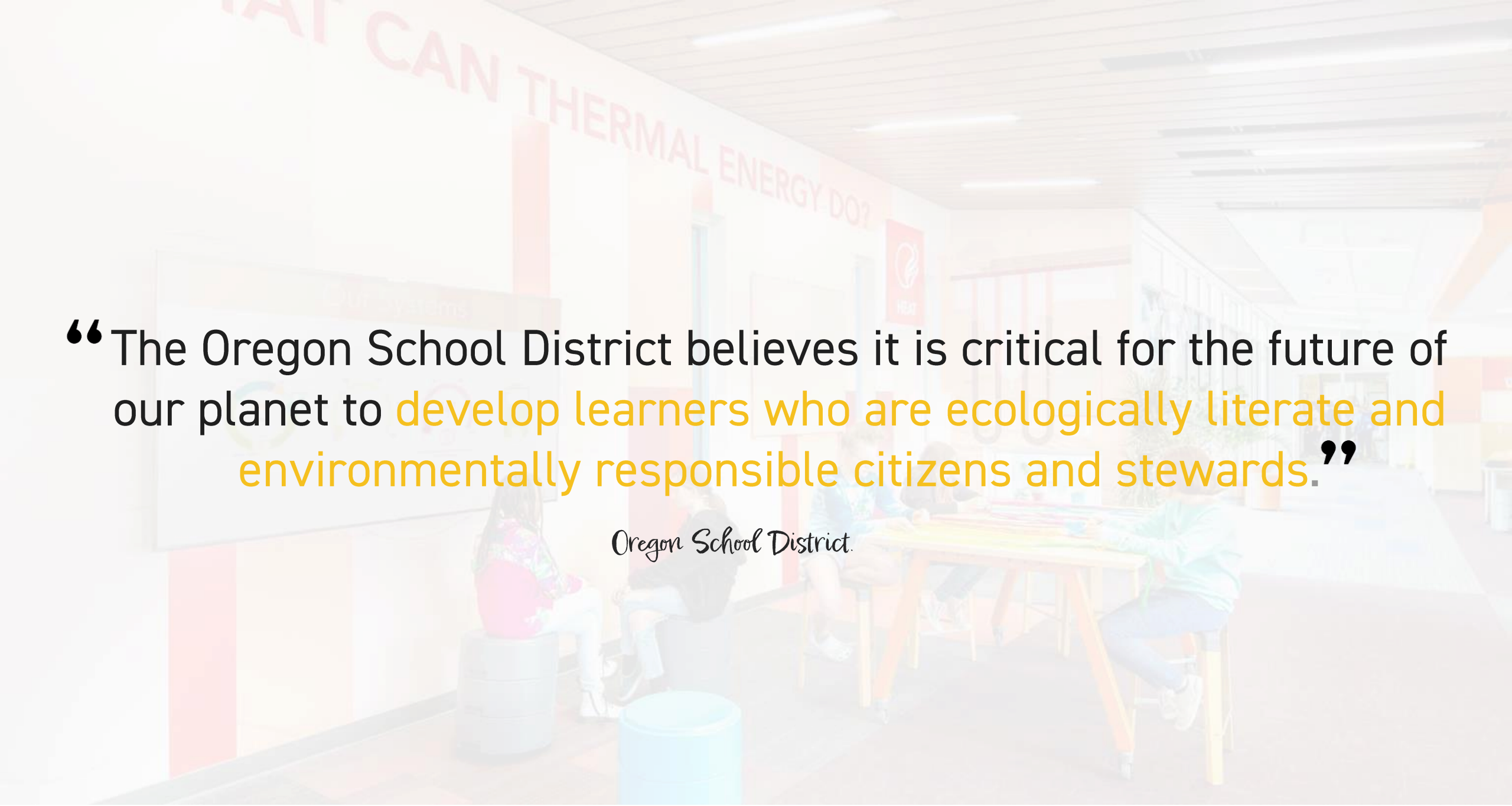
shared locker +
restroom area


CAN THERMAL ENERGY DO?
Our Systems
71
14
10°
HEAT


WHAT CAN WIND DO?
WIND
DEFINITION
Forest Edge Elementary
Net-Zero Data

goals

- *Sustainability*
- *Passive strategies*
- *Active strategies*
- *Net zero status*
- *Biophilic design*



“The Oregon School District believes it is critical for the future of our planet to develop learners who are ecologically literate and environmentally responsible citizens and stewards.”

Oregon School District

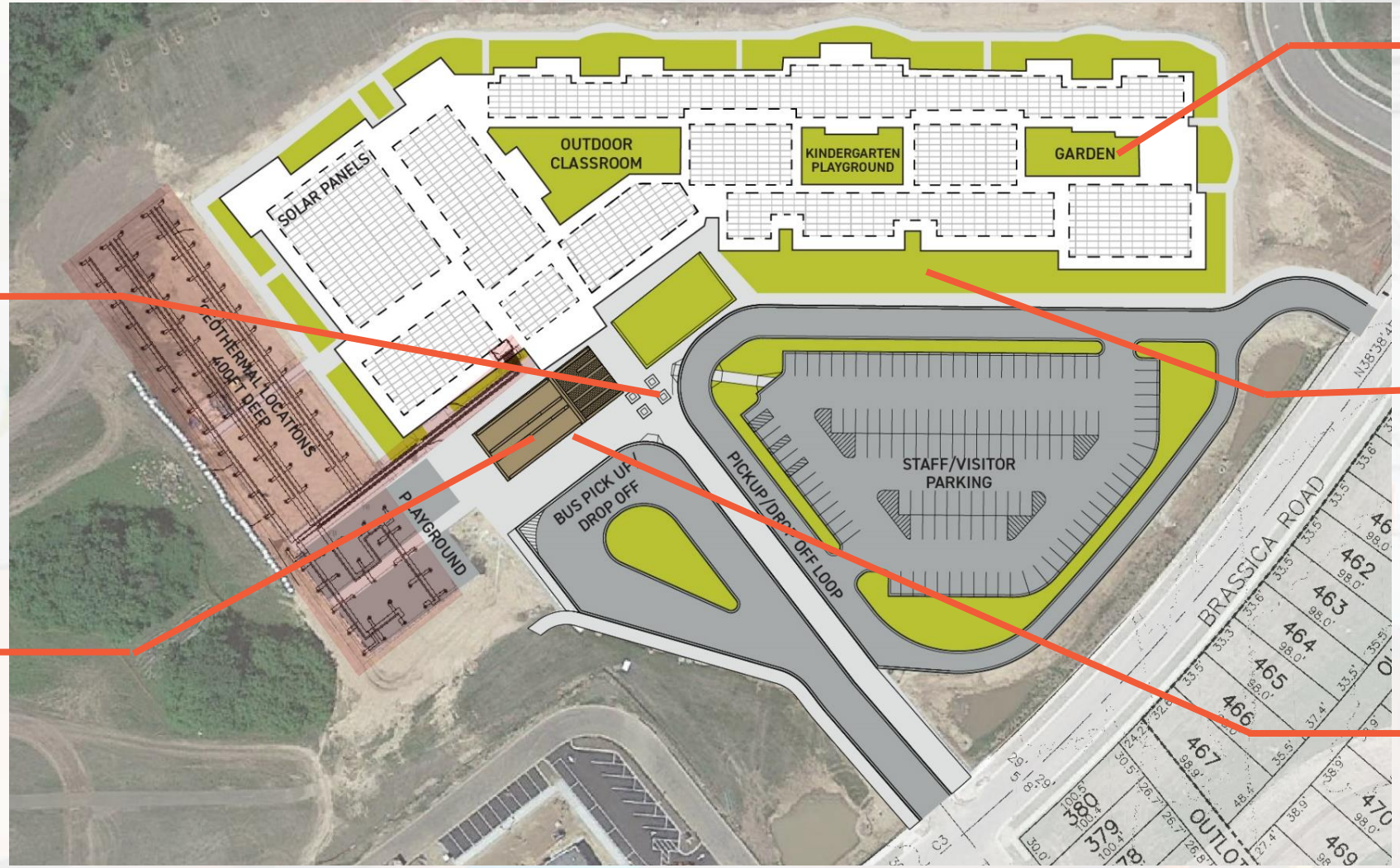
https://youtu.be/zOFcQLLbZRQ

Andy Weiland, OSD Business Manager.

sustainable site features

shade trees

reclaimed site materials



courtyards

indigenous plants + onsite bioretention

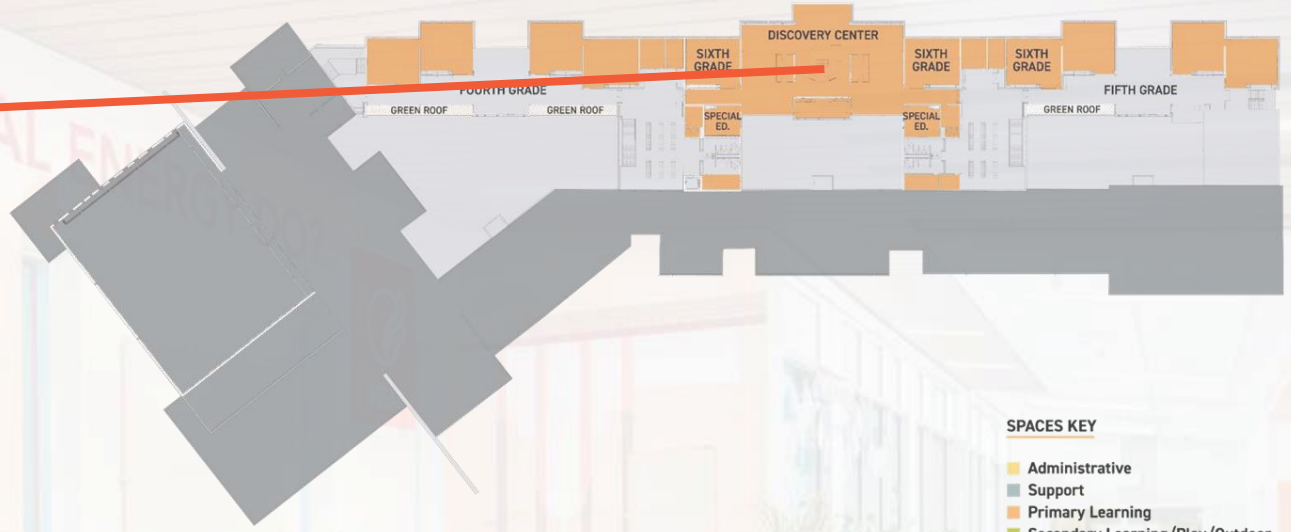
permeable surfaces

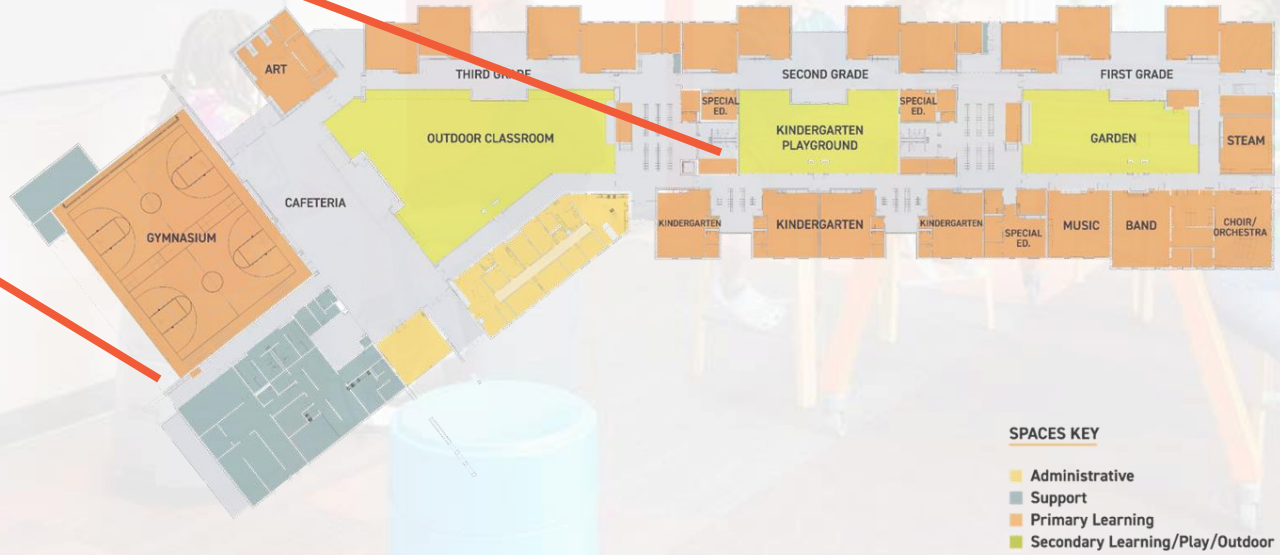
sustainable building features

reclaimed
materials

low flow plumbing fixtures +
hand dryers

natural
building materials

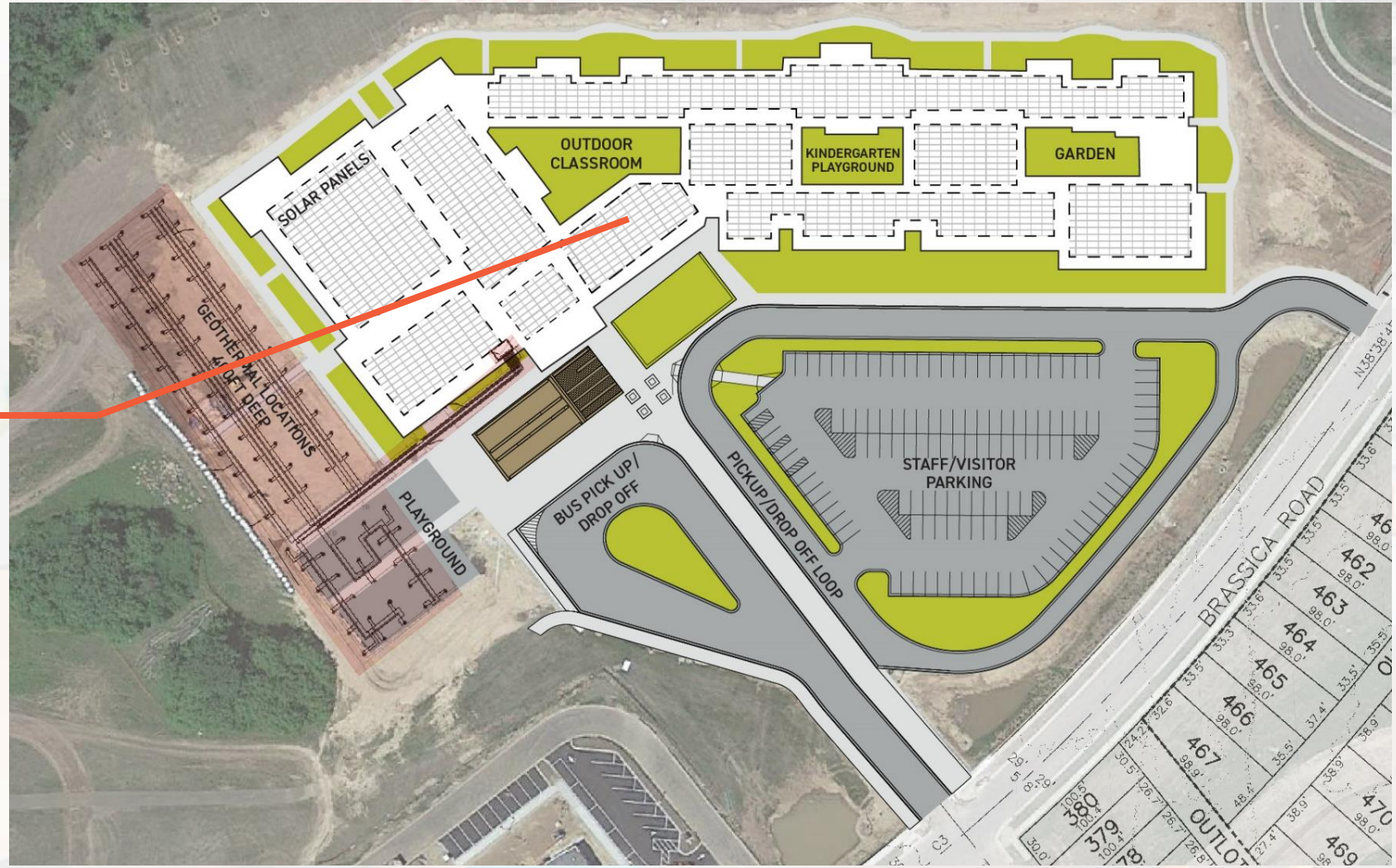




sustainable features

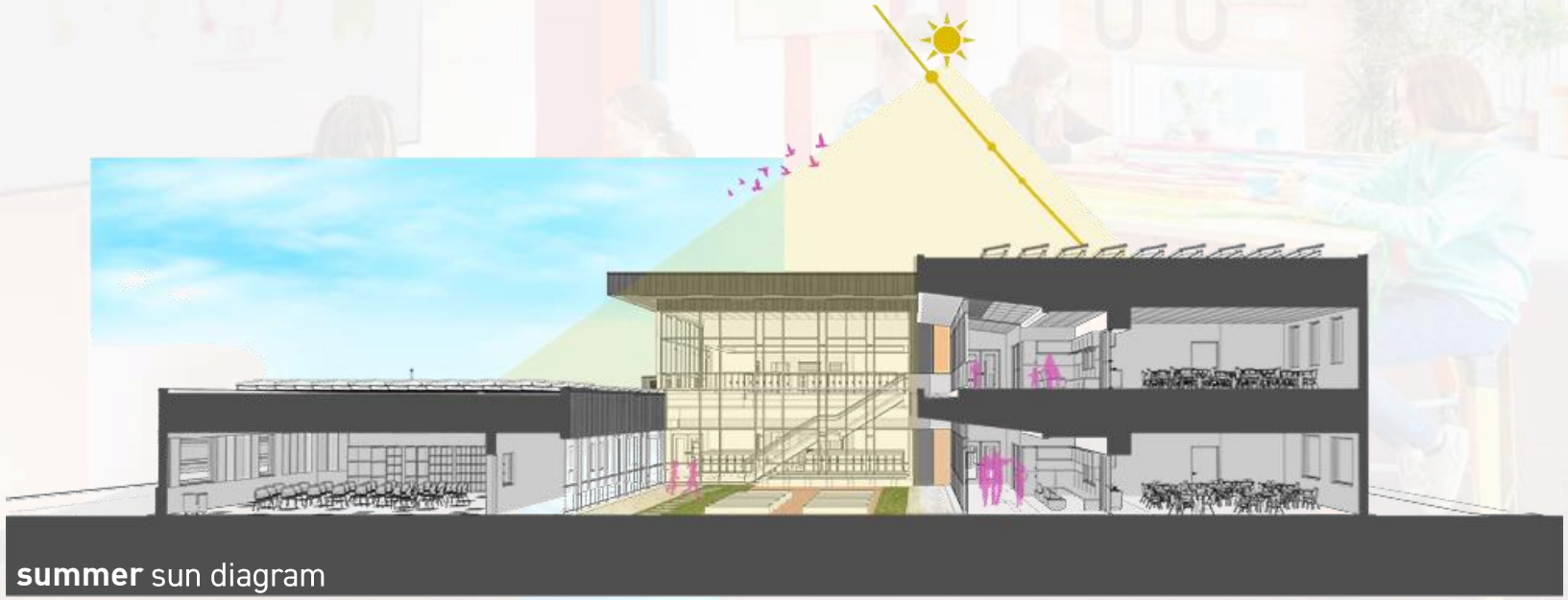
passive strategies

overall
building configuration



passive strategies

winter sun diagram



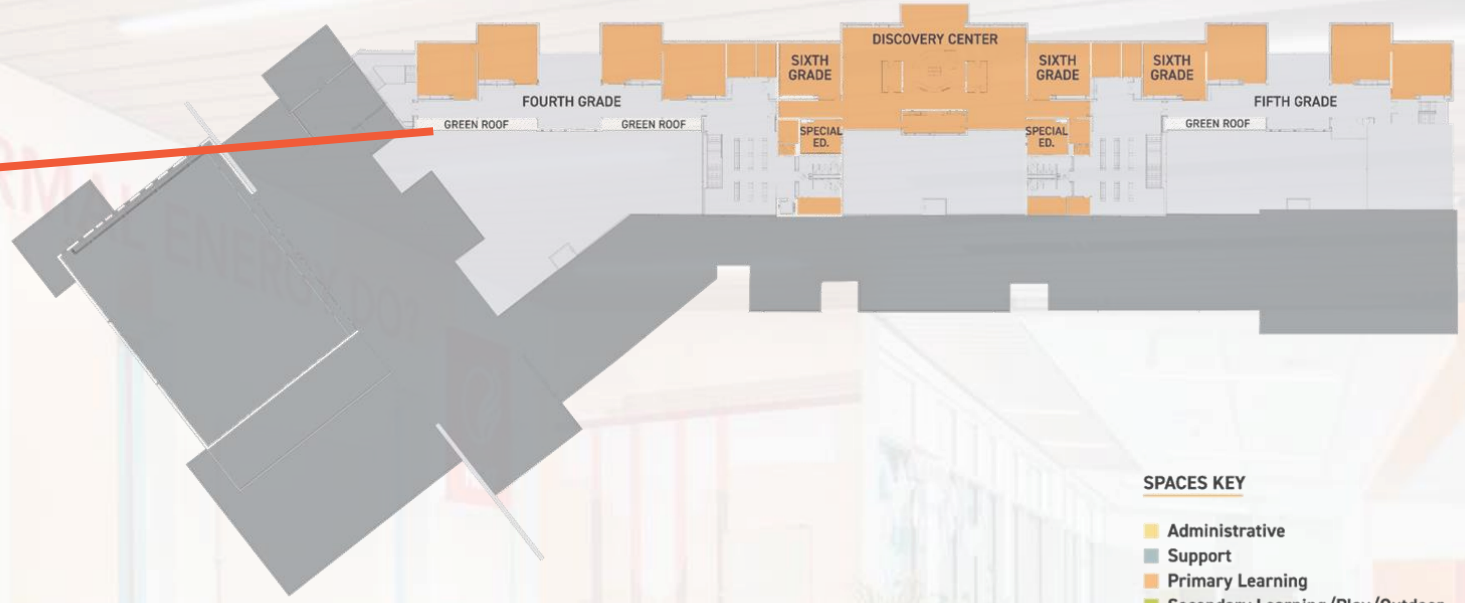
summer sun diagram

passive strategies

roof overhangs + green roofs

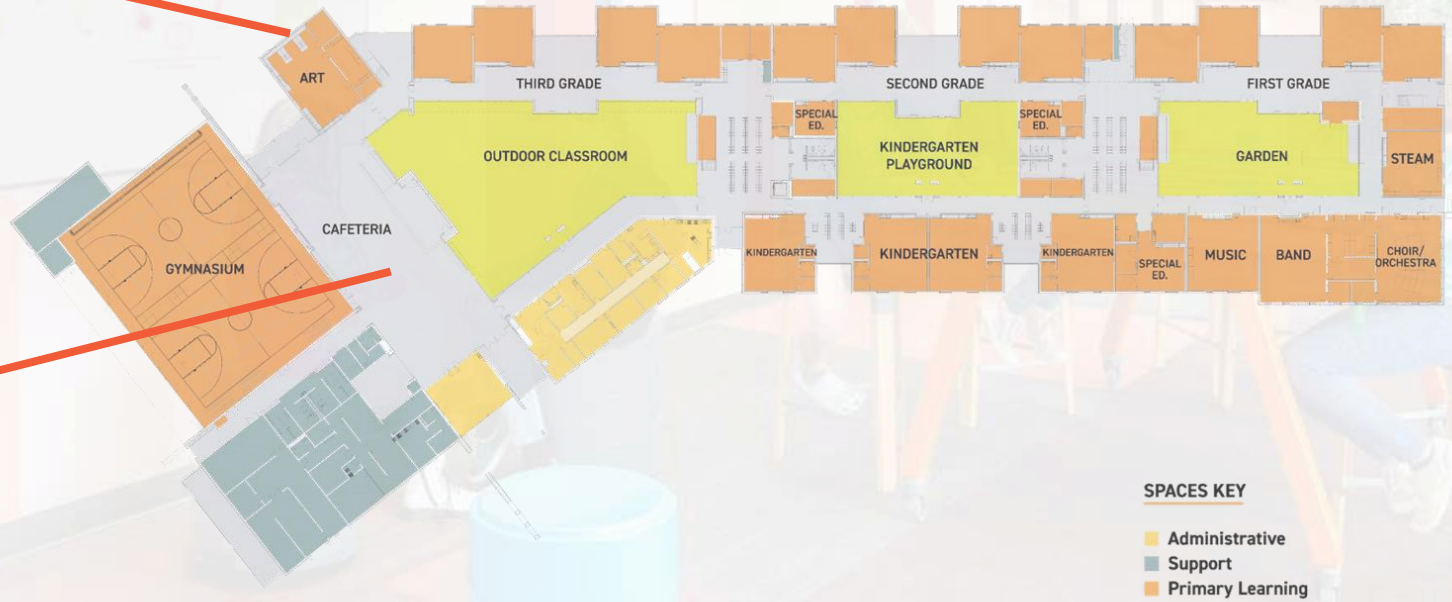
envelope efficiency

natural daylighting



SPACES KEY

- Administrative
- Support
- Primary Learning
- Secondary Learning/Play/Outdoor



SPACES KEY

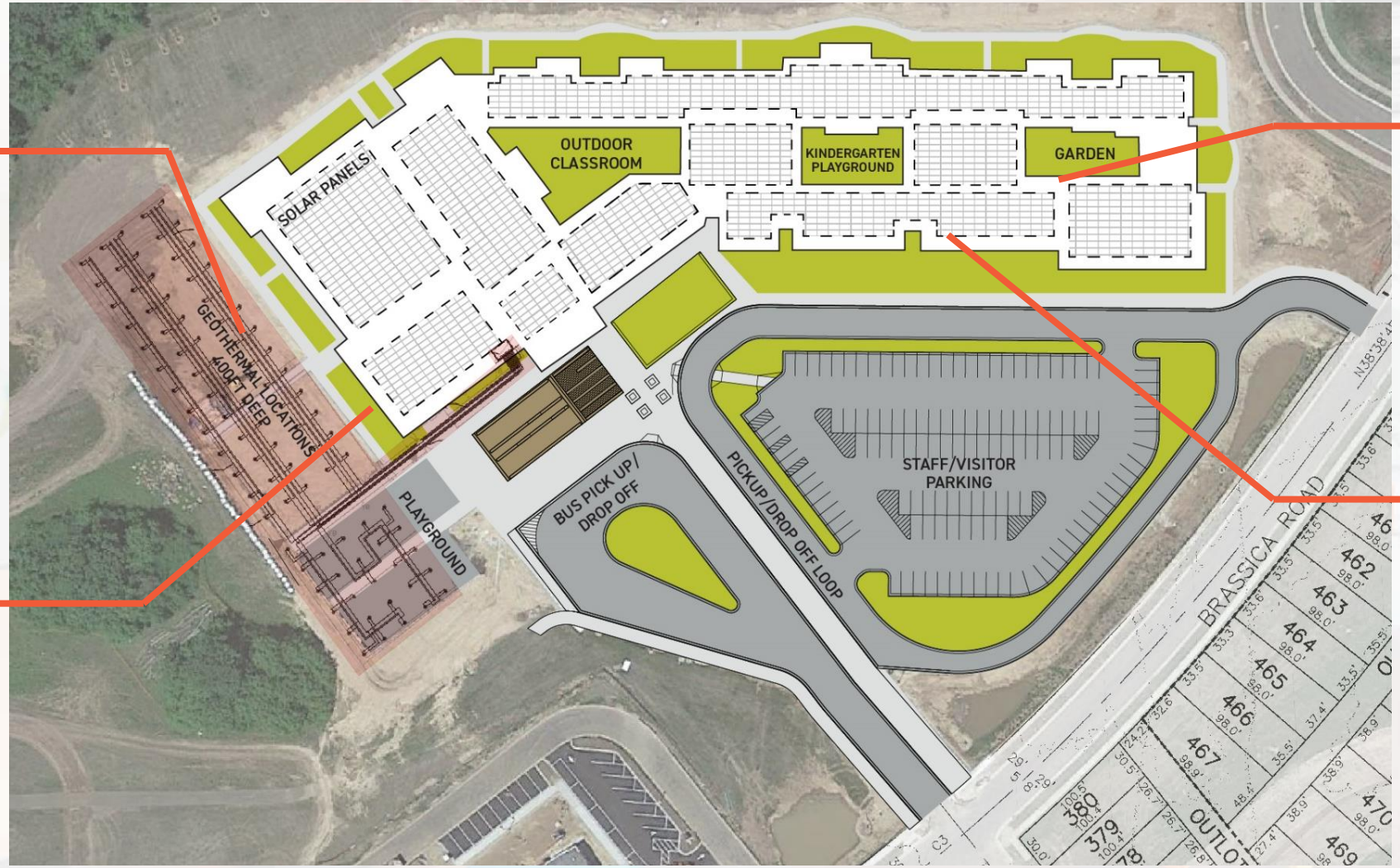
- Administrative
- Support
- Primary Learning
- Secondary Learning/Play/Outdoor

passive strategies

active strategies

geothermal

battery



electrochromic glazing

solar power

More info about the Active Systems

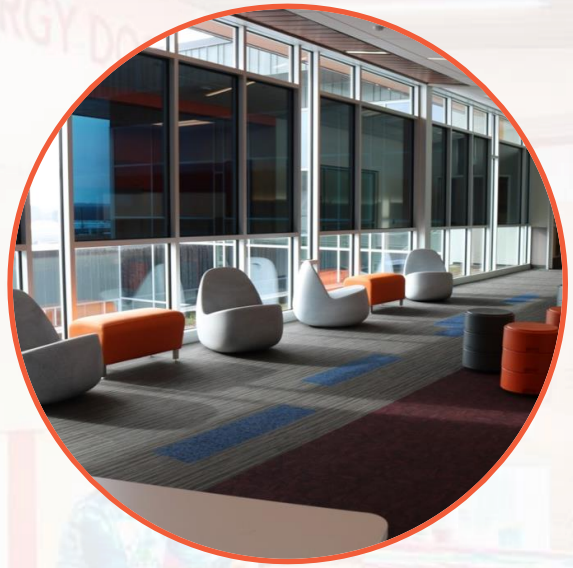
geothermal

90 geothermal wells

extend **406** feet into the ground

battery

125kW battery



electrochromic glazing

solar power

1704 solar panels

Produces **646kW**

Forest Edge Elementary

eGauge

View | LAN Access | Tools | Settings | Help

9/14/2022 9:12am – 9/15/2022 9:12am

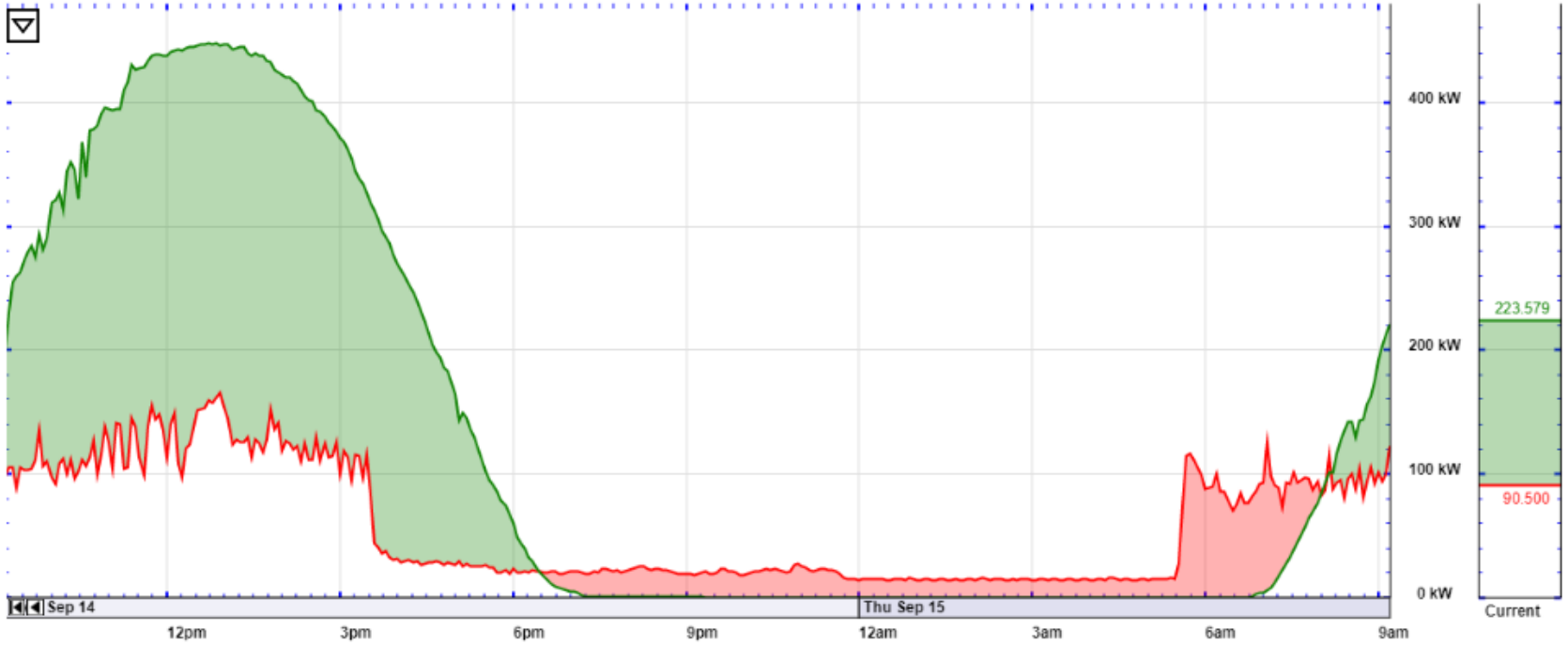
Summary for time-period shown in graph

Energy Used	1.39 MWh	(approx. $180.52 used)
Energy Generated	3.17 MWh	(approx. $411.75 saved)
Net	1.78 MWh sold	(approx. $231.23 earned)

Summary over last 30 days

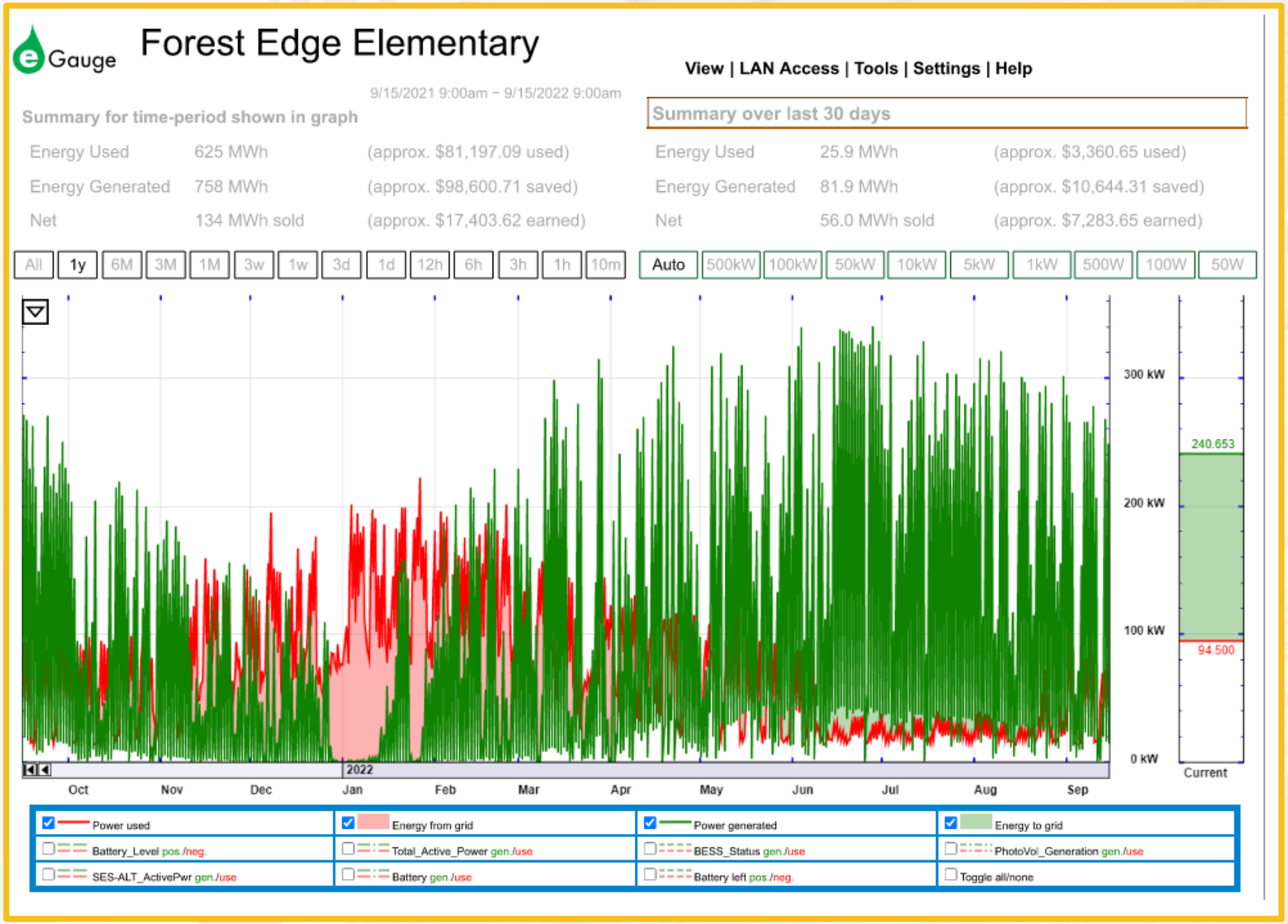
Energy Used	25.9 MWh	(approx. $3,360.51 used)
Energy Generated	81.9 MWh	(approx. $10,644.40 saved)
Net	56.0 MWh sold	(approx. $7,283.89 earned)

All | 1y | 6M | 3M | 1M | 3w | 1w | 3d | 1d | 12h | 6h | 3h | 1h | 10m | Auto | 500kW | 100kW | 50kW | 10kW | 5kW | 1kW | 500W | 100W | 50W



Power used	Energy from grid	Power generated	Energy to grid
Battery_Level pos./neg.	Total_Active_Power gen./use	BESS_Status gen./use	PhotoVol_Generation gen./use
SES-ALT_ActivePwr gen./use	Battery gen./use	Battery left pos./neg.	Toggle all/none

Information generated by: https://www.egauge.net/



Information generated by: https://www.egauge.net/

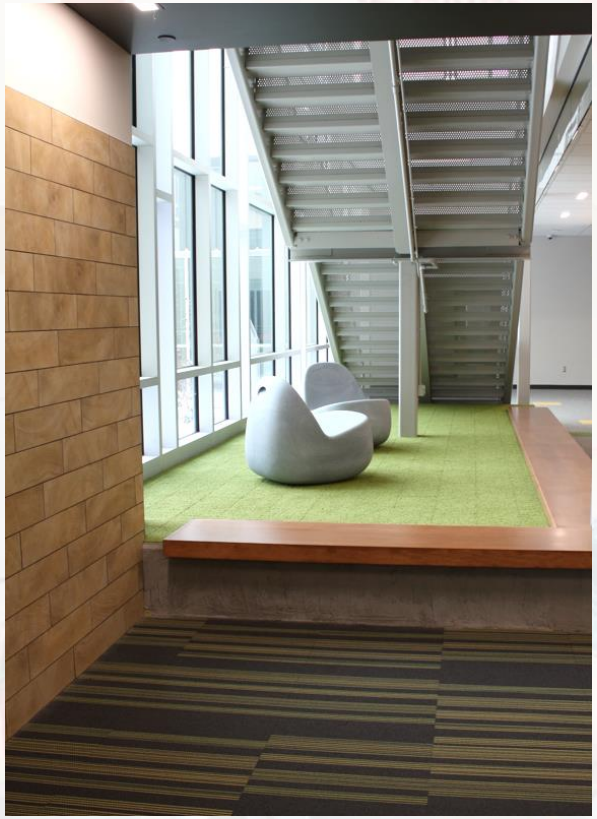
One Year Period:
Energy Used: 625MWh
Energy Generated: 758 MWh
Net: 134 MWh (sold)

Net Zero
Achievement!

biophilic design

natural imagery

fractal patterns



natural colors + finishes

natural daylight + views

How does a vibrant and unique sense of place, identity, and community **enhance** teaching and learning?

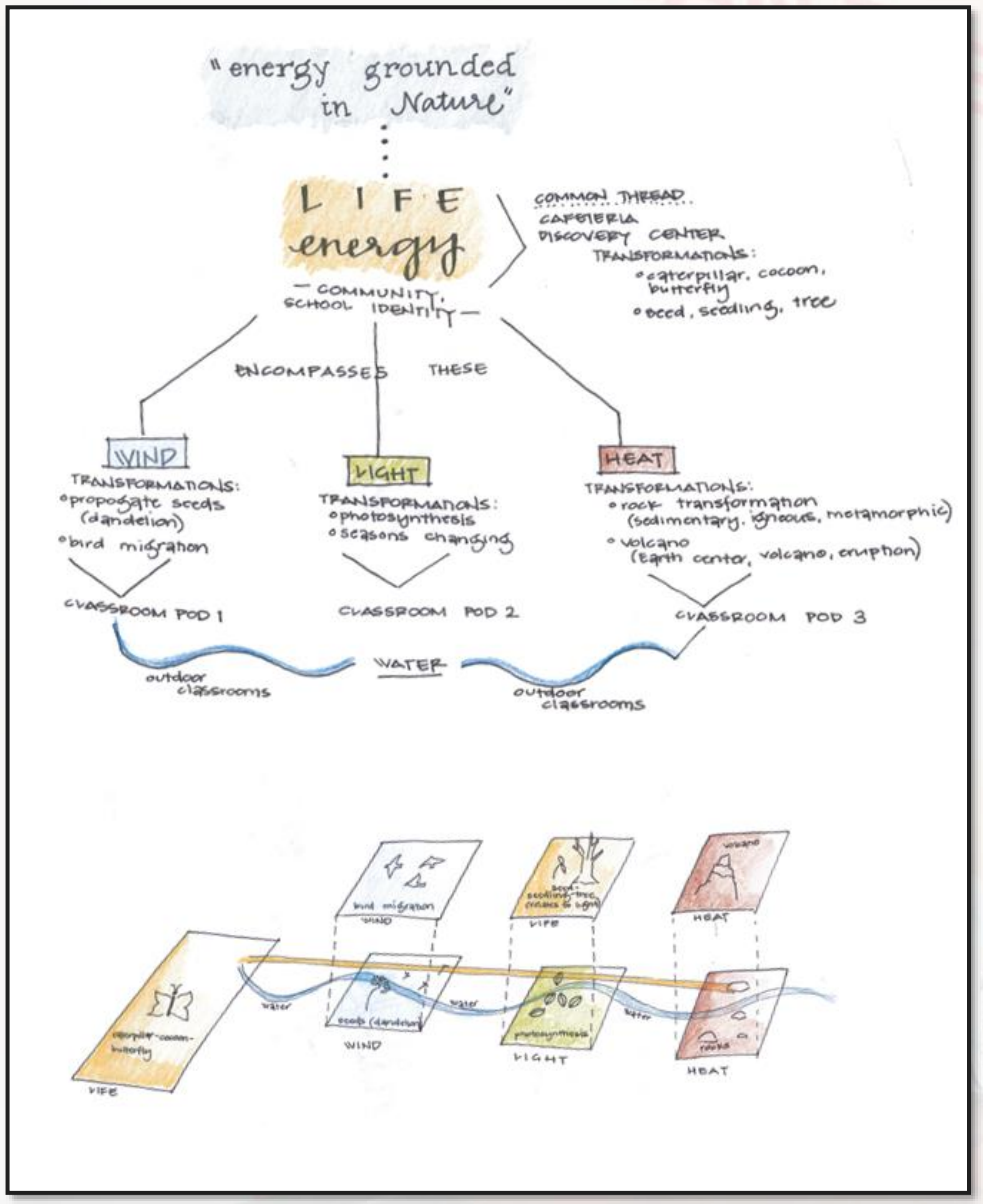
where design meets education

“Our Board and District has a long-standing commitment to being leaders in education and environmental stewardship.”

Dr. Leslie Bergstrom, Oregon School District Superintendent.

https://youtu.be/SqIF1V-s0eI

Kerri Modjeski, FES Principal



Energy Grounded in **Nature**

Life Energy

Light Energy

Wind Energy

Heat Energy

educator collaboration

IDENTITY QUESTIONS/THOUGHTS:

1. What does "Energy Grounded in Nature" mean to you?
   - Connection between natural processes and energy it produces or collects

   Based on your understanding of the project, how would you explain "Energy Grounded In Nature" to an elementary age student?
   - Energy can come from and is used in nature, nature can produce energy
2. What is a natural example of wind energy? Light energy? Heat energy?
   - Dandelion seeds spreading
   - Photosynthesis
   - Heat cooks food
3. How do graphics/illustrations aid your teaching? How do they aid student learning?
   - Help draw comparisons
     Example: we grew enough lettuce to feed 10000 earthworms
4. What colors come to mind when you think about wind energy? Light energy? Heat energy?
   - Wind – blue
   - Light – yellow
   - Heat -red
5. Are there aspects of your curriculum that relate to nature and energy? If so, explain.
   - Recycling
   - Garden
   - Kids walking to school – energy
   - weather and seasons changing

passive learning – learning on display

highlight natural processes + outdoors

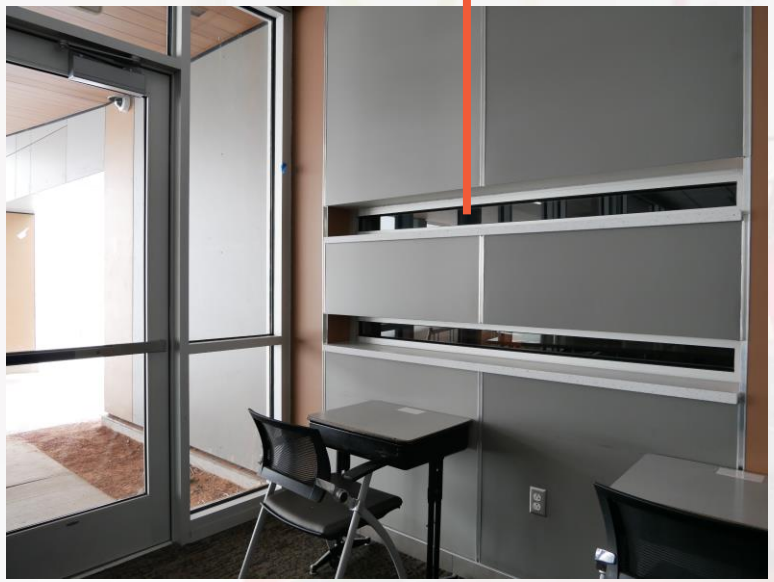
(nature)

highlight net zero systems

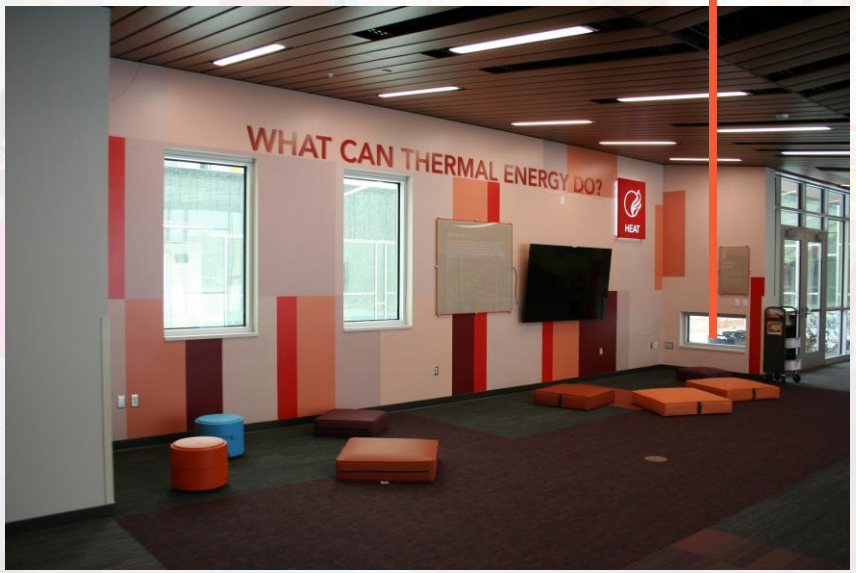
(energy)

Learning on display inspires curiosity and instills a sense of **lifelong learning**

passive learning – visibility to systems (energy)



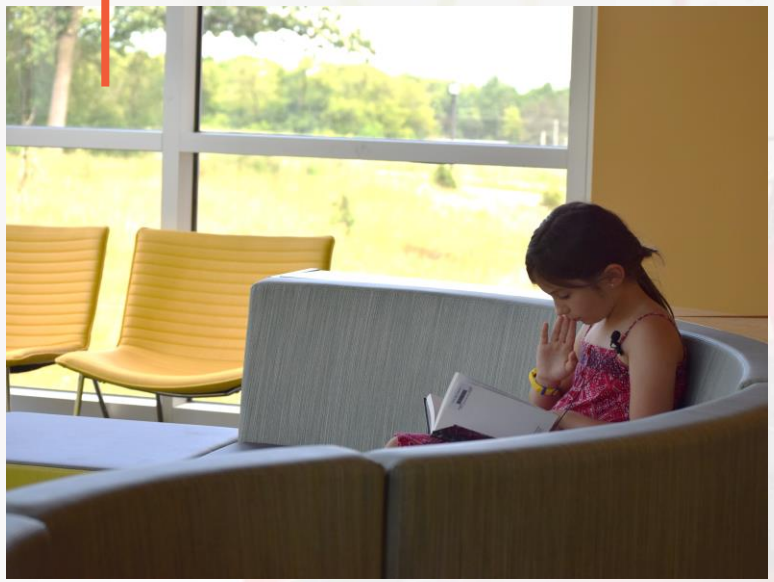
peek at geothermal vault



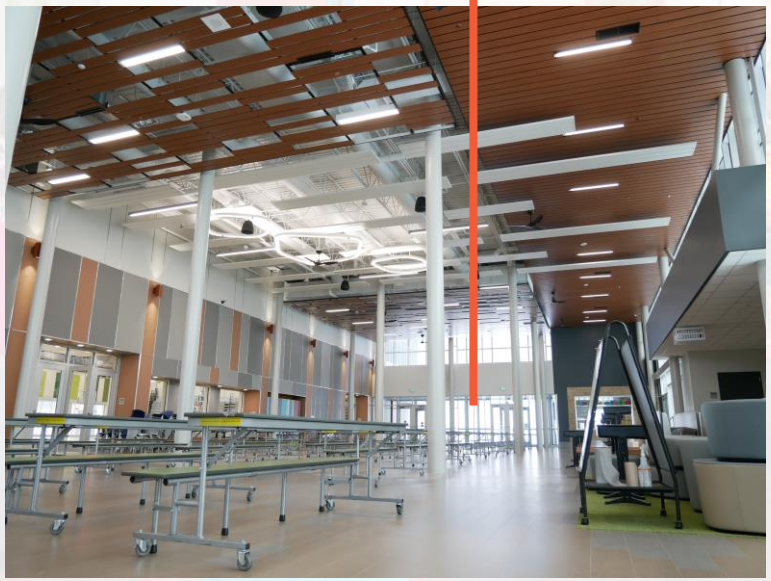
peek at green roof

peek at solar panels

passive learning – visibility to outdoors (nature)

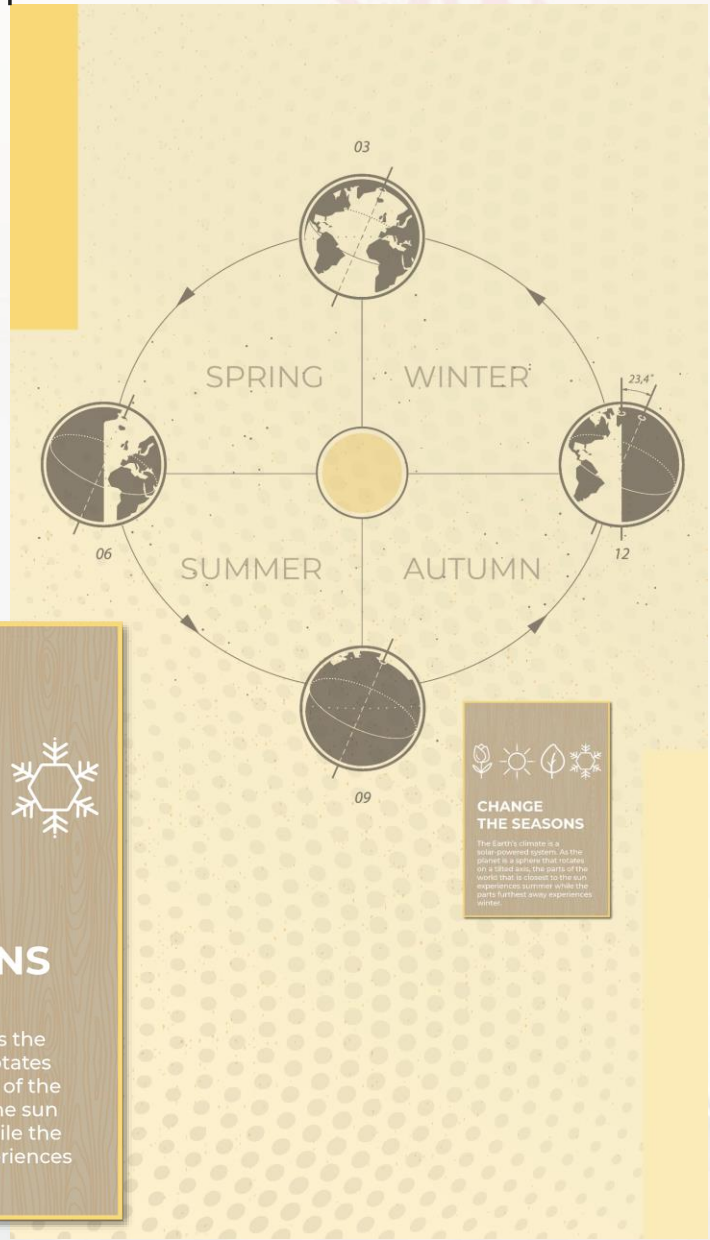


view to forest



view to wildlife

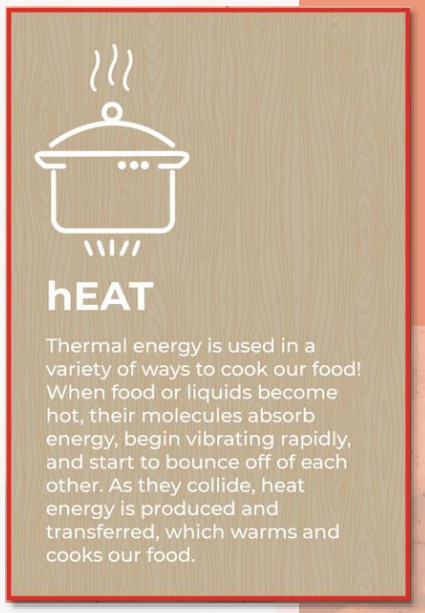
view to gardens

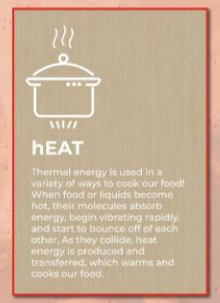


CHANGE THE SEASONS

The Earth's climate is a solar-powered system. As the planet is a sphere that rotates on a tilted axis, the parts of the world that is closest to the sun experiences summer while the parts furthest away experiences winter.

light energy



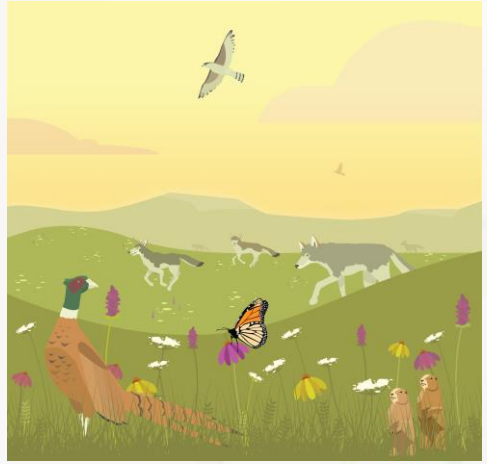


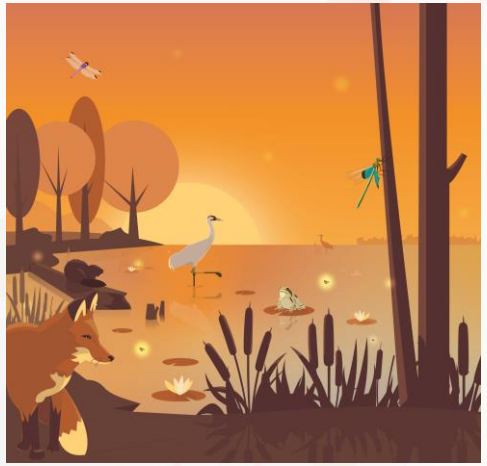
thermal energy

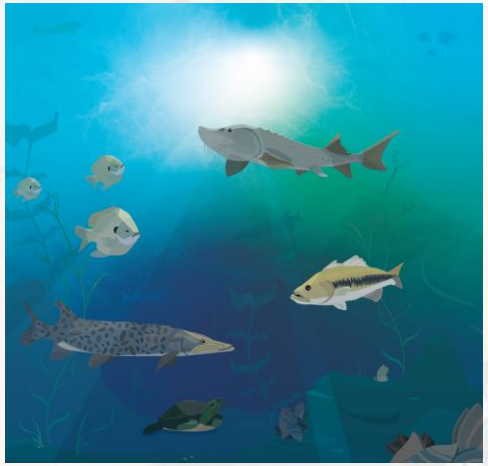
PLANTED BY NATURE

There is no limit to how far the wind can travel, and most people have seen the fluffy white tufts of Dandelion seeds floating on the breeze. Seeds are often carried as many as five miles from their origin!

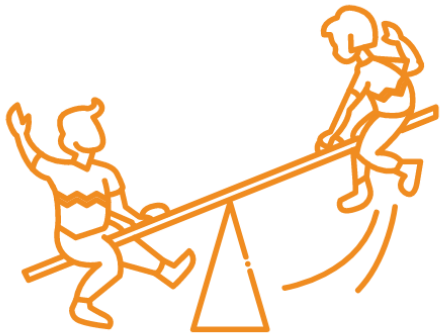
wind energy







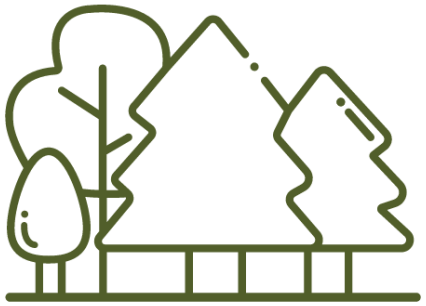
kindergarten graphics



our playground

Let's Move!

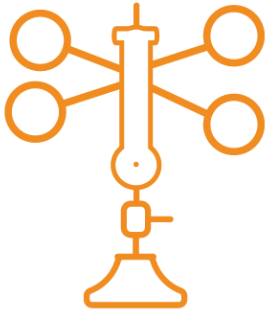
Exercising is part of being healthy and strong, and it is a lot of fun! What games can we play outside? What is your favorite part of our playground?



our forest

Our forest is important to us.

Forests provide habitats for animals and offer watershed protection that prevents soil erosion.



anemometer

An anemometer is a device for measuring wind speed.

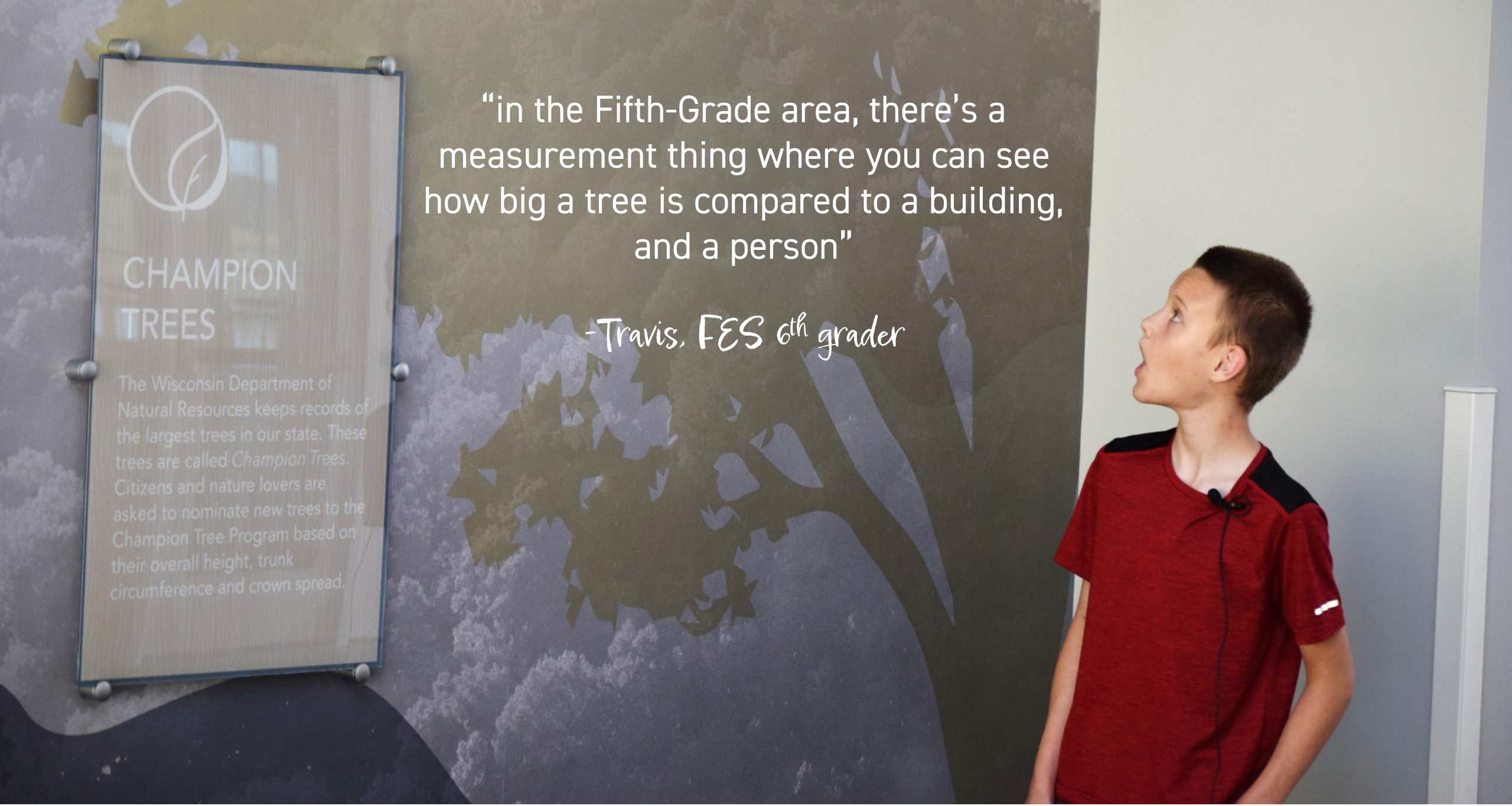
Anemometers are used with tornado data collectors, which measure the velocity, precipitation, and pressure of tornadoes.

our garden

We can grow our own food.

We learn about what plants need to grow, and how to be patient as seeds turn into plants. Some plants we eat as food. They give us energy and nutrients to be healthy and strong.

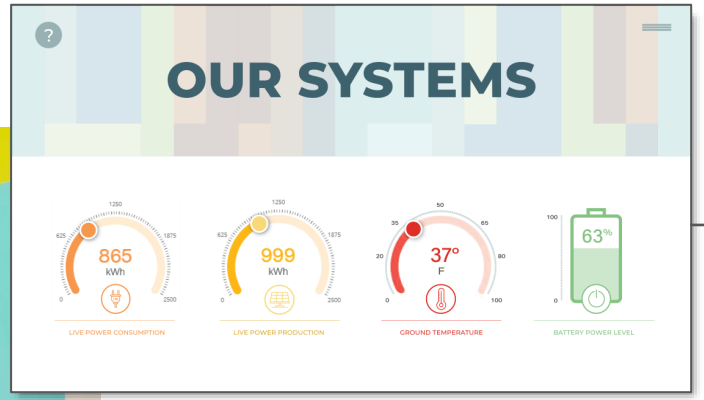
window graphics

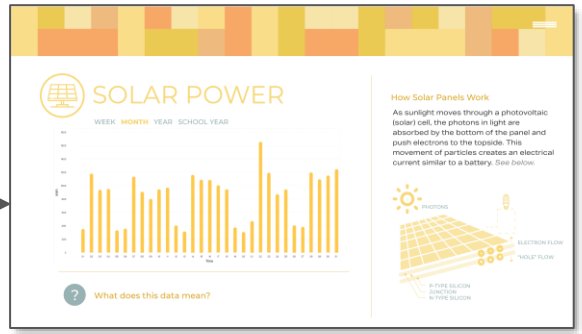


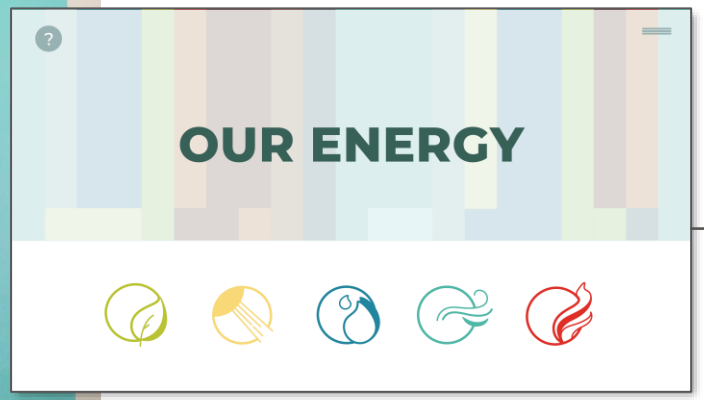
"in the Fifth-Grade area, there's a measurement thing where you can see how big a tree is compared to a building, and a person"

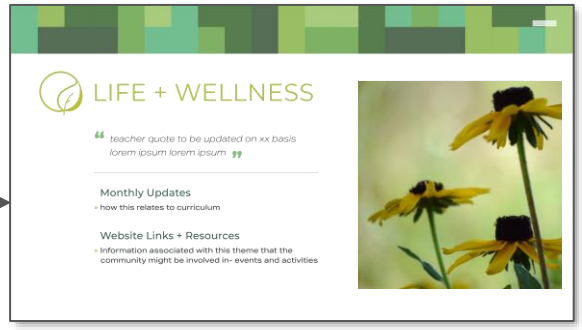
-Travis, FES 6th grader

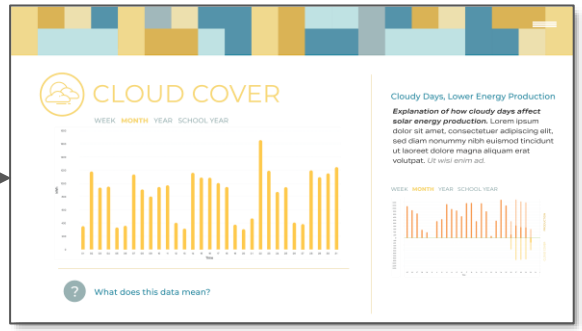
active learning







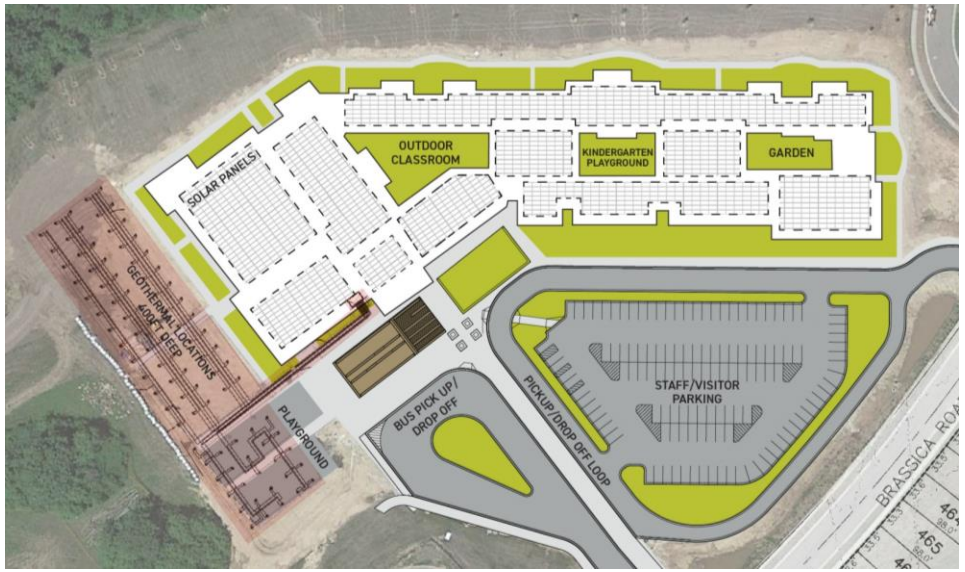




How about a **lesson?**

Lesson 1: photovol-t-what?

one solar (PV) panel

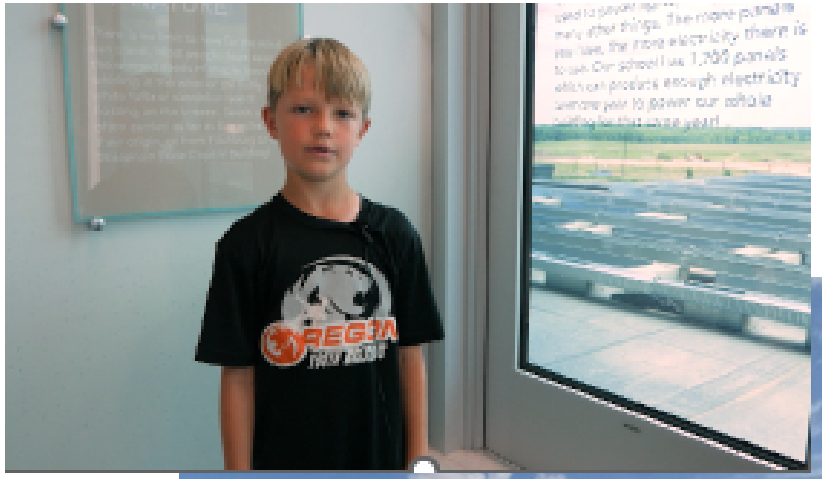


Our school gets power from the sun!

The roof has a lot of solar (photovoltaic) panels on it – can you guess how many?

_____ Solar Panels @FES

Lesson 1: photovol-t-what?

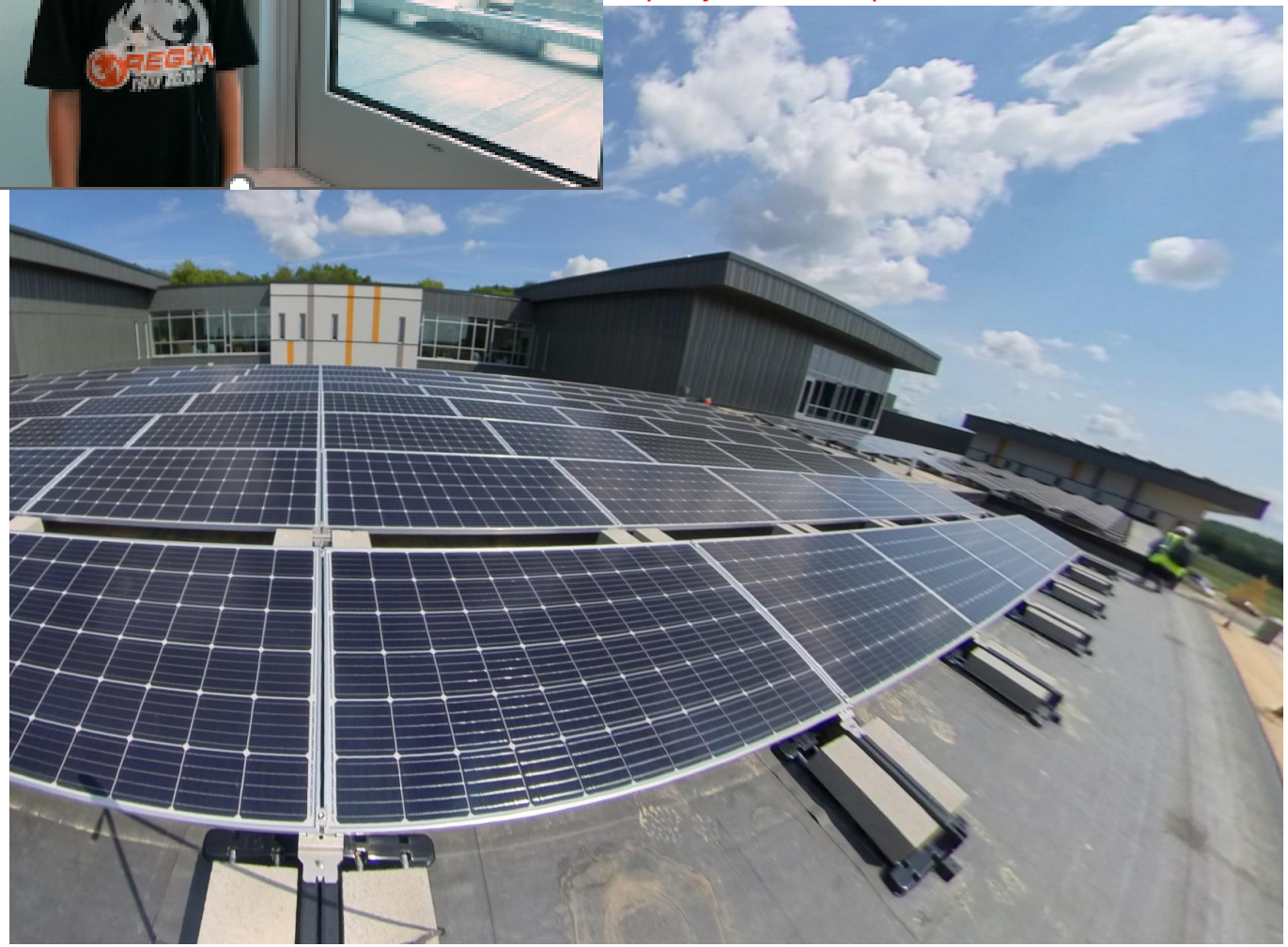


https://youtu.be/VsqP-Xkb7tk

Our school gets power from the sun!

The roof has a lot of solar (photovoltaic) panels on it – can you guess how many?

1704 Solar Panels @FES

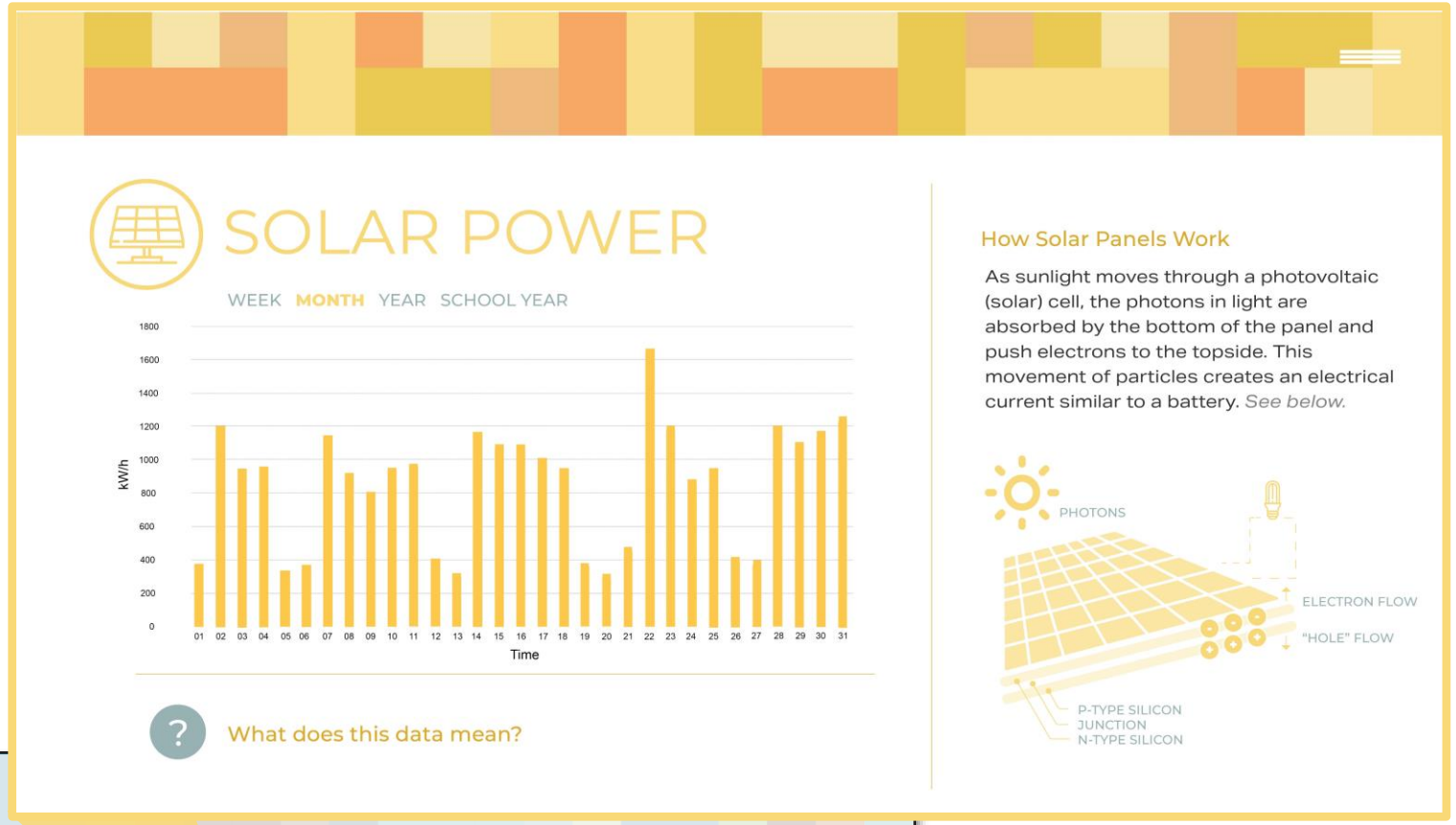


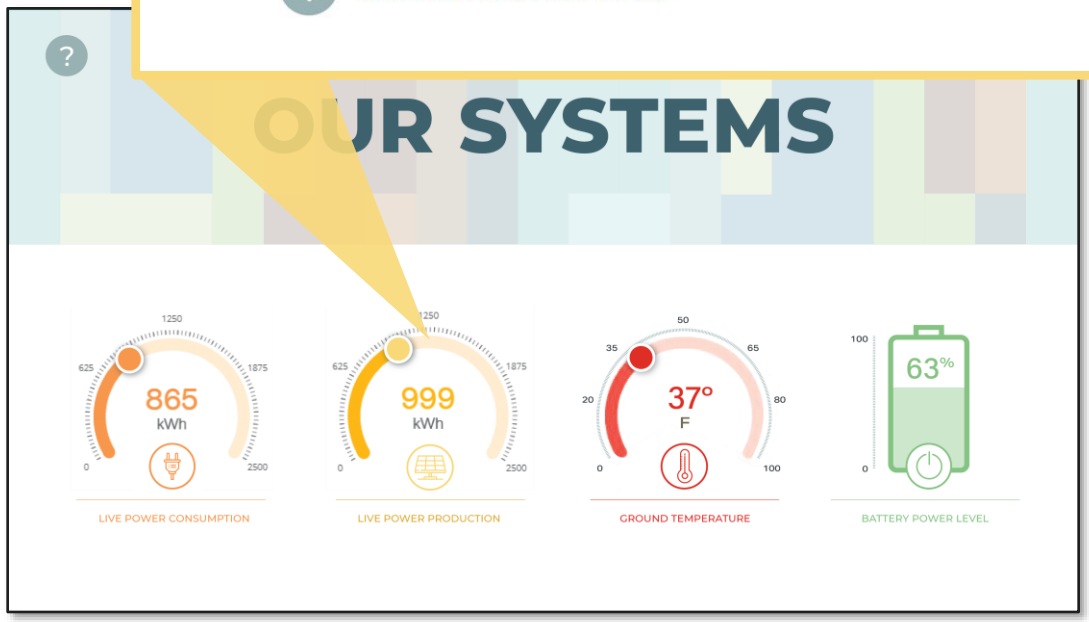
Lesson 2: lots of energy

Our school produces power!

How much solar energy did we produce on the 23rd of this month?

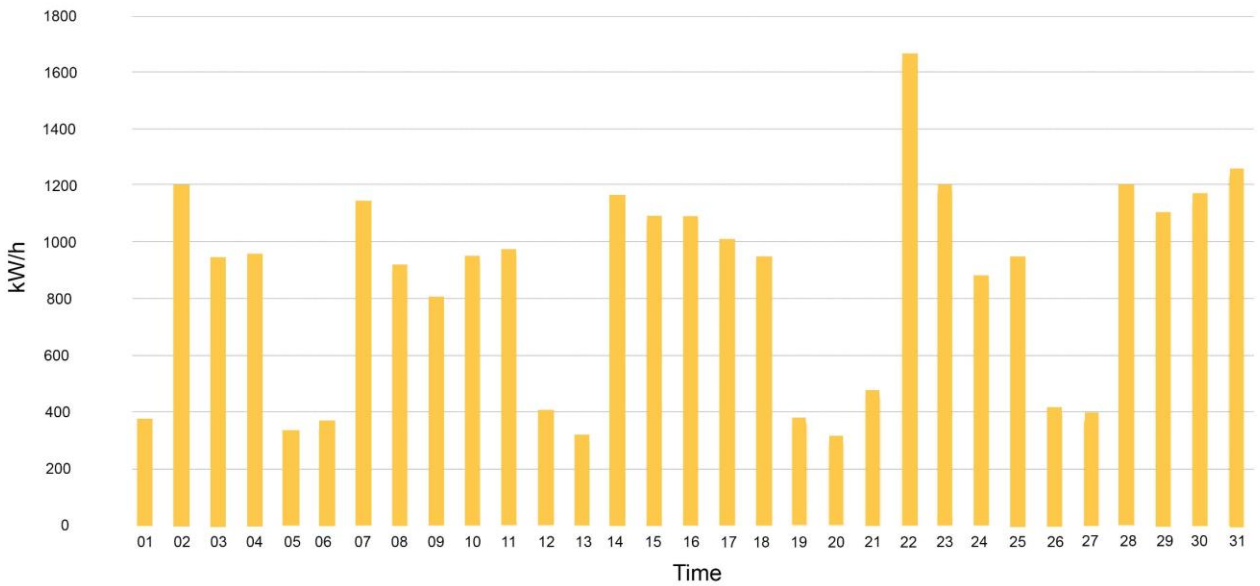
_____ kWh this month





SOLAR POWER

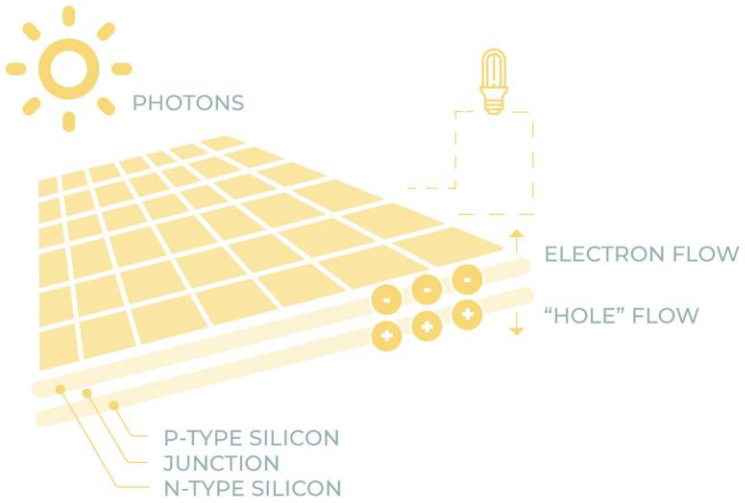
WEEK **MONTH** YEAR SCHOOL YEAR



What does this data mean?

How Solar Panels Work

As sunlight moves through a photovoltaic (solar) cell, the photons in light are absorbed by the bottom of the panel and push electrons to the topside. This movement of particles creates an electrical current similar to a battery. *See below.*

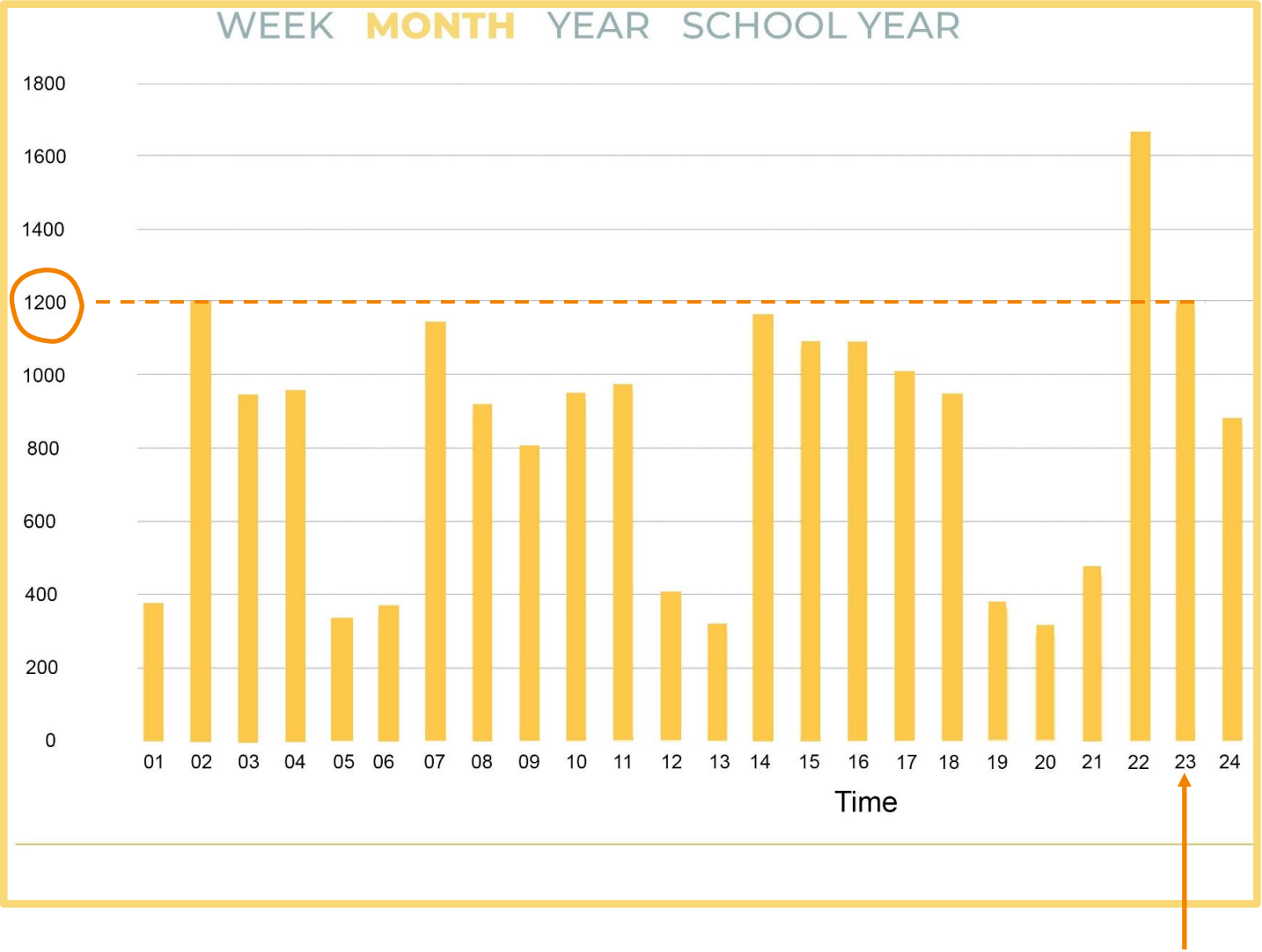


Lesson 2: lots of energy

Our school produces power!

How much solar energy did we produce on the 23rd of this month?

1200 kWh this month

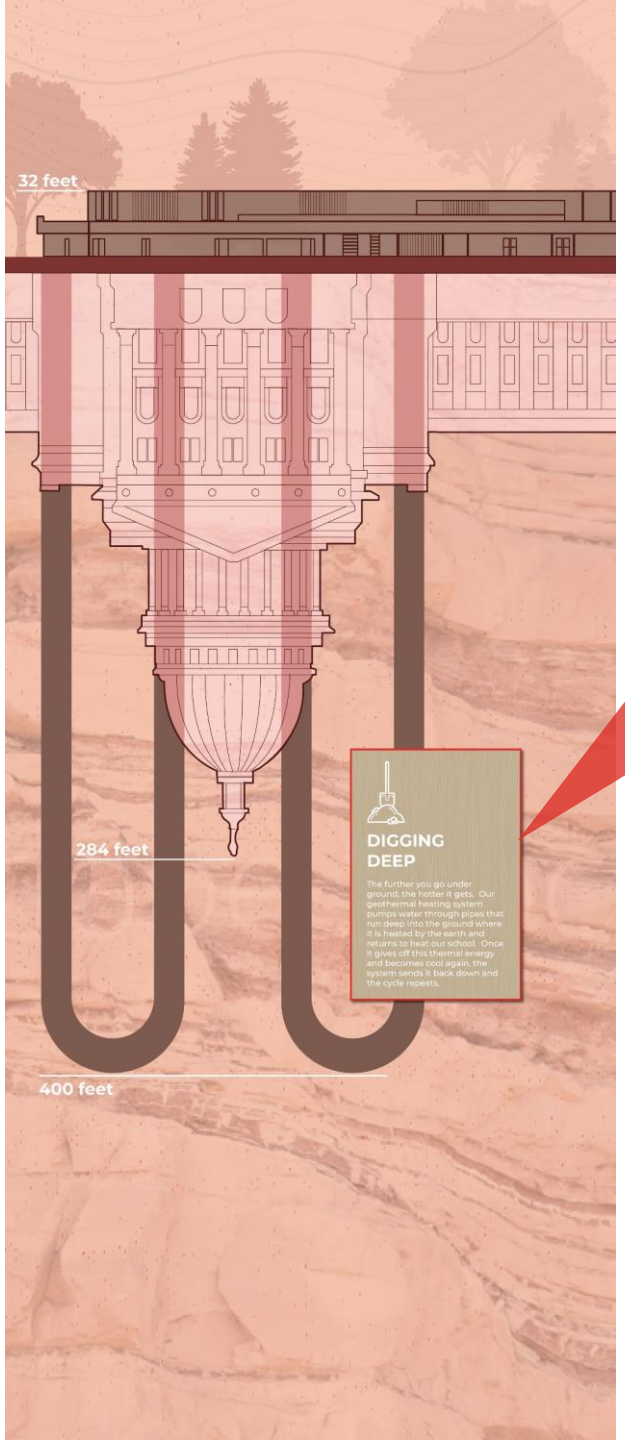


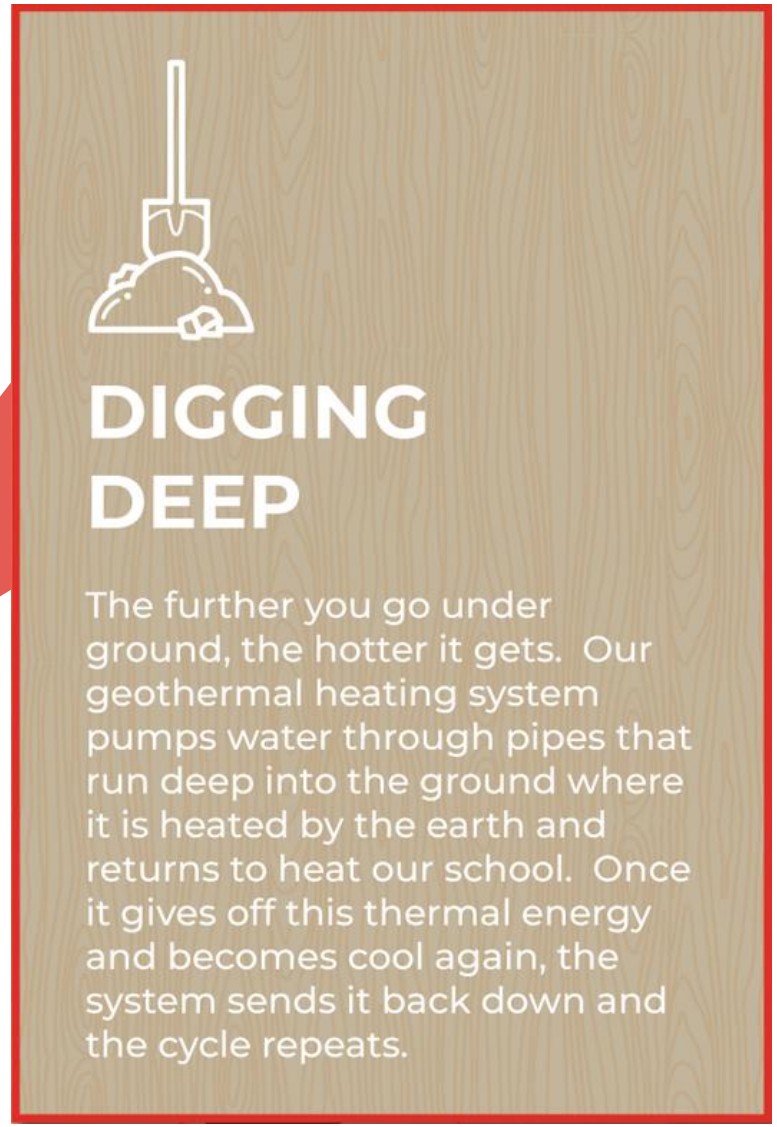
Lesson 3: how deep does it go?

Our school is heated by thermal energy underground!

Do you know how far down into the Earth the geothermal wells go?

_____ feet



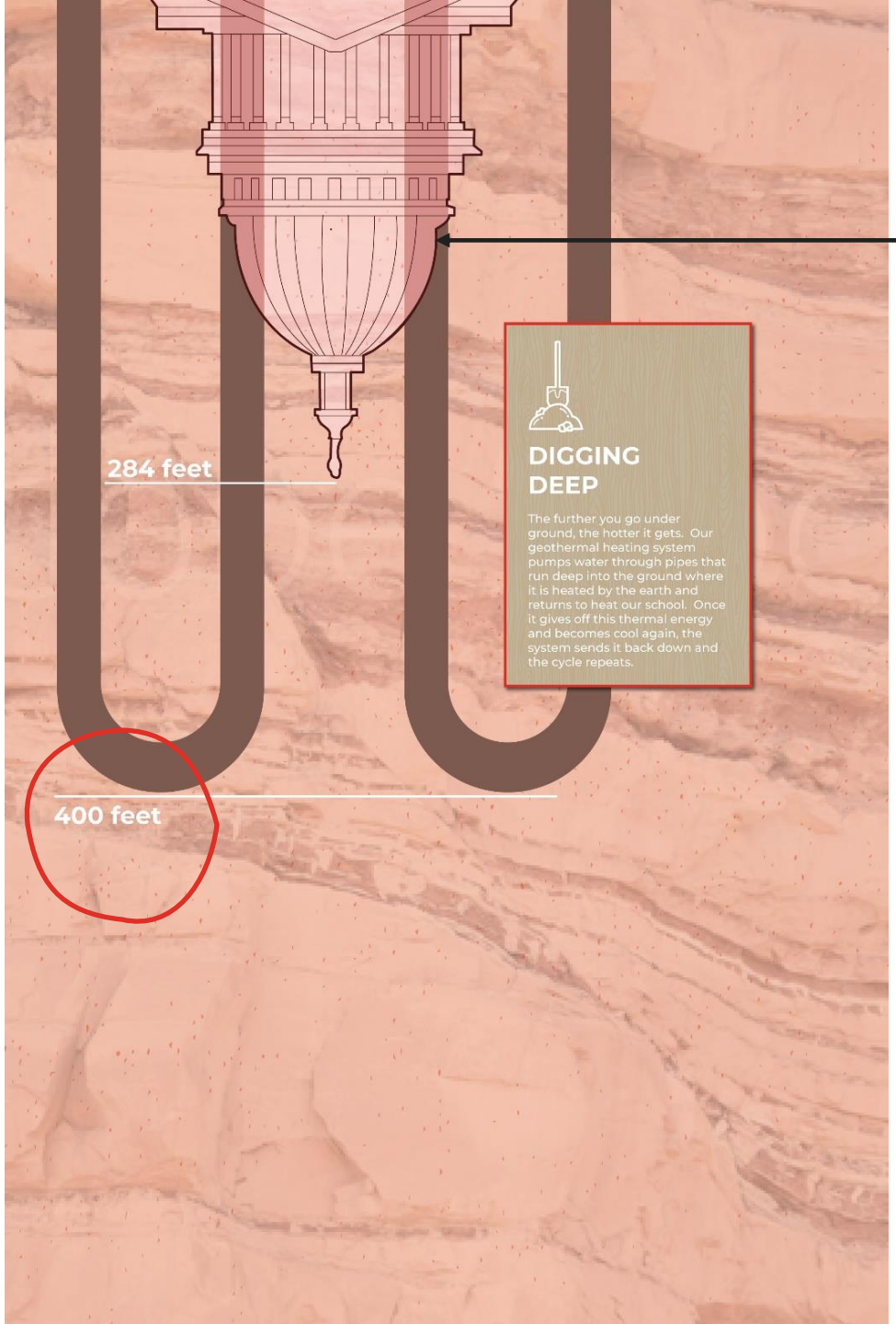


Lesson 3: how deep does it go?

Our school is heated by thermal energy underground!

Do you know how far down into the Earth the geothermal wells go?

400 feet



116 feet deeper than Wisconsin's State Capitol building is tall!

Lesson 4: veggie garden 101 (as told by FES students)

Our school garden helps feed us!

How do you plan a garden?

Step 1:_____

Step 2:_____

Step 3:_____

Step 4:_____

https://youtu.be/WQbbn9mx_yg

Lesson 4: veggie garden 101 (as told by FES students)

Our school garden helps feed us!

How do you plan a garden?

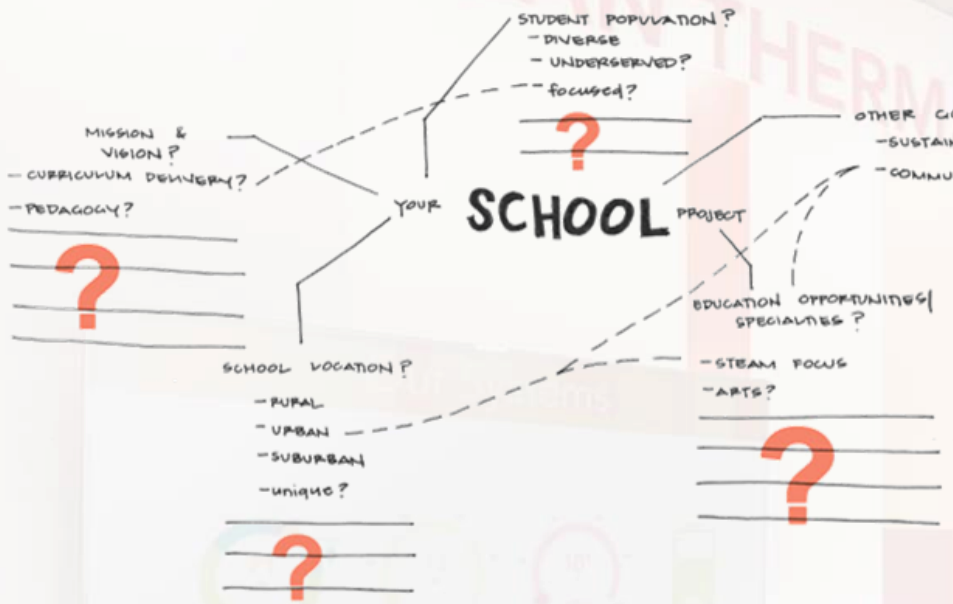
Step 1: CALCULATE PERIMETER AND AREA FOR YOUR PLANT BEDS!

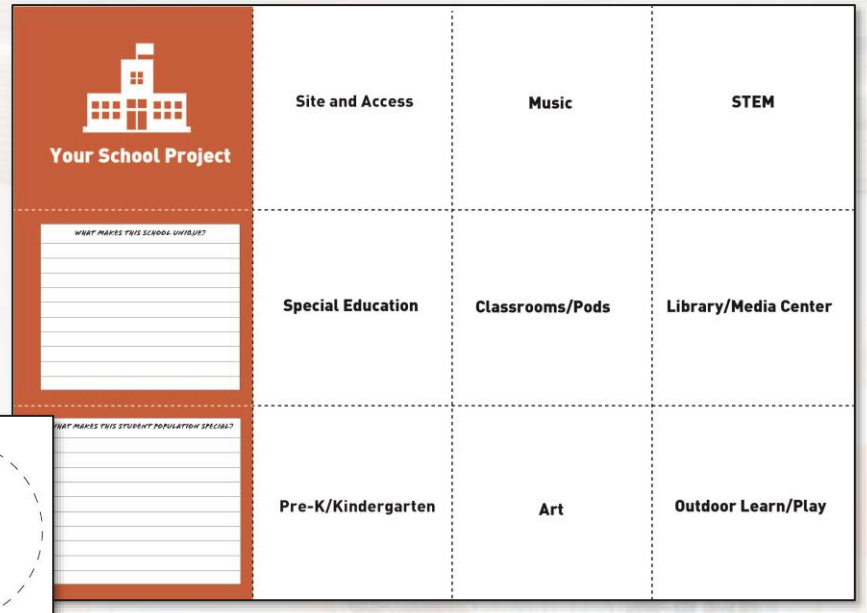
Step 2: FIGURE OUT WHAT PLANTS YOU WANT AND HOW MANY

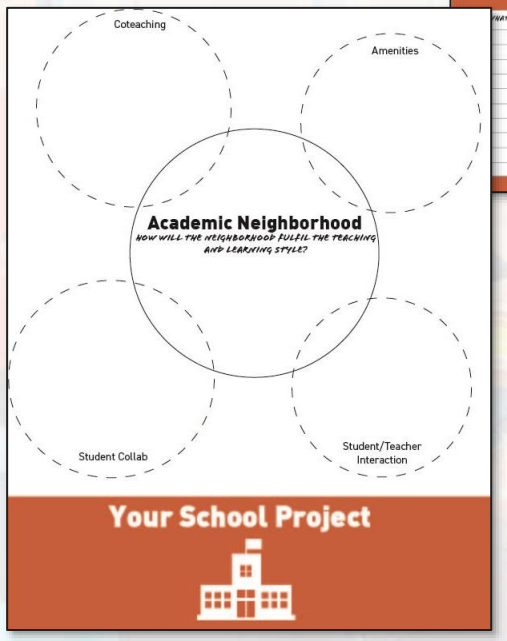
Step 3: MAKE SIGNS TO LABEL YOUR PLANTS

Step 4: MAKE SURE YOU TASTE IT!

How can you **cultivate** a sense of place and community in your next learning environment project?







throw it all **out there**

determine what makes your school **unique**


Becca,
Future teacher?
Karola,
Future gardener?
Luke,
Future artist?
Jack,
Future engineer?

Want to learn more about Forest Edge Elementary?

Reach out to our team
@brayarch.com

QR code?

thank you.

BRAYARCHITECTS