



## 2025-2026 EXHIBIT DESIGN CHALLENGE

The ZOOMS STEM Design Challenge presented by Flint Hills Resources offers students a chance to develop a solution to a ‘real’ problem faced by Zookeepers and staff at the Minnesota Zoo. While designing an engaging enrichment for an animal, the problem will challenge students to use the engineering design process while applying their science and math knowledge, creativity, and problem-solving skills to best solve the problem and present a solution.



### THE CHALLENGE

The Minnesota Trail’s outdoor bird deck was once a space for birdwatchers to observe wild birds visiting a variety of bird feeders, but today, it sits quiet and unutilized. Minnesota Zoo leaders see this as a golden opportunity imagining how this space could be used while still offering guests the opportunity to continue to connect to native Minnesota birds in a more purposeful way. Therefore, the Zoo is envisioning a brand-new ‘Raptor Experience’—a series of three modern habitats that would include expanding our Bald Eagle’s home and bring at least two new behind-the-scenes raptor species into new dedicated homes for public view; the great horned owl, red-tailed hawk, and/or burrowing owls. The Zoo is looking for help developing this concept to transform the space into a purposeful destination meets animal and zookeeper needs while also serving as a platform to teach guests about the importance of Minnesota bird conservation and tell the rehabilitation story of all the raptors in our care.

## THE TASK

The exhibit design challenge will require students to imagine a new raptor experience section on the Minnesota Trail, expanding the existing bald eagle habitat and developing and additional three new spaces for red tailed hawk, great horned owl, and burrowing owls currently found behind the scenes while meeting animal, visitor, and zookeeper needs.

Students will need to make special considerations such as:

- How can the empty space be divided to accommodate the individual species?
- How can the existing bald eagle space be reimagined to solve existing challenges?
- What will the new habitats look like and how can it be designed to address husbandry challenges for the animals?
- How can the space highlight Minnesota bird conservation efforts and the threats these animals face in the wild?
- What can be done to allow visitors to feel more connected to the animals?
- How can the habitats allow staff to safely and easily access the ambassador species for encounters and Wings and Things shows?
- How can the space allow the zookeepers to provide better care for the animals, such as their off-habitat spaces, training, and providing enrichment easier?
- How can the new space incorporate the Zoo's mission of connecting people to the natural world to save wildlife through immersive design and interactive interpretive elements?

## A CLOSER LOOK AT EXHIBIT DESIGN

Zoos are frequently welcoming new animals, whether it be in a brand-new exhibit or in an existing one.

Whatever the case may be, the zoo exhibit designer's job is to design the best environment for the animals as well as the keepers and the visitors.

Designing an exhibit starts by researching the animal's natural environment to learn all they can about the animal's habitat, including the plants, climate, and topography. Research might also include a consideration of the animal's behavior, such as how much space it needs, if it climbs, jumps, or swims, and how strong it is.

Working cooperatively with curators, zookeepers, educators, artists, engineers, and many others, exhibit designers must also consider the needs of the keepers, by creating functional and easy-to clean spaces, and the visitors, by creating exhibits that are educational, and interactive, and deliver an important message about conservation. Balancing these needs in one design is a difficult job with many differing opinions and constraints!



## PROJECT REQUIREMENTS BY LEVEL

### Level 1: 3<sup>rd</sup> – 5<sup>th</sup> Grade Requirements

- Development of a **physical or digital model** that closely resembles the shape/size of the animal exhibits and surrounding visitor spaces for bald eagle and 2 Zoo raptor species. (*no dioramas*)
- **Basic bird's eye view blueprint (see Figure 1)**
  - Label key features and design elements.
  - Include a key with measurements/dimensions of key exhibit features (tree height, barrier height, water depth, etc.)
  - *Optional:* Panoramic profile drawing of the exhibit (see Figure 2)



**Figure 1**

### Level 2: 6<sup>th</sup>-8<sup>th</sup> Grade Requirements

- Development of a **physical or digital model that is scaled or closely resembles the actual Zoo exhibit blueprint measurements/shape** of the animal exhibit and surrounding visitor and Zookeeper spaces for bald eagle and 2 Zoo raptor species.
- **Scaled bird's eye blueprint (see Figure 1)**
  - Labeling of key features and design elements
  - Include a chart of scaled and real-world measurements of exhibit features and the scale. being used (tree height, barrier height, water depth, etc.) •
  - *Optional:* Panoramic profile drawing of the exhibit (see Figure 2)

### Level 3: 9<sup>th</sup>- 12<sup>th</sup> Requirements

- Development of a **physical or digital model that is scaled or closely resembles the actual Zoo exhibit blueprint measurements/shape** of the animal exhibit and surrounding visitor and Zookeeper spaces for bald eagle and 2 Zoo raptor species.
- **Scaled bird's eye blueprint including: (see Figure 1)**  
*Use of technology (CAD) is encouraged to draft an accurately scaled blueprint, but required*
  - Labeling of key features and design elements
  - Include chart of scaled and real-world measurements of exhibit features as well as the scale being used (tree height, barrier height, water depth etc.)
    - Mark changes in elevation for both land and water features.
    - Total volume/area of the enclosure(s) and any water or shelter features.
  - Include any important material and safety specifications for real world materials used in exhibit (*ex: glass thickness, fence or visitor barrier height, water depth, type of plants being used, dimensions of zookeeper and shift doors*)
- **Panoramic profile drawing of the exhibit from visitor perspective (see Figure 2)**

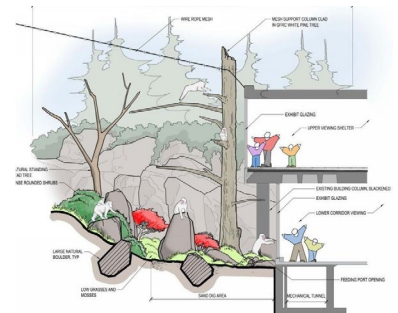


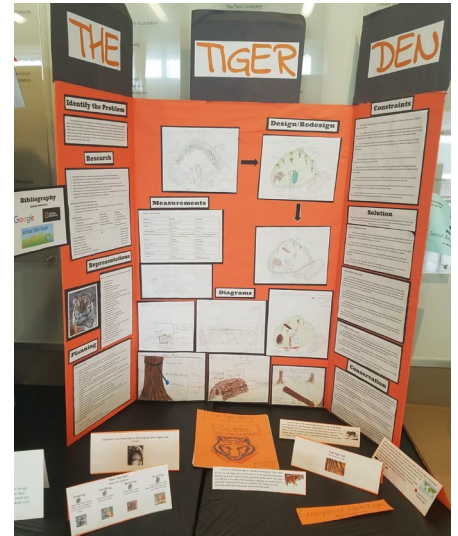
**Figure 2**

## ADDITIONAL REQUIREMENTS FOR ALL LEVELS

**Presentation of Engineering Process:** A visual presentation documenting each step during the design process.

| High Tech Presentation Options:                                                                      | Low Tech Presentation Options:                                                       |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Google Slides (preferred)</li> <li>• Power Point</li> </ul> | <ul style="list-style-type: none"> <li>• Tri Fold Board</li> <li>• Poster</li> </ul> |

☐ *Minimum required written sections for presentation of engineering process (at teacher's discretion). Students should still be prepared to address non-required sections in verbal presentation.*



**Problem:** Why is this solution needed?

**Research:** What are the natural behaviors of the animal? What does its natural habitat look like? What are the husbandry requirements? Does research support decision-making throughout the design process?

**Constraints:** What factors prevent a perfect design (ex: cost, space)? Could your solution exist in real life? What issues might you encounter if your plan was chosen to build?

**Planning:** Brainstorm possible solutions. How did you modify your design along the way? Save sketches and documents created through the process to document the evolution of ideas.

**Final Design:** Select the best solution. What are the main features of the new exhibit? What are the measurements/dimensions? Is there a theme? What are the real-life materials that would be used? How does the exhibit design act as a solution to the problems mentioned in the challenge?

- How does the design meet animal, keeper, and visitor needs?
- Is the space functional, safe, and does it mimic the animal's natural habitat?
- Does the new design include any zoo-specific requested features?
- Does the new design improve the current challenges of the exhibit?
- How does the design differ from the current exhibit?

**Conservation Connection:** How does exhibit design help the Minnesota Zoo with conservation efforts? How is the animal doing in the wild? What can visitors learn at the exhibit to help them act on behalf of wildlife? What real world actions can people take?



## CONDITIONS

Open to all 3rd-12<sup>th</sup> grade teachers and their students

- Students must work with students in their grade level range (3-5, 6-8, or 9-12) unless approved by the Zoo.
- Students should work in groups of 2-4 students.
- Teachers must register to participate no later than Friday, November 13<sup>th</sup>, 2026.
- Field trips are not required to participate, joining ZOOMS STEM Design Challenge is free!  
➤ *ZOOMS animal species visibility for field trips is never guaranteed due to last animal care needs. Field trips should be planned accordingly in the rare event an animal is off habitat.*

## EVALUATION

1. **Presentation Checklist (5 pts):** Visual presentation addresses required sections: Problem, Research, Planning, and Final Design.
2. **Engineering Process (25 pts):** Demonstration of how the engineering design process was used in the development of the exhibit design solution. Evidence of design/redesign.
3. **Solution (30 pts)**
  - a. How will the space improve on existing designs and address current husbandry challenges with the species? Can the design exist in real life?
  - b. Does the design meet animal, zookeeper, and visitor needs?
  - c. What is the conservation and educational message? What will guests learn?
  - d. How can the space mimic the animal's natural habitat in the wild?
  - e. How can environmental enrichment be built in to encourage natural behaviors of the species?
  - f. How can the new design incorporate cutting edge trends in habitat design of AZA Zoos?
  - g. Birds-eye blueprint includes real world measurements of key features and elements.
4. **Creativity and Conservation (15 pts):** Originality of approach to problem solving and solution. Demonstrates knowledge of conservation as it connects to the project and species, including suggested actions to take or includes purposeful design elements.
5. **Teamwork/Presentation (10 pts)** Effective communication, organized presentation, demonstrates collaboration. The presentation is well organized and follows guidelines of what to include.

## ASSESSING PROJECTS TO SUBMIT FOR EXHIBITION CONSIDERATION

### Teacher Choice

Teachers may evaluate projects individually or host their own Design Challenge Virtual/Classroom showcase at their school.

### In Person or Virtual Feedback Session with the MN Zoo Education Staff

*\*In-person visits are limited to schools 1 hour from Zoo and dependent on staff availability.*

Education staff members(s) may be available to listen to student presentations or provide verbal feedback on design solutions during the planning phase.

Appointments for zoo staff to meet virtually with your students must be scheduled 2 weeks in advance. Please contact [Kristi.Berg@state.mn.us](mailto:Kristi.Berg@state.mn.us) to arrange.



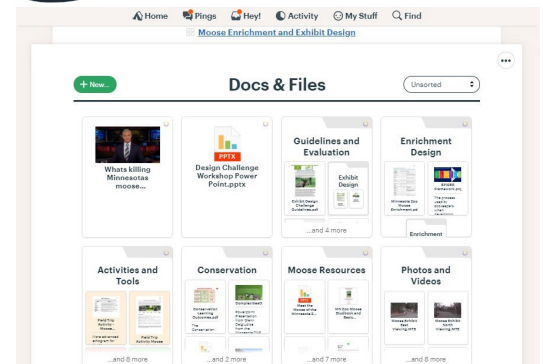
## ZOOMS EXHIBITION

- Teachers can submit up to 20% of their student projects near the end of January to be considered to advance to the in-person ZOOMS Exhibition or Virtual Exhibition (*\*limited virtual spots*). Select projects will be chosen to present their projects to Zoo staff during ZOOMS Exhibition Week in early March. Teachers planning to submit projects will use a Google submission form link that will be shared on Basecamp in November.
- Submission does not guarantee a spot at the exhibition. Projects will be narrowed by zoo staff and announced in mid-February.
- In person at the Zoo Exhibition and a Limited Virtual Exhibition (pre-recorded or live Zoom presentations) option is available. Schools on spring break during exhibition week or that are more than 2+ hours from the Zoo will be given priority to virtual spots.
- While we do our best to have all schools submitting projects for consideration represented at the exhibition, we are unable to guarantee every school will have a project advance due to the high volume of submissions the Zoo receives.

## TEACHER TRAINING AND SUPPORT

Teacher and student participation in the ZOOMS Design Challenge is FREE! Teachers will be given access to Basecamp, an online communication portal for teachers to access digital resources to support the implementation of the design challenge with their students.

Participating teachers may also choose to attend the free in-person September ZOOMS teacher training or access a shorter on-demand pre-recorded ZOOMS training (shared in early October). This training overviews the design challenges, shares background info about the animals and exhibit spaces, and highlights resources to assist teachers with planning and implementing the challenge in the classroom. Teachers will also receive ongoing support from zoo staff through Basecamp during the school year to assist in answering student questions, clarifying project requirements, and helping with curriculum planning as needed.



**ZOOMS Classroom Sign up:** To have your class participate this school year, visit [mnzoo.org/stem](https://mnzoo.org/stem) and click the 'Sign Up Now' link to fill out the form.

**ZOOMS Teacher Training Registration:** To attend the fall ZOOMS in person training, visit: <https://mnzoo.org/professional-dev/> *\*Space is limited!*



## IMPORTANT DATES

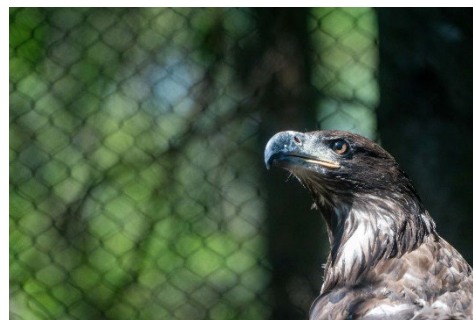
|                                                                                                                      |                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STEM at the Zoo: Intro to the ZOOMS Design Challenge Teacher Training<br><i>*Recommended for New ZOOMS Teachers!</i> | Thursday, August 6, 2026 9 am – 3 pm<br><i>*Registration Required - FREE</i>                                                                                                                                                                                      |
| In Person ZOOMS Design Challenge Teacher Training at Minnesota Zoo (Option 1)                                        | Thursday, September 24, 2026 9 am-3 pm<br><i>*Registration Required- FREE</i>                                                                                                                                                                                     |
| ZOOMS Design Challenge On-Demand Teacher Training Recording (Option 2)                                               | <i>*Recording will be available by October 1<sup>st</sup> and shared on Basecamp.</i>                                                                                                                                                                             |
| ZOOMS Challenge Class Registration Closes                                                                            | Friday, November 13, 2026                                                                                                                                                                                                                                         |
| Closing Date for Virtual and In-person ZOOMS Exhibition Project Submissions                                          | January 28, 2027 at 12 pm                                                                                                                                                                                                                                         |
| ZOOMS Exhibition Week (In Person and Virtual)                                                                        | March 1-5, 2027<br>Monday –Virtual Exhibition Day (3-5; 6-12)<br>Tuesday – Middle and High School Day<br>Wednesday – Elementary Enrichment Day<br>Thursday – Elementary Exhibit Design Day<br>Friday – Virtual Awards Announced, All Awards shared on Zoo Website |

## CONTACT

Reach out to STEM Specialist and ZOOMS Challenge Coordinator, Kristi Berg, for further questions and information.

Email: [STEM@mnzoo.org](mailto:STEM@mnzoo.org)

Visit [mnzoo.org/stem](http://mnzoo.org/stem) to learn more!



**Thank you to our ZOOMS Sponsor!**

