



DOT Exhibit DD

Phase 2 Sponsor Sign-off 4/19/22

Meeting Purpose

Background

In October/November 2021, the DOT LT met with the DOT sponsor, Erin, to report on progress after DD, phase 1 activities and received exhibit feedback from two partners - Biomimicry Institute and The Fleet. We were given permission to proceed to DD, phase 2, and asked to respond to overarching feedback. We are now moving from DD, phase 2 to DD, phase 3 which includes finalizing the exhibit for CDs and production.

Objective

The *Creatividad silvestre* / *Wild Creativity* exhibit team is preparing to transition from design development to construction documentation and is meeting with the sponsor to confirm forward movement.

Agenda

- Welcome (2 min)
- Guiding ideas and overarching responses (10 min)
- Logo (2 min)
- Layout (2 min)
- Components (15 min)
- Key Team Takeaways (20 min)
- Next Steps (5 min)

Addressing Sponsor & Partner Feedback

The team began with three main categories of feedback to address:

- 1) Content clarity & cohesion
- 2) Look & feel cohesion
- 3) Budget

Exhibition Basics

Broad theme: *Creatividad silvestre* / *Wild Creativity* (part of the *Designing our Tomorrow*, or *DOT* project) is an exhibition about sustainable engineering practices through the lens of biomimicry.

Target audiences: Girls aged 9-14 and their families

Languages: Spanish-English bilingual, leading with Spanish

Codevelopment processes include: Project leads, partners, and advisors from Latino communities; visitors' input from diverse cultural communities—including Latino communities; and consultants' input from the Oregon Commission for the Blind.

Big Idea: "Biomimicry engages us with nature's strategies to design solutions for the challenges we face in our own communities around the world."

Through the use of design challenges that are interactive, fun, and engaging, we aim to inspire our visitors and connect them with the fascinating world of biomimicry.

Theory of Action & Engagement

	THESE WILL MAKE ME NOTICE THE EXHIBIT:	THESE WILL INVITE ME TO THE EXHIBIT:	THESE WILL MAKE ME FEEL MORE ENGAGED IN THE EXHIBIT:	THESE WILL FOSTER A DEEPER ENGAGEMENT:
 VISUAL	Animals and plants People Vibrant colors	Diverse role models Playful-whimsical elements	Seeing my community	
 VOICE		Simple language Clear Instructions Altruistic situations Characters that challenge stereotypes	Stories of inspiration & empowerment Stories that make me feel hope	Collaboration Opportunities to feel more confident
 FEELINGS		Immersive experiences Hearing nature's voice An invitation to be creative	Stories that spike wonder & curiosity Connections to nature An optimistic perspective	Knowing why I'm doing this Working with communities
 ACTIVITY		Fun Opportunities to express my voice	Activities about improving the world	Learning new things Open-ended problems An invitation to be creative A space to embrace struggles

OMSI Strategic Plan



UN Global Goals
& Local Problem
Solving



Traveling
Exhibits



Culturally Inclusive
Experiences



Partnerships Serving
Communities

Exhibition Structure

This exhibit includes 12 interactive components divided into **3 thematic areas**:

1) Pillars (composed of *Pavilion/Entrance*, *Workshop*, *Biomimicry in Action*)

Components introducing biomimicry and creating a community space.

2) Community Challenges (composed of *Rooftop Garden*, *Kinetic Kites*, and *Helmet Drop*)

Design challenges focusing on how biomimicry solves community issues.

3) Nature's Inspiration (composed of *Kangaroo*, *Flea*, *Prairie Dogs*, and *Bird Beaks*)

Interactive components exploring nature's amazing engineering solutions.

**Creatividad
SILVESTRE**

La biomimesis transformando nuestro mundo



**WILD
Creativity**

Biomimicry changing our world

Exhibition Floor Plan



Exhibition Floor Plan



Exhibition Floor Plan



PILLARS

Components introducing biomimicry and creating a community space.

PAVILION OVERALL VIEW

At a glance: The exhibit entrance orients visitors and offers components that explore introductory biomimicry concepts. Copy includes a definition of biomimicry and examples of common biomimetic designs along with their natural inspirations. A light-up, push-button interactive invites visitors to see examples of useful functions and the natural strategies that achieve them.



COMIENZA AQUÍ GET STARTED

Una **función** es el propósito de algo – qué es lo que hace.

A **función** is the purpose of something – what it does.

Reservar un boleto, conducir un automóvil, hacer un video, lavar la ropa, usar gafas, jugar un deporte, etc.

Reservar un boleto, conducir un automóvil, hacer un video, lavar la ropa, usar gafas, jugar un deporte, etc.

- Función
- Estrategia
- Forma
- Material

¿Puedes crear una función para un objeto?

¿Puedes crear una estrategia para un objeto?

¿Puedes crear una forma para un objeto?

¿Puedes crear un material para un objeto?

Una **estrategia** explora cómo una función se lleva a cabo.

A **strategy** is how a function gets done.

Reservar un boleto, conducir un automóvil, hacer un video, lavar la ropa, usar gafas, jugar un deporte, etc.

Reservar un boleto, conducir un automóvil, hacer un video, lavar la ropa, usar gafas, jugar un deporte, etc.

- Función
- Estrategia
- Forma
- Material

¿Puedes crear una función para un objeto?

¿Puedes crear una estrategia para un objeto?

¿Puedes crear una forma para un objeto?

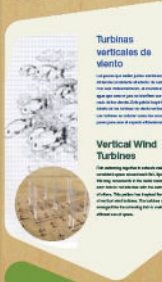
¿Puedes crear un material para un objeto?

USA TU CREATIVIDAD
CON INSPIRACIÓN DE LA
NATURALEZA.

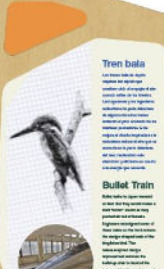
GET CREATIVE WITH
NATURE'S INSPIRATION.



Velcro®
Este producto fue creado por el ingeniero de velcro, el cual se inspiró en las semillas de la planta de la velcro. Las semillas de la planta de la velcro tienen un gancho que se adhiere a las fibras de la ropa.



Turbinas verticales de viento
Este tipo de turbinas de viento se inspiró en las aves que vuelan en un ángulo que les permite aprovechar el viento de cualquier dirección.



Tren bala
Este tipo de trenes se inspiró en el movimiento de los animales que se deslizan sobre el agua para reducir la resistencia.



Vertical Wind Turbines
Este tipo de turbinas de viento se inspiró en las aves que vuelan en un ángulo que les permite aprovechar el viento de cualquier dirección.

¿QUÉ ES LA BIOMIMESIS? WHAT IS BIOMIMICRY?

La biomimesis es una forma de ingeniería que aprende de las estrategias de la naturaleza para ayudar a resolver desafíos humanos.

Biomimicry is an approach to engineering that learns from nature's strategies to help solve human challenges.

WORKSHOP

OVERALL VIEW

At a glance: This gathering space encourages creative thinking, community building, and exploring more about biomimicry and the people practicing it. Visitors are invited to sit at the workshop table to create their own designs or gather on the bleacher-like seating along the mural wall. Designs can be pinned up to share with future visitors.



Workshop Pinup Wall (Frontside)



EL PROCESO DE LA BIOMIMESIS THE BIOMIMICRY PROCESS

Los Ingenieros y los ingenieras comienzan con una inspiración natural o con un desafío humano cuando practican la Biomimesis.

Engineers approach biomimicry starting either with a natural inspiration or with a human challenge.

ELIGE UNO CHOOSE ONE

Empieza con inspiración de la naturaleza
Start with inspiration from nature



1 Inspírate en un organismo, función o fenómeno de la naturaleza.
Inspire in observing biological or other phenomena.

2 ¿Qué función cumple ese organismo?
What function does that organism serve?

3 ¿Qué función humana podría ser mejorada con eso?
What human function could be improved by observing that strategy?

¿Cómo puedes mejorarlo?
How can you improve it?



4 Crea un diseño que imite esa estrategia de la naturaleza para resolver el desafío.
Create a design that imitates a strategy that nature has solved.

Empieza con un desafío humano
Start with a human challenge



1 Piensa en un desafío que los humanos estén enfrentando.
Think about a challenge people face.

2 ¿Qué función humana podría mejorarse con eso?
What human function could be improved with that challenge?

3 ¿Qué estrategia biológica podría ser mejorada para resolver eso?
What biological strategy or strategy from nature could be improved to solve that?

4 Crea un diseño que imite esa estrategia de la naturaleza para resolver el desafío.
Create a design that imitates a strategy that nature has solved.

Workshop Pinup Wall (Backside)



CANBIEMOS EL MUNDO.

Las personas alrededor del mundo están usando biomimética para mejorar el manejo de la agricultura, la energía limpia y el transporte.

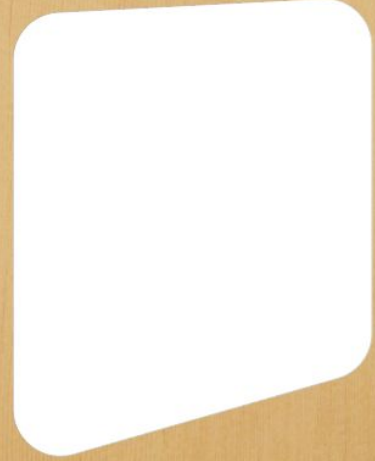
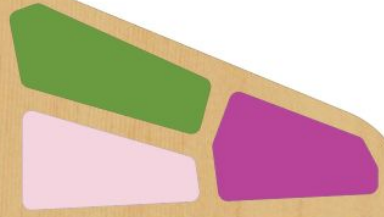
¿Qué te inspira?



LET'S CHANGE THE WORLD.

People around the world are using biomimetry to improve approaches to agriculture, clean energy, and transportation.

What inspires you?



Workshop

Bleacher Wall



3D for shape reference only (2D IN PROGRESS)



Workshop

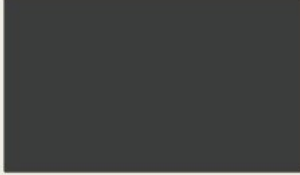
Back of Bleacher Wall

At a glance: The back wall of the mural/bleacher seating features videos of people around the world who are solving challenges through biomimicry and sustainable engineering. A flip-up door interactive shares seven of nature's design principles revealing examples from the human-built and the natural worlds.



DISEÑANDO PARA UN CAMBIO

Explora las historias de cuatro participantes del desafío de diseño de biomimétsis.



FullHD
Play All

DESIGNING FOR CHANGE

Explore the stories of four biomimicry design challenge participants.

PRINCIPIOS DE DISEÑO DE LA NATURALEZA DESIGN PRINCIPLES FROM NATURE

La biomimétsis es más que encontrar ideas en la naturaleza para hacer cosas que funcionan. La biomimétsis utiliza los principios de la naturaleza para hacer diseños más sostenibles.

Abre las puertas para ver ejemplos de los principios de diseño de la naturaleza.

Biomimicry is more than finding ideas in nature to engineer designs that work. Biomimicry uses principles from nature to engineer more sustainable designs. Open the doors to see examples of some design principles from nature.



Se responde y resiste. Da respuesta and resists.



Si una partícula se sitúa fuera de su zona local. Da a un bien-timed part of the local environment.



Use materiales que sean fuertes, duros y abundantes. Use safe, local, and abundant materials.



Use energía que no contamine. Use sustainable energy that does not pollute.



Material de naturaleza que sea fácil de limpiar. Materials from nature's to clean easily.



Use la forma para apoyar la función. Use shapes to support function.



Use la eficiencia en el uso del espacio y los materiales. Make efficient use of space and materials.

BIOMIMICRY IN ACTION

OVERALL VIEW

At a glance: Visitors explore the work of Design Challenge winners and participants in this 5-panel component. Five teams of biomimics are introduced in three panels. Every panel has a large book that features team members, the challenge, and their biomimetic solutions. The fourth panel shows videos of the teams.

The fifth panel is an interactive that demonstrates *The Reflective Roof Design* inviting visitors to experiment with prisms to direct light away from the city.



Biomimicry in Action

Unit A



Biomimicry in Action

Unit B



FRONT,
Unit B

**Enfriando nuestras
ciudades** **Cooling down
our cities**

REFLEJA

El Diseño del techo reflectante usa prismas modulados según los patrones triangulares de las hormigas planeadas del Sahara. En ciertos ángulos, un prisma triangular refleja toda la luz que entra por un lado hacia otro.

REFLECT

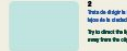
The Reflective Roof Design uses prisms modulated after the triangular trails of the Saharan silver ant. At certain angles, a triangular prism reflects all of the light that enters from one side out another side.



Refleja la luz solar lejos de la ciudad.
Reflect sunlight away from the city.



1
Una vez que los prismas están en posición, ¿cómo se reflejan?
Once back in place, how does the light reflect away from the city?



2
Trata de dirigir la luz lejos de la ciudad.
Try to direct the light away from the city.



3
¿En todos los prismas puedes reflejar toda la luz? ¿Puedes dirigir la luz hacia afuera? ¿Cómo lo haces con un prisma?
Does every prism reflect all the light? Can you direct the light away from the city? How do you do it with a prism?



4
¿En todos los prismas puedes reflejar toda la luz? ¿Puedes dirigir la luz hacia afuera? ¿Cómo lo haces con un prisma?
Does every prism reflect all the light? Can you direct the light away from the city? How do you do it with a prism?



BACK, Unit
B

EXPLORA EN TU COMUNIDAD
EXPLORE IN YOUR COMMUNITY

Ve al zoológico
Go to the zoo

Visita un parque
Visit a park

Haz senderismo
Take a walk in nature

¿CÓMO VAS A COMENZAR CON TU VIAJE BIOMIMÉTICO?
HOW WILL YOU START YOUR BIOMIMICRY JOURNEY?

Descubre la naturaleza
Get inspired by nature

Define el desafío
Identify a Challenge

Escanea este código QR para obtener ideas sobre cómo puede inspirarte en la naturaleza.
Scan this QR code for ideas for how you can get inspired with biomimicry.

BIOMIMICRY INSTITUTE

COMMUNITY CHALLENGES

Design challenges focusing on how biomimicry solves community issues.

Rooftop Garden

At a glance: At this iterative game, visitors are invited to use a touchscreen interface to design a garden that produces the most yield, which can be improved by mimicking natural ecosystems where certain plants are benefitted by growing near one another. Visitors are prompted to place crops in different squares on the digital garden, then improve their design to grow fresh produce for an urban family. After filling the garden with crops of their choice, on-screen feedback offers a yield score encouraging visitors to try again for a higher yield by utilizing biomimetic systems strategy.



COLABORA COLLABORATE

En ecosistemas naturales, muchas plantas cubren sus necesidades individuales y se benefician unas a otras mientras crecen en conjunto.

In natural ecosystems, many plants have their individual needs met and benefit each other while growing together.



Let's build gardens with things that grow well together. It's a natural ecosystem that's naturally fit to grow together.

Let's build gardens with things that grow well together. It's a natural ecosystem that's naturally fit to grow together.

Let's build gardens with things that grow well together. It's a natural ecosystem that's naturally fit to grow together.



"It's so much fun to see plants growing together. It's a natural ecosystem that's naturally fit to grow together. It's so much fun to see plants growing together. It's a natural ecosystem that's naturally fit to grow together."

Many plants in natural ecosystems have their individual needs met and benefit each other while growing together.



Diseña un jardín de techo. Design a rooftop garden.



Diseña un jardín de techo. Design a rooftop garden.



Design A Helmet

At a glance: Visitors select and stack inserts modelled after hedgehog quills, cat paw pads, and pomelo rinds into a cabinet to design a helmet cushion that will protect a bicycle rider. After closing the door, visitors see a hammer fall on their design. Results are displayed as on-screen feedback. Visitors continue to iterate to improve their design and create the safest possible cushion for a bike helmet.



Kinetic Kites

At a glance: Mimicking natural strategies like flying squirrels, dandelion seeds, and gliding birds, visitors will design, build, and test kite models to generate electricity. Bins provide a variety of materials (paper, pipe cleaners, etc.) for visitors to construct a kite that floats in a wind tube. Once visitors connect their design to a test station and push the button, on-screen feedback displays a real-time measure of the energy generated by their kite encouraging visitors to iterate its design.





Diseña una cámara o teléfono para generar electricidad. Design a life to generate electricity.

1.  **1** 1. Conecta un cable a la batería.
Connect a wire to the battery.
2.  **2** 2. Conecta un cable a un motor.
Connect a wire to a motor.
3.  **3** 3. Conecta un cable a un ventilador.
Connect a wire to a fan.

VUELA FLY

Muy poco peso y una superficie amplia ayudan a las plantas y los animales a planear, flotar y remontarse a través del aire.
Light weights and large surface areas help plants and animals to glide, float, and soar through the air.



1 1. Pasa una alfiler por el centro de la hoja. Usa un clip para mantenerla plana.
Pass a pin through the center of the leaf. Use a clip to keep it flat.

2 2. Corta una ranura en el centro de la hoja para que se levante al ser lanzada.
Cut a notch in the center of the leaf so it will rise when you throw it.

3 3. Pasa una alfiler por el centro de la hoja. Usa un clip para mantenerla plana.
Pass a pin through the center of the leaf. Use a clip to keep it flat.



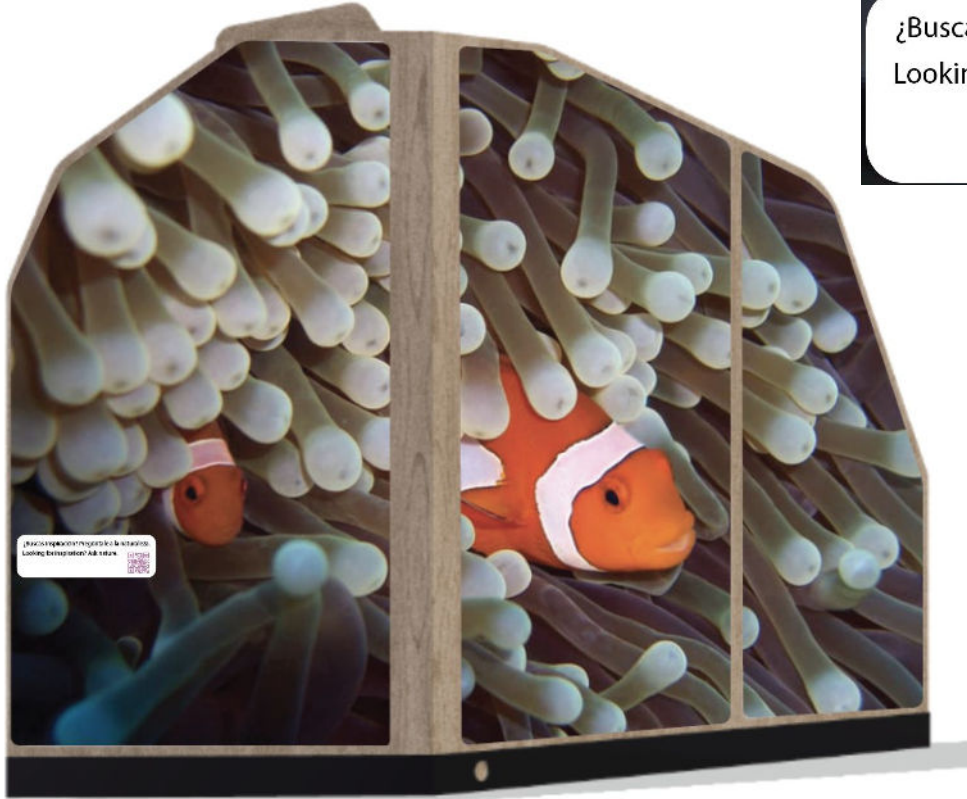
1 1. Corta y plegue la hoja para que se levante al ser lanzada.
Cut and fold the leaf so it will rise when you throw it.

2 2. Pasa una alfiler por el centro de la hoja. Usa un clip para mantenerla plana.
Pass a pin through the center of the leaf. Use a clip to keep it flat.



1 1. Corta la semilla de la dandelión y pégala en un pedacito de papel.
Cut the dandelion seed and glue it to a piece of paper.

2 2. Pasa una alfiler por el centro de la semilla. Usa un clip para mantenerla plana.
Pass a pin through the center of the seed. Use a clip to keep it flat.



¿Buscas inspiración? Pregúntale a la naturaleza.
Looking for inspiration? Ask nature.



DRAFT COPY



NATURE'S INSPIRATION

Interactive components exploring nature's amazing engineering solutions.

Bird Beaks

At a glance: Demonstrating nature's design principle that form follows function, three food gathering tasks challenge visitors find the right tool for the job. Using oversized models of three beaks birds, visitors attempt to crush a seed, gather nectar, or locate insects and determine which beak is best for each task. Panels show the three birds and describe their particular beak adaptations.





**Alimentar al colibrí.
Feed the colibri.**

**Encuentra el pico que funciona mejor para cada tarea.
Find the beak that works best for each task.**



¡Cuello largo!
Long neck!



¡Cuello corto!
Short neck!

Lower beak: able to reach deep into the flower to get nectar. The longer the neck, the more nectar it can reach.

Upper beak: able to reach shallowly into the flower. The shorter the neck, the more nectar it can reach.

**Tallar la savia.
Chop the sap.**

**Resaca el insecto.
Pit the bug.**



ALIMENTA

Los picos de los pájaros están adaptados para conseguir comida.

Elige el pico que mejor se adapte a cada tarea para conseguir comida. Píntalo en los dibujos de las aves que ves.

FEED

Bird beaks are adapted to get food.

A bird's beak is a specialized tool for feeding. Use it to get the different types of food.

¡Cuello largo! Long neck!	¡Cuello corto! Short neck!	¡Cuello medio! Medium neck!
 <small>• Puede llegar a profundidades. • Puede conseguir comida que otros no pueden. • Útil para conseguir comida que está en lugares altos. • Útil para conseguir comida que está en lugares bajos.</small>	 <small>• Puede conseguir comida que otros no pueden. • Útil para conseguir comida que está en lugares altos. • Útil para conseguir comida que está en lugares bajos.</small>	 <small>• Puede conseguir comida que otros no pueden. • Útil para conseguir comida que está en lugares altos. • Útil para conseguir comida que está en lugares bajos.</small>

Kangaroo

At a glance: Visitors adjust the angle of trampolines and select the drop height of a ball to see if they can bounce the ball to one of three targets while learning about how kangaroos bounce to gain energy.





REBOTA
Los canguros rebotan hacia adelante.

Los canguros de la gran familia de los macropodidos saltan como un trampolín. Cuando saltan rebotan. En otros macropodidos (como los canguros) el movimiento de rebote hacia adelante. Los canguros de la gran familia de macropodidos pueden saltar a una altura de 10 metros.



BOUNCE
Kangaroos bounce forward.

Powered by a kangaroo's long tail, kangaroos lift the kangaroo's tail up, the kangaroo bounces. Then, they quickly push the kangaroo forward. Kangaroos can jump up to 10 meters high and take energy all in one leap.



Flea

At a glance: Mimicking how fleas store and release energy to make big jumps, visitors adjust the angle of the launcher and the amount of tension in the spring to see if they can launch a ball (a flea) to a target (a cat, a dog, or a horse). Visitors iterate to improve their aim and learn about stored energy.



SALTA

Las pulgas usan un elástico natural para viajar lejos rápidamente.

Las pulgas usan un elástico para apretar una estructura similar a un resorte biológico, al mismo se le conoce que es el elástico. Como una estructura, una vez comprimido se libera rápidamente, lanzando a la pulga hacia arriba y adelante.



JUMP

Fleas use a natural elastic to travel fast and far.

A flea uses its structure to squeeze an elastic structure to the back legs, the spring like structure you see here stretches the leg structure once compressed. It releases quickly, sending the flea up and away.



Las pulgas utilizan un elástico natural para viajar lejos rápidamente. Este elástico se comprime y libera rápidamente, lanzando a la pulga hacia arriba y adelante.



Prairie Dogs

At a glance: There are two “mound” entrances in this exhibit and one wind source. Visitors stack prairie dog tunnel “mounds” of different shapes and heights at the entrances to change airflow within the tunnel. An anemometer indicates the current airflow displayed on a digital readout. Data display is immediate, allowing visitors to quickly improve their mound designs.





En este vídeo se muestra cómo se puede hacer un modelo de un sistema de ventilación para un hogar. Este modelo puede ser utilizado para explicar el funcionamiento de un sistema de ventilación en un hogar.

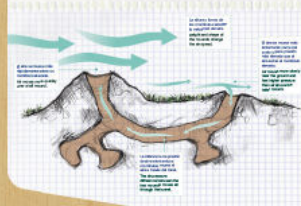
VENTILA VENTILATE

Los perritos de las praderas usan el viento para ventilar sus hogares.

Los perritos de las praderas construyen galerías con aperturas a diferentes alturas. Las aberturas de perritos de las praderas ayudan al aire de nuevo cuando el viento sopla.

Prairie dogs use the wind to ventilate their homes.

Prairie dogs build tunnels with openings at different heights. Openings at air pressure of each opening cause air exchange through their tunnels.



Haz que el aire se mueva a través del túnel.
Get the air moving through the tunnel.



Haz que el aire se mueva a través del túnel.
Get the air moving through the tunnel.



Key Team Takeaways

- Reflection on addressing feedback and gaps since phase 1 presentation?
- What are you excited about or proud of?
- What have we learned that we can impart to future work?
- Anything you want to share with your teammates?

Next Steps

DD, Phase 3

- Develop plan for addressing Sponsor feedback, questions
- Wrap-up prototyping
- Finalize copy
- Finalize graphics
- Finalize 3D

Construction Documentation

Production

Install